

Exploring research on educational curriculum: a systematic review using bibliometric analysis

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Abstract

The educational curriculum is made up of learning materials and activities that are meant to help students learn the knowledge, skills, and values they need to become productive, skilled, and good global citizens. The purpose of this study was to evaluate the most productive authors in terms of publication output, as well as the most cited educational curriculum topics. Scopus data sources are utilized because they are considered suitable for analysis with bibliometrics. As a bibliometric analysis tool, VOSviewer software is used to show the author's network, and keywords. Then, for future theme prediction analysis, utilize Rstudio software. The search was conducted on the keyword education curriculum in 2021. Data was obtained from 437 publication documents. Results showed that the authors wrote most of Anderson P's publications, followed by Ayaz-AlKay S and Barrett M. However, in terms of the highest number of citations, different results were found. The highest-grossing writers of 2021 were O'Connor J and Penney D. As expected, the keywords of the education curriculum will be included in the list of keywords that are still in demand by researchers. A number of anticipated keywords will continue to be in demand in the future. There are themes of human, curriculum, child, student, physical education, COVID-19/SARS-cov-2, and medical. These themes, which could serve as future authors' references to the educational curriculum, can be collaborated on.

Keywords: Bibliometric Analysis, Disability Curriculum, Education Curriculum

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Introduction

One of the most important parts of the education system around the world is the curriculum. The curriculum includes learning materials and strategies designed to help students acquire the knowledge, skills, and values needed to become productive and competent citizens in the global community (Hasan, Mallik, and Tsou 2021; Ramos, Wolf, and Hauber-Özer 2021; Vitello, Greatorex, and Shaw 2021). In the context of globalization and technological advancement, changes in the educational curriculum continue to be made to conform to the development of the times (Molas-Gallart et al. 2021; Veza 2021).

Technological development and digitalization have influenced learning worldwide. The current educational curriculum focuses more on the development of digital skills and technology, such as programming and software development (Gallardo-Fernández, Monsalve Lorente, and Aguasanta-Regalado 2021; Tudor Car et al. 2021; Aldulaimi et al. 2021; Rehman and Lakhani 2021). The curriculum is also meant to help students use technology creatively and come up with new ways to use it.

There is a global trend that emphasizes the development of leadership skills and entrepreneurship. The current worldwide educational curriculum is designed to develop students' leadership and entrepreneurship skills, such as initiative, leadership, and time management (Chirgwin 2021; Riley et al. 2021; Tabuena, Morales, and Perez 2021; Ellapen and Paul 2021). It is intended to produce students who are ready to lead in their careers and in society.

Sustainability and the environment are increasingly important topics in educational curricula around the world. The curriculum includes learning about climate change, waste management, and carbon emission reduction (Duane et al. 2021; Okanović et al. 2021). This aims to produce students who are concerned and responsible for the environment. The current educational curriculum also focuses on social and emotional skills. The curriculum is designed to develop skills such as cooperation, empathy, and conflict resolution (Blewitt et al. 2021; Peterson 2021; Moon 2021). Its goal is to help students make good friends and contribute to society in a positive way.

The educational curriculum also emphasizes more project-based learning and hands-on experience. The curriculum is designed to develop practical skills and help students apply their knowledge in a real-world context (Juuti et al. 2021; Liu and Zhao 2021). Project-based learning and experience should make students more interested in learning and help them learn how to solve problems. The educational curriculum also emphasizes inclusivity and justice. The curriculum is designed to fit students' cultural differences, needs, and abilities (Reese 2021; Edwards and Hekel 2021; Artiles, Harris-Murri, and Rostenberg 2021). It is intended to create an inclusive learning environment and eliminate discrimination in education.

This study was conducted using the Scopus database, and the results were then presented. The purpose of this study was to evaluate the most productive authors in terms of publication output as well as the most cited educational curriculum topics. This article offers information on relevant educational trends. Based on this, researchers want to explore the development of research related to the education curriculum in 2021. In addition, this bibliometric study examines the authors, keyword analysis, and future theme predictions that researchers are still interested in.

Method

Pritchard (1969) He created and initially defined the word bibliometrics as the application of mathematical and statistical approaches to books and other forms of communication consisting of techniques such as content analysis, text analysis, citation analysis, co-keyword emergence, co-quote analysis, and co-writing analysis. These techniques are commonly used, for example, in the study of bibliography, scientometrics, and linguistics.

When applied to academic research, bibliometrics is a set of quantitative analysis techniques for academic literature (De Bellis 2009). The most common indicators in research bibliometric studies include the following: number of publications, as an indirect measure of knowledge production; number of quotations, as a measure of international scientific impact and visibility internasional (Jones, Huggett, and Kamalski 2011), average number of quotes per article as a measure of impact, no matter how many articles are published per year. (Canavero et al. 2013), and h-index.

Study design

Research Question

To answer the research questions posed in the introduction, we used three bibliometric techniques: (a) joint citation of documents to look into the relationship between the authors of the most influential publications and find related educational curriculum; (b) joint keyword analysis to find key content sets and their relationships; and (c) bibliography incorporation to find current hot topics and possible directions for future research. The purpose of this study was to examine the literature of the educational curriculum by comprehensively conducting bibliometric analysis to answer the following research questions:

RQ1: Who is the most active author in publications regarding the educational curriculum?

RQ2: What are the main keywords in the theme of the education curriculum?

RQ3: What are future theme predictions related to the educational curriculum?

Data selection strategy

Techniques Review

Data used for this analysis was obtained from the Scopus® database. The database is used because it returns a larger sample size than other sources, especially the Web of Science, for the required search terms. The fact that "the correlation between the size obtained with the two databases for the number of papers and the number of quotations received by the state, as well as their rank, is very high" and that "there is also a very high correlation when the state of the paper is broken down by field" Archambault et al. 2009) also played a role in this decision. Some data sources are not evaluated because of their limited scope (mis., EGRL) or because it contains documents and quotes from unpublished and peer-reviewed content (mis. Google Cendekia). The combination of quotes from different sources was turned down because of the differences in how they were calculated.

The results of the data obtained through the Scopus database are 437 publication documents. Data retrieval on the Education curriculum is based on the "titles, abstracts, and keywords" of the scopus. Then the data are stored for the next bibliometric review after selection by determining the relevance of the topic. Only topics published in 2021 are included in the data.

Analysis tools

Openrefine, VOSviewer, and Rstudio are the three software programs that address our research issues. Openrefine is a computer language for calculating keywords and authors of Scopus articles. Users can create and display bibliometric networks, often known as maps, using the VOSviewer. With the VOSviewer application, bibliometric networks are created and displayed (versi 1.6.17, Universitas Leiden, Leiden, Belanda). According to Eck & Waltman (2014), It looks at co-authorship, co-occurrence, and co-citation, and it talks about how authors, sources, countries, and keywords are related to each other. In addition, it allows users to combine bibliographies, which facilitates the construction of literary representation groups. The study ended with Rstudio's projection of the future theme.

The search was conducted in 2021 using the search term "education curriculum". 2021 was selected as a search window for a comprehensive publication investigation. The author keeps all the documents found. There are 437 publications containing the phrase "education curriculum." All data collected is exported as CSV files with full notes and references cited. The author uses this data for co-authority and co-occurrence analysis. As a result, it is possible to build a network map of authors as well as predictions of future themes and keywords. Keywords used are:

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TITLE-ABS-KEY ( "education curriculum" ) AND ( LIMIT-TO ( PUBSTAGE , "final" ) ) AND ( LIMIT-TO ( PUBYEAR , 2021 ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) )
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Types of analysis

As we've already seen, the data that is collected after the search results have been refined is saved as CSV files. The file was then processed with Openrifine software to properly compile the Scopus database. The data was then examined using Rstudio and Vosviewer to fine-tune the metadata of the collected articles, including the author's name, title, keywords, and future subject estimates. When the data is insufficient, the data set is checked, and the missing data is added. The search results are then examined and categorized by the number of publications contributed by individual authors and subject categories.

Research analysis consists of three components: overall effectiveness, citations, networking, and content. General performance analysis provides information about the evolution of the literary canon all the time. With citation analysis, the author and document of the most quotations are determined. Then, by combining bibliography, joint quotations, and event analysis together, we conducted network and content analysis and clustering.

Results and Discussions

Table 1 presents a description of the data used in the study. As follows:

Table 1 < Data Description >

Description	Criteria	Results
Main information about data	Timeframe	2021
	Source Documents	437
	Author	1597
Document Type	Article	437
Publication area	Final	437
Source type	Journal	437
Language	English	437
	German	1
	Portuguese	1

Based on table 1, it can be understood that the data used in bibliometric analysis is only from 2021. This is done to understand the development and focus of research on the topic of this education curriculum. The document type used is only the final journal article. The language that is analyzed is also the only one: English.

RQ1: Most active author in publications related to education curriculum

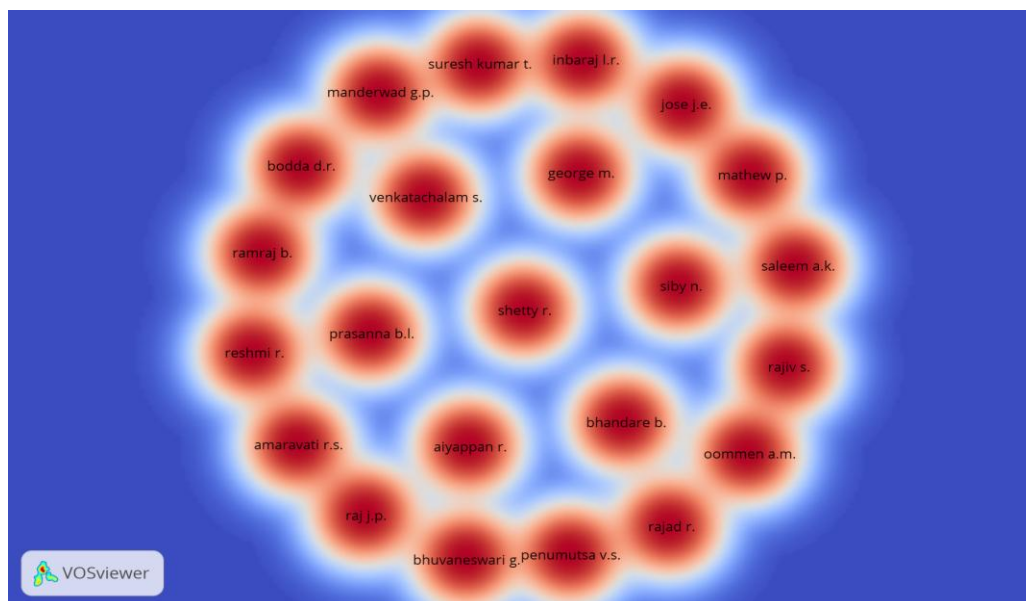


Figure 1 <Visualization of the Authorization Network>

An explanation of the author analysis of a total of 1597 authors reveals themes related to the educational curriculum and other related topics. The top 10 authors based on the highest number of publication documents are presented in Figure 1. In 2021, writers who are active in publications on the education curriculum will have the same level. Where ten authors both have two publication documents on this topic, The authors include Anderson P, followed by others such as Ayaz-Al Kaya S, Barrett M, Basit I, Batool SH, Baumler E, Borg G, Chen C, Cofie N, and Coyle K. However, in terms of the highest number of citations, different results were found. The highest-grossing writers of 2021 were O'Connor J. and Penney D., who received the same result once each.

Vosviewer is used to pull out results based on how often an author keyword appears in bibliometric data. There is a minimum keyword frequency requirement of six meetings. 2530 keywords were identified, of which only 104 met the criteria at least six times. After examining the results, the author determines a total of three groups of current research issues in the educational curriculum, denoted by circles of appropriate colors (Figure 3).

The first group marked in green with the word curriculum appearing is the curriculum. The focus is on education, e-learning, higher education, students, sustainability, pedagogy, teacher training, pedagogy, education computing, and engineering education. Furthermore, the second group marked in red appeared to be human. It also refers to other words such as major clinical study, health education, physical education, skill, controlled study, female, sexual health, and gender. In the last group marked in yellow, the word that appears is medical education. The focus of these word networks is on medical school, clinical competence, leadership, residency education, COVID 19, education programs, and education, medical, graduation.

RQ3: prediction of future themes related to education curriculum

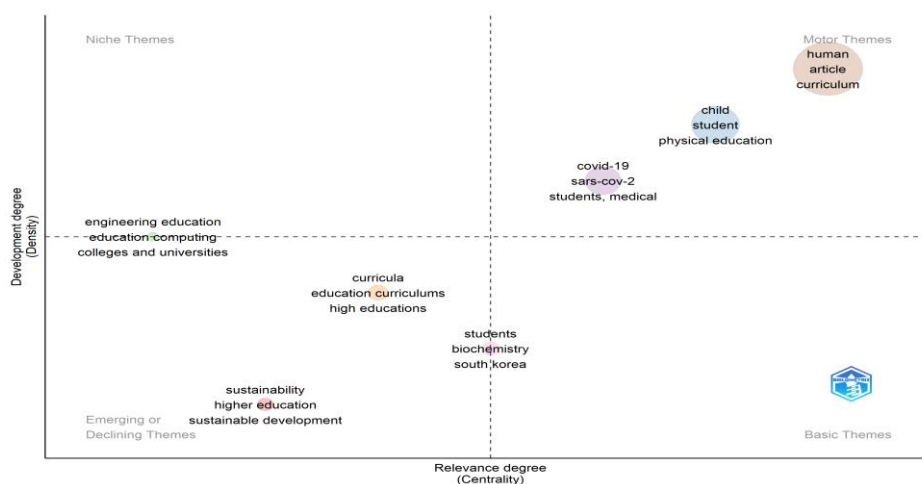


Figure 5 <Overview of Future Topics>

Figure 5 shows that some keywords that were thought to be popular will still be popular in the future. There are themes of human, curriculum, child, student, physical education, COVID-19/SARS-cov-2, and medical. These themes, which could serve as future authors' references to the educational curriculum, can be collaborated on. This theme is still compatible, as the cluster frequency in Rstudio analysis is still quite high compared to other terms. This may serve as a reference for future authors to conduct research on these themes.

Some of the discussions that have frequently appeared in the study include:

1. The use of technology in education, such as online learning and the use of software to help students learn (Nimavat et al. 2021; Tudor Car et al. 2021; Aldulaimi et al. 2021; Badowski et al. 2021).
2. Renewal of the curriculum with a focus on skills and competencies relevant to the needs of the working world today (Riley et al. 2021; Ching et al. 2021; Chirgwin 2021).
3. Innovations in teaching and learning, such as project-based approaches, flipped classrooms, and blended learning, have been introduced (Rehman and Lakhani 2021; Low et al. 2021).
4. Increased participation and inclusion in the curriculum, such as efforts to make education more accessible and fair for students with special needs or who come from poor backgrounds (Reese 2021; Edwards and Hekel 2021).
5. Changes in the evaluation and assessment system, with a focus on formative evaluation and the development of more holistic alternative assessments (Molas-Gallart et al. 2021; García-Riveros et al. 2021).

6. Teachers' roles in putting the educational curriculum into action, such as making the curriculum, choosing learning materials, and helping students learn (Haapaniemi et al. 2021; Veza 2021).
7. The role of stakeholders, such as parents and industry, in developing and implementing the education curriculum (Ajuoga and Keta 2021; Dias and Brito 2021).

Technology facilitates school inclusion processes, increases collaborative and cooperative work, and promotes attention to diversity. When digital technology is brought into schools, it also changes how teachers teach and how students learn. The addition of digital materials can increase accessibility and address digital gaps in schools thanks to access to technological resources (Gallardo-Fernández, Monsalve Lorente, and Aguasanta-Regalado 2021).

Then the pace of change in technological advancement could end or at least symbolize some traditional university degrees, and increase the application of the principle of adult learning through combined study and work-based curriculum (Chirgwin 2021). In addition, it is necessary to revise the higher education curriculum from the perspective of intercultural competence and structural inequality, and the issues of equality, justice, and diversity must be a red thread throughout higher education (European and Agency, n.d.). Meanwhile, in the field of health, such as compulsory 2-hour instructional training, it greatly increases students' knowledge and skills about the interpretation of PFT and therefore must be included in the medical education curriculum (Braun et al. 2021).

Conclusions

Results of bibliometric analysis of research related to the educational curriculum in 2021. The data used is limited to final journal articles that use English. There are the top 10 authors based on the highest number of publication documents. Results show that themes of technology application in the educational curriculum, such as online learning and the use of learning software, are the most researched topics in 2021. In addition, this article also shows a cluster of keywords to show what topics are most researched and anticipated themes that will continue to be in demand in the future. The themes include human, curriculum, child, student, physical education, COVID 19/SARS-cov-2, and medical.

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