

RESEARCH ON LEARNING MODALITIES: A BIBLIOMETRIC STUDY OF GLOBAL SCHOLARSHIP (2001–2023)

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DOI: <https://doi.org/10.5281/zenodo.16993452>

Received	Revised	Accepted	Published
29 April, 2025	29 June, 2025	29 July, 2025	29 August, 2025

ABSTRACT

This research paper aims to conduct a comprehensive bibliometric analysis on the topics of visual learning, aural learning, verbal learning, physical learning, logical learning, and social learning. The analysis covers the period from 2001 to 2023 and involves data retrieved from the Web of Science (Core Collections) database on 29-10-2023, and 3560 published documents have been extracted. An analysis has been made using Biblioshiny, VOSviewer, ScientoPy, and MS Excel. The study analysis parameters include keyword analysis, authorship patterns, citation analysis, and geographical analysis. Analyzed the processed data to interpret trends, emerging topics, and influential factors within the domain of visual learning, aural learning, verbal learning, physical learning, logical learning, and social learning. The study findings reveal that the highest publication year is 2021, and also the highest citation year as well. The highest subjects of the published years have been reported as psychology, computer science, and education & educational research. The top country of the published research documents has been reported as the United Kingdom, the United States as the top productive country, and the top publication sources named as Archives of Clinical Neuropsychology. Social learning has been found as a top co-occurrence keyword and an author keyword as well.

Keywords: Visual Learning, Verbal Learning, Physical Learning, Logical Learning, Social Learning

INTRODUCTION

In the fields of sociology of education and educational psychology, understanding the various components of learning has been found to create effective teaching strategies and accommodating students learning styles in developing and developed world (Lahey & Rizopoulos, 2023; Lasrado, Dean, & Eady, 2024; Ludwig & Tassinari, 2023; Peeters & Mynard, 2023; Shoaib, Shehzadi, & Abbas, 2023). It has been observed that visual learning, physical learning, verbal

learning, logical learning, auditory learning, and social learning represent distinct modalities that students assimilate information and create knowledge (Booton, Hodgkiss, & Murphy, 2023; Bradley, Bartram, Al-Sabbagh, & Algers, 2023; Tarkiainen, Heino, Tapola-Haapala, & Kara, 2021). These instructional components have been extensively studied in the fields of sociology of education, psychology, education, neuroscience and have also

shaped the way educators' tactics instruction and curriculum design (Ramos, Cattaneo, de Jong, & Espadeiro, 2021; Tchoukaleyska et al., 2021). Similarly, visual learning involves the use of imagery to enhance understanding, visual aids, and auditory learning acmes auditory stimuli, and verbal learning emphasises language communication (Piumatti, Abbiati, Gerbase, & Baroffio, 2021; Podsiadlik, 2021). However, logical learning emphasizes reasoning and problem solving. Likewise, physical learning integrates tactile experiences, and social learning emphasizes the importance of collaborative interactions among students (Nicolaidou, Pissas, & Boglou, 2021; Pawlak, Zawodniak, & Kruk, 2021). It is worth to mention here that each learning style furnishes to a specific set of cognitive predilections and skills, and acknowledging (McMillan & Moore, 2020). This multiplicity has been found essential to foster an inclusive learning environment for students (Leatherman & Cleveland, 2020; Shoaib, 2021; Shoaib, Abdullah, & Ali, 2020; Shoaib, Ali, & Akbar, 2021). Sociologists, Psychologists, and educators have investigated these components of learning through an assortment of methodologies, including psychological experiments, empirical studies, and educational interventions (Kisanga & Kisanga, 2020; Shoaib, 2023a, 2023b; Shoaib, Ali, & Akbar, 2021; Shoaib, Fatima, & Jamil, 2021). Educators adjust their teaching methods to more effectively lead to improved academic performance (Shoaib, 2024b, 2024c), engage students, and deeper understanding of the subject specifically, sociology of education, educational psychology, and education (Shoaib, 2024a, 2024d, 2024e).

It has been asserted that visual learning has been linked to the process of understanding and retaining information through visual means (Jacobs, Parke, Ziegler, Headleand, & De Angeli, 2020; Shoaib, Waris, & Iqbal, 2025b, 2025c; Shoaib, Waris, & Iqbal, 2025b; Shoaib & Zaman, 2025). Similarly, auditory learning, also known as auditory learning, involves learning through hearing and listening (Dougherty & Callender, 2020; Shoaib, Waris, & Iqbal, 2025a; Shoaib, Waris, & Iqbal, 2025a). Auditory learners excel at absorbing information through the spoken word, discussions, lectures, and other auditory stimuli (Shoaib, Tariq, & Iqbal, 2025a, 2025b; Shoaib, Tariq, Rasool, & Iqbal, 2025). Likewise, verbal learning focuses on language

communication (Shoaib, Rasool, Zaman, & Ahmed, 2025; Shoaib, Shamsheer, & Iqbal, 2025; Shoaib, Shamsheer, & Shamraiz Iqbal, 2025; Wrigglesworth & Harvor, 2018). Students who excel in verbal learning learn best through writing, speaking, reading, and listening (Othman, Manap, Ramli, & Kassim, 2018; Shoaib, Kausar, Ali, & Abdullah, 2025; Shoaib, Rasool, Kalsoom, & Ali, 2025). They often rely on words, both written and spoken, to understand, communicate information and process (Shoaib, Ali, & Kausar, 2025; Shoaib, Iqbal, & Iftikhar, 2025). In the same way, verbal learners have been found to be very very skilled in language-related activities and excel in areas including reading comprehension and writing (Shoaib, Ali, Iqbal, & Abdullah, 2025; Shoaib & Bashir, 2025). However, bodily learning, also known as kinesthetic learning, involves understanding and retaining information through physical activities and hands-on experiences (Shoaib, Ahmed, & Usmani, 2025a; Shoaib, Ahmed, Zaman, & Abdullah, 2025). Moreover, logical learning has been reported as logical-mathematical intelligence, is centered around logic, problem solving, and reasoning (Marunda-Piki, 2018; Shoaib, Ahmed, Iqbal, & Abdullah, 2025; Shoaib, Ahmed, & Usmani, 2025b). Students with this learning style excel at understanding complex patterns, relationships, and structures (Shoaib, 2025b; Shoaib, Ahmed, & Iqbal, 2025). Further, social learning emphasizes the importance of social interactions and collaboration in the learning process among students (Ali, Shoaib, & Kausar, 2025; Shoaib, 2025a). It is adept at understanding empathizing with others, social cues, and working effectively in teams (Ahmed, Shoaib, & Zaman, 2025; Shoaib, 2025b).

Main Objective: This study aims to conduct a comprehensive bibliometric analysis on the topics of visual learning, aural learning, verbal learning, physical learning, logical learning, and social learning. The analysis covers the period from 2001 to 2023 and involves data retrieved from the Web of Science (Core Collections) database. The study also explores the trends, patterns, and influential factors in scholarly publications related to these learning components.

Review of Literature

Several studies have been conducted to examine the learning modalities include visual learning, auditory learning, verbal learning, physical education, logical

learning, and social learning in the developing and developed world. Visual learning has been extensively researched in the field of education. Studies by Mayer (2011) and Mayer (1989) have shown that the use of visual aids such as diagrams and graphs improves students' understanding and retention of complex concepts. Visual learning strategies have been integrated into modern educational technologies that provide interactive visual simulations that cater to different learning styles (Jonassen, Hernandez-Serrano, & Choi, 2000). Similarly, auditory learning, or auditory learning, focuses on the importance of sound and speech in the learning process. Research by Vesonder and Voss (1985) emphasizes the role of active listening in educational contexts. The integration of podcasts and audio lectures into e-learning platforms has revolutionized auditory learning and made education accessible to auditory learners (Liu & Lan, 2025). Likewise, verbal learning emphasizes language-based communication. A study by Snow and Hoefnagel-Höhle (1978) examined the importance of language acquisition and its impact on cognitive development. Educational interventions such as language-based games and storytelling have been used to improve children's verbal learning skills (Lake, 2015). However, kinesthetic or physical learning involves hands-on experience. Researchers such as Williams, Anderson, and Winett (2005) have investigated the link between physical activity and better learning outcomes. Implementation of experiential learning techniques in classrooms, including role playing and interactive experiments, addresses the needs of kinesthetic learners (Tanner, 1980). Further, logical learning focuses on reasoning and problem-solving skills. Studies by Halpern (1998) delved into the cognitive processes underlying logical thinking. Incorporating logic puzzles and critical thinking exercises into the curriculum improves logical learning skills among students (Elder & Paul, 2007). In the same way, social learning emphasizes collaborative interactions. Social learning theory (Bandura, 1986) was the basis for understanding the influence of peers and mentors on learning. The implementation of group discussions, peer teaching, and collaborative projects in education develops social learning skills (Johnson & Johnson, 1999). A huge body of literature have been found to use bibliometric analysis technique to examine different patterns and trends of existing published research

documents (Ali, Zaman, & Shoaib, 2024; Shoaib, Abdullah, & Ali, 2021; Shoaib, Ahmad, Ali, & Abdullah, 2021; Shoaib, Ali, Anwar, Rasool, et al., 2021; Shoaib, Usmani, & Ali, 2022; Shoaib, Zaman, & Abbas, 2024). Similarly, the studies have focused to assess the published documents on learning outcomes (Shoaib, Ali, Anwar, & Shaukat, 2021), precautionary measures of COVID-19 (Shoaib, Ali, & Naseer, 2021), social work education (Shoaib, Usmani, & Abdullah, 2023), and research visualizations of COVID-19 (Naseer, Shoaib, Ali, & Bilal, 2021). Similarly, several studies have also been conducted to examine learning aspects of students using different domains including qualitative and quantitative approaches (Crogman & Trebeau Crogman, 2018; Goodlad, Westengard, & Hillstrom, 2018; Hargreaves, Elhawary, & Mahgoub, 2018; Henry, Carroll, Cunliffe, & Kop, 2018).

Theoretical Framework

This study is grounded in the theoretical perspectives of learning theories and scientometric analysis frameworks, which together provide a basis for understanding the evolution, patterns, and dynamics of research on diverse learning modalities.

Learning Theories as Conceptual Foundation: The investigation draws upon the tradition of cognitive and social learning theories that recognize multiple modes of learning as central to human knowledge acquisition. The classification of visual, aural, verbal, physical, logical, and social learning is largely influenced Multiple Intelligences Theory (Gardner, 1995), which highlights the diverse ways students process and apply knowledge. Additionally, Social Learning Theory (Bandura, 1986) emphasizes the interactive role of observation, imitation, and modeling in learning that aligns with the prominence of 'social learning' observed in the bibliometric results. These frameworks justify the multidimensional exploration of learning as both a student and a social phenomenon.

Bibliometric and Scientometric Framework:

To systematically examine the structure and growth of knowledge production, this study employs a bibliometric approach, drawing upon the principles established by Theory of Scientific Growth (Price, 1963) and further informed by Lotka's Law (Egghe,

1992), Bradford's Law (Borgohain, Verma, Nazim, & Sarkar, 2021), and Zipf's Law (Corral, Boleda, & Ferrer-i-Cancho, 2015). These scientometric principles enable the mapping of research trends, authorship patterns, citation dynamics, and keyword co-occurrence across disciplines.

Integration of Learning and Bibliometric Perspectives: By integrating learning theories with bibliometric analysis, the framework conceptualizes learning research as both a substantive domain of inquiry (what is studied learning modalities) and a social system of knowledge production (how it is studied publication patterns, citations, and collaborations). This dual perspective allows the study to interpret not only the volume and direction of research growth but also the thematic priorities and intellectual structures shaping the field.

Thus, the theoretical framework situates the bibliometric analysis of visual, aural, verbal, physical, logical, and social learning within the intersection of educational theory and scientometric paradigms, providing a lens to understand emerging trends, influential factors, and the evolving significance of different learning modalities in global scholarship.

The Data and Methods

This study has been based on the bibliometric analysis of the published documents on the search query: visual learning, aural learning, verbal learning, physical learning, logical learning, and social learning from 2001 to 2023. The data have been extracted on

29-10-2023 and 3560 published documents have been extracted from Web of Science (Core Collections) and analysis has been made using Biblioshiny (a bibliometric analysis tool, to preprocess and clean the retrieved data for analysis), VOSviewer (a software tool for constructing and visualizing bibliometric maps, to create visual representations of research networks, co-authorships, and keyword clusters), ScientoPy (a Python library for scientometric and bibliometric analyses, to perform statistical computations and identify patterns within the dataset), and MS Excel (for organizing and structuring the data, allowing for further analysis and generating visualizations). The study analysis parameters include keyword analysis (identified and analyzed keywords associated with each learning component to understand prevalent themes and research focus), authorship patterns (explored prolific authors and collaborations to recognize influential researchers and research networks in the field), citation analysis (examined citation patterns to identify seminal works and their impact on subsequent research), and geographical analysis (investigated the geographical distribution of research output to recognize regional contributions to the study of learning components). Analyzed the processed data to interpret trends, emerging topics, and influential factors within the domain of visual learning, aural learning, verbal learning, physical learning, logical learning, and social learning.

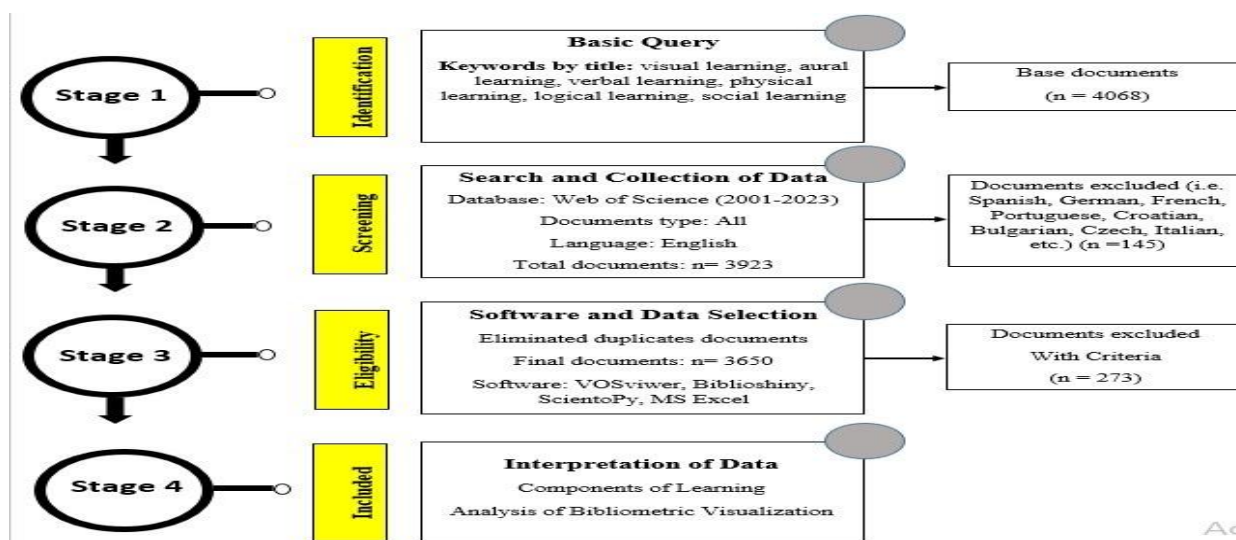


Figure 1: Flow Chart of Search Query and Data Screening

Results and Discussion

The provided data spans in Figure 1 from 2001 to 2023 and comprises a total of 3,560 documents sourced from 1,766 journals, books, and other publications. The data indicates an annual growth rate of 4.82 percent, showcasing a steady increase in scholarly output over the years. The average age of the documents stands at 8.58 years, suggesting a mix of recent and older publications. These documents have an average of 22.06 citations per document, indicating a relatively high impact within the academic community. The references within these documents amount to a total of 101,891, indicating a rich

network of interconnected scholarly works. Additionally, the dataset includes 9,796 unique authors, with 454 single-authored documents and an average of 3.61 co-authors per document, demonstrating a prevalent trend of collaborative research. Moreover, 24.38 percent of the collaborations are international, underlining the global nature of the research network represented in the data. The presence of a substantial number of keywords and author-generated terms further enriches the dataset, reflecting the diverse and multifaceted nature of the research topics covered.

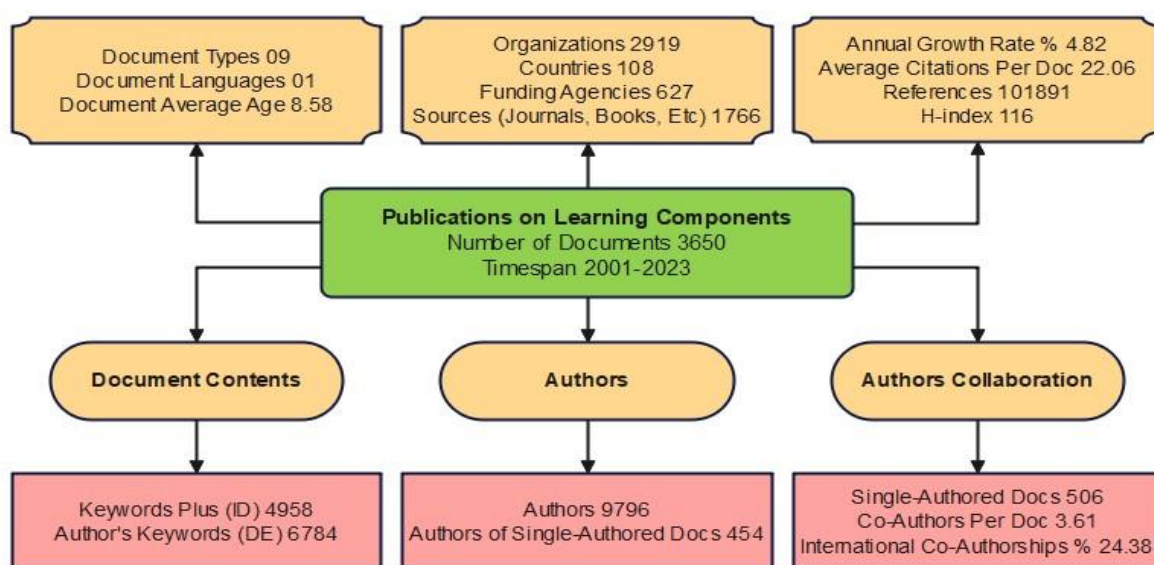


Figure 2: Main Information about Data

Table 1

Published Document and Citation by Year

Publication Years	Record Count	Citations	Publication Years	Record Count	Citations
2001	61	80	2013	204	3394
2002	55	72	2014	203	3861
2003	49	163	2015	189	4334
2004	83	276	2016	189	4699
2005	85	413	2017	225	5203
2006	92	569	2018	226	5861
2007	112	898	2019	223	7444
2008	113	1167	2020	220	7658
2009	127	1477	2021	261	8974
2010	137	1990	2022	229	8806
2011	168	2266	2023	129	5993
2012	180	2991			

The provided data in Table 1 (see Figure 3) illustrates the publication trends and citation counts in the field over a span of 23 years, from 2001 to 2023. The number of publications shows a general upward trajectory, with fluctuations in certain years. Notably, the number of publications steadily increased from 61 in 2001 to a peak of 261 in 2021, indicating a growing volume of research output. Correspondingly, the citation counts also reflect a consistent rise, suggesting that the research produced during these years has

garnered increasing attention and recognition within the academic community. The data reveal significant growth from 80 citations in 2001 to a peak of 8,974 citations in 2021, indicating the expanding impact and influence of the scholarly work. The slight decrease in the number of publications and citations in 2023 might indicate a shift in research focus or a temporary trend, emphasizing the dynamic nature of academic contributions within this period.

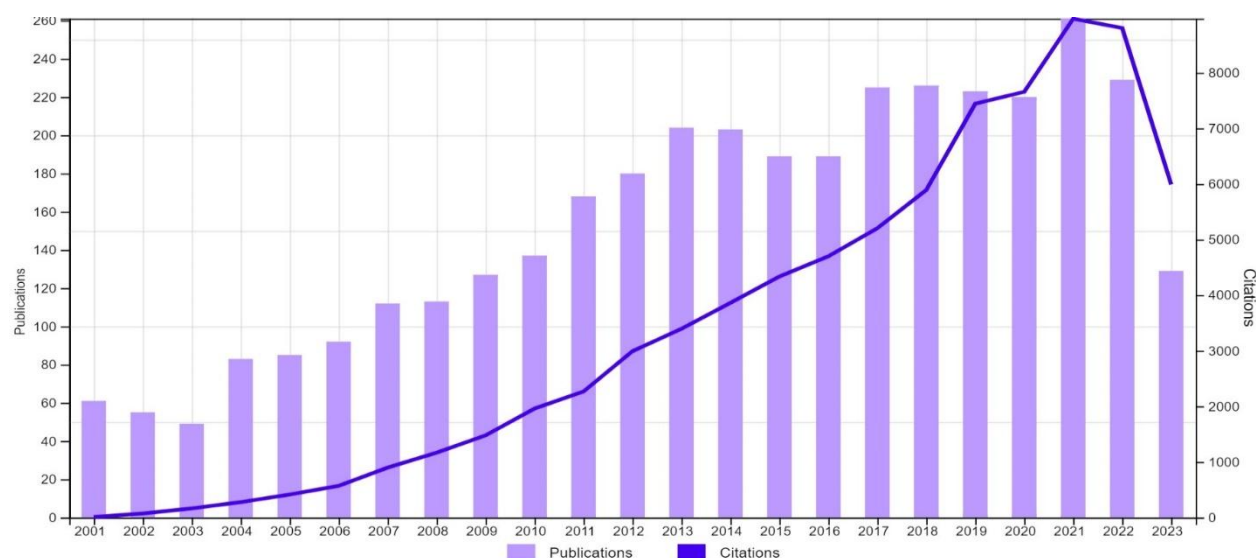


Figure 3: Published Document and Citation by Year

Table 2

Subject of the Published Documents

Sr. No.	Subject	Total	AGR	ADY	PDLY	h-Index
1	Psychology	594	-8	34	5.7	66
2	Computer Science	477	-12	15	3.1	38
3	Education & Educational Research	385	-8	14	3.6	34
4	Neurosciences & Neurology	361	-3	19	5.3	52
5	Environmental Sciences & Ecology	311	0	20	6.4	59
6	Business & Economics	272	-18	18	6.6	43
7	Engineering	238	3	16	6.7	27
8	Behavioral Sciences	225	1	7	3.1	53
9	Science & Technology - Other Topics	176	-8	11	6.2	31
10	Zoology	170	5	6	3.5	48

The provided data in Table 2 (see Figure 4) presents a comparative analysis of research output in various

academic disciplines. Psychology emerges as the leading field with 594 publications, showcasing a

substantial body of work. Despite a slight decrease in publications (-8% Annual Growth Rate, AGR), Psychology maintains a strong presence with an average document age (ADY) of 34 years, suggesting enduring relevance. The field exhibits a relatively high productivity per document per year (PDLY) at 5.7 and boasts an impressive h-index of 66, indicating a significant impact on academic literature. Computer Science follows closely with 477 publications, although it experiences a decline in output (-12% AGR). The field has a lower ADY of 15 years, indicating a focus on contemporary topics. Despite a modest PDLY of 3.1, Computer Science maintains a respectable h-index of 38, denoting substantial

influence within its domain. Education & Educational Research, with 385 publications, demonstrates a stable presence despite an -8 percent AGR. The field exhibits an ADY of 14 years and a PDLY of 3.6, suggesting consistent research output and relevance. The h-index of 34 underscores the impact of its contributions. Other disciplines, such as Neurosciences & Neurology, Environmental Sciences & Ecology, Business & Economics, and Behavioral Sciences, display varying levels of research output, growth rates, document ages, productivity, and impact, indicating the diverse landscape of academic productivity and influence across different fields.

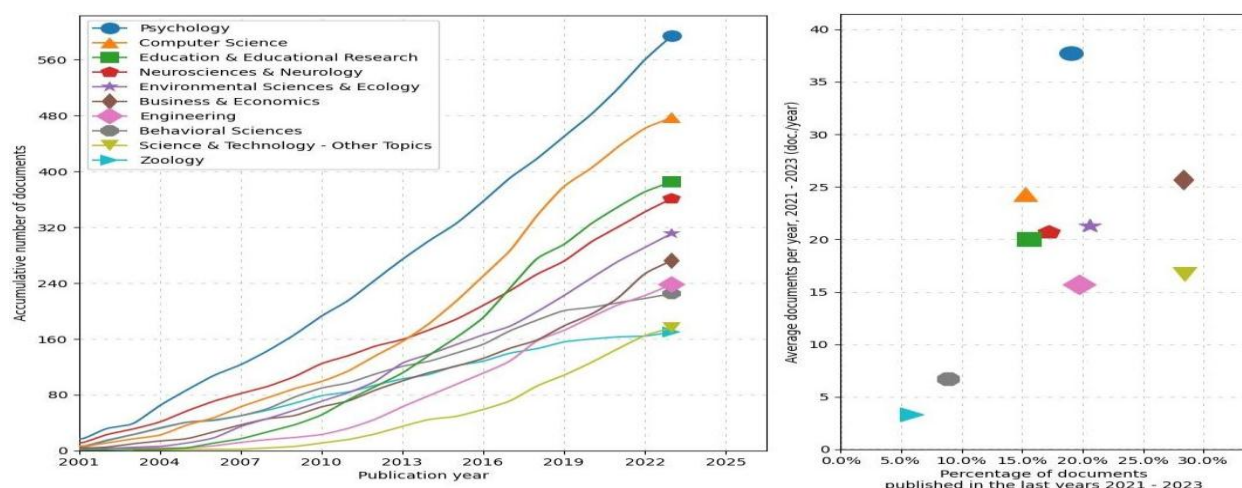


Figure 4: Subject of the Published Documents

Table 3

Top Organizations with Countries of the Published Documents

Sr. No.	Institution with Country	Total	AGR	ADY	PDLY	h-index
1	University St Andrews, United Kingdom	62	-3	1	1.6	30
2	Department Psychology, United States	46	0	0	0	25
3	University Calif San Diego, United States	34	-1	1	2.9	13
4	University Illinois, United States	31	0	2	6.5	13
5	MIT, United States	26	1	1	3.8	10
6	University Oxford, United Kingdom	26	0	2	7.7	17
7	University Florida, United States	25	3	3	12	13
8	Wageningen University, Netherlands	25	2	2	8	17
9	Stanford University, United States	23	1	3	13	13
10	University Penn, United States	23	1	2	8.7	9

Table 3 (see Figure 5) outlines the research performance of various academic institutions along with their respective countries. The University of St Andrews in the United Kingdom leads the list with 62 publications. Despite a slight decline in output (-3% Annual Growth Rate, AGR), it maintains a low average document age (ADY) of 1 year, indicating a focus on current research topics. However, the productivity per document per year (PDLY) is relatively low at 1.6, suggesting a slower publication rate. The institution boasts an h-index of 30, signifying a significant impact within its research domain. The Department of Psychology in the United States follows with 46 publications, showing

consistent output with no growth or decline (0% AGR). However, it has an ADY and PDLY of 0, indicating a lack of recent publications and productivity. The h-index of 25 suggests moderate influence within the academic community. Other institutions like the University of California, San Diego, the University of Illinois, and MIT exhibit varying levels of research output, average document ages, productivity, and impact. The data showcases the diverse research landscapes across institutions, emphasizing the importance of considering not only the quantity of publications but also the age, productivity, and impact of research output when evaluating academic institutions.

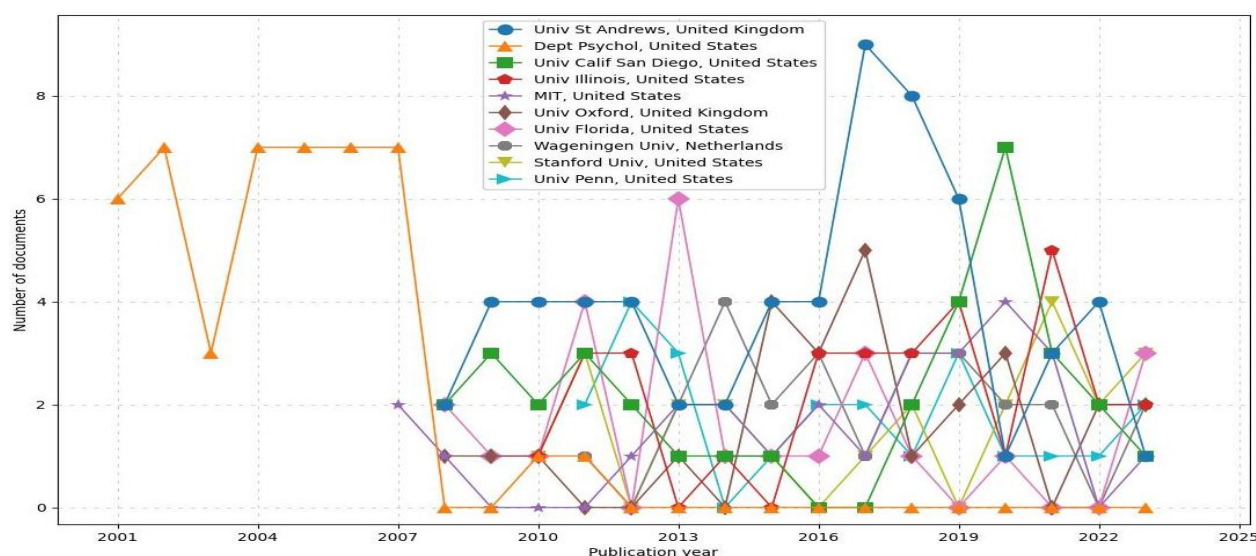


Figure 5: Distribution of Top Productive Organizations

Table 4
Top Productive Countries

Country	Articles	SCP	MCP	Freq.	MCP_Ratio
USA	1069	885	184	0.3	0.172
United Kingdom	334	230	104	0.094	0.311
China	260	208	52	0.073	0.2
Canada	168	127	41	0.047	0.244
Germany	142	86	56	0.04	0.394
Australia	131	87	44	0.037	0.336
Netherlands	121	68	53	0.034	0.438
Spain	94	76	18	0.026	0.191
Japan	58	46	12	0.016	0.207
Switzerland	58	29	29	0.016	0.5

Table 4 (see Figure 6) presents a comparative analysis of research output in different countries, highlighting

key metrics related to scholarly publications. The United States leads with 1069 articles, demonstrating

a significant research output. The country also excels in the Scopus Cited Publications (SCP) category with 885 articles, indicating the wide recognition and citation of American research globally. The United Kingdom follows with 334 articles, showing a substantial scholarly contribution. Interestingly, Switzerland exhibits a high ratio of Most Cited Papers (MCP) to SCP, indicating a concentrated impact with a balanced number of highly cited papers. China, with 260 articles, showcases a noteworthy research presence, further emphasized by a high MCP ratio of

0.2, indicating the significance of its cited papers. Other countries like Canada, Germany, Australia, the Netherlands, Spain, Japan, and Switzerland also contribute significantly to the global research landscape, each with distinct strengths. This data provides insights into the research productivity, citation impact, and concentration of highly cited papers across different nations, reflecting the diverse and competitive nature of academic research worldwide.

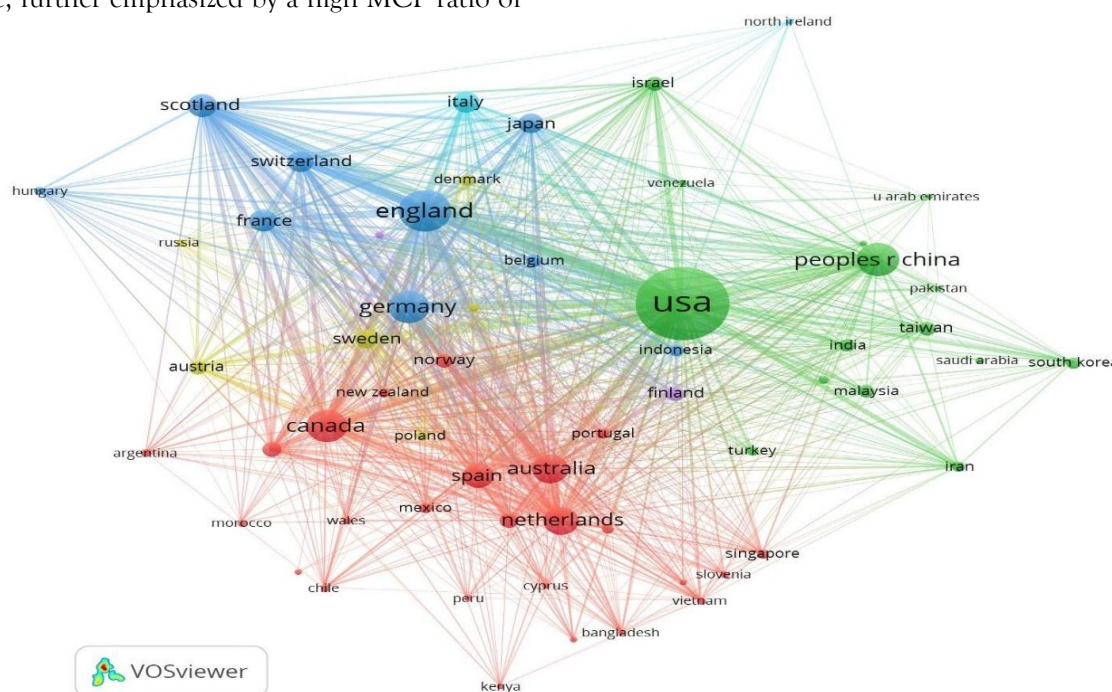


Figure 6: Top Productive Countries

Table 5 offers a snapshot of several academic journals and their corresponding publication metrics. Archives of Clinical Neuropsychology, Clinical Neuropsychologist, and Journal of the International Neuropsychological Society are consistent publications since 2001, indicating enduring contributions to the field. Animal Behaviour and Proceedings of the Royal Society B-Biological Sciences are noteworthy journals with substantial citation counts, emphasizing their influence in the academic community. PLOS ONE, a relatively newer journal since 2008, has gained recognition with a significant number of publications and a respectable h-index. Sustainability and Ecology and Society, although not

as prolific in terms of the number of articles, have notable m-indices, indicating a concentrated impact through a cluster of highly cited papers. Journal of Clinical and Experimental Neuropsychology and Animal Cognition exhibits consistent contributions, with moderate citation counts, suggesting a stable presence in the academic landscape. This data underscores the diversity in the academic impact of journals, highlighting factors such as longevity, citation counts, h-indices, g-indices, m-indices, and the year of publication initiation. It demonstrates the varied contributions of these journals to their respective fields, showcasing their influence and longevity in the academic community.

Table 5

Top Publication Sources

Journal	Publication	Citation	h_index	g_index	m_index	PY_start
Archives of Clinical Neuropsychology	102	1397	16	37	0.696	2001
Clinical Neuropsychologist	68	879	17	29	0.739	2001
Animal Behaviour	60	2576	31	50	1.348	2001
Plos One	34	614	14	24	0.875	2008
Journal of the International Neuropsychological Society	32	1540	16	32	0.696	2001
Proceedings of The Royal Society B-Biological Sciences	30	1502	19	30	0.826	2001
Journal of Clinical and Experimental Neuropsychology	28	692	13	26	0.565	2001
Sustainability	27	230	8	14	0.667	2012
Ecology and Society	26	2384	21	26	1.167	2006
Animal Cognition	24	859	15	24	0.682	2002

Table 6
Co-occurrences of All Keywords

Keywords	Occurrences	Total Link Strength	Keyword	Occurrences	Total Link Strength
Social Learning	944	2209	Learning	122	302
Behavior	263	777	Management	114	358
Memory	247	730	Children	111	337
Evolution	197	720	Education	102	267
Performance	184	593	Cultural Transmission	94	336
Information	169	586	Cognition	90	299
Knowledge	134	474	Social Learning Theory	88	150
Model	132	313	Networks	87	245
Transmission	130	509	Culture	86	318
Imitation	126	452	Verbal Learning	79	236

Table 6 presents a list of keywords along with their respective occurrences and total link strength, providing insights into the importance and influence of these terms within the context they are used. 'Social learning' emerges as a highly prevalent keyword, occurring 944 times and having a substantial total link strength of 2209, indicating its significant influence and interconnectedness within the academic literature. 'Behavior' and 'Memory' follow, with 263 and 247 occurrences respectively, showcasing their prominence in the research domain, supported by strong linkages. 'Evolution,' 'Performance,' and 'Information' also appear frequently, reflecting their relevance across various contexts. Notably, terms like 'Knowledge,' 'Model,' and 'Learning' are present,

underlining their foundational importance in academic discourse. Additionally, specific concepts such as 'Cultural Transmission,' 'Cognition,' and 'Social Learning Theory' are highlighted, indicating the nuanced focus within the broader field of study. This data provides valuable insights into the thematic focus and interconnectedness of keywords within the academic literature, shedding light on the key concepts and areas of interest in the study of learning, behavior, and related fields. The occurrences and link strength metrics offer a quantitative perspective on the significance of these terms, guiding researchers and scholars in understanding the trends and emphasis in relevant literature.

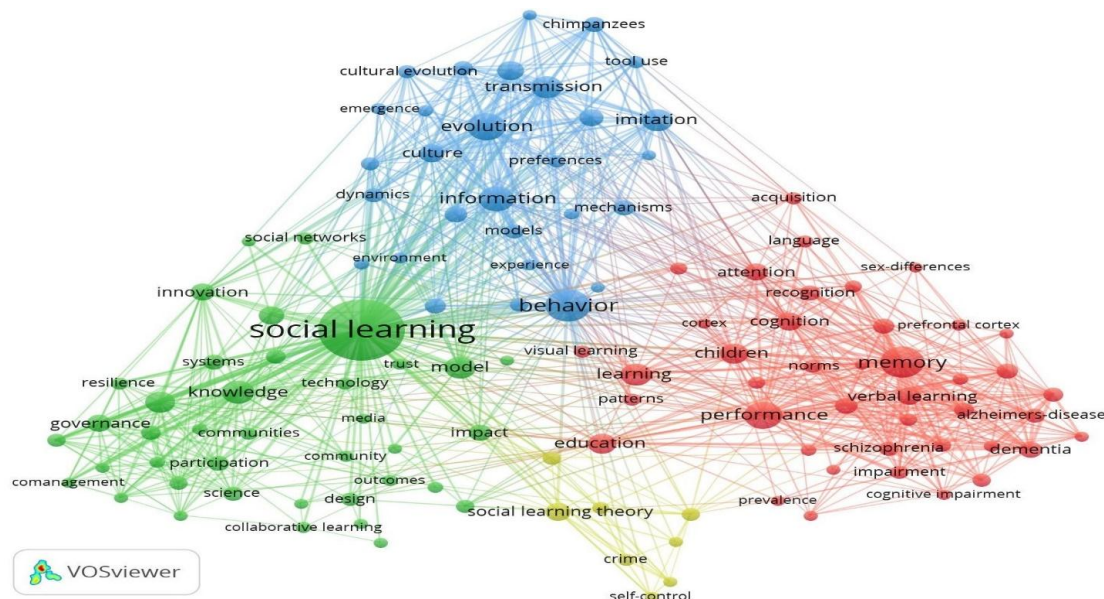


Figure 7: Co-occurrences of All Keywords

Table 7
Co-occurrences of Author Keywords

Author Keyword	Occurrences	Total Link Strength	Author Keyword	Occurrences	Total Link Strength
Social Learning	944	684	Visual Learning	39	9
Memory	138	204	Culture	35	60
Learning	122	143	Neuropsychology	34	60
Social Learning Theory	88	29	Innovation	33	52
Verbal Learning	79	98	Collaborative Learning	31	41
Cognition	63	94	Communities Of Practice	31	35
Imitation	55	104	E-Learning	30	33
Cultural Evolution	48	70	Schizophrenia	30	49
Social Networks	42	46	Episodic Memory	27	38
Verbal Memory	41	52	Higher Education	27	32

Table 7 (see Figure 8) lists various keywords, along with their occurrences and total link strength, offering insights into their significance and connections within academic literature. ‘Social learning’ stands out as the most prevalent keyword, occurring 944 times and having a substantial total link strength of 684, indicating its strong influence and extensive interconnections in scholarly research. ‘Memory’ follows with 138 occurrences and a total link strength of 204, highlighting its considerable importance in academic discussions. ‘Learning’ appears 122 times with a total link strength of 143, demonstrating its enduring relevance and scholarly connections. ‘Social

learning theory' and 'Verbal learning' are also noteworthy keywords, with 88 and 79 occurrences respectively, although their total link strengths are comparatively lower, indicating more specialized or focused discussions within the literature. 'Cognition' is cited 63 times with a total link strength of 94, signifying its significance in the academic discourse surrounding these topics. Other notable keywords include 'Imitation,' 'Cultural evolution,' 'Social networks,' and 'Visual learning,' each contributing to specific thematic areas within the broader context of learning and cognition. The data provides valuable insights into the prevalence and connections of these

keywords, guiding researchers in understanding the focal points and interrelated concepts within the domain of social learning, memory, and related fields.

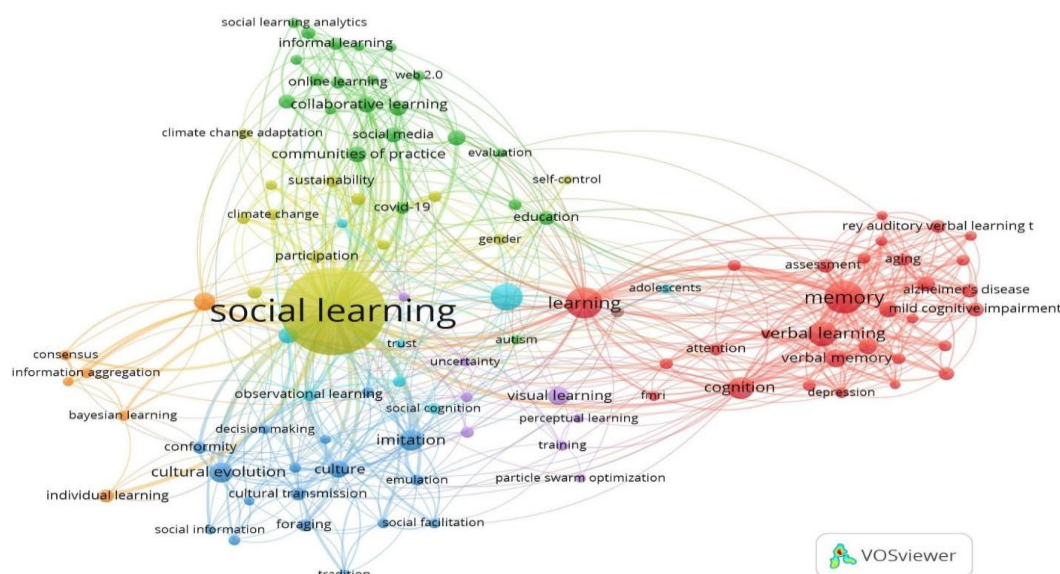


Figure 8. Co-occurrences of Author Keywords

Table 8
Author Keywords

Sr. No.	Author Keywords	Total	AGR	ADY	PDLY	h-index
1	Social Learning	914	-3.3	69	22.6	74
2	Memory	134	-1.7	7	15.7	30
3	Learning	116	-1.7	3.7	9.5	29
4	Social Learning Theory	85	-1.3	7.7	27.1	22
5	Verbal Learning	76	-0.3	3	11.8	20
6	Cognition	59	-1	2.3	11.9	19
7	Imitation	52	0.7	2	11.5	26
8	Cultural Evolution	48	0	3.3	20.8	21
9	Social Networks	41	-1.7	2	14.6	14
10	Verbal Memory	38	0.3	3.7	28.9	15

Table 8 (see Figure 9) presents a ranking of author keywords based on their total occurrences, annual growth rate (AGR), average document age (ADY), productivity per document per year (PDLY), and h-index. 'Social learning' tops the list with 914 occurrences, showing a slight decline in recent years (-3.3% AGR). Despite this, it maintains a high average document age of 69 years and a substantial productivity per document per year at 22.6, indicating enduring relevance and prolificacy. The keyword 'Memory' follows with 134 occurrences, displaying a moderate decrease in output (-1.7% AGR) but with a relatively low average document age of 7 years,

emphasizing its contemporary significance. 'Learning' and 'Social learning theory' exhibit consistent presence with 116 and 85 occurrences respectively. While their AGR is negative, indicating a decline, they maintain moderate PDLY values. 'Verbal learning' and 'Cognition' follow, demonstrating stable output with slight fluctuations in AGR. 'Imitation' and 'Cultural evolution' showcase positive growth, indicating increasing scholarly interest. 'Social Networks' and 'Verbal memory' also maintain their positions in the ranking, reflecting their consistent but relatively lower presence in the literature. This ranking provides insights into the

a dynamic landscape of research interests, with certain themes maintaining their importance over time and new concepts gaining traction within the academic community.



Cognitive Evolution and Learning: Authors Mesoudi from the USA and the Netherlands are linked to ‘Cognition’ and ‘Cultural Evolution,’ respectively, indicating research interests in these topics. Similarly, authors Chittka 1. from the USA and China are

associated with 'Learning,' showing a focus on learning processes. 'Social Learning' in the USA: Multiple authors in the USA are engaged in 'Social Learning,' indicating that this topic is a significant area of research within American academia. 'Memory' in UK and Canada: Authors from the United Kingdom and Canada are linked to 'Memory,' suggesting a research focus on memory related studies in these countries. 'Cultural Evolution' in Netherlands: Authors from the Netherlands are involved in 'Cultural Evolution,' signifying a research emphasis on cultural evolution processes in this country. In summary, the three field plot illustrates the diverse research interests of authors within specific countries and their associated keywords. It provides valuable insights into the thematic focus of researchers in different regions, highlighting key areas of emphasis within the field of study.

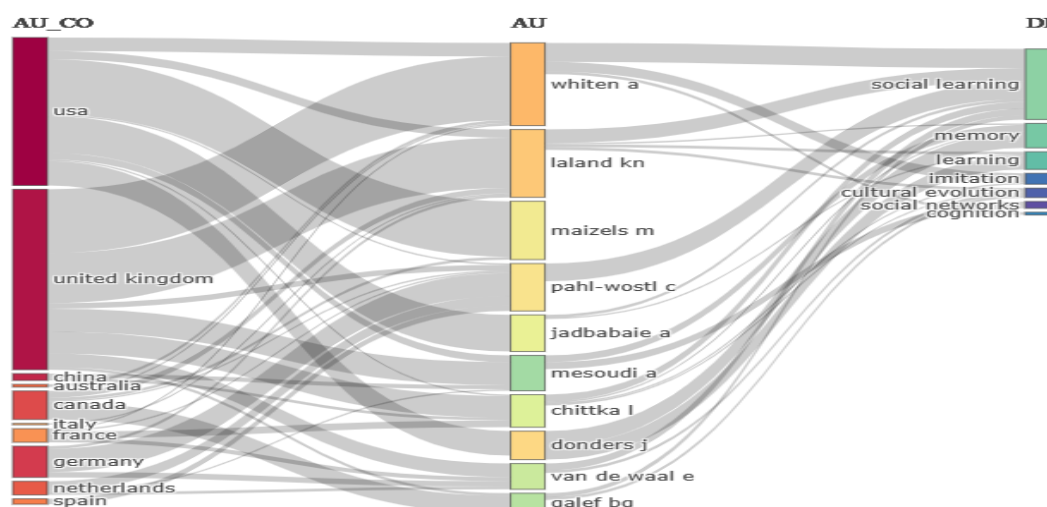


Figure 10: Three Field Plot of Author, Countries, and Keywords

Conclusion

This bibliometric study provides a comprehensive overview of research trends in visual, aural, verbal, physical, logical, and social learning from 2001 to 2023. The analysis of 3,560 documents highlights 2021 as the peak year for both publications and citations, reflecting growing academic interest in these domains. Psychology, computer science, and education & educational research emerged as the leading subject areas, while the United Kingdom and the United States were identified as the most productive contributors. Archives of Clinical Neuropsychology stood out as a major publication source. Notably, social learning dominated as both a co-occurrence and an author keyword, underscoring its central role in learning-related scholarship. Overall, the findings reveal the interdisciplinary nature of learning studies and provide valuable insights into influential trends, geographical patterns, and emerging themes that guide future research directions.

References

- Ahmed, R., Shoaib, M., & Zaman, M. A. (2025). Female Acceptability in STEM Higher Education in Pakistan: The Role of Gender Expression, Gender Sensitivity, and Supportiveness. *Annual Methodological Archive Research Review*, 3(7), 296-322.
- Ali, R., Zaman, M. A., & Shoaib, M. (2024). Trends of Research Visualization of Gender Inequality, Equality, and Equity: A Bibliometric Analysis from 1981 to 2020. *Pakistan Journal of Law, Analysis and Wisdom*, 3(8), 237-252.
- Ali, S. R., Shoaib, M., & Kausar, N. (2025). Gender Disparity in Enrolment, Classroom, Learning Environment, and Learning Achievements of the Students in Higher Education in Pakistan. *Journal of Media Horizons*, 6(3), 330-342.
- Bandura, A. (1986). *Social Foundations of Thought and Action*. Englewood Cliffs, NJ, 23-28.
- Booton, S. A., Hodgkiss, A., & Murphy, V. A. (2023). The impact of mobile application features on children's language and literacy learning: a systematic review. *Computer Assisted Language Learning*, 36(3), 400-429. doi:10.1080/09588221.2021.1930057
- Borghain, D. J., Verma, M. K., Nazim, M., & Sarkar, M. (2021). Application of Bradford's law of scattering and Leimkuhler model to information science literature. *COLLNET Journal of Scientometrics and Information Management*, 15(1), 197-212.
- Bradley, L., Bartram, L., Al-Sabbagh, K. W., & Algers, A. (2023). Designing mobile language learning with Arabic speaking migrants. *Interactive Learning Environments*, 31(1), 514-526. doi:10.1080/10494820.2020.1799022

- Corral, Á., Boleda, G., & Ferrer-i-Cancho, R. (2015). Zipf's law for word frequencies: Word forms versus lemmas in long texts. *PloS one*, 10(7), 1-23.
- Crogman, H., & Trebeau Crogman, M. (2018). Modified generated question learning, and its classroom implementation and assessment. *Cogent Education*, 5(1), 1459340. doi:10.1080/2331186X.2018.1459340
- Dougherty, K. J., & Callender, C. (2020). Comparing and learning from English and American higher education access and completion policies. *Policy Reviews in Higher Education*, 4(2), 203-227. doi:10.1080/23322969.2020.1737959
- Egghe, L. (1992). Duality aspects of the Gini index for general information production processes. *Information processing & management*, 28(1), 35-44.
- Elder, L., & Paul, R. (2007). Critical thinking. Foundation for Critical Thinking.
- Gardner, H. (1995). Reflections on multiple intelligences. *Phi Delta Kappan*, 77(3), 200-208.
- Goodlad, K., Westengard, L., & Hillstrom, J. (2018). Comparing Faculty and Student Perception of Academic Performance, Classroom Behavior, and Social Interactions in Learning Communities. *College Teaching*, 66(3), 130-139. doi:10.1080/87567555.2018.1453472
- Halpern, J. Y. (1998). A logical approach to reasoning about uncertainty: a tutorial. Paper presented at the Discourse, Interaction and Communication: Proceedings of the Fourth International Colloquium on Cognitive Science (ICCS-95).
- Hargreaves, E., Elhawary, D., & Mahgoub, M. (2018). Children critique learning the "pure" subject of English in the traditional classroom. *Educational Studies*, 44(5), 535-550. doi:10.1080/03055698.2017.1382329
- Henry, M., Carroll, F., Cunliffe, D., & Kop, R. (2018). Learning a minority language through authentic conversation using an online social learning method. *Computer Assisted Language Learning*, 31(4), 321-345. doi:10.1080/09588221.2017.1395348
- Jacobs, L., Parke, A., Ziegler, F., Headleand, C., & De Angeli, A. (2020). Learning at school through to university: the educational experiences of students with dyslexia at one UK higher education institution. *Disability & Society*, 1-22. doi:10.1080/09687599.2020.1829553
- Johnson, D. W., & Johnson, R. T. (1999). Making cooperative learning work. *Theory Into Practice*, 38(2), 67-73.
- Jonassen, D. H., Hernandez-Serrano, J., & Choi, I. (2000). Integrating constructivism and learning technologies. *Integrated and holistic perspectives on learning, instruction and technology: Understanding complexity*, 103-128.
- Kisanga, S. E., & Kisanga, D. H. (2020). The role of assistive technology devices in fostering the participation and learning of students with visual impairment in higher education institutions in Tanzania. *Disability and Rehabilitation: Assistive Technology*, 1-10. doi:10.1080/17483107.2020.1817989
- Lahey, T., & Rizopoulos, L. (2023). Learning from alumni: Creating middle school classrooms that support English language learners. *Middle School Journal*, 54(1), 32-40. doi:10.1080/00940771.2022.2142005
- Lake, G. (2015). Let's talk! An intervention supporting children's vocabulary and narrative development through sustained planned pretend play and group shared storybook reading in the early years. University of Oxford,
- Lasrado, F., Dean, B. A., & Eady, M. J. (2024). Inclusive work-integrated learning in higher education: a scoping review. *Studies in Higher Education*, 49(9), 1588-1609. doi:10.1080/03075079.2023.2271048
- Leatherman, J. L., & Cleveland, L. M. (2020). Student exam performance in flipped classroom sections is similar to that in active learning sections, and satisfaction with the flipped classroom hinges on attitudes toward learning from videos. *Journal of Biological Education*, 54(3), 328-344. doi:10.1080/00219266.2019.1575266
- Liu, B., & Lan, J. (2025). Teaching Chinese Phonetic Radicals Enhances Reading Fluency in Chinese-Speaking Children With Hearing Loss. *Language, Speech, and Hearing Services in Schools*, 56(2), 372-379.

- Ludwig, C., & Tassinari, M. G. (2023). Foreign language learner autonomy in online learning environments: the teachers' perspectives. *Innovation in Language Learning and Teaching*, 17(2), 217-234. doi:10.1080/17501229.2021.2012476
- Marunda-Piki, C. J. (2018). The impact of narrative-based learning in classroom. *Research in Drama Education: The Journal of Applied Theatre and Performance*, 23(1), 107-113. doi:10.1080/13569783.2017.1399055
- Mayer, R. E. (1989). Models for understanding. *Review of Educational Research*, 59(1), 43-64.
- Mayer, R. E. (2011). Instruction based on visualizations. In *Handbook of research on learning and instruction* (pp. 441-459): Routledge.
- McMillan, J. H., & Moore, S. (2020). Better Being Wrong (Sometimes): Classroom Assessment that Enhances Student Learning and Motivation. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 93(2), 85-92. doi:10.1080/00098655.2020.1721414
- Naseer, A., Shoaib, M., Ali, N., & Bilal, M. (2021). Trend of Research Visualization of COVID-19 Complications in PubMed Database Using Scientometric Analysis from 2020 to March 20, 2021. *Library Philosophy and Practice*, 5731, 1-17.
- Nicolaidou, I., Pissas, P., & Boglou, D. (2021). Comparing immersive Virtual Reality to mobile applications in foreign language learning in higher education: a quasi-experiment. *Interactive Learning Environments*, 1-15. doi:10.1080/10494820.2020.1870504
- Othman, N. A., Manap, M. R., Ramli, N. F. M., & Kassim, A. A. M. (2018). Motivation in English language Learning: A Case Study of Afghanistan Students in Malaysia. Paper presented at the 4th International Conference ILANNS 2018, Malaysia.
- Pawlak, M., Zawodniak, J., & Kruk, M. (2021). Individual trajectories of boredom in learning English as a foreign language at the university level: insights from three students' self-reported experience. *Innovation in Language Learning and Teaching*, 15(3), 263-278. doi:10.1080/17501229.2020.1767108
- Peeters, W., & Mynard, J. (2023). Supporting self-regulated language learning skills online: awareness raising approaches for computer-supported collaboration. *Language Awareness*, 32(1), 132-152. doi:10.1080/09658416.2021.2018447
- Piumatti, G., Abbiati, M., Gerbase, M. W., & Baroffio, A. (2021). Patterns of Change in Approaches to Learning and Their Impact on Academic Performance Among Medical Students: Longitudinal Analysis. *Teaching and Learning in Medicine*, 33(2), 173-183. doi:10.1080/10401334.2020.1814295
- Podsiadlik, A. (2021). The Blended Learning Experiences Of Students With Specific Learning Difficulties: A Qualitative Case Study Located In One British Higher Education Institution. *International Journal of Disability, Development and Education*, 1-16. doi:10.1080/1034912X.2021.1876217
- Price, D. J. D. S. (1963). *Little science, big science*: Columbia university press.
- Ramos, J. L., Cattaneo, A. A. P., de Jong, F. P. C. M., & Espadeiro, R. G. (2021). Pedagogical models for the facilitation of teacher professional development via video-supported collaborative learning. A review of the state of the art. *Journal of Research on Technology in Education*, 1-24. doi:10.1080/15391523.2021.1911720
- Shoaib, M. (2021). Sociological Analysis of Teachers Perspectives on Students Academic Performance in Higher Education in the Punjab. (PhD Thesis). International Islamic University Islamabad, Central Library.
- Shoaib, M. (2023a, September 22). Galvanising Bourdieu's typology with Pakistani education and social class. *The Nation*, p. 4.
- Shoaib, M. (2023b, December 05). Gender Differences in Academic Performance. *The Nation*.

- Shoaib, M. (2024a, January 09). Gender Disparity in Education. The Nation.
- Shoaib, M. (2024b). Gender Diversity and Inclusion in Higher Education in Pakistan. *Pakistan Journal of Law, Analysis and Wisdom*, 3(1), 207-222.
- Shoaib, M. (2024c, April 30). Gendered Space in Higher Education. *Daily Parliament Times*, p. 3.
- Shoaib, M. (2024d). Gendering Bourdieu's Cultural Capital in Higher Education in Pakistan. *Pakistan Journal of Law, Analysis and Wisdom*, 3(2), 265-278.
- Shoaib, M. (2024e). Tailoring Theoretical Lens and Nudging Bourdieu's Cultural Capital on Gender and Academic Performance. *Journal of Social Sciences Review*, 4(4), 87-101.
- Shoaib, M. (2025a). Academic Achievement and Gender Inequality in Higher Education: A Systematic Review of Muslim Majority Nations. *Sociology & Cultural Research Review* 3(02), 373-380.
- Shoaib, M. (2025b). A Systematic Review of Gender Disparities in Academic Achievement in Higher Education Across Muslim Countries. *Advance Social Science Archive Journal*, 3(02), 1622-1639.
- Shoaib, M., Abdullah, F., & Ali, N. (2020). Library Resources and Research Environment in Higher Education Institutions: Students' Satisfaction. *Library Philosophy and Practice*, 1-18.
- Shoaib, M., Abdullah, F., & Ali, N. (2021). A Research Visualization of Academic Learning Skills among Students in Higher Education Institutions: A Bibliometric Evidence from 1981 to 2020. *Library Philosophy and Practice*, 5579, 1-34.
- Shoaib, M., Ahmad, A., Ali, N., & Abdullah, F. (2021). Trend of Research Visualization of Learning, Classroom, and Class Participation in Higher Education Institutions: A Bibliometric Analysis from 2001 to 2020. *Library Philosophy and Practice*, 5743, 1-26.
- Shoaib, M., Ahmed, R., & Iqbal, S. (2025). Female Acceptability in Stem Higher Education in Pakistan: The Interplay of Careerist Femininity, Job Oriented, and Family Orientation. *Journal for Current Sign*, 3(3), 181-202.
- Shoaib, M., Ahmed, R., Iqbal, S., & Abdullah, F. (2025). Feminization of STEM Education in Higher Education: Arrays of Acceptability and Resistance. *Research Consortium Archive*, 3(2), 1002-1021.
- Shoaib, M., Ahmed, R., & Usmani, F. (2025a). Empirical Study on Acceptability and Resistance to Feminization in STEM Fields at the Higher Education Level. *Physical Education, Health and Social Sciences*, 3(3), 135-143.
- Shoaib, M., Ahmed, R., & Usmani, F. (2025b). Feminization in STEM Fields in Higher Education in Pakistan: A Case of Female Acceptability and Resistance. *Social Science Review Archives*, 3(3), 646-660.
- Shoaib, M., Ahmed, R., Zaman, M. A., & Abdullah, F. (2025). Exploring Acceptability and Resistance to Feminization in STEM Fields: An Empirical Perspective from Higher Education. *Dialogue Social Science Review (DSSR)*, 3(7), 722-736.
- Shoaib, M., Ali, N., Anwar, B., Rasool, S., Mustafa, R.-e., & Zici, S. (2021). Research Visualization on Teaching, Language, Learning of English and Higher Education Institutions from 2011 to 2020: A Bibliometric Evidences *Library Philosophy and Practice*, 5677, 1-27.
- Shoaib, M., Ali, N., Anwar, B., & Shaukat, B. (2021). Plotting the Literature on Learning Outcomes and Academic Performance in Higher Education from 2001 to 2020: A Scientometric Analysis. *Library Philosophy and Practice*, 5919, 1-24.
- Shoaib, M., Ali, N., & Naseer, A. (2021). Plotting the Literature on Precautionary Measures of COVID-19: A Scientometric Analysis of Web of Science. *Library Philosophy and Practice*, 5899, 1-20.

- Shoaib, M., Ali, R., & Akbar, A. (2021). Library Services and Facilities in Higher Education Institutions in Pakistan: Satisfaction of Patrons. *Library Philosophy and Practice*, 1-19.
- Shoaib, M., Ali, S. R., Iqbal, T., & Abdullah, F. (2025). Gender Disparity in Learning Achievements of the Students in Higher Education in Pakistan. *International Journal of Social Sciences Bulletin*, 3(6), 840-853.
- Shoaib, M., Ali, S. R., & Kausar, N. (2025). Gender Disparity on Teaching Materials, Communication, Institutional Support, and Learning Achievements of the Students in Higher Education in Pakistan. *International Journal of Social Sciences Bulletin*, 3(7), 169-183.
- Shoaib, M., & Bashir, Z. (2025). Virtual Classrooms and Academic Performance of the Students in Higher Education during the COVID-19 Outbreak. Paper presented at the 5th International Conference of PNQAHE and AGM on Stakeholder Engagement in Quality Assurance – Shaping Higher Education with Inputs from All Relevant Voices, Forman Christian College University, Lahore.
- Shoaib, M., Fatima, U., & Jamil, R. (2021). Academic Library and Students' Learning at University Level: Nothing is Pleasanter than Exploring a Library. *Library Philosophy and Practice*, 1-19.
- Shoaib, M., Iqbal, A., & Iftikhar, I. (2025). Engagement of Students in Learning in Higher Education: The Role of Academic Library Spaces. *The Regional Tribune*, 4(3), 311-328.
- Shoaib, M., Kausar, N., Ali, S. R., & Abdullah, F. (2025). Gender Disparity in Learning Achievements in Higher Education: Insights from a Literature Review. *Policy Research Journal*, 3(6), 634-648.
- Shoaib, M., Rasool, S., Kalsoom, A., & Ali, S. R. (2025). Exploring Gender-Based Dissimilarities in Educational Outcomes at the Tertiary Level: A Review of Existing Literature. *Policy Research Journal*, 3(7), 287-302.
- Shoaib, M., Rasool, S., Zaman, M. A., & Ahmed, R. (2025). An Empirical Insight into Acceptability and Resistance to Feminization in STEM Fields at the Higher Education Level. *Research Consortium Archive*, 3(3), 157-178.
- Shoaib, M., Shamsher, A., & Iqbal, S. (2025). A Systematic Review of Academic Library Spaces as Facilitators of Student Engagement in Higher Education Learning. *The Knowledge*, 4(1), 123-134.
- Shoaib, M., Shamsher, A., & Iqbal, S. (2025). Understanding Student Engagement in Higher Education: The Contribution of Academic Library Spaces. *ProScholar Insights*, 4(1), 245-257.
- Shoaib, M., Shehzadi, K., & Abbas, Z. (2023). Contemporary Research on Learning Spaces and Teacher Effectiveness in Higher Education. *Pakistan Journal of Law, Analysis and Wisdom*, 2(03), 352-369.
- Shoaib, M., Tariq, I., & Iqbal, S. (2025a). Extracurricular Activities in Higher Education: Diversity and Inclusion. *Regional Lens*, 4(1), 174-187.
- Shoaib, M., Tariq, I., & Iqbal, S. (2025b). Intersectionality and Student Inclusion in Higher Education: A Study of Class, Residence, Culture, and Extracurricular Participation. *Journal of Social Horizons*, 2(1), 1-14.
- Shoaib, M., Tariq, I., Rasool, S., & Iqbal, S. (2025). The Role of Extracurricular Activities in Fostering Diversity and Inclusion in Higher Education: A Systematic Review. *Advance Social Science Archive Journal*, 3(2), 1377-1392.
- Shoaib, M., Usmani, F., & Abdullah, F. (2023). Plotting The Literature On Social Work Education From 1971-2020: A Scientometric Analysis. *Pakistan Journal of Social Research*, 5(2), 1347-1360.
- Shoaib, M., Usmani, F., & Ali, N. (2022). Citing the Empirical Shreds on Social Welfare and Methods of Social Work Employing Bibliometric Analysis From 1971 to 2020. *Pakistan Journal of Social Research*, 4(3), 1113-1133.

- Shoaib, M., Waris, T., & Iqbal, S. (2025a). Assessing Gendered Participation Spaces in Online Learning Environments in Higher Education in Pakistan. *The Knowledge*, 4(2), 63-74.
- Shoaib, M., Waris, T., & Iqbal, S. (2025b). Gender Dynamics in Online Higher Education: Insights from Empirical Evidence. *The Regional Tribune*, 4(2), 89-102.
- Shoaib, M., Waris, T., & Iqbal, S. (2025c). A Quantitative Study of Gendered Interactions and Spatial Perceptions in Online Higher Education in Pakistan. *ProScholar Insights*, 4(2), 96-108.
- Shoaib, M., Waris, T., & Iqbal, S. (2025a). A Review-Based Examination of Gender Dynamics in Virtual Learning Environments in Higher Education. *Sociology & Cultural Research Review*, 3(02), 448-454.
- Shoaib, M., Waris, T., & Iqbal, S. (2025b). Virtual Learning Environments and Gendered Spaces in Higher Education in Pakistan: A Quantitative Approach. *Regional Lens*, 4(2), 65-78.
- Shoaib, M., & Zaman, M. A. (2025). Evaluating Academic Performance in Higher Education during COVID-19 A Study of Virtual Learning Environments. *Pakistan Journal of Law, Analysis and Wisdom*, 4(4), 64-78.
- Shoaib, M., Zaman, M. A., & Abbas, Z. (2024). Trends of Research Visualization of Gender Based Violence (GBV) from 1971-2020: A Bibliometric Analysis. *Pakistan Journal of Law, Analysis and Wisdom*, 3(7), 203-216.
- Snow, C. E., & Hoefnagel-Höhle, M. (1978). The critical period for language acquisition: Evidence from second language learning. *Child development*, 1114-1128.
- Tanner, T. (1980). Significant life experiences: A new research area in environmental education. *The Journal of Environmental Education*, 11(4), 20-24.
- Tarkiainen, L., Heino, E., Tapola-Haapala, M., & Kara, H. (2021). Students' learning reflections when using works of fiction in social work education. *Social Work Education*, 1-13. doi:10.1080/02615479.2021.1928624
- Tchoukaleyska, R., Carter, K., Dluginski, E., Forward, M., King, A., Leblanc, O., & Ratcliffe, C. (2021). The mobility of experiential learning pedagogy: transferring ideas and practices from a large- to a small-campus setting. *Journal of Geography in Higher Education*, 1-21. doi:10.1080/03098265.2021.1955244
- Vesonder, G. T., & Voss, J. F. (1985). On the ability to predict one's own responses while learning. *Journal of Memory and Language*, 24(3), 363-376.
- Williams, D. M., Anderson, E. S., & Winett, R. A. (2005). A review of the outcome expectancy construct in physical activity research. *Annals of behavioral medicine*, 29(1), 70-79.