



## Revisiting Three Decades of Educational Research in Iran: A Bibliometric and Authorship Analysis

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ARTICLE INFO	ABSTRACT
<p>Received: 9 June 2019 Revised: 13 June 2019 Accepted: 23 June 2019 Online: 6 October 2019</p>	<p>Educational research is one of the fundamental infrastructure factors that improve sustainable development of a country. The aim of this mixed methods study was to explore research trends by employing scintometric approach in order to visualize and structure Iranian educational research literature. Based on the bibliometric technique, all 3,812 existing documents from 2000 to 2018 are investigated. Additionally, we employed bibliometric analyses on a sample of 100 most cited papers to identify articles of higher quality or impact. Major trends in Iranian educational research literature, including variations across publication years, identifying active research areas, and the most prolific authors were also investigated. The results of the thematic analysis showed that educational psychology in the schools, technology based research in higher education, improvement in language learning and micro view to teaching and learning are valuable Iranian educational research themes. Implications for research institutions, education policy makers, and educational researchers are discussed.</p>
<p><b>KEYWORDS</b></p> <p>Educational Research, Iran Bibliometric Analysis, Bibliometric Mapping, Research Trends, Thematic Analysis</p>	

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## **Introduction**

Educational research has been defined as the formal systematic application of the scientific method to the study of educational problems (Wellington, 2015; Mills & Gay, 2016). In most countries, educational research is one of the performance indicators for sustainable development (Sile, & Vanderstraeten, 2019). In addition, it has the potential to make an important contribution to policy formulation and analysis (Ion, Marin, & Proteasa, 2018) and education reforms (Dudaité, 2018) since it is the tool, which enables policy makers to determine national educational needs, to assess new approaches to resolving issues, and to evaluate the effectiveness of policies and strategies (Postlethwaite, 2003). In addition, it also plays a critical role in the educational reform (Ordonez & Maclean, 2003). In other words, in developing countries educational research has become one of the key political matters (Dudaité, 2018). From different points of view, educational research is a fundamental principle that underpins the relationships and interactions among teachers, students, and resources in the learning environments (Shakiba, Ale Ebrahim, Danaee, Bakhtiyari, & Sundararajan, 2016). For these reasons, it can be stated that one of the objectives of educational research is to help people to be smarter. At the same time, the researchers need to explore how educational research can effectively support teaching and learning. For this reason, there is exponential growth of research articles, conference papers and books in the field of education in developed countries. However, despite the important potential of educational research, it seems that little attention is paid to the impact of this type of research on developing countries, including Iran. One of the ways that shows the impact is research performance by employing bibliometric indicators (Sile & Vanderstraeten, 2019). In addition, in some cases, educational research has had relatively little direct impact on practice (Ordonez & Maclean, 2003). In order to improve the current situation, there is a need to investigate educational research trends and themes in Iran because this issue is of great interest to academicians, policy makers, and development practitioners. Furthermore, overview of educational research area in Iran is limited. In particular, the latest literature review (e.g. Shakiba et al., 2016) has investigated educational growth between 1990 and 2012.

The purpose of this research is to conduct a bibliometric and authorship analysis of educational research in Iran. Bibliometric analysis has been widely applied to evaluate research papers and to provide information on the growth trend (Chuang, Chuang, Ho, & Ho,

2011; Khodabandelou, Mehran, & Nimehchisalem, 2018; Amoozegar, Khodabandelou, & Ale Ebrahim, 2018; Fellnhofe, 2019). It has become as a common procedure involving publications used for assessment of research impact (Eduan & Yuanqun, 2018). Generally, *bibliometric* is a statistical technique to bibliographic information (Fellnhofe, 2019). To facilitate this type of studies, many web-based tools exist to easy analysis of research performance InCites (using the Web of Science (WoS)) and SciVal (using Scopus) (Eduan & Yuanqun, 2018). For the purpose of this study, bibliometric data was extracted from WoS, which is the most popular database used to capture and measure the number and quality of academic publications and provide strong database to support this information.

### ***Bibliometric mapping***

One of the specific types of bibliometric analysis is bibliometric mapping. According to Vošner, Kokol, Bobek, Železnik, and Završnik (2016), this analysis is used to visualize research literature with a variety of visual maps, providing a structural overview of the articles. As Van Eck and Waltman (2014) argue, one way of using bibliometric mapping is to identify the research areas with the purpose of providing an overview of the topology, themes, topics, and terms of the publications. In this context, Fellnhofe (2019) states that “bibliometric mapping applies quantitative methods to bibliographic data to present scientific knowledge visually” (p. 5). One of the popular techniques of mapping is Visualization of Similarities (VOS), which has been implemented by Leiden University, Netherlands as a computer application called VOSviewer (Van Eck & Waltman, 2010, 2013, 2014). This computer program visualizes bibliometric maps in different ways in order to analyze the publications comprehensively. One of the advantages of the software is to provide mapping and clustering “based on the normalized term co-occurrence matrix and a similarity measure” (Van Eck & Waltman, 2010, 2013, 2014). In addition, the VOSviewer uses both mapping and clustering approach in order to calculate association strength between keywords. In his technique, the keywords that are closely associated are structured into same clusters by the same colors (Van Eck & Waltman, 2014). For this reason, the VOSviewer can be used in the thematic analysis. Furthermore, VOSviewer can generate institution, co-authors, countries, citation, and keyword networks (Vošner et al., 2016). The significance of VOSviewer has been highlighted in the previous research. For instance, Fellnhofe (2019) articulated that VOSviewer devotes significant effort to the graphical depiction of bibliometric maps.

In this paper, we utilized Web of Science (WoS) Core Collection database to collect the most relevant educational research articles published between 1990 and 2018 by Iranian scholars. Then we analyzed the articles based on the publication year, number of authors, document type, keywords, co-authorship collaboration, and highly cited articles to explore the major trends in educational research studies. Based on the above statements, it can be noted that the overall aim of the study was to explore Iranian educational research bibliometric characteristics to conduct a descriptive bibliometric analysis. Further, the aim of this study was to visualize the content of Iranian publications by using a mixed methods approach, combining bibliometric mapping with thematic analysis to find out the educational research patterns of Iran between 1990 and 2018.

## **1. Research Method**

One common method of bibliometric research is to trace publications using the “Web of Science Core Collection” (Fu et al., 2010) database that includes “SCI-EXPANDED”, “SSCI”, “A & HCI”, “CPCI-S”, “CPCI-SSH”, and ESCI to include articles with an acceptable level of quality. The data of the following variables were collected and analyzed to reveal research trends: publication and citation number in each year, top ranking institution, and author and subject area. This paper reviewed the articles published from 1990 until 2018. To depict a real picture of the published documents, the researchers excluded 2019 items. The topic search could trace the related information in the title, abstract, and keyword in one time (Fu, et al., 2010). “Education and Educational research” was used as a research phrase to search topics in WoS for the period from 1990 to 2018.

For the purpose of this study, the software tool VOSviewer version 1.6.10 was used for constructing and visualizing bibliometric mapping from titles and abstract of articles published in the WoS over the period 1990-2018. Furthermore, we designed our measurement of the number of citations studies have received from our sample. Afterwards, we designed and calculated a citation index for each study as the average number of citations per year. Then, we ranked the studies in our sample based on this index to identify top 100 articles with highest citation index. We used this sub-sample for our core analyses. However, for more general analysis, full sample (i.e., 3,812 studies) has been used as described in the Results section.

## Results

### *Document type*

In our analysis of data set, 3,812 information sources which have been published from 1990 to 2018 within 9 document types have been identified. Table 1 shows the frequency along with percentage of each type of the documents.

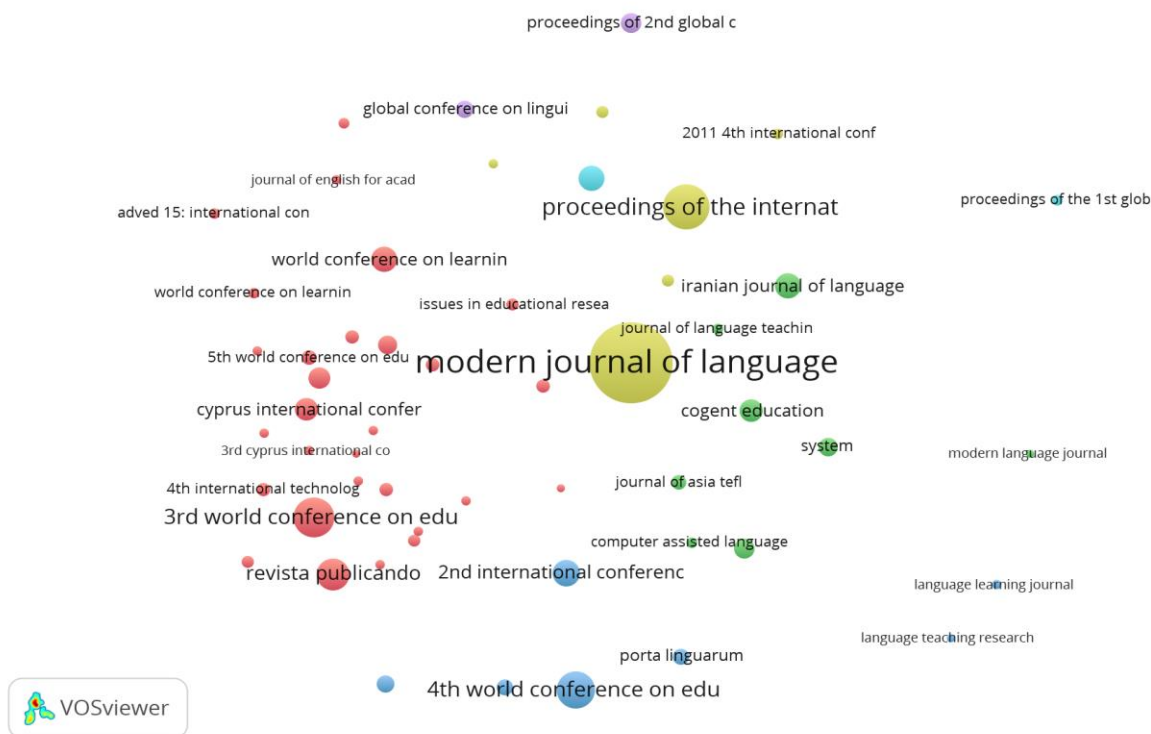
**Table 1. Document types of the Iranian educational research**

Document types	Number of total articles	%of 3812
Article	1885	49.44
Proceedings paper	1820	47.44
Book review	65	1.71
Book Chapter	38	0.99
Review	24	0.63
Editorial material	11	0.28
Correction	4	0.10
Note	2	0.05
Letter	1	0.02

As Table 1 shows, there were 1,885 (49.44 per cent) article, indicating that articles were the dominant document type of the total Iranian educational research production. Proceedings paper was the next document type ( $f = 1,820$ ; 47.44 per cent), followed by book review ( $f = 65$ ; 1.71 per cent), review ( $n = 24$ ; 0.63 per cent), and editorial material ( $f = 11$ ; 0.28 per cent). Minimum numbers of information sources have been published were note ( $f = 2$ ; 0.05 per cent) and letter ( $f = 1$ ; 0.02 per cent) document types.

Further analysis was applied by using bibliometric mapping in order to find out where articles were published by Iranian educational researchers. Several scientific journals published the articles observed in this bibliometric study. Iranian educational researchers published and presented their scientific production in 403 different resources. 54 out of 403 resources published more than 10 papers from Iran. Among them, *Procedia Social and*

*Behavioral Sciences* with (n= 1411, %37.01) papers and *Modern Journal of Language Teaching Methods* with (n=803, %21.05) papers were the most noteworthy journals regarding number of publications.



**Fig 1. Distribution of document types of the Iranian educational research>10**

The second trend we describe is the time trend of educational research publications in our sample. Fig 2 displays the number of publications from year 1990 to 2018. And Figure 3 displays the number of citations per year. As Fig 2 indicates, the highest number of publications is observed in 2016 (n= 573) and 2011 (n=493). The data up to 2018 point to a growing trend of publications over time, implying that there is an interest among the Iranian scholars in conducting research in the education area.

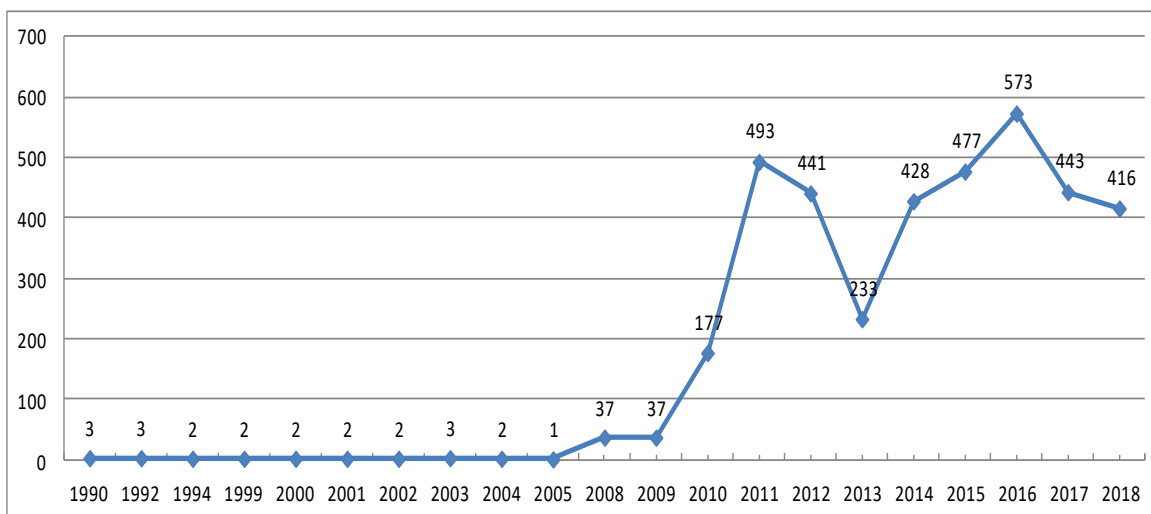


Fig 2. Number of educational research publications per year

As mentioned earlier, Fig 2 displays the number of citations per year. The table also shows the data up to 2018 point to a growing trend of citations over time, implying that there is growing impact of Iranian scholars' papers in the education area.

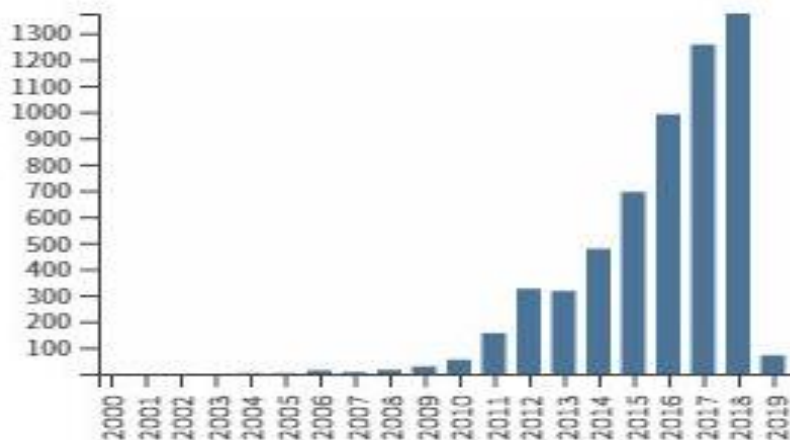


Fig 2. Number of citations per year

### ***Iranian most prolific authors***

In Table 3, we listed the top Iranian prolific authors, along with the number of publication in the WoS data set from 1990 to 2018 and the corresponding percentages. There were 23 authors with more than 10 papers. Among them Gorjian, Sadeghi, and Sadighi are the most

successful with 35 (%0.918) published articles and in 4<sup>th</sup> place is Rahimi with 35 (%0.866) published articles. It is worth noting that the difference in the number of published articles between the 1<sup>st</sup> and 8<sup>th</sup> most Iranian prolific authors is 13 published publications. In addition, the difference between the 1<sup>st</sup> and the 2<sup>nd</sup> most prolific authors is only two articles, while the difference between the 8<sup>th</sup> and 9<sup>th</sup> authors is only one published article.

**Table 3. Most prolific authors**

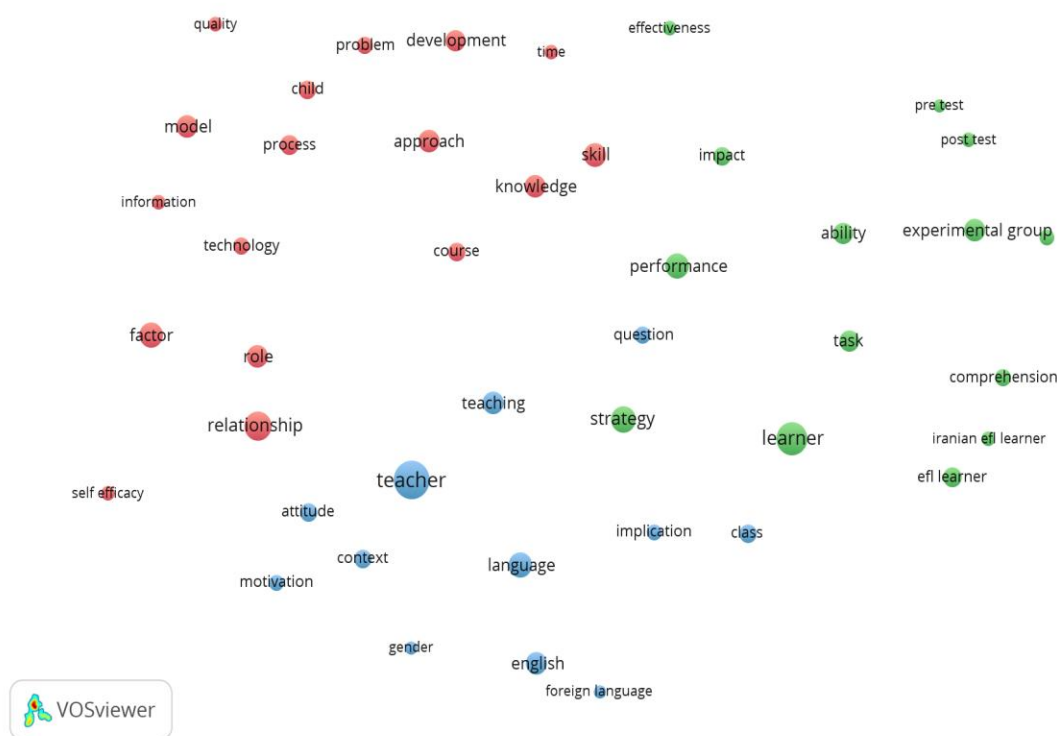
<b>Authors</b>	<b>Records</b>	<b>% of 3812</b>
Gorjian, B	35	0.918
Sadeghi, K	35	0.918
Sadighi, F	35	0.918
Rahimi, A	33	0.866
Hashemi, M	30	0.787
Rahimi, M	27	0.708
Mehrdad, A. G	25	0.656
Gowhary, H	23	0.603
Ahmadi, A	22	0.577
Azizifar, A	22	0.577

### ***Thematic analysis***

The VOSviewer software was used to generate the scientific overview on top 80 more frequently terms (n=4,7657) the basis of terms occurring in publication's titles and abstracts presented in Fig 3. Based on the mapping and clustering approach described, three (3) clusters emerged automatically in the scientific overview. According to the most frequently used keywords found in these clusters, the researchers labeled each cluster with an appropriate research theme:



- Technology and learning related research (red color): This cluster includes terms such as “quality”, “problem”, “technology”, “information”, “child”, “approach”, “knowledge”, “skill”, “course”, “self-efficacy”, “model”, “process”, etc.
- Policy and strategic related research (green color): This cluster includes terms such as “effectiveness”, “impact”, “performance”, “strategy”, “experiment”, etc.
- Language learning and educational psychology (blue color): This cluster includes terms such as “attitude”, “teacher”, “teaching”, “English as Foreign Language”, “English”, “motivation learners”, “motivation”, “perception”, etc.



**Fig 3. The scientific overview of Iranian educational research from 1990 to 2018 (n >250)**

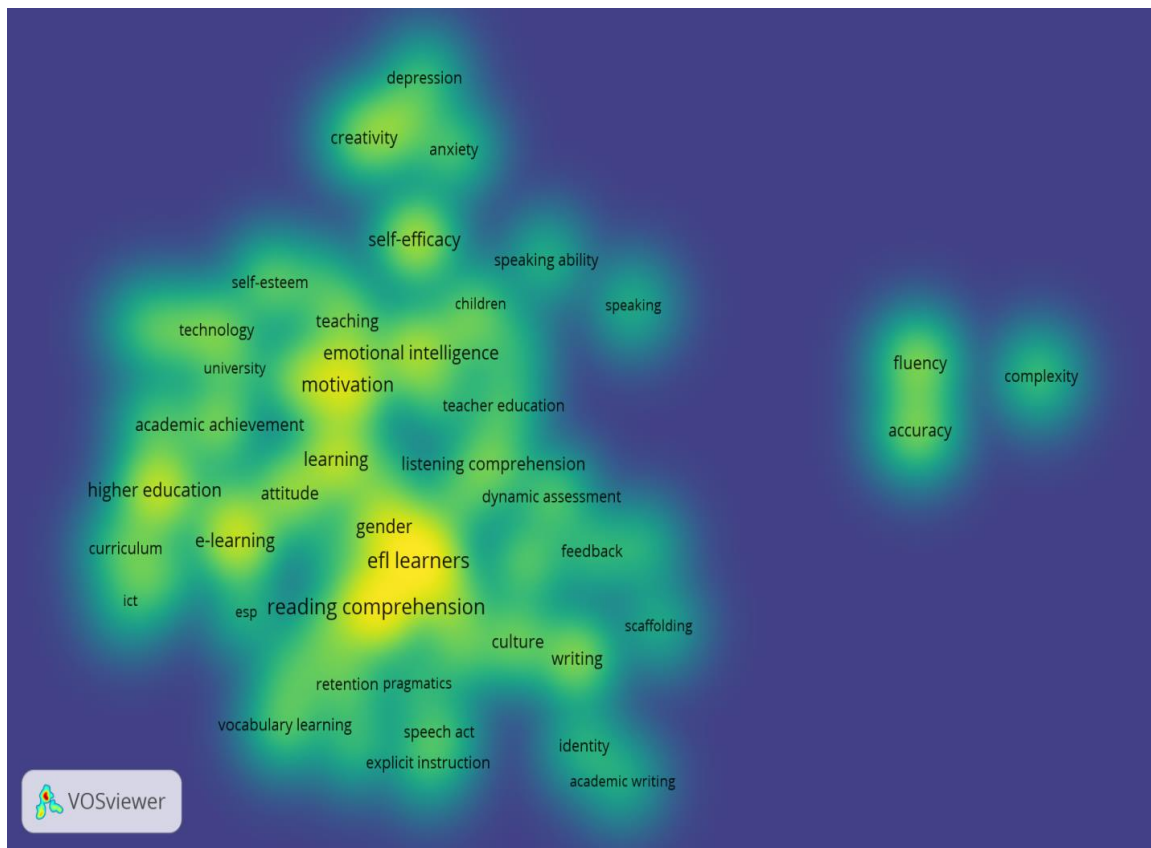
Author keywords are used for analyzing the text. They are very important because author keywords represent the main concepts of the articles. The co-occurrences network of the author keywords is another aspect of themes published in journals. Moreover, it shows which author keywords occur frequently together in the same publications (Vošner et al., 2016).

Iranian authors who published their research articles in WoS data set used 8,564 (73 of them appeared more than 15) different keywords. For the purpose of this study, the keywords

which are used more often are marked with larger circles and those which are used less often are marked with a smaller circle by using VOSviewer (Fig. 4). Keywords such as “Iran”, “education”, “higher education”, “teaching”, “learning” and “curriculum” are obviously by far the most used author's keywords, followed by “emotional intelligence”, “students”, “critical thinking” and “academic achievement”. By using the software, keywords occur within 6 different clusters, separated by color, and representing the following themes:

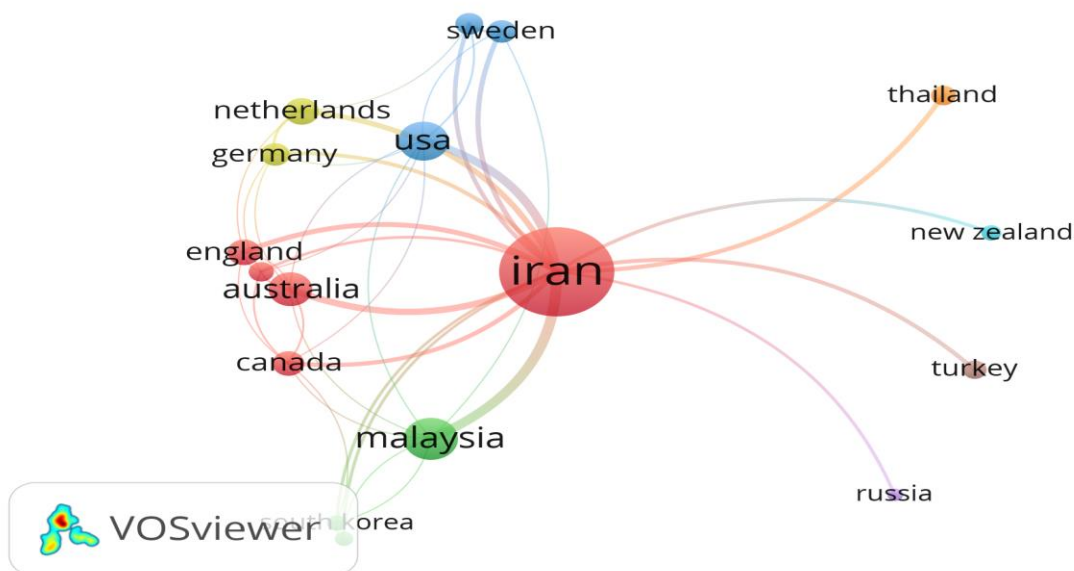
- English language learning (**red color**) containing keywords such as “reading”, “ELF”, “reading comprehension”, “English for specific purposes”, “vocabulary”, “speech act”, “gender”, etc.
- Technology based research (**green color**) is characterized by author keywords such as “collaborative learning”, “curriculum”, “e-learning”, “education”, “higher education”, “education”, “ICT”, “Iran”, which are all connected to the technology and computer pitfalls.
- Strategic and evaluation related studies (**blue color**) represented by author keywords such as “culture”, “feedback”, “assessment”, “scaffolding”, etc.
- Technology in higher education research (**yellow color**) containing author keywords like “academic achievement”, “higher education”, “technology”, “e-learning”, etc.
- Teacher education and (**violet color**) presented by author keywords such as “teacher education”, “children”, etc.
- Psychological aspect research (**maya color**) presented by author keywords such as “depression”, “anxiety”, “self-efficacy”, “creativity”, etc.





**Fig 5. Author keywords co-occurrences map (n > 10).**

Fig. 6 presents the co-authorship collaboration between Iranian researchers and other researchers from various countries. Collaboration was identified between 25 countries are shown in Fig. 6. Based on the data extracted from WOS, 50 countries collaborated with Iranian scholars, 17 of which appeared more than 5 times. Iranian authors are mostly active in co-authorship collaboration (seen from the size of the circle) with American, Australian, Malaysian, and the UK researchers. As shown in Figure 6, the frequency of co-authorship collaboration with each country is evident from the thickness of the line, indicating that the Iranian researchers collaborate most intensively with the above mentioned countries. Iranian researchers also have some collaboration with Canada, Thai, Turkey, and Sweden. The whole list is shown in the figure below.



**Fig 6. Co-authorship collaboration between Iran and the 20 most collaboration intensive countries**

The most productive institutions from a total of 1017 (63 of which published more than 10 publications) were Islamic Azad University (n=816, 43.38%) and University of Tehran (n=159, 8.45%). As mentioned above, the current research indicated that institutional co-authorship exists between 434 institutions. Fig. 7 shows the co-authorship collaboration between 10 institutions. Interestingly, Islamic Azad University collaborates very intensively with University of Tehran and Allameh Tabatabaei University. It seems that Islamic Azad University has collaboration with almost top Iranian institutions. As Figure 7 shows, institutional co-authorship exists between all Iranian institutions.

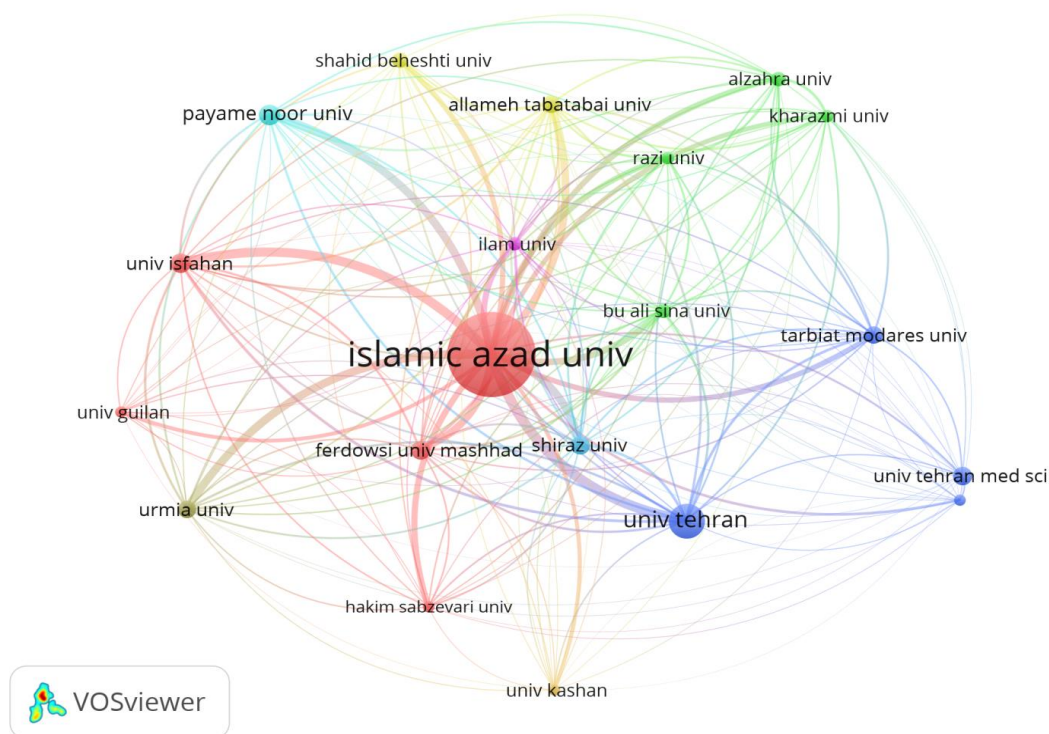


Fig 7. Co-authorship collaboration of the 10 most collaboration intensive Iranian institutions

### ***Further analysis of highly cited articles***

In order to have a comprehensive overview of educational research in Iran and to evaluate the impact of Iranian educational research, it was of interest to identify the most frequently cited papers as a whole. Therefore, we analyzed highly cited articles. Krauskopf (2018) stated the number of citations a particular paper receives is a measure of its visibility to other researchers. Consequently, top 100 highly cited documents were further analyzed by citation counts in the WoS database (as at 4th February 2019). By using total citation, the 20 most frequently cited documents published between 1990-2018 and their authors identified. The citation counts of these articles ranged between 78 and 13. The top 10 cited papers and their citation frequency are listed in Table 4. The most high-ranking article in the field was written by Papi (2010); and Taleghani, Ansari, and Jennings (2010) (78 citations), followed by a paper authored by Noroozi, et al (2012); and Mahdizadeh, Biemans & Mulder (2008) (75 citations) followed by Shekary and Tahririan (2006) with 66 citations. Some argue that the publication with more citation may has more contribution to the field (Ozcinar, 2009; Krauskopf, 2018).

**Table 4. Top-ten highly cited papers that were published between 1990–2018**

No	Title	Authors	Source Title	Year	Vol	Issue	Page	Total Citations	Average per Year
1	The L2 motivational self-system, L2 anxiety, and motivated behavior: A structural equation modeling approach	Papi, M	System	2010	38	3	467-479	78	7.8
2	Renewable energy education in sustainable architecture: lessons from developed and developing countries	Taleghani, Ansari, & Jennings	Energy Education Science and Technology Part B-Social and Educational Studies	2010	2	3-4	111-131	78	7.8
3	Argumentation-Based Computer Supported Collaborative Learning (ABCSCCL): A synthesis of 15 years of research	Noroozi, et al.	Educational Research Review	2012	7	2	79-06	75	9.38
4	Determining factors of the use of e-learning environments by university teachers	Mahdizadeh Biemans & Mulder	Computers & Education	2008	51	1	142-154	75	6.25
5	Negotiation of meaning and noticing in text-based online chat	Shekary & Tahririan	Modern Language Journal	2006	90	4	557-573	66	4.71
6	Testing the Mediating Role of Open Innovation on the Relationship between Intellectual Property Rights and Organizational Performance: A Case of Science and Technology Park	Davoudi, et al.	Eurasia Journal Of Mathematics Science And Technology Education	2018	14	4	1359-1369	55	27.5
7	The Impact of Technology Acquisition &	Fartash, et al.	Eurasia Journal Of Mathematics	2018	14	4	1497-1507	54	27

	Exploitation on Organizational Innovation and Organizational Performance in Knowledge-Intensive Organizations		Science And Technology Education						
8	Facilitating argumentative knowledge construction through a transactive discussion script in CSCL	Noroozi, et al.	Computers & Education	2013	61		59-76	52	7.43
9	Benefits of collaborative learning	Laal, & Ghodsi	World Conference on Learning, Teaching & Administration - 2011	2012	31		486-490	48	6
10	Factors affecting university instructors' adoption of web-based learning systems: Case study of Iran	Motaghian, et al.	Computers & Education	2013	61		158-167	44	6.29

Among the top 10 most cited articles, only 2 articles are published before 2010. None of the most Iranian prolific authors were ranked on the top citations. The first prolific author, Gorjian, was ranked in the 153<sup>rd</sup> place.

### Discussion and Conclusion

Educational research is a fundamental infrastructure factor that shows sustainable development of a country in the education area, especially in developing countries. Therefore, evaluation and measurement of educational research are essential for establishing a development road map for all countries, particularly developing countries such as Iran. These trends are also the fundamental criteria in university ranking. In this regard, the main objective of this research was to explore theme and trends of educational research in Iran by combining bibliometric analysis, bibliometric mapping, and thematic analysis. In this research we investigated the dynamics and trends of Iranian educational research articles, more productive authors and institutions, and the cooperation between Iranian scholars and other foreign researchers, most productive research themes, and their evolution. The novelty of this



study is related to using mix methods approach by combining bibliometric analysis, bibliometric mapping, and thematic analysis.

Web of science is the most popular database that is used to capture and measure the number and quality of academic papers, providing valuable information. This database is used to capture Iranian educational trends, providing the general overview of educational research in Iranian context from 1990 to 2018. After conducting a comprehensive search process in WoS database and refining the results, we found 1,881 articles which have been produced by Iranian scholars.

Descriptive bibliometric analysis revealed that the Iranian educational researchers published seven different document types in the 16 selected years (from 1990 to 2018). Our study showed almost the positive trend in literature production, implying that the number of articles published in the field of education increased over the years. The greatest progress in the number of articles published happened in 2016, when 573 articles were published (almost articles more than in 2015). For this increment, many reasons, such as the exponential development of ICT, development in higher education and teaching and learning strategies can be given. However, after 2011 there is slightly reduction in the number of the published articles.

In this study, we found that among the 10 most cited articles two of them were published before 2010. It is interesting that the article by Papi (2010) Taleghani, Ansari and Jennings (2010) ranked so high on the scale. Since the articles are focused on renewable energy education and psychological topic this is a current research issue, the articles' subject area is probably one of the important factors affecting the citation trend. The USA, Malaysia, Australia, and Canada made the largest contributions to Iranian educational research, indicating that Iranian scholars have more collaboration with the above countries in order to produce and publish articles. This research also showed that Iranian institutions collaborate very intensively at the national level. For example, collaboration between Islamic Azad University and University of Tehran is very popular. In addition, very intensive also is the collaboration of University of Tehran with Isfahan University.

Bibliometric mapping and thematic analysis on publication abstract and titles and then on author keywords enabled the most productive themes published by Iranian educational researchers to be identified. In this study, the themes identified from abstracts

and titles are almost the same with author keywords, and they are also comparable. The sameness may be due to using same keywords that authors present in title and keywords parts (Vošner et al., 2016). Consequently, the abstract, titles, and author keywords derived themes more focused rather than general. In this regard, each theme and cluster are associated with higher education, teaching and learning, and language learning.

The novelty of our study is using a combination of bibliometric mapping and thematic analysis is the more diverse set of keywords and journals to include more articles and research areas undertaking Iranian educational research studies. In addition, this study is the first in this filed. The results of this study have several implications for Iranian educational researchers and policy makers. First, a large number of Iranian educational research studies (47.77%) have been presented in international conferences and Iranian researchers have low contribution to the filed because fewer publications belong to particularly leading journals in the field of education. Since a journal is superior to conference papers because of the depth analysis of the journal article, there is an urgent need to change phenomena from conference presentation to journal articles.

Second, our results showed that during 28 years only 24 papers have been published by Iranian educational researchers as review paper (0.63% total number of publications). Since the review papers are valuable academic productions and clarify the researcher understanding of the field and define key concepts and areas, as well as to identify relevant methodological issues. Since few studies have been published in this type of literature production, this indicates a need to publish the review papers in the field of education by Iranian scholars.

Third, analyzing large sample of 3812 publications in addition to a subsample of citation classics (100 most cited articles) enabled us to capture the growing interest in educational research studies among Iranian scholars. However, their share among the most cited articles is still trivial. This may imply a lower quality for studies produced in Iran. These results are in line with previous studies such as Shakiba et al. (2016) and Akhavan et al. (2016). The findings of the current study provide a great opportunity to education policy makers and research institutions in Iran to consider this matter and encourage scholars to contribute high quality publications.

Despite its contributions, this research did have some limitations, as well. First, the thematic analysis and bibliometric mapping were performed on information source author

keywords, abstracts, and titles of publications only. The results might have been different if the whole publications had been involved to analyze. However, combination of thematic analysis and bibliometric mapping has not been used in the analysis of literature production of Iranian educational research yet, which is one of the strengths of this study. Second, we drew our sample of literature production from WoS only, while, there are other sources and outlets that have been growing in recent years such as Scopus and ISC databases. Third, we only included 100 most cited papers in our core analysis.

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