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A Research Visualization of Academic Learning Skills among Students in Higher Education Institutions: A Bibliometric Evidence from 1981 to 2020

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Declaration

Authors declare no potential conflict of interest for this study.

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Abstract

This article provides an insight into the academic learning skills acquired by students in higher education institutions across the globe. A bibliometric study was designed to consolidate the published scholarship of the academic learning skills in the Web of Science indexed documents from 1981 to 2020. The data were extracted on March 18, 2021, at 06:54 AM, PST. A total of 964 publications were found using Biblioshiny, ScientoPy, VOSviewer, and MS Excel to extract data and preparation of figures. The study findings asserted that knowledge skill was the top topic, article as a type of documents, and the English language was used as majority published documents. Similarly, the data revealed that the published documents increased in number per year gradually, Al-Adawi S was the top author, Hacettepe Univ., Turkey top organization, United States top country, and education educational was indicated as a top research area of the published documents along with education as the top keyword. The FASEB Journal was reported as the top source of publication and the document of Hattie, J; Biggs, J; Purdie, N as the top by citation. Further, the tables and figures were presented to show the trend of data.

Keywords: Knowledge Skill, Learning Skill, Intellectual Skill, Critical Skills, Bibliometric Study

Introduction

We steered this study to examine the tendency of dissemination of knowledge, learning skills, in academic settings across the globe. This study, thus, is conducted in the academic tradition of sociology of knowledge and library & information science focusing on the key academic learning skills. It is based on the bibliometric evidence collected from 1981-2020 across the globe. Historically, the sociology of knowledge has a significant role in producing knowledge (Banks, 1982; Hirschy & Wilson, 2002; Schwartz, 1997; Ullah & Shoaib, 2021). The Sociology of knowledge has a long history of producing knowledge. It ranges from Laster Ward's Dynamic Sociology in 1883 and Dewey's work on School and Society in 1889 to the present stage of knowledge being produced by the theorists, researchers, and academics (Floud & Halsey, 1958). Moreover, a major part of the knowledge has less relevance to the sociology of education rather than the social institutions as given by Durkheim (Ullah & Shoaib, 2021). Durkheim is one of the earlier theorists who contributed to the literature of education through the sociology of knowledge. In 1916, the sociology of education was coined and used in academic writings and discourses. It

is important to mention here that knowledge on the sociology of education existed however it was not aligned in the academic writing (Banks, 1982). As in 1928, the journal of sociology of education was established. Later developments showed that the significance of sociology of education across the globe. The theoretical concepts of sociology of education were included in mainstream sociology. As many sociologists worked on the education system and explored new horizons in education (Peng, Zhu, & Wu, 2020). It drew the attention of academics and researchers towards the important reforms in the educational system the world over. Thus, sociology of education became an important area of research for the governments and other stakeholders (Bourdieu, 1986). The earlier work focused on the analysis of educational systems related to the division of labor and social stratification in terms of learning skills (Henslin, 1997). In Europe, education was debated to produce the educated labor for the industrial sector. In developed world, functionalism prevailed to criticize the potential of the working class. This study attempted to examine the academic learning skills in the domain of information science and sociology of education employing bibliometric analysis from 1981 to 2020.

Objectives of the Study

We articulated the following objectives to evaluate knowledge skill, learning skill, critical skills, and intellectual skill using bibliometric analysis from 1981 to 2020.

- The topic of the documents
- Type of the documents
- Language of the published documents
- Year of the published documents
- Authors' information by published documents
- Top ten organizations of the published documents
- Top ten countries of the published documents
- Top ten research areas of the published documents
- Top ten keywords of the published documents
- Top ten sources of publications
- Top ten documents by citations

Review of Literature

A large number of studies showed that the use of technology has significantly improved the bibliometric use of collecting research evidence in the field of library science and sociology of

education (Aparicio, Iturralde, & Maseda, 2021; Barbosa & Ferreira-Lopes, 2021; Sharma, Singh, Tamang, Singh, & Singh, 2020; Shaukat, Ali, & Naveed, 2021). It has been further improved with the rise and adaptation of technology in academic institutions (I. Ali & Aboelmaged, 2020; Ullah & Shoaib, 2021). The technology brought the revolution in knowledge development, dissemination, and reconstruction (Ashour, 2020; McNicholl, Desmond, & Gallagher, 2020). Similarly, the stock of knowledge has been provided where on one click one finds the relevant matter (Cassia, Costa, da Silva, & de Oliveira Neto, 2020; Kisanga & Kisanga, 2020). It has given easy and simple access to all the people around to search the papers or research of their choice (Gamlath, 2021). In the past, scholars, researchers, and academicians had to travel miles to study books and other material (Bell & Kennan, 2021; McManus & Rook, 2021; Silva et al., 2020). It may take many days to travel to reach the destination to find the material from different libraries (Salisbury, Dollinger, & Vanderlelie, 2020). Similarly, the scholars had to travel long to visit the libraries and find the research material (Hamad, Fakhuri, & Abdel Jabbar, 2020; Pacios & Serna, 2020b; Vogus, 2020). With the advent of modern technology, the countries came forward and adopted the technology (J. A. Murphy & Newport, 2021; O'Donnell, Maloney, Masters, & Liu, 2020).

Research showed that in developed countries, technology was adopted rapidly in every sphere of life (Cusker, 2020; Weeks, Houk, Nugent, Corn, & Lackey, 2020; Williamson et al., 2021). Like other spheres, the technology was used to accumulate the knowledge that was previously in the raw form (Hoogland, 2021; Rapanta, Botturi, Goodyear, Guàrdia, & Koole, 2020). Similarly, the emphasis was laid to produce new knowledge (Colahan & Perske, 2020; Weyant, 2020). In this regard, governments took initiatives to engage the researchers and academicians to further create knowledge on the social issues of the society (Annala, Mäkinen, Lindén, & Henriksson, 2020; Garcia, Grineski, Morales, & Corral, 2020; Langørgen, Kermit, & Magnus, 2020). It is asserted that previous knowledge was preserved and reproduced in the first phase (Cassia et al., 2020; Veer-Ramjeawon & Rowley, 2020). In the second phase, the traditional knowledge in the form of academic writings and skills was preserved in the digitalized way by developing different web of knowledge and e-libraries (Bell & Kennan, 2021; Benzie & Harper, 2020). In this way, the knowledge was accumulated for easy access to human beings that were previously inaccessible (Cribbs, Gardner, & Holvoet, 2021; Perkins, 2020; Weyant, 2020). This knowledge was utilized by academics and researchers to further reshape and reproduced the knowledge in the form of

digits (Colahan & Perske, 2020; Jin, 2021; Perkins, 2020). Thus, whole knowledge was systematically converted into bibliometric (Aparicio et al., 2021; Barbosa & Ferreira-Lopes, 2021; Sharma et al., 2020). Presently, all the bibliometric evidence is available for the researchers in the digitalized form (Bell & Kennan, 2021; Benzie & Harper, 2020). The developed countries that advanced in technology developed different knowledge banks including the e-libraries that are equally utilized by the researchers, academicians, and students the world over (Alajmi & Alotaibi, 2020; Crawford et al., 2020; Khanchandani, 2021; Weyant, 2020). Similarly, one has not to travel for long to find the materials (Hardy & McKenzie, 2020). As it is available with a single click while sitting anywhere in the world. All the knowledge developed in the domain of sociology of education focusing the academics skills i.e., intellectual, and critical form (Shoaib, Abdullah, & Ali, 2020; Shoaib & Ullah, 2019, 2021; Ullah & Shoaib, 2021). This stock had further guided to produce knowledge on different aspects of life (N. Ali, Shoaib, & Asad, 2021). It is important to mention here that knowledge developed out of the efforts of human beings. As they were in constant effort to find the solutions to the issues around them. Thus, all the knowledge is produced in the domain of sociology of education (Ullah & Shoaib, 2021). Moreover, the utilization of this stock has been helpful for the rest of the world.

By looking at the technological advancement of developed nations, developing countries also adopted the technological use of accumulating the knowledge in the form of e-libraries and developing the stock of data for the utilization of the researchers and academicians (Greaves, 2021; Tibingana-Ahimbisibwe, Willis, Catherall, Butler, & Harrison, 2020). Although the measures were taken in many of the developed countries however the majority of these countries are still relying on the traditional mode of material (Goodsett, 2021; Kang & Zhang, 2020). Moreover, many countries have developed the banks of knowledge for the sake of academic pursuits to facilitate the students and academicians (Brown, Lawrence, Basson, & Redmond, 2020). Research shows that many developing countries are using the subscribed data banks (Azonobi, Uwaifo, & Tella, 2020; Cirelli & Long, 2020; Jena, 2020; M. P. Murphy, 2020). It is asserted that such facilities are not satisfying the researchers and academicians. As most of these countries are using the data banks of the developed nations however there is limited access to the whole data. Similarly, the new research articles are not provided to the researchers and scholars to know the updated version of the knowledge (Adeoye, Oladokun, & Opalere, 2020; Atta-Obeng & Dadzie, 2020). At the same time, the books are not accessed while government and education commissions

are not taking measures to provide the new stock of data to the universities in time (Chidi Nuel-Jean & Okoye, 2020). It has been argued that the developing countries find the latest research and books much later even the decades (Atta-Obeng & Dadzie, 2020; Lynch, Young, Jowaisas, Boakye-Achampong, & Sam, 2020; Rafiq, Batool, Ali, & Ullah, 2021). Thus, the developing countries also rely on the bibliometric evidence of the knowledge stocks of developed countries.

The Data and Methods

For the bibliometric analysis, data extracted from the Science Citation Index database, Web of Science (Core Collection). The searched query in Web of Science was used as: TI=("Knowledge Skill*") OR TI=("learning Skill*") OR TI=("Intellectual Skill*") OR TI=("Critical Skill*"). The timespan of 1981-2020 years and the data were extracted on March 18, 2021, at 06:54 AM, PST. A total of 964 publications were found using Biblioshiny, ScientoPy, VOSviewer, and MS Excel to extract data and preparation of figures. Further, the data were presented in tables and figures to show the trends and visualization.

The Results

This section provides the results and discussion on the subject under consideration. It is further divided into sub-sections as per the objectives of the paper.

The topic of the Documents

Table 1

Distribution of Published Documents retrieved from Web of Science Database (1981-2020)

The topic of the documents	Total Publications	Percentage
Knowledge Skill	450	46.68
Learning Skill	400	41.49
Critical Skills	74	07.68
Intellectual Skill	40	04.15
Total	964	100.00

Table 1 shows the published documents retrieved from the web of science database about the research documents from 1981-2021. These documents mainly comprised the four types of skills extending from knowledge, learning, critical and intellectual skills. In this table, we searched a total of 964 publications. These publications are further categorized percentage-wise. On knowledge skills, we found 450 (46.68%) publications. Similarly, on learning skills, we found 400 publications comprising 41.49 percent of the total search. Contrarily, 7 .7 percent of critical skills

and 4 percent intellectual skills are found. It is evident that a high percentage of knowledge and learning skills. This shows that most of the publications we retrieved belonged to the knowledge and learning skills while a meager ratio of publication was found on the critical and intellectual skills. Based on the data we retrieved, it is concluded that a large proportion of publication is on knowledge and learning skills. However, the publications on critical and intellectual skills are less likely found.

Type of the Documents

Table 2

Distribution of Published Documents by Document Types (1981-2020)

Type of the documents	Total Publications	Percentage
Article	589	61.10
Proceedings Paper	152	15.77
Meeting Abstract	94	09.75
Book Review	50	05.18
Editorial Material	37	03.84
Review	30	03.11
Letter	6	00.62
Correction	2	00.21
News Item	2	00.21
Note	2	00.21
Total	964	100.00

In table 2, a total of 964 publications were retrieved that are further divided into the publication categories as per the data repossessed. Among the 964 publications, 61. 10 percent are found research articles, 15.77 percent are found proceedings papers of the conferences or seminars, 9.75 are found meeting abstracts, 5.28 percent were book reviews, 3.84 percent were editorial materials, 3.11 percent was review material, 0.62 percent comprised letter and 0.21 percent each was found corrections, news items, and notes, respectively. The data interpreted in the above table shows that most of the publications retrieved are found research articles. As 730 evidence of articles is mainly repossessed from two major sources of the data banks either from journals or books. These articles have average10.8 years from publication. Similarly, the average citation per document is found at

8.618 while the average citation per document is 0.764 per year. In these 964 documents, a total of 22637 references are used.

Language of the Published Documents

Table 3

Language of the Published Documents from 1981 to 2020

Languages	TP*	Percentage	Languages	TP*	Percentage
English	896	92.946	German	4	0.415
Spanish	27	2.801	Latvian	2	0.207
Russian	10	1.037	Afrikaans	1	0.104
French	8	00.83	Bulgarian	1	0.104
Turkish	7	0.726	Czech	1	0.104
Portuguese	6	0.622	Italian	1	0.104

TP* = Total Publication

In above table 3, the publications are portrayed concerning the languages used in the text. A total of 12 languages are used in 964 publications. The major language is English is used in 896 publications comprising 92.9 percent of the total percentage. After the English, Spanish is used in 27 (2.8%) publications, Russian is used in 10 (1.037%), French is used in 8 (0.82%). Turkish is used in 7 (0.726%), Portuguese is used in 6 (0.622%), German is used in 4 (0.415%), Latvian is used in 2 (0.207%), Afrikaans, Bulgarian, Czech, and Italian is used in one publication each pertaining the 0.104 percent respectively. The bibliometric data shows that English is the major language used in the publication across the globe while all the other languages have a meager ratio in publications.

Year of the Published Documents

The overhead table 4 shows the year of publications of the retrieved documents. The range of publications starts from the year 1981 to 2021. Among the total 964 publication, 6 (0.622%) were published in each year of 1981-1984-1996, 5 (0.519%0 were published in 1982, 4 (0.415%) published in 1983, 7 (0.726%) were published in each year of 1985, 1986, 1989, 1993,1994,19 97,1998 and 1999, 9 (0.934%) each published in 1987, 1988 and 2004, 8(0.83%) were published in each year of 1990, 2000, 200, 12 (1.245%) published in 1991, 10 (1.037%) each published in 1992 and 2002, 17 (1.763%) each published in 1995 and 2006, 11 (1.141%) published in 2003, 20

(2.075%) published in 2005, 14 (1.452%) published in 2007, 25 (2.593%) published in 2008, 24 (2.49%) published in 2009, 39 (4.046%) published in 2010, 41 (4.253%) published in 2011, 46 (4.772%) published in 2012, 67 (6.95%) published in each 2013 and 2020, 63 (6.535%) each published in 2014, 2015 and 2016, 58 (6.017%) published in 2017, 74 (7.676%) published in 2018 and 89 (9.232%) published in 2019. It shows that the percentage of the publications increased with the passage of time starting from a minimum number of 4 to a higher number 89. It also shows that as long as the world used technology, the publication increased.

Table 4

Year of the Published Documents from 1981 to 2020

Year	TP*	%	Year	TP*	%	Year	TP*	%	Year	TP*	%
1981	6	0.622	1991	12	1.245	2001	8	0.83	2011	41	4.253
1982	5	0.519	1992	10	1.037	2002	10	1.037	2012	46	4.772
1983	4	0.415	1993	7	0.726	2003	11	1.141	2013	67	6.95
1984	6	0.622	1994	7	0.726	2004	9	0.934	2014	63	6.535
1985	7	0.726	1995	17	1.763	2005	20	2.075	2015	63	6.535
1986	7	0.726	1996	6	0.622	2006	17	1.763	2016	63	6.535
1987	9	0.934	1997	7	0.726	2007	14	1.452	2017	58	6.017
1988	9	0.934	1998	7	0.726	2008	25	2.593	2018	74	7.676
1989	7	0.726	1999	7	0.726	2009	24	2.49	2019	89	9.232
1990	8	0.83	2000	8	0.83	2010	39	4.046	2020	67	6.95

TP* = Total Publication

Authors' Information by Published Documents

A total of 2731 authors participated in the publications while 2972 appearances of authors are recorded. In total publications, 267 single authors published documents and 2464 multi-authored documents were retrieved. Similarly, single-author documents were 279. Documents pertain an average of 0.353 percent while author per document found 2.83, co-author per document found 3.08, and collaboration index is found 3.6. Above table 5 shows the publications by the top them productive authors from 191-2020. The authors are mentioned with publications and citations. As Al-Adawi S has 5 publications published in 2013 with a total citation of 9 in which I is ranked in h_index, 3 in g_index, and 0.111 m-index. Similarly, Al-Asmi A has 5 publications published in

2013 with a total citation of 9 in which I ranked in h_index, 3 in g_index, and 0.111 m-index. Lee S has 5 publications published in 2001 with a total citation of 55 in which 3 is ranked in h_index, 5 in g_index, and 0.143 m_index. Subash S has 5 publications published in 2013 with a total citation of 9 in which 1 is ranked in h_index, 3 in g_index, and 0.111 m_index. Vaishnav R has 5 publications published in 2013 with a total citation of 9 in which 1 is ranked in h_index, 3 in g_index, and 0.111 m_index. Eylon BS has 4 publications published in 2008 with a total citation of 10 in which 1 is ranked in h_index, 3 in g_index, and 0.071 in m_index. Krumm S has 4 publications published in 2013 with a total citation 81 in which 4 is ranked in h_index, 4 in g_index, and 0.444 in m_index. Murdoch-Eaton D has 4 publications published in 2012 with a total citation of 16 in which 2 is ranked in h_index, 4 in g_index, and 0.2 in m_index. Ozsoy-Gunes Z has 4 publications published in 2014 with a total citation of 4 in which 1 is ranked in h_index, 1 in g_index, and 0.125 in m_index. Scherz Z has 4 publications published in 2008 with a total citation of 10 in which 1 is ranked in h_index, 3 in g_index, and 0.0.71 in m_index.

Table 5

Top Ten Productive Authors (1981-2020)

Author	TP*	TC*	h_index	g_index	m_index	PY*_start
Al-Adawi S	5	9	1	3	0.111	2013
Al-Asmi A	5	9	1	3	0.111	2013
Lee S	5	55	3	5	0.143	2001
Subash S	5	9	1	3	0.111	2013
Vaishnav R	5	9	1	3	0.111	2013
Eylon BS	4	10	1	3	0.071	2008
Krumm S	4	81	4	4	0.444	2013
Murdoch-Eaton D	4	16	2	4	0.2	2012
Ozsoy-Gunes Z	4	4	1	1	0.125	2014
Scherz Z	4	10	1	3	0.071	2008

TC* = Total Citations, TP* = Total Publication, PY* = Publication Year

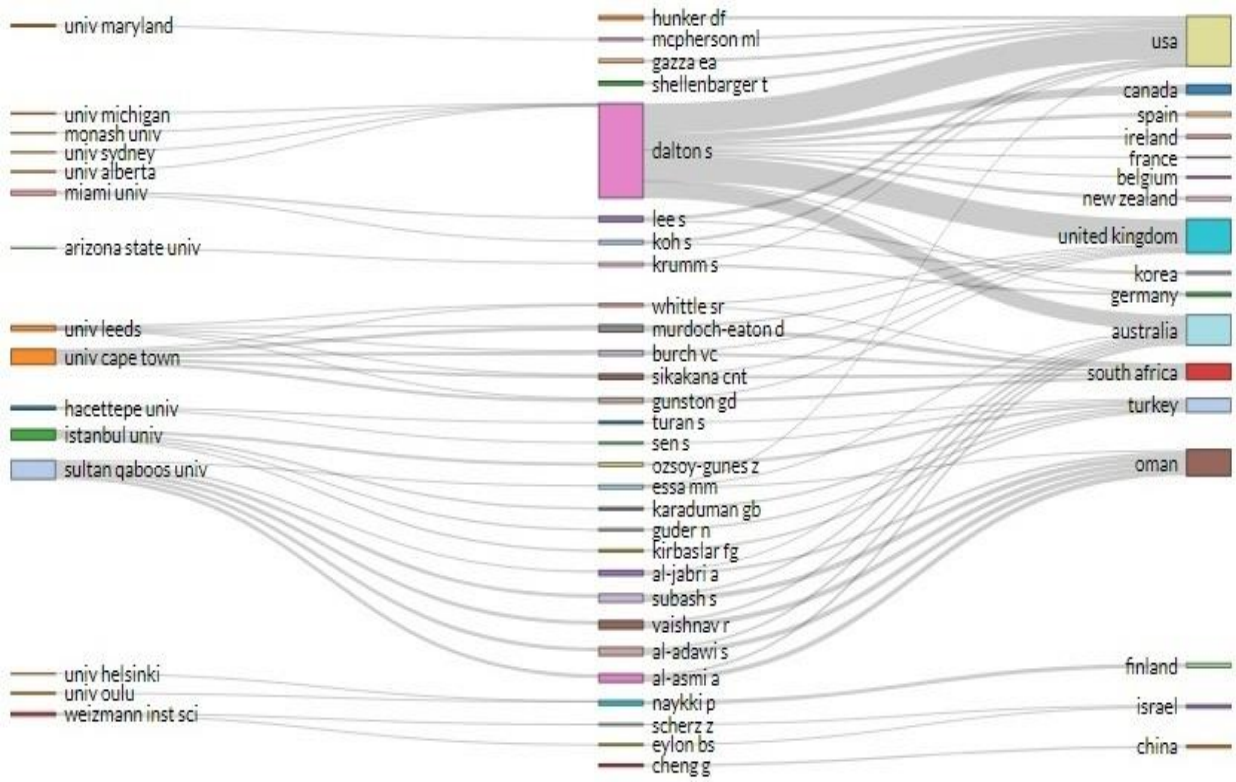

Figure 1. Author affiliation with organizations and countries

Top Ten Organizations of the Published Documents

Above table 6 shows the affiliation of the authors with organizations/universities across the world. Although a total of 1055 organizations have been involved in producing the documents, however, we discussed the top ten organizations/universities that contributed to publications. In Hacettepe University of Turkey, total publications are found 13 in which -1 is the average growth rate of the publications, 1 is the average document per year, 15.4 is the percentage of the document in last years while scoring the 6 h_index. In Univ. Colorado, United States, total publications are 7 in which average growth rate is zero, 0.5 is average document per year, 14.3 is the percentage of documents in last years while having 5 h_index. In Univ. Toronto, Canada, total publications are 7 in which average growth rate in 2, 02 is average document per year, 57.1 is the percentage of documents in last years while having 3 h_index. In Arizona State Univ., In the United States, total publications are 6 with which average growth rate of -0.5, 0.5 is the average document per year, 16.7 is the percentage of documents in the last years while having 4 h_index. In Hong Kong Polytech Univ., China, total publications are 6 in which average growth rate is 1, 1.5 is average document per year, 50 is the percentage of documents in last years while having 4 h_index. In Univ. Alberta, Canada, total publications are 6 in which average growth rate in 0, 1 is average

document per year, 33.3 is the percentage of documents in last years while having 3 h_index. In Univ. Michigan, United States, total publications are 6 in which average growth rate in 0, 0.5 is average document per year, 16.7 is the percentage of documents in last years while having 4 h_index. In Univ. Queensland, Australia, total publications are 6 in which average growth rate is -0.5, 0.5 is average document per year, 16.7 is the percentage of documents in last years while having 5 h_index. In Istanbul Univ., Turkey, total publications are 5 in which average growth rate is 0, 0 is average document per year, 0 is the percentage of documents in last years while having 2 h_index In McMaster Univ., Canada, total publications are 5 in which average growth rate in 0.5, 1 is average document per year, 40 is the percentage of documents in last years while having 3 h_index

Table 6

Top Ten Organizations (1981-2020)

Organization	TP*	AGR*	ADY*	PDLY*	h-index
Hacettepe Univ., Turkey	13	-1	1	15.4	6
Univ. Colorado, United States	7	0	0.5	14.3	5
Univ. Toronto, Canada	7	2	2	57.1	3
Arizona State Univ., United States	6	-0.5	0.5	16.7	4
Hong Kong Polytech Univ., China	6	1	1.5	50	4
Univ. Alberta, Canada	6	0	1	33.3	3
Univ. Michigan, United States	6	0	0.5	16.7	4
Univ. Queensland, Australia	6	-0.5	0.5	16.7	5
Istanbul Univ., Turkey	5	0	0	0	2
McMaster Univ., Canada	5	0.5	1	40	3

TP* = Total Publication, AGR* = Average Growth Rate, ADY* = Average Documents per Year, PDLY* = Percentage of Documents in Last Years

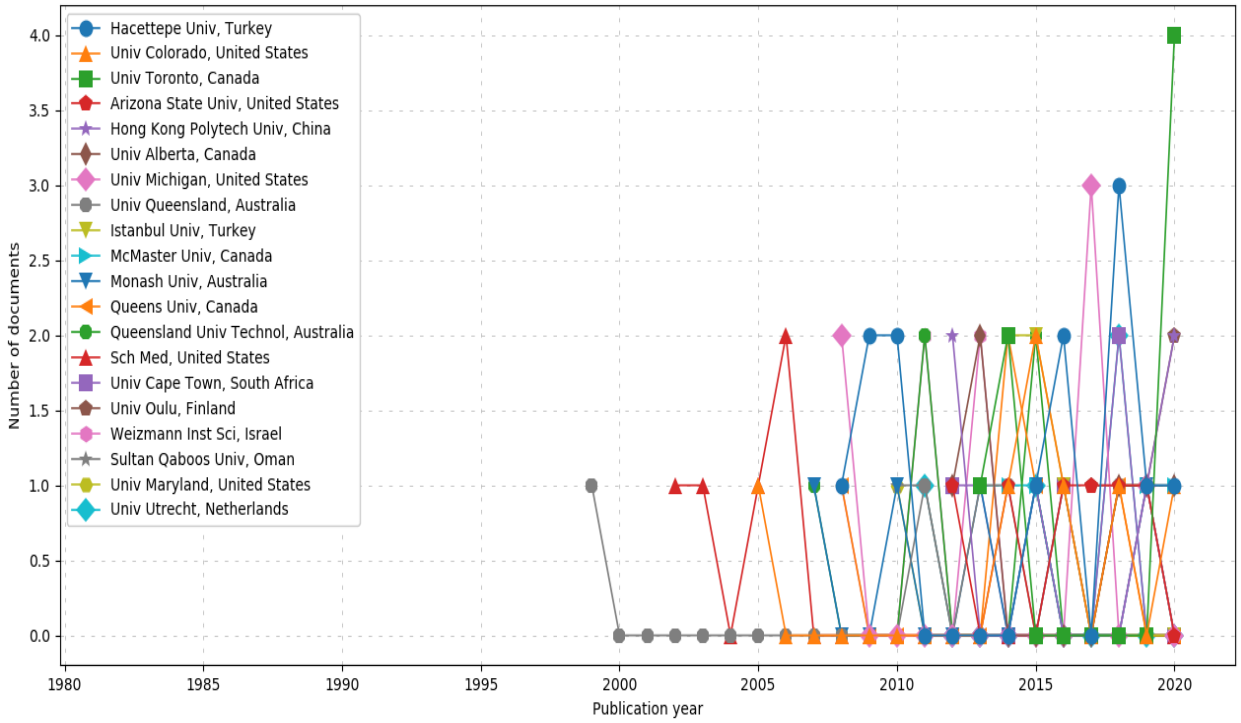

Figure 2. Top Productive Organizations (1981-2020)

Top Ten Countries of the Published Documents

Table 7 portrays the published documents by the top ten countries in the world from 1981-2020. Although 86 countries were found engaged in publications, however, we focused on the top ten countries having the highest ratio of publications. As in the USA, 290 publications were published comprising the frequency of 0.35583 in which 273 are single country publications, 17 are multiple country publications while scoring 0.0586 multiple country publication ratio. As in the UK, 64 publications were published with a frequency of 0.07853 in which 57 are single country publications, 7 are multiple country publications while scoring 0.1094 multiple country publication ratio. As in Australia, 52 publications were published comprising the frequency of 0.06258 in which 45 are single country publications, 6 are multiple country publications while scoring 0.1176 multiple country publication ratio. In Turkey, 42 publications were published comprising the frequency of 0.05153 in which 41 are single country publications, 1 are multiple country publications while scoring 0.0238 multiple country publication ratio. In Canada, 40 publications were published comprising the frequency of 0.04908 of which 34 are single country publications, 6 are multiple country publications while scoring 0.15 multiple country publication ratio. In Spain, 22 publications were published comprising the frequency of 0.02699 of which 17 are single

country publications, 5 are multiple country publications while scoring 0.2273 multiple country publication ratio. In China, 20 publications were published comprising the frequency of 0.02454 of which 15 are single country publications, 5 are multiple country publications while scoring 0.25 multiple country publication ratio. In South Africa, 17 publications were published comprising the frequency of 0.02086 of which 12 are single country publications, 5 are multiple country publications while scoring 0.2941 multiple country publication ratio. In Netherland, 15 publications were published comprising the frequency of 0.0184 of which 10 are single country publications, 5 are multiple country publications while scoring 0.3333 multiple country publication ratio. In Brazil, 14 publications were published comprising the frequency of 0.01718 in which 11 are single country publications, 3 are multiple country publications while scoring 0.2143 multiple country publication ratio.

Table 7

Top Ten Countries (1981-2020)

Country	TP*	Freq.	SCP*	MCP*	MCP*_Ratio
USA	290	0.35583	273	17	0.0586
United Kingdom	64	0.07853	57	7	0.1094
Australia	51	0.06258	45	6	0.1176
Turkey	42	0.05153	41	1	0.0238
Canada	40	0.04908	34	6	0.15
Spain	22	0.02699	17	5	0.2273
China	20	0.02454	15	5	0.25
South Africa	17	0.02086	12	5	0.2941
Netherlands	15	0.0184	10	5	0.3333
Brazil	14	0.01718	11	3	0.2143

TP* = Total Publication, SCP* = Single Country Publications, MCP* = Multiple Country Publications

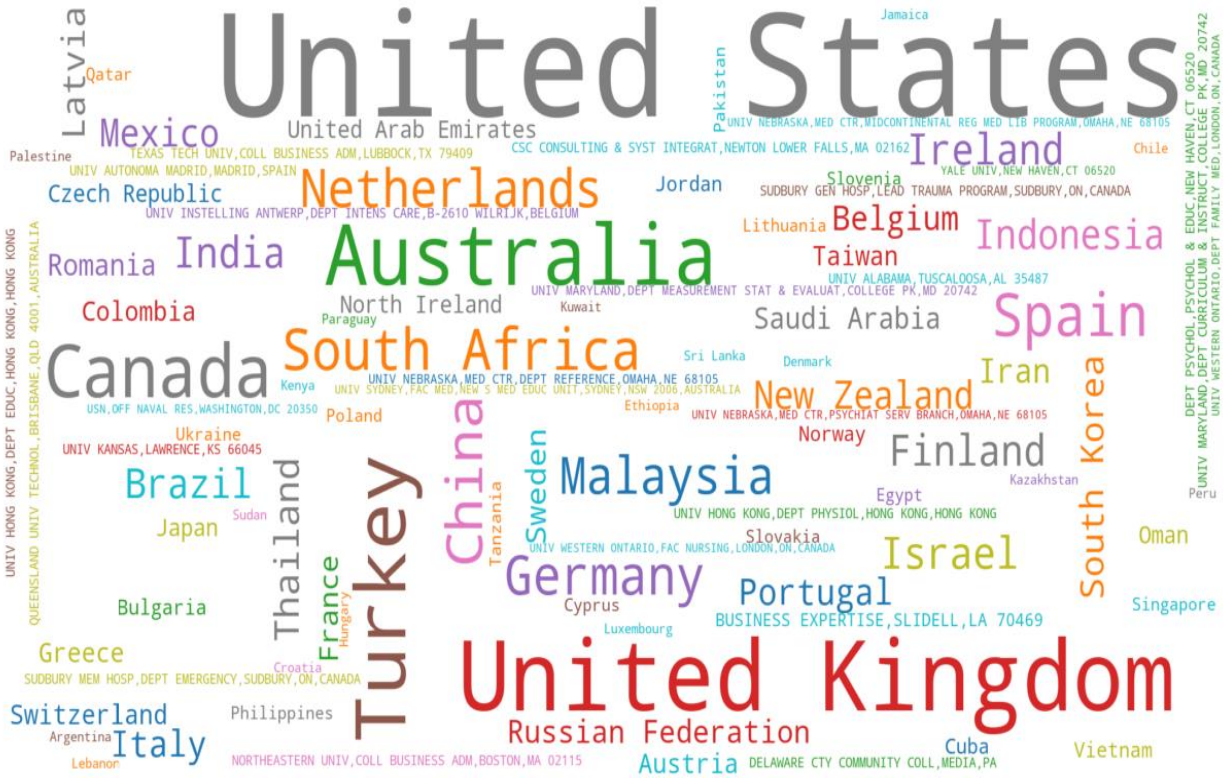

Figure 3. Top Productive Countries (1981-2020)

Top Ten Research Areas of the Published Documents

Table 8 of published documents are portrayed by the top ten research areas from 1981-2020. A total of 96 research areas were identified however top ten research areas are discussed in the table that remained more focused on the publications retrieved. In the above table, 381 publications are published in education and educational research that pertain to 39.623 percent of the total 964 publications. Similarly, 111 (11.515%) published in psychology, 69 (7.158%) published in the field of nursing, 61 (6.328%) published in computer science, 58 (6.017%) published in Business Economics, 50 (5.187%) published in Health Care Sciences Services, 48 (4.979%) published in General Internal Medicine, 38 (3.942%) published in Engineering, 35 (3.631%) published in Rehabilitation, 34 (3.527%) published in Public Environmental Occupational Health, 31 (3.216%) published in Psychiatry, 27 (2.801%) published in Neurosciences Neurology, 19 (1.971%) published in Informational Science Library Science, 18 (1.867%) published each in Pediatrics and Science Technology and other Topics, 16 (1.66%) published in Social Science other Topics, 15 (1.556%) published in Pharmacology Pharmacy, 14 (1.452%) published in Bio-Chemistry and Molecular Biology while 13 (1.349%) published in each Life Sciences and Sociology. The data

shows that the major proportion of the research retrieved is published in education and educational research while a lesser ratio is published in sociology.

Table 8

Top Ten Research Areas (1981-2020)

Research Areas	TP*	% of 964	Research Areas	TP*	% of 964
Education Educational Research	381	39.523	Psychiatry	31	3.216
Psychology	111	11.515	Neurosciences Neurology	27	2.801
Nursing	69	7.158	Information Science Library Science	19	1.971
Computer Science	61	6.328	Pediatrics	18	1.867
Business Economics	58	6.017	Science Technology Other Topics	18	1.867
Health Care Sciences Services	50	5.187	Social Sciences Other Topics	16	1.66
General Internal Medicine	48	4.979	Pharmacology Pharmacy	15	1.556
Engineering	38	3.942	Biochemistry Molecular Biology	14	1.452
Rehabilitation	35	3.631	Life Sciences Biomedicine Other Topics	13	1.349
Public Environmental Occupational Health	34	3.527	Sociology	13	1.349

TP* = Total Publication

Top Ten Keywords of the Published Documents

Above table 9 shows the top ten keywords used in the published documents retrieved in this study. As 2770 keywords were found in which keywords plus (ID) were 1087 and author's keywords (DE) were 1939. In the above table, education is used 97 times having 242 total link strength. Knowledge is utilized 70 times scoring total link strength of 234. Students are found 47 times and the total link strength is 164. Skills are found 43 times and total link strength is 146. Learning is found 33 times and the total link strength is 69. Performance is found 32 times and total link strength is 106. Children are found 25 times and the total link strength is 57. Motivation is found 25 times and the total link strength is 88. The curriculum is found 23 times and the total link strength is 57. Self-Regulated Learning is found 22 times and the total link strength is 54.

Achievement is found 21 times and total link strength is 87. Training is found 21 times and the total link strength is 55. Attitudes are found 19 times and the total link strength is 76. Management is found 19 times and the total link strength is 47. Higher Education is found 18 times and the total link strength is 48. Care is found 17 times and the total link strength is 55. Learning Skills are found 17 times and the total link strength is 23. Strategies are found 17 times and the total link strength is 71. Model is found 16 times and total link strength is 51. Perceptions are found 33 times and the total link strength is 48. The data in the table shows that the education and knowledge linked with students and learning skills are frequently searched keywords. Figure 4 showing the co-occurrence of the keyword magnifies the total link strength in the graph. As 6 clusters are portrayed, in which 125 items with 1482 links and 2176 total link strength are depicted.

Table 9

Top Ten Keywords (1981-2020)

Keywords	*f*	TLS*	Keyword	*f*	TLS*
Education	97	242	Achievement	21	87
Knowledge	70	234	Training	21	55
Students	47	164	Attitudes	19	76
Skills	43	146	Management	19	47
Learning	33	69	Higher Education	18	48
Performance	32	106	Care	17	55
Children	25	57	Learning Skills	17	23
Motivation	25	88	Strategies	17	71
Curriculum	23	57	Model	16	51
Self-Regulated Learning	22	54	Perceptions	16	48

TLS* = Total Link Strength

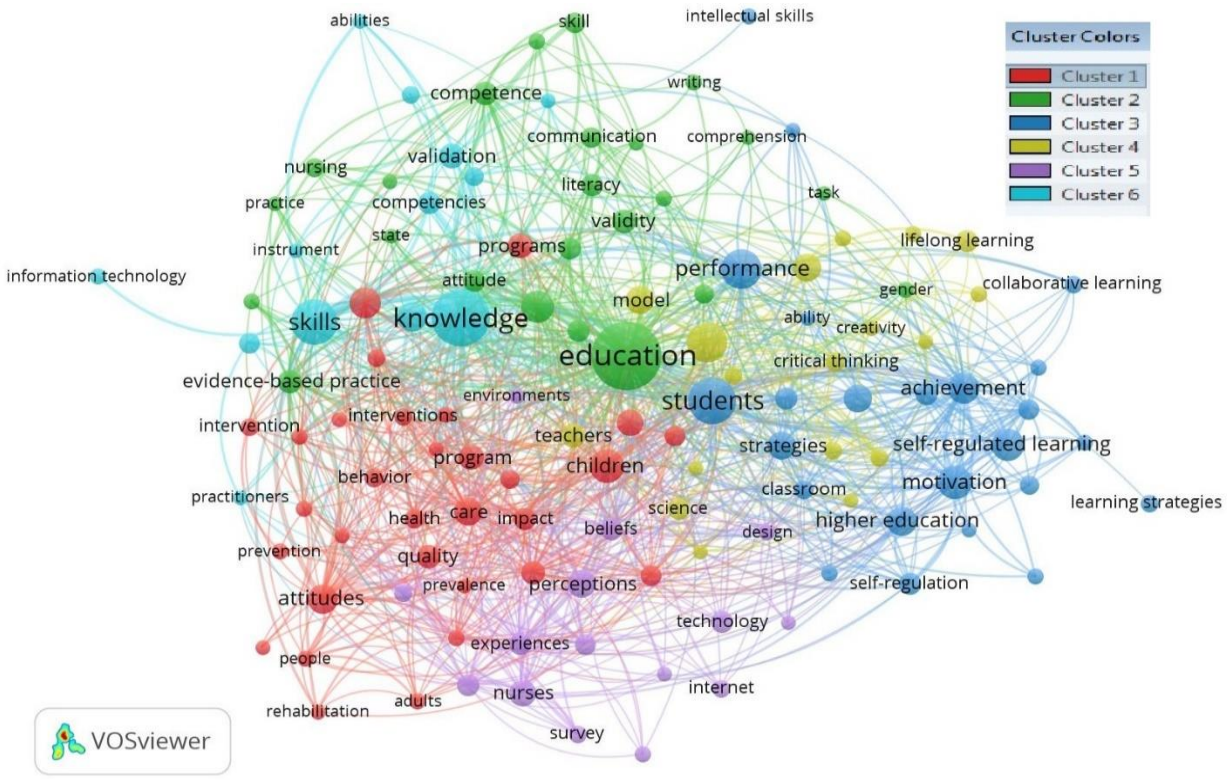

Figure 4. Co-Occurrences of Keywords (1981-2020)

Top Ten Sources of Publications

As we have retrieved the 730 sources comprising journals and books during the bibliometric retrieval of the publications. In Table 10 *(See Appendix A)*, the top ten sources of the publications are showed. These are all the journals where the publications are published. In The FASEB Journal, 12 total publications in 1999 with 1 total citation, 1 h_index, 1 g_index, and 0.043478 m_index. In Medical Teacher, 10 total publications in 2002 with 96 total citations, 5 h_index, 9 g_index, and none found in m_index. In Nurse Education Today, 9 total publications in 2012 with 58 total citations, 4 h_index, 7 g_index, and 0.4 m_index. In the American Journal of Pharmaceutical Education, 6 total publications in 1999 with 32 total citations, 3 h_index, 5 g_index, and 0.130435 m_index. In Academic Psychiatry, 5 total publications in 2006 with 29 total citations, 4 h_index, 5 g_index, and 0.25 m_index. In Advanced Science Letters, 5 total publications in 2015 with 1 total citation, 1 h_index, 1 g_index, and 0.142857 m_index. In the International Journal of Psychology, 5 total publications in 1992 with 0 total citations, 0 h_index, 0 g_index, and 0 m_index. In Academic Medicine, 4 total publications in 2006 with 191 total citations, 4 h_index,

4 g_index, and 0.25 m_index. In the British Journal of Educational Technology, 4 total publications in 2006 with 55 total citations, 3 h_index, 4 g_index, and 0.1875 m_index. In Contemporary Psychology, 4 total publications in 1986 with 4 total citations, 2 h_index, 2 g_index, and 0.055556 m_index.

Top Ten Documents by Citations

Table 11 portrayed the top ten publications among the 964 publications that are best cited during 1981-2020 *(See Appendix B)*. In the table few documents highly cited are shown. The DOI number is provided for the authenticity of the publication for each document in the table that is used to retrieve the original publication. Similarly, the ISSN number along with volume and issues numbers are also showed in the table. Here, we discuss the number of citations acquired by each document. The first article is written by Hattie, J; Biggs, J; Purdie, N in 1996 comprised the 38 pages that pertain to the highest citation of 447. The second article was written by Stevens, MJ; Campion, MA in 1994 has 28 pages and 393 citations. The third article was written by Lee, DMS; Trauth, EM; Farwell, D in 1995 receives 350 citations. The fourth article was written by Head, Denise; Isom, Marlisa in 2010 gets 154 citations. The fifth article Madigosky, WS; Headrick, LA; Nelson, K; Cox, KR; Anderson, T in 2006 is cited by 146 times. The sixth paper is written by Hodges, B; Inch, C; Silver, I in 2001 is cited by 138 people. The seventh paper is written by Lahti, Mari; Hatonen, Heli; Valimaki, Maritta in 2014 is cited by 134 researchers. Paper number eight is written by Thompson, P; Warhurst, C; Callaghan, G in 2001 and cited 122 ties. The ninth paper is written by Prior, Markus; Lupia, Arthur in 2008 and cited by 121 times. The last and tenth paper is written by George, Pradeep Paul; et al. in 2014 and received 105 citations.

Discussions

Knowledge has existed on the face of the earth since human life (Noor, Guo, Shah, Nawaz, & Butt, 2020; Shu, 2020; Yanniris & Huang, 2018). Human beings are the prime source of producing knowledge (Batra et al., 2020; Onyancha, 2020). This knowledge is in the form of skills and is traditionally practiced (Bell & Kennan, 2021). As long as the education developed, the knowledge was transformed, and new horizons were explored in academic skills (Peng et al., 2020). This produced knowledge was deconstructed and reconstructed and stored into the libraries and thus utilized by human beings (Onyancha, 2020). With time, new methods of producing knowledge were invented and utilized for academic skills in education (Chanana, 2011). In this way, humans came to accumulate the web of knowledge in more sophisticated manners that further distributed

into the different categories in education (On-Lee & Mak, 2010). In modern times, the knowledge is revisited and produced in the form of research documents i.e., academic thesis, books, chapters in books, articles, and reports (Rose, 1993; Veer-Ramjeawon & Rowley, 2020). All these types of documents are read, cited, and used by researchers, academicians, and students across the globe through a different web of knowledge (Ajibade & Mutula, 2020; Yanniris & Huang, 2018). Moreover, academic writing is also called academic skills that further denote different types of skills i.e., learning skills, intellectual skills, and critical skills (I. Ali & Aboelmaged, 2020; French, 2020; Podsiadlik, 2021).

In the domain of the sociology of education, a substantial body of literature is conducted around the world (Shoaib & Ullah, 2021; Ullah & Shoaib, 2021). As most of these studies are available to researchers, students, and academics on different knowledge banks (Shoaib et al., 2020; Shoaib, Rasool, & Anwar, 2021). These studies are on academic skills, intellectual skills, and critical skills (Barbosa & Ferreira-Lopes, 2021; Goh & Kim, 2021; Veer-Ramjeawon & Rowley, 2020). Previously, these skills as we mentioned were utilized traditionally. However, these skills have been specified and turned into schools of thought (Beisly, Kwon, & Jeon, 2020; Nam, Love, & Marshall, 2021). For example, we have different schools of thought of critical, functionalist, conflict, and interactionist schools. These schools of thought complied the academic skills in the form of concepts and theories that are verified and principled into the web of society. This stock of knowledge is utilized by researchers, academicians, and students in academic writing to further test the phenomena in society (Aparicio et al., 2021; Kim, Choi, & Park, 2020; Mason, 2020; Sachini, Sioumalas-Christodoulou, Chrysomallidis, Siganos, & Karampekios, 2020). Primarily, it provides an insight into the problem under study. Secondarily, it guides the researchers to further develop the assumptions and hypothesis and given clarity over the problems under study (Huijts & Kolster, 2021; Langørgen et al., 2020; Saunders, Brooks, & Dawson, 2020). Finally, the researchers come to locate the actual position of the phenomenon they want to explore (Anikina, Goncharova, & Evseeva, 2020; Benzie & Harper, 2020; El Alfy, 2021). Thus, the academic skills are indebted to the web of sociology of education in the form of concepts and theories that are further challenged, modified, and restructured (Børte, Nesje, & Lillejord, 2020; Vierula, Haavisto, Hupli, & Talman, 2020; Zongozzi, 2020). While these academic skills are available to all the people to add on the knowledge in the field of education (Shoaib & Ullah, 2021).

It is important to state that we have analyzed the published documents on the academic skills in the domain of sociology of education and information science through bibliometric evidence from 1981-2020. A heap of literature is available on the academic skills for the researchers employing a web of knowledge and e-libraries (Cirelli & Long, 2020; Copeland, Yoon, & Zhang, 2020; Ertz, 2021; Robinson, Saddler, Kerr-Campbell, Patrickson-Stewart, & Walker, 2020; Vandepontseele & Isbergue, 2020). All types of knowledge produced mainly rely on the institutional development of the country (Falloon, 2020; Fu, He, & Xi, 2020; Pacios & Serna, 2020a). As long as the institutions develop, the efforts are further made to produce the knowledge (Anikina et al., 2020; Annala et al., 2020). For all types of knowledge production, academic development is the major source where the ideas are developed and initiatives are taken to further conduct the research (Joseph Jeyaraj & Wald, 2020; Tang, Chang, & Hwang, 2021; Tibingana-Ahimbisibwe et al., 2020; Yang, Hwang, & Sung, 2020). So, the research has the foundation block in producing and disseminating the knowledge. Research suggested that the knowledge is primarily produced by academicians, researchers, and other experts in the academic setting (Jacobs, Parke, Ziegler, Headleand, & De Angeli, 2020; Marchiori & Mendes, 2020; Sharma et al., 2020; Tran, 2020). It is also revealed that academia has been found a prime source of knowledge production for all the developed and developing nations (Goh & Kim, 2021; Kang & Zhang, 2020; Veer-Ramjeawon & Rowley, 2020). The effort to produce the knowledge is initiated by the governments while academia is involved in the recommendations in the light of prevailing issues (Aparicio et al., 2021; Huijts & Kolster, 2021; Zou, Xie, Wang, & Kwan, 2020). It is asserted that the knowledge comes from the developed nations (Bell & Kennan, 2021; Cassia et al., 2020; Marchiori & Mendes, 2020). As they spend a considerable amount of money and time to resolve the issues by engaging the researchers and academicians (Veer-Ramjeawon & Rowley, 2020).

Conclusion

The overall conclusion that we reached based on bibliometric analysis enabled researchers to gain more in-depth insights into the academic learning skills and support to recognize variables that were used during published documents on the issue under discussion. This paper was based to evaluate knowledge skill, learning skill, intellectual skill, and critical skills using bibliometric analysis of the document published and indexed in Web of Science from 1981 to 2020. The study findings concluded that knowledge skill was the top topic, article as a type of documents, and the English language was used as majority published documents. Similarly, the data revealed that the

published documents increased in number per year gradually, Al-Adawi S was the top author, Hacettepe Univ., Turkey top organization, United States top country, and education educational was indicated as a top research area of the published documents along with education as the top keyword. The FASEB Journal was reported as the top source of publication and the document of Hattie, J; Biggs, J; Purdie, N as the top by citation. The study recommended that further scientometric analysis may be employed from other databases and variables under the domain of academic learning skills-oriented topic to make a clear picture of the data.

Limitations of the Study

The present bibliometric analysis was based on published documents in the Web of Science only and we did not use other databases. Further, it only concentrated to evaluate knowledge skill, learning skill, intellectual skill, and critical skills using bibliometric analysis of the document published and indexed in Web of Science from 1981 to 2020. Thus, we did not use other related topics that are interlinked with academic learning skills and the current study.

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Appendix A

Table 10

Top Ten Sources of Publications (1981-2020)

Sources	TP*	TC*	h_index	g_index	m_index	PY*_start
The FASEB Journal	12	1	1	1	0.043478	1999
Medical Teacher	10	96	5	9	----	2002
Nurse Education Today	9	58	4	7	0.4	2012
American Journal of Pharmaceutical Education	6	32	3	5	0.130435	1999
Academic Psychiatry	5	29	4	5	0.25	2006
Advanced Science Letters	5	1	1	1	0.142857	2015
International Journal of Psychology	5	0	0	0	0	1992
Academic Medicine	4	191	4	4	0.25	2006
British Journal of Educational Technology	4	55	3	4	0.1875	2006
Contemporary Psychology	4	4	2	2	0.055556	1986

TP* = Total Publications, TC* = Total Citations, PY* = Publication Year

Appendix B

Table 11

Top Ten Documents by Citations (1981-2020)

DOI	Authors	ISSN	Vol./No.	Pages	PY*	TC*
10.2307/1170605	Hattie, J; Biggs, J; Purdie, N	0034-6543	66(2)	38	1996	447
10.1177/014920639402000210	Stevens, MJ; Campion, MA	0149-2063	20(2)	28	1994	393
10.2307/249598	Lee, DMS; Trauth, EM; Farwell, D	0276-7783	19(3)	28	1995	350
10.1016/j.bbr.2010.01.012	Head, Denise; Isom, Marlisa	0166-4328	209(1)	10	2010	154
10.1097/00001888-200601000-00022	Madigosky, WS; Headrick, LA; Nelson, K; Cox, KR; Anderson, T	1040-2446	81(1)	8	2006	146
10.1176/appi.ajp.158.10.1579	Hodges, B; Inch, C; Silver, I	0002-953X	158(10)	8	2001	138
10.1016/j.ijnurstu.2012.12.017	Lahti, Mari; Hatonen, Heli; Valimaki, Maritta	0020-7489	51(1)	14	2014	134
10.1111/1467-6486.00266	Thompson, P; Warhurst, C; Callaghan, G	0022-2380	38(7)	20	2001	122
10.1111/j.1540-5907.2007.00306.x	Prior, Markus; Lupia, Arthur	0092-5853	52(1)	15	2008	121
10.7189/jogh.04.010406	George, Pradeep Paul; et al.	2047-2978	4(1)	17	2014	105

PY* = Publication Year, TC* = Total Citations