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## **Mentorship in Education: A bibliometric analysis of 100 top-cited articles**

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## **ABSTRACT**

This is the first study of its kind to investigate the 100 most cited articles of mentoring in education that indexed in the world-leading database, i.e., Web of Science. The objectives are to find out publishing trends, authorship patterns, principal authors, highly productive countries, commonly mentioned features in the journals (title, rate, quartile, country, age and the effect of citations) and organization within 100 most cited articles of mentoring in education.

Bibliometrics analysis was used to draw the inferences. This study cover 45 years from 1970 to 2014. The result shows that the 100 most cited mentorship articles received 5448 citations ranging from 228 to minimum 27. The number of articles and citations have gradually increased significantly. The United States is the main contributor to the 100 most cited mentoring articles in education.

**Keywords:** mentoring-bibliometric, mentoring education, Bibliometric, highly cited articles- Mentorship, mentorship in education

## INTRODUCTION

Mentoring is a continuous process of learning with a major impact on the mentees, mentors, and the organization. Comprehensive literature found that mentorship has an important role in growing awareness, professional development, problem-solving, and trust (Akçamete, Aslan & Dinçer, 2010; Aslan & Öcal, 2012; Flesch, 2005). These characteristics ultimately entail and transmit the best practices among educators. While many researchers focused on conventional one-on-one mentoring relationships alone, studies such as (De Janasz & Sullivan, 2004; Mathews, 2003) talked about mentorship as a process that at once included many mentoring partners in a crosscultural and non-hierarchical environment to promote communication, participatory work, and creativity in this process. However, since its many connotations, contexts, and definitions, mentoring has been more important than ever since the 1970s (Vance & Olson, 1991; Cahill, 1996; Gibb, 1999), and the word mentoring remains elusive (Vance & Olson, 1991; Cahill, 1996; Gibb, 1999). Ehrich, Tennen and Hansford (2002) note that the term 'mentoring' has been used interchangeably in education with a peer coach, peer tutor and executive coach. Such an analysis of 159 empirical studies and mentorship was also carried out in Ehrich, Tennen and Hansford (2002), "with a mentor-mentor relationship that involves professional and development and different levels of support" (p. 3). Mentoring means supporting both the program and the individual needs for continuous learning as an organizational education process. Universities and schools have traditionally had a new faculty orientation program that supports the new faculties to quickly adapt to the university community. After the program has been adequately developed, faculty members are integrated into the university community to build on their unique research skills. Mentoring is a way of guiding newly appointed individuals, often superiors, and outstanding achievements (Mullen & Hutinger,

2008). Allen and Eby (2007) have stated: “nearly all occupations, including science, literature, politics, arts, sport, and entertainment, have found mentoring relations in modern history” ( p. 7).

Formal mentoring partnerships benefit from job selection and encouragement, better career satisfaction, individual growth, improved academic skills, increased promotion, and success in study. Mentorship consists of many productive institutions in higher education (Sambunjak et al., 2006). An essential element of career progression is the training of all newly hired faculty members. The mentoring was described as a multifaceted partnership between a young and senior employee, primarily to encourage young employees to work. Mentoring has several advantages, including: practical guidance, developing interpersonal skills, finding and solving academic problems, social networking, increasing personal satisfaction and trust (Allen & O'Brien, 2006; Scandura, 1992).

In a particular field of knowledge, the method used for assessing an article's academic significance is to count how many times other researchers cite the article (Andrés, 2009). Besides, the number of citations represents not only the content of the item but also the credibility of the authors and the influence of articles (Cheek & Quan, 2006). The citation check the academic standard and the significance of the thesis, and the analysis obtains additional citations. Then the research, the authors, the papers, the countries and the organizations that create specific academic works will gradually become more prestigious. This study therefore allows to recognize research patterns and the most frequently present parameters such as authors, articles, etc. There are numbers of bibliometric publication on various educational areas like educational psychology (Walberg, 1990), educational research (Ivanović, 2019), mentoring in nursing education (Ehrich, Tennent, & Hansford, 2002), educational technology (Amiel and Reeves 2008) etc. however, bibliometric studies on mentorship in education is quite scarce.

Though, mentoring is growing focus in education as well as in other fields especially after 1970s. Hence, this study is the first effort that will highlight the top 100 cited articles of mentoring in education, the major contributing countries, key authors, highly ranked organizations and major areas within 100 top cited articles of mentoring in education. The study will be helpful for educationist, young researchers and the people involve in mentoring process.

## **RESEARCH QUESTIONS**

1. What is the trend in the publication of articles?
2. In selecting items, which authorship patterns exist?
3. Whose authors, institutes, and papers are highly cited?
4. What are the most commonly mentioned features in the journals (title, rate, quartile, country, age and the effect of citations)
5. What is the subject dispersion of highly cited articles?

## **METHODOLOGY**

For data collection from the ISI Science Database website, a bibliometric analysis was used. Bibliometric is a method for studying the trends and effects of research in one particular subject. As an informed, globally based research tool for accessing extensive bibliometric knowledge, the Web of science was selected. In the search box, "Mentoring OR Mentorship or Coaching OR Leadership" was applied to the search strategy for data extraction. The extracted data were further restricted by selecting only types of "books" and categories of research, i.e., Health, Studies in Education. The most frequently cited alternative was chosen to organize the results and to identify the top 100 posts. The first full citations of 500 most of the articles mentioned, only 71 items required, were downloaded, followed by over 300 501-800 most of the

above records to complete the 100 articles data set (Annex-A). The data was imported into the MS Excel sheet, which was subsequently grouped into various categories according to the requirements to draw conclusions from the resulting section.

## RESULTS

The production of the top hundred most cited articles per five years is given in Table 1. The 100 most cited articles received a total of 5435 citations. The data covered the period between 1970 and 2014 for 45 years. It shows that the first article published in 1970-1974, which received 55 quotes. The significant growth started in the 1995-1999 era in which 10 articles were published. The maximum articles 38 were published in 2005-2009 gaining 55.42 percent citations; however, the maximum citation impact got the articles published in 2010-2014 that reached 76.5% citation impact.

**Table 1:** Production of 100 most cited articles with their citation score

<b>Period</b>	<b>Publications</b>	<b>Total Citations</b>	<b>Citation Impact</b>
1970-1974	1	55	55.0
1975-1979	0	0	0
1980-1984	5	221	44.2
1985-1989	5	213	42.6
1990-1994	8	369	46.12
1995-1999	10	595	59.5
2000-2004	23	1111	48.30
2005-2009	38	2106	55.42
2010-2014	10	765	76.5
<b>Total</b>	<b>100</b>	<b>5435</b>	<b>54.35</b>

The authorship pattern of 100 most cited articles is given in Table 2. It shows that the single-author, two-authors, and three-authors were the preferred authorship pattern; however, the most preferred authorship pattern was two-authors in which the maximum 40 articles were published that received 2120 citations, and their citation impact was 56.21%. There was also a

significant single-author pattern that got 1855 quotes, and the result of these citations was the maximum, i.e., 56.21%.

**Table-2:** Authorship pattern of 100 most cited article

<b>Authorship Pattern</b>	<b>Publications</b>	<b>Total Citations</b>	<b>Citation Impact</b>
Single Author	33	1,855	56.21
Two-Authors	40	2120	53.00
Three-Authors	15	789	52.60
Four-Authors	5	235	43.83
Five-Authors	4	237	58.75
Six-Authors	2	104	52.00
Seven-Authors	0	0	0
Eight-Authors	1	95	95.00

The 100 most cited articles on mentorship in education were published in a total of 49 journals, however, here is only the most productive top 10 journals are listed (Table 3). The list provided the name of a publishing country, frequency, accessibility, age of journals, number of publications, Impact and Quartile factory, total citations, and their citation impact. It shows that most of the chronicles (07) belonged to the United States, two from England and one from Australia. The journal ‘Teaching and Teacher Education’ published in England was the most productive journal with 20 publications from the 100 most cited articles. This journal fall in Q1 rank, got 1206 citations and the impact of these citations was 60.3%, followed by the ‘Journal of Teacher Education’ in which 10 publications appeared. Notably, the journal ‘Educational Leadership’ got the maximum citation impact, i.e., 82.25.

**Table-3:** Highly productive Journals

<b>S.No.</b>	<b>Journal’s Name</b>	<b>Country</b>	<b>Frequency (issues in a year)</b>	<b>Accessibility (Online/ print/ both)</b>	<b>Age of journals</b>	<b>Publication (n)</b>	<b>Impact &amp;Quartile Factor</b>	<b>C</b>
1.	Teaching and Teacher Education	England	Monthly	Both	1985	20	2.47 Q1	



2.	Journal of Teacher Education	United States	5 issues/year	Both	1950	10	3.18 Q1
3.	Research in Higher Education	United States	8 issues/year	Both	1973	6	1.79 Q2
4.	Educational Administration Quarterly	United States	5 issues / year	Both	1965	4	1.85 Q2
5.	Educational Leadership	United States	8 issues /year	Both	1943	4	0.25 Q4
6.	Academy of Management Learning & Education	United States	Quarterly	Both	2009	2	2.86 Q1
7.	American Journal of Education	United States	Quarterly	Both	1893	2	1.33 Q3
8.	Australasian Journal of Educational Technology	Australia	6 issues/year	Online only	1985	1	1.39 Q2
9.	Communication Education	United States	Quarterly	Both	1952	2	0.14 Q4
10.	Computers & Education	England	Monthly	Online only	1976	3	4.53 Q1

The country distribution in the 100 most cited articles in mentorship in education is given in Table 4. There are 16 countries in the list. The United States obviously was the most productive and contributing country with remarkably 73 publications, 4082 citations against these publications, and 55.91 citation impact. Australia was the second on this rank with 9 releases following by England with 7 papers and other countries in the table. Notably, only one publication was published in Germany, but it received 118 citations, the highest of all on the list.

**Table-4:** Country distribution of articles based on the affiliated countries of all authors

Rank	Country	Publications	Total Citations	Citation Impact
1	USA	73	4082	55.91
2	Australia	9	504	56.00
3	England	7	350	50.00
4	Canada	3	168	56.00

5	Israel	3	94	31.33
6	Netherland	3	94	31.33
7	Wales	2	145	72.50
8	Norway	2	122	61.00
9	Sweden	2	111	55.5
10	Finland	2	79	39.50
11	Germany	1	118	118.00
12	Greece	1	95	95.00
13	Italy	1	40	40.00
14	South Africa	1	32	32.00
15	Taiwan	1	30	30.00
16	Estonia	1	29	29.00

Table 5 presents the most productive organization based on the authors' affiliation mentioned in the article. Interestingly, of the 12 most productive organizations, all belong to the United States. The researchers affiliated with the University of California produced a maximum of six articles, followed by the University of Georgia and the University of New Mexico with five publications each. Two universities contributed four articles each, and four universities submitted three items each. The citation impacts of the top 12 organizations vary from 36.00 to 127.50. The publications by Cornell University (10<sup>th</sup> in the list) got the highest ratio of citation impact with 127.50, and the lowest citation impact of 36.00 by the University of New Mexico (3<sup>rd</sup> in the list).

**Table-5:** Most productive and highly cited institutions

S. No.	Name of the University	Country	Publications	Citations	Citations impact
1	University of California	USA	6	305	50.83
2	University of Georgia	USA	5	300	60.00
3	University of New Mexico	USA	5	180	36.00
4	University of North Carolina	USA	4	201	50.25
5	Michigan State University	USA	4	159	39.75
6	Purdue University	USA	3	236	78.66
7	University of Kentucky	USA	3	153	51.00
8	Auburn University	USA	3	143	47.66

9	Appalachian University	USA	3	116	38.66
10	Cornell University	USA	2	255	127.5
11	California State University	USA	2	156	78.00
12	University of Minnesota	USA	2	87	43.5

Most prolific authors are named in table 6. It is noteworthy that a total of 210 scholars wrote the top 100 articles. There were only seven authors that produced two articles each, whereas the rest of 203 authors contributed only one item each in 100 most cited articles. The author ' Showers, B. ' was the most prolific author in two publications and maximum citations from the University of Oregon, USA., i.e., 248.

**Table 6:** Most productive authors

S.No	Author's Name	Publications (n)	Institutions	Country	Citations
1	Showers, B.	2	University of Oregon	USA	248
2	Edwards, A.	2	Univ Birmingham	England	177
3	Protheroe, L.	2	Univ Birmingham	England	177
4	Darwin, A.	2	University of South Australia	Australia	155
5	Achinstein, B.	2	University of California	USA	91
6	Stanulis, RN.	2	University of Georgia	USA	79
7	Bradbury, LU.	2	Appalachian State University	USA	73

As Table 7 shows, hundreds of most cited articles have been distributed into seven substantial categories of educational mentoring. The majority of the articles (78), i.e., faculty mentorship with 3106 citations and student mentorship with 1059 quotes. Most items (n=57) were on ' faculty mentorship' followed by twenty-one articles on' student mentorship. Also, seven pieces were on' mentorship concepts,' six on 'coaching staff, 'four on 'career mentoring,' three on 'mentoring youth', and two on 'general mentoring' respectively.

**Table – 7:** Subject dispersion, broad theme, and citation impact

<b>Rank</b>	<b>Subjects</b>	<b>Broad Theme</b>	<b>Publications</b>	<b>Citations</b>	<b>Citations impact</b>
1	Faculty Mentoring	Faculty Mentoring	57	3106	54.49
2	Faculty Students Mentoring	Student Mentoring	21	1059	50.42
3	Mentoring Concept	Mentoring Concept	7	300	42.8
4	Coaching Staff	Coaching Staff	6	300	50
5	Mentoring Leadership	Career Mentoring	4	244	61
6	Mentoring Adults	Mentoring Youth	3	108	36
7	Mentoring General	Mentoring General	2	89	44.5

## **DISCUSSION**

The aim of the current study was to analyze the 100 most highly cited articles of mentoring in education and to identify the gradual growth of annual research, authorship patterns, highly cited authors, countries, institutions, journals, and papers. Besides, the subject of dispersion of highly cited articles is also explored. The analysis of highly cited articles illustrates that after 2000, the number of articles and citations has increased. This can be due to the growth and importance of the concept of mentoring in the field of education. As we examine the rise in published material and the quantity of mentoring citations, we start a new analysis of the Science Database, showing that 326 of 3,683 articles were written before 2000. We also compared the citation analysis and found that 88% of citations were published between (2000-2018). Kosmützky and Krücken (2014) concluded that there was a positive trend in the growth of mentoring educational publications and citations after 2000. Similarly, Heradio et al. (2016) observed that after 2000, paper and citation advances in digital and remote laboratories have gradually increased over the years.

### **Pattern of authorship**

The analysis of highly cited articles revealed that collaborative authorship pattern dominates (67%). Whereas a single authorship pattern has higher citation impact (56%) than collaborative authorship (50%). The sole author's dominance can be attributed to the competence and knowledge of the discipline and the evolving nature of the concept of mentoring. This is an unusual case in which it does not apply in other areas. Bayer and Smart (1991) claim that co-authorship becomes more popular than single authorship because it offers more opportunities to change jobs and improve their employers' reputation. There is also some proof that joint research results in a better product for research. The co-authorship can develop creative and innovative ideas, improve research skills, improve the productivity of research, save time, offer more funding opportunities, conduct multidisciplinary research, promote quality research, prevent the burnout of researchers, and strengthen social links. Ale Ebrahim et al. (2013) agreed with this point of view and concluded that both national and international authorship collaboration has a positive impact on research productivity.

### **Highly cited journals**

These articles were published in 48 research journals. The majority of highly cited articles published in journals belong to U.S.A (N=33) and England (n=13). Most of the journals in the top 10 have Q1 and Q2. These journals focus on areas of expertise, a pioneer in printing of quality mentorship, peer review, a high impact factor, and up-to-date information of priceless value. Researchers tend to select these journals for promotion and accreditation purposes. The top five journals were: *Teaching and learning For teachers*, *teaching and learning*, *the Education Teacher Journal*, *Educational Administration Quarterly* and *Educational Leadership* respectively. It indicates that the frequency of the journal and the citations have a positive correlation. More citations will be sent to the frequently published journal. Some articles have

been published in: education and training. It may be clarified that it is a typical, highly regarded academic journal with Quartile 1, which can influence the authors' decision on where to publish. There are different characteristics associated with highly cited journals, including the reputation of the journal, the novelty of the topic, impact factor, frequency of journal, quality of publications, and visibility and accessibility of the journal. This is inconsistent with Lokker et al. (2012) and Prevezanos, P., Tsolakis, A. I., and Christou, P. (2018).

### **Key contributing organizations and authors**

The University of California, the University of Georgia, and the University of Purdue were the three primary contributing universities. The reason behind that they have developed mentoring programs and are providing funding for mentoring studies. These universities are pioneering in terms of mentoring, expertise, and the support of stakeholders. The four most frequently mentioned authors go to Showers, B. Edwards, A., of England came second with the highest number of citations, Protheroe, L., of England, come third, Darwin, A., from Australia, comes fourth. The mentoring leadership, led by faculty mentors, was most noteworthy for the scattering of subjects, while faculty /students were in the third position, and coaching personnel was fourth. It is because of the importance of the issue and the status of the paper that these subjects are cited more than others.

### **LIMITATIONS AND FUTURE RESEARCH DIRECTIONS**

The study was limited to only one database, i.e., ISI Web of Science, and further, the data were extracted within 100 top-cited articles of mentorship in education. Future studies should explore the highly cited article based on Scopus, ERIC and Google Scholar databases. Future bibliometric research on a mentor training program, as well as research collaboration and authorship pattern, need to be investigated.

## **CONCLUSION**

This article has examined the following characteristics: the publishing years, journals, and the web of science categories, authors, organizations, the countries, and the highest cites in the field of mentoring in education. Some interesting findings have been identified by bibliometric research on relevant articles in education mentorship-related research. This work also shows that the "classic" article that continues to be cited for many years will likely become a rare commodity in the future as data is produced and disseminated at a faster pace. The number of articles has increased rapidly between 1970 and 2014. The majority of items in the field of mentoring education research are published by countries with high incomes, whereas fewer papers are published by countries with low-incomes. When considering the overall and per capita number of publications, the United States is the wealthiest country. However, some European countries and Australia may have a higher quality of articles.

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## ANNEXURE –A

### Hundred most cited articles with some citations

S.No.	Article Description	Citations
1.	Crawford, B. A. (2007). Learning to teach science as inquiry in the rough and tumble of practice. <i>Journal of research in science teaching</i> , 44(4), 613-642.	228
2.	Showers, B., & Joyce, B. (1996). The evolution of peer coaching. <i>Educational leadership</i> , 53, 12-16.	178
3.	Campbell, T. A., & Campbell, D. E. (1997). Faculty/student mentor program: Effects on academic performance and retention. <i>Research in higher education</i> , 38(6), 727-742.	118
4.	Paglis, L. L., Green, S. G., & Bauer, T. N. (2006). Does adviser mentoring add value? A longitudinal study of mentoring and doctoral student outcomes. <i>Research in Higher Education</i> , 47(4), 451-476.	117
5.	Fantilli, R. D., & McDougall, D. E. (2009). A study of novice teachers: Challenges and supports in the first years. <i>Teaching and teacher education</i> , 25(6), 814-825.	107
6.	Dimitriadis, S., Barbas, A., Molohides, A., Palaigeorgiou, G., Psillos, D., Vlahavas, I., ...&Pombortsis, A. (2003). “Cultures in negotiation”: teachers’ acceptance/resistance attitudes considering the infusion of technology into schools. <i>Computers &amp; Education</i> , 41(1), 19-37.	95
7.	Glazer, E. M., &Hannafin, M. J. (2006). The collaborative apprenticeship model: Situated professional development within school settings. <i>Teaching and teacher education</i> , 22(2), 179-193.	93
8.	Wang, J. (2001). Contexts of mentoring and opportunities for learning to teach: A comparative study of mentoring practice. <i>Teaching and teacher education</i> , 17(1), 51-73.	90
9.	Kamler, B. (2008). Rethinking doctoral publication practices: Writing from and beyond the thesis. <i>Studies in Higher Education</i> , 33(3), 283-294.	87
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