

Integration of Knowledge in Education: A Bibliometric Review

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ABSTRACT

Based on the citation records, this study for the first time examines the bibliometric characteristics of integration of knowledge in education literature from the year 1985 to June 2020. This study reviews total 102 documents published in the Web of Science index journals. For the visualization and analysis, VOSviewer software was applied. The bibliometric results identified the most productive and impactful authors and journals in this literature. After the science mapping of bibliometric data, this paper identifies the major underlying research themes integration of knowledge in education. The key themes in this literature include the knowledge transfer, higher education, university, innovation and management. Among these keywords, knowledge transfer, higher education and model show the strongest correlation, followed by innovation, commercialization; performance and management; multiple intelligence and information. However, there is no significant correlation among keywords like knowledge transfer, knowledge integration, healthcare, and multiple intelligence. Therefore, future research can be directed focusing on these keywords to expand the existing knowledge in this literature.

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Introduction

Integration of knowledge is the process of synthesizing multiple knowledge models into a common model (Polak et al., 2014). The past decade and a half has seen an explosion in the number of models integrating knowledge all over the world. However, considering a religious viewpoint, very few scholars have identified how integration of knowledge affects the educational system of a country (Schweitzer, 2019). Therefore, there is a research gap that needs to be fulfilled determining why and how religious viewpoints affect integration of knowledge in education.

In order to fulfill this lacking, this paper conducts a quantitative bibliometric research on integration of knowledge of education. This study examines total 102 published documents from Web of Science (WoS) indexed sources during 1985-2020. Bibliometric results indicate a gap of any dedicated WoS indexed journal source for nurturing this study topic- integration of knowledge in education specially from Islamic perspective. However, several journals (i.e., *Islamic Journal of Integrated Thought*, *Bangladesh Journal of Integrated Thought*, *American Journal of Islamic Social Sciences and others*) worldwide have been seeking to contribute, yet they are lagging behind based on the impact of their contribution.

By identifying significant literature gaps, this study explores the existing knowledge in integration of knowledge in education for future research guidance. The key findings are comprised of a comprehensive analysis of the publication trends between a time period of 1985 and 2020. The ways

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the trends have been changed and a visible ignorance of Islamic viewpoint in university level of education (Zaman, 2010) are also noted.

Among the major findings of this bibliometric paper, Schweitzer F is found to be the most productive author and *Human Systems Management, 12th International Conference of Education, Research and Innovation and HTS Theological Studies* are the major sources for this research study (figure 2). The core research streams in this research field are knowledge transfer, higher education, university, innovation and management. The researchers collaborating to study these research streams include Simonsmeier Ba, Rosman T, Mayer AK and others. The trend topics focused on research focusing on students, learning, papers, development, and university. Also, another noteworthy finding is that there are more to study about Islamic viewpoint in education; the existing studies do not suffice to generate any significant findings. Therefore, this research topic has potential future research scope.

The remaining sections are organized as follows: the study methodology is shown in section 2, the extensive results from the analysis of integration of knowledge are described in section 3, the extant research gap in the literature and more research directions for future are discussed in section 4 and section 5 shows the limitations and conclusions of this study.

Methodology

A number of review techniques are available in literature: model review, systematic review, meta-analysis, theory based review, hybrid review, bibliometric review and others (Paul & Criado, 2020). The application of bibliometric review is very common in recent time because of its capacity in science mapping based on citations and co-citation (Archambault, Campbell, Gingras, & Larivière, 2009; Hassan, Paltrinieri, Dreassi, Khan, & Bahoo, 2020). Although there were some papers on this topic that focused on definite sectors like knowledge management and sustainability, higher education, etc., this study for the first time, to the best of the authors' knowledge, applies bibliometric study in the integration of knowledge in education literature (Figure 1).

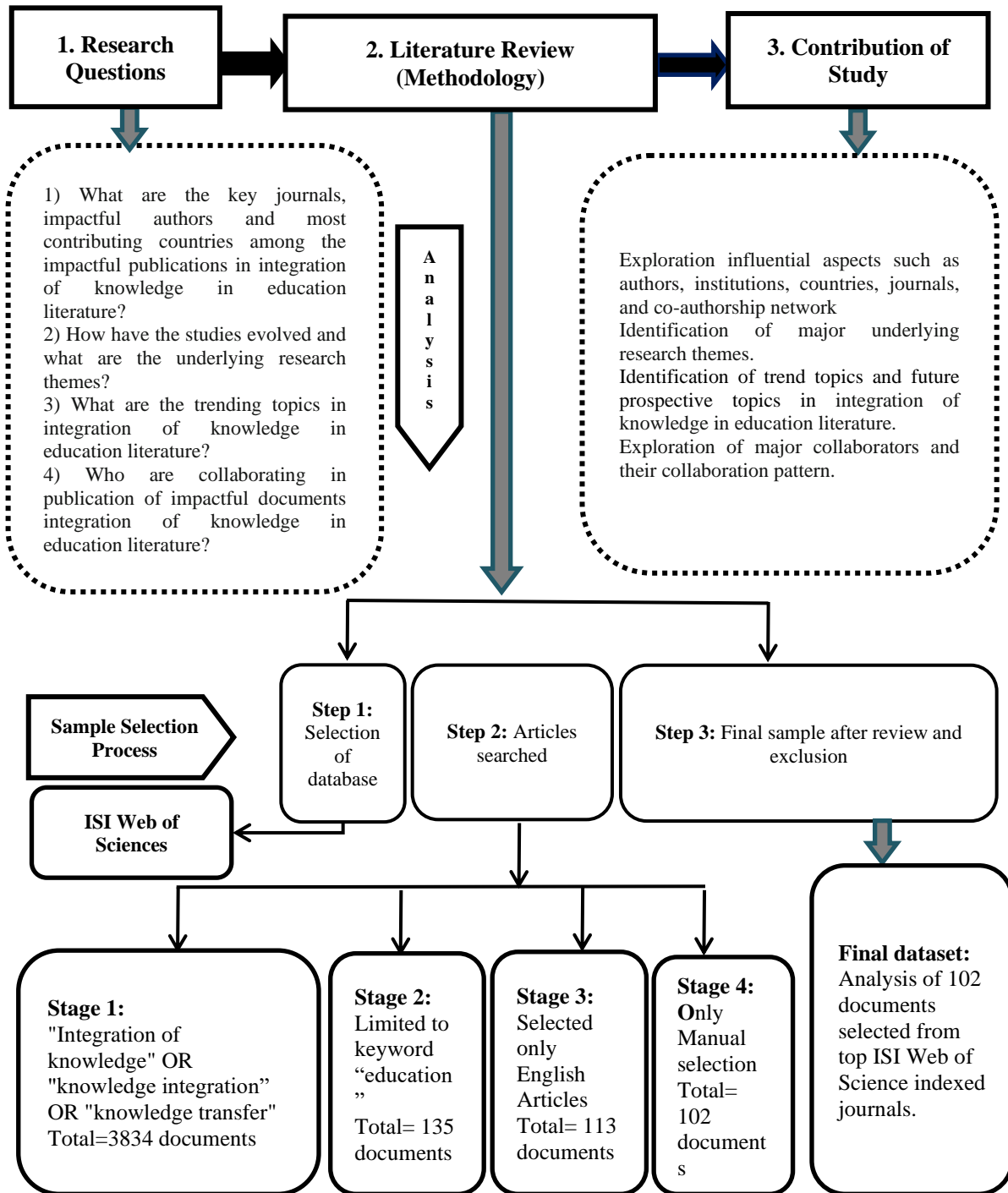


Figure 1: Methodological procedure for bibliometric review and document selection

This study adopts a systematic document (sample) selection process which first collects all relevant articles and sequentially filters them to pin-point the objective areas of a study similar to earlier studies (Mumu, Tahmid, & Azad, 2020). Before starting the search option, this study selected only Web of Science (WoS) database considering its reputation as a depository of high impactful documents since 1950 (Archambault et al., 2009). The application of WoS database for examining bibliometric study is now common in literature (Meditati, Munim, Schramm, & Kummer, 2018).

In the first stage of searching data from WoS database, we did literature review and to the best of our knowledge, the best fitted keywords for collecting documents on the focus of this study are "integration of knowledge" OR "knowledge integration" OR "knowledge transfer" which resulted

with total 3834 documents. In the second stage, we filtered this data set documents which are only suitable, and categorized studying “education” only resulted with 135 documents. In the language filter, we run our data set and only 113 documents remain in the English language article category. Finally, all titles, abstracts and author keywords were manually examined to fit the data set solely for the purpose of this study resulting in final 102 articles.

Analysis of bibliometric results

This study examines total 102 published documents from 95 Web of Science (WoS) indexed sources during 1985-2020. These 102 documents were produced by 227 authors which is justified considering the topic. The study itself demands experts from multi-discipline. Among these documents, 35 are found to be single authored. Average citation⁵ per document is 4.325 which is more than 1, indicating an emerging interest among the academicians and researchers for the development and growth of this field of knowledge (Beane, 1997).

The most productive authors, keywords used and sources of publication

A three fields plot depicts how the existing authors are citing their extant research work in many prestigious journals on key research areas identified in this study. The three field plot helps in pinpointing the entire study in one figure and demonstrates the relationship between the contents (Mumu et al., 2020). The names of the authors are being demonstrated in the left of this study, key research themes in center and valuable journal sources in the right. By considering top 6 authors, it has been noticeable that several authors are focusing on 10 key research streams published in 9 different sources (Figure 2).

It is observed from the left side of the field that Schweitzer F is the ultimate significant author whose work was mainly on knowledge transfer, religious education and transfer. However, he did not focus on key literature streams like ‘education’ or ‘higher education’ in his studies. One possible reason might be that religious education still now aren’t much connected to higher education at universities all over the world. Interestingly, all the top authors ignored these key research streams. This lacking generates an effective opportunity for future research. The literature from middle side of the field can be classified into 10 significant research streams: education, higher education, higher education institutions, knowledge, knowledge transfer, research, religious education, gamification, transfer and innovation. From some of the prime sources, *Human Systems Management*, *12th International Conference of Education, Research and Innovation* and *HTS Theological Studies* are contributing noteworthy roles as prime producers. Although, its main emphasis is in knowledge transfer and religious studies, only a few documents were relevant to education, innovation, higher education and so on.

⁵ Total citations of 102 selected papers divided by 102

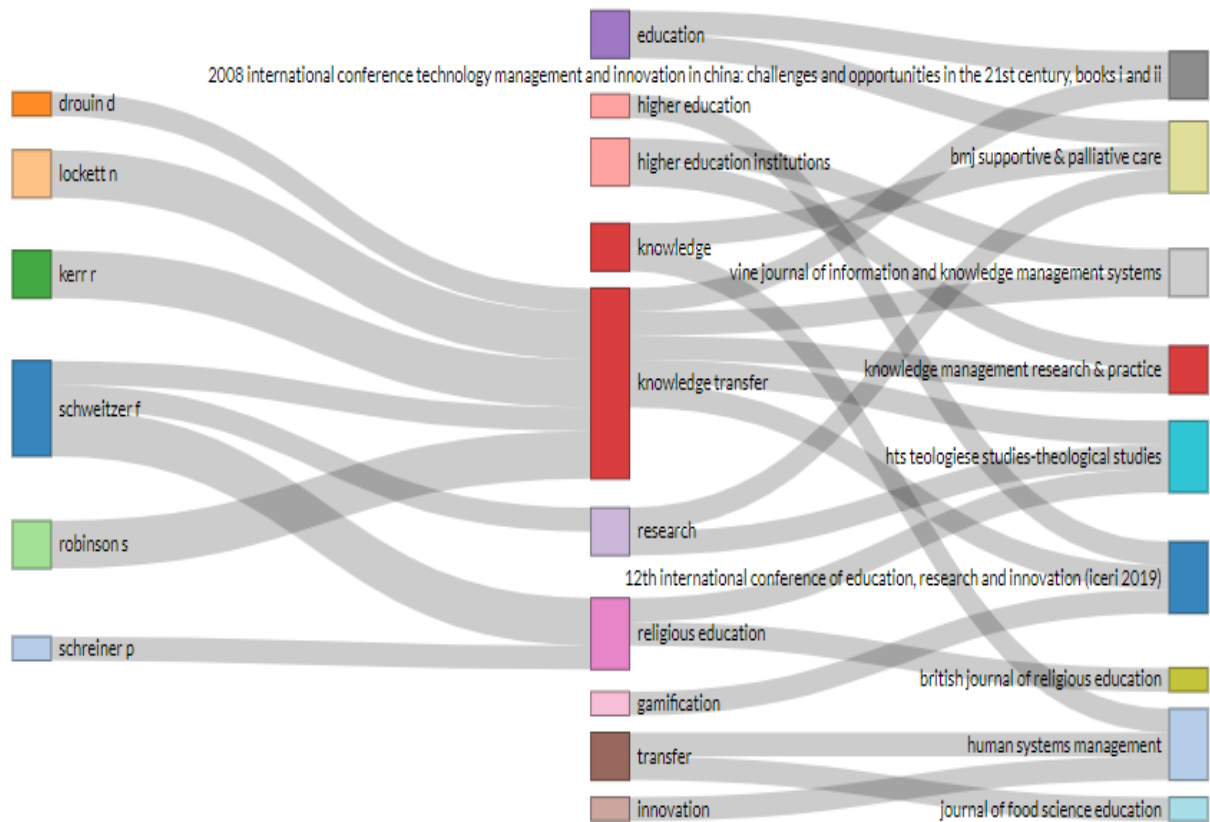


Figure 2: Three-field plot

Conceptual structure

Keyword analysis is a powerful systematic tool to identify the key research streams or its link to the research questions (Strozzi, Colicchia, Creazza, & Noè, 2017). According to Ding, Chowdhury, and Foo (2001), concurrence of keywords used by authors are a key indicator that papers of those authors carry a common theme. Figure 3 shows keyword analysis where the minimum number of occurrences of each keyword is 2, and out of 343 keywords, only 49 meets the requirements set. Every node signifies a reference and its size represents how many times it was cited. Two nodes that have a link specifies a co-citation relationship. Every link has a strength and the thickness of the link increases with the strength. The nodes are also assembled in accordance with similarity. The nodes that have same color are included as the same cluster. Seven different color-coded clusters are developed based on similarity in existing research papers in this field.

The strongest link among those clusters have been portrayed in the red cluster. Keywords like higher education, university and location are highly connected to each other. This signifies that ongoing research in this literature mainly uses these words. However, the most common subject in this literature includes knowledge transfer, higher education, university, innovation and management. The studies on these topics are highly interrelated. For instance, knowledge transfer, higher education and model show the strongest correlation, followed by innovation, commercialization and performance and management, multiple intelligence and information respectively. The results reveal that, till date, the identified major research streams are superior (as mentioned in co-citation networks) in terms of production and impact. From the results, it is also revealed that the keywords used in this study for data collection are valid and significant. However, it is quite interesting to notice that there is no significant correlation among significant keywords like knowledge transfer, innovation, knowledge integration, health care and multiple intelligence. Therefore, future research can be directed focusing on these keywords to expand the existing knowledge in this literature.

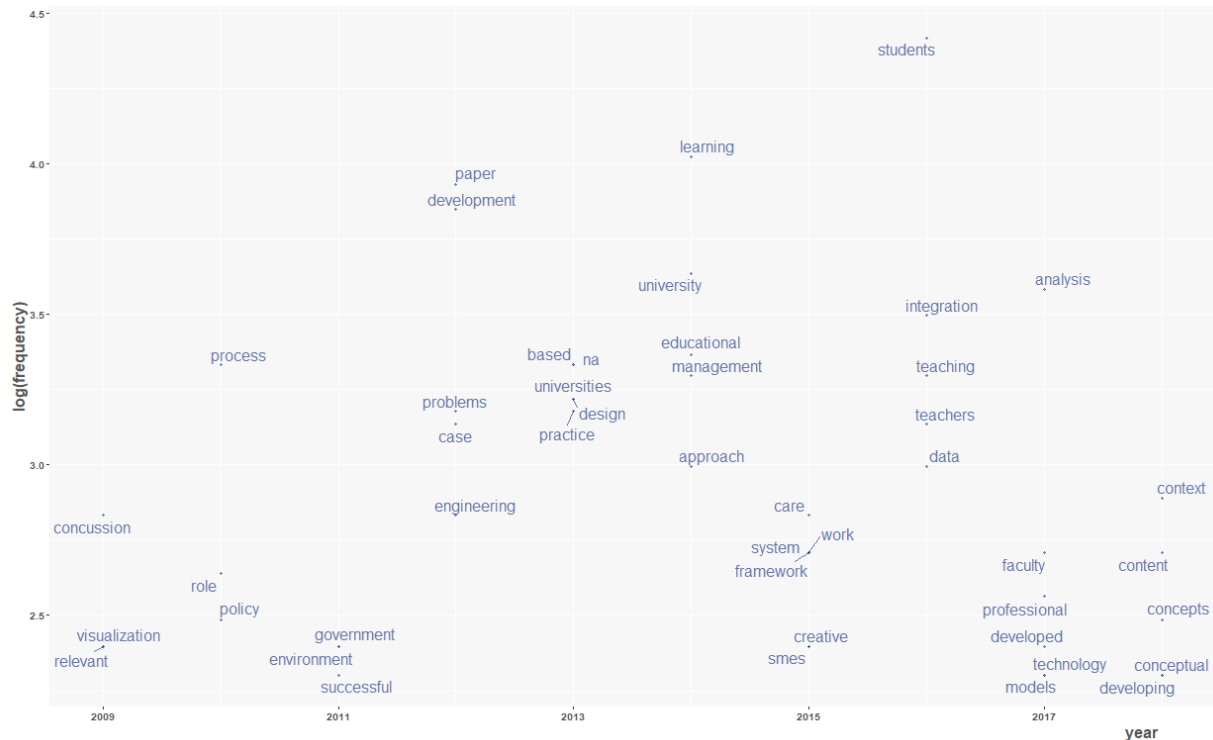


Figure 4: Trend Topics

Social structure

A collaboration network forming the social structure between significant authors and social groups helps to gather the advantages in the flow of information due to the extensive location and social networks. Figure 5 explores the social network structure of authors collaborating to contribute to this research field. Setting the field parameters using Louvain clustering algorithm and network layout to multidimensional scaling, 20 authoritative researchers have been identified to show maximum research strength via extensive collaboration. Three different clusters have been identified based on research interests among the authors within this field. The first cluster is the red color coded cluster which includes collaboration among significant author like Gomez-Batiste et al. (2019). The research focus of this red cluster includes paper entitled like “Chair ICO/UVIC-UCC of palliative care at the University of Vic - Central University of Catalonia: an innovative multidisciplinary model of education, research and knowledge transfer”. The main research interest of this cluster is based on forming an innovative multidisciplinary model of education and research. The findings of this were divided into 3 main sections: contribution in program development, education and diverse training activities and knowledge transfer activities and research. The framework developed by these prolific authors have served as a standard for many other multidisciplinary studies.

The second cluster is the blue one which emphasized on the conceptual change. It posits a well investigated learning mechanism in school children's acquisition of new concepts. Author like Flaig et al. (2018) studied the concepts of human memory of 137 undergraduate psychology longitudinally to note down conceptual changes via the latent student profile changes analysis. The findings of this paper also highlight the significance of the conceptual change, especially the knowledge integration in the higher education platforms, and also exemplify the functionality of the LPTA for modeling the individual differences in the identified knowledge structures. Finally, the third cluster, the green one, is the smallest one. This cluster includes author like Faler, Perez, Tordoff, Salinas, and Gross (2019). The main focus of this cluster is based on using data aggregation to determine thematic knowledge transfer and lasting performance change in multiple continuing education activities on IBD. Therefore, all these findings strongly point out the significance of this research topic and helps to direct the future research directions in this field.

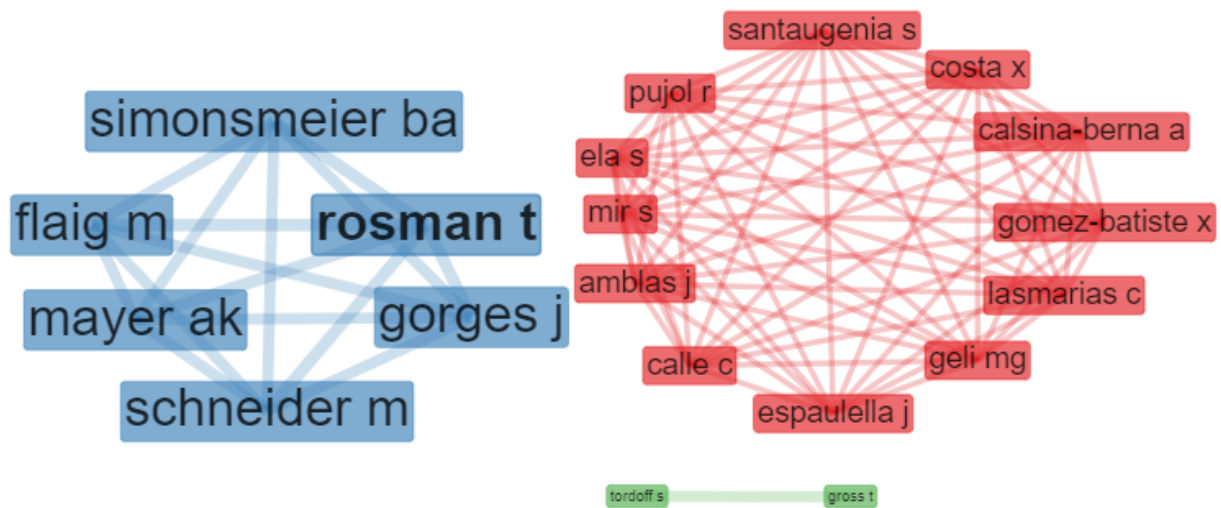


Figure 5: Collaboration network

Islamic viewpoint on integration of knowledge

Islam never forbade the Muslims to get engaged on acquiring foreign knowledge. In fact, they are highly encouraged for it. This religion highly supports gaining knowledge and education. The Muslims are instructed to gain knowledge on both worldly affairs and the Hereafter. Lining the modern age knowledge with the Islamic point of view can lead to an unfolding of understanding the religion with whole other view. The knowledge revealed to the Muslims help them maintain themselves whereas the knowledge they will acquire will help maintain proper life in the society. Gaining both types of knowledge will help them in proper maintenance and peace of their body, soul and mind. Such integration of knowledge in Islam will help to understand more clearly about their religion than ever. Of course, it has to go through many challenges to actually integrate knowledge in Islamic viewpoint in this modern era.

Conclusion

This paper executes a thorough literature review on integration of knowledge in education by performing a bibliometric analysis. To innovate integration of knowledge in education, this paper disintegrated several topics focusing on a few research questions to uncover the conceptual structure, trend topics, social structure and important authors, keywords and sources of publications. This bibliometric literature review was carried on 102 Web of Science indexed research papers.

This study's prime contribution is in distinguishing the gaps in the existing literature and suggesting the potential research scopes for further analysis. The major findings conclude that Schweitzer F is the most productive author, and *Human Systems Management, 12th International Conference of Education, Research and Innovation and HTS Theological Studies* are the major sources for this research study. Another noteworthy finding is that there are more to study about Islamic viewpoint in education; the existing studies do not suffice to generate any significant findings. Therefore, this research topic has potential future research scope.

Like many other papers, this paper also has few limitations. Only Web of Science data base has been considered to conduct this study. So future research might include other sources like Scopus, Google Scholar and so on. Additionally, the search was restricted to certain keywords, which may have affected the results. Also, this research mainly focused on journal articles ignoring relevant publications in other domains. Future studies can include other databases with other keywords and domains. While our study is based on a literature review, future research can be done using empirical testing.

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