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Research Article

A Bibliometric Analysis of the Current Trends in Collaboration Skills in the Learning Process

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Abstract.
This study aims to analyze research trends related to collaboration skills in the learning process from 2019 to 2023 through bibliometric analysis with the Scopus database. Based on the criteria, 740 articles from 3176 documents were obtained. The articles have been analyzed from Scopus-indexed international journals. The selected references were supervised utilizing Mendeley, a reference management software. Once it was processed, this study classified and visualized the data using VOSviewer software. The results indicate that research on collaboration skills in the learning process is gradually increasing every year. The United States accounts for the most research globally, followed by Indonesia in fourth place. Four clusters were found while visualizing the research trend of collaboration skills in the learning process from 2019 to 2023. The results of this study offer guidance to future researchers and support them in their research of global trends in the study of collaboration skills in the learning process. Overall, this review serves as a good foundation for subsequent research concerning collaboration skills in the learning process.

Keywords: bibliometric analysis, collaboration skills, learning proses

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1. INTRODUCTION

As the twenty-first century approaches, it is imperative that students possess the necessary skills to confront any challenges and advancements that may arise. The aforementioned competencies are frequently referred to as the “4Cs” namely critical thinking, collaboration, communication, and creativity (1,2). It is believed that numerous changes have occurred in education, among other facets of human existence, in the current era. In educational settings, students are expected to possess a range of essential

skills, including critical thinking, problem-solving, effective communication, information absorption and filtration, and collaboration skills to solve problems (3,4).

Effective learning can be facilitated by a conducive learning environment, collaboration among peers, and seamless communication channels among teachers, students, and fellow learners. Collaboration skills are crucial to the process of classroom learning activities because they enable students to acquire more information in order to accomplish the intended learning objectives (5,6). By improving collaboration skills, students gain the ability to exchange ideas in order to resolve problems during the learning process. Thus, they will generate more knowledge than if they had merely completed assignments independently (7,8).

Collaboration skills are an essential skill in contemporary education, as the learning process increasingly emphasises students' capacity to solve challenges encountered in both academic and social spheres through collective effort (9,10). Collaboration skills are critical in the classroom because they enable students to acquire the knowledge and abilities necessary to solve problems as a group (11,12). Knowledge will be generated by students who can collaborate effectively; therefore, encouraging students to cooperate or collaborate is the key to social success in the twenty-first century.

There has been research conducted in the domains of health and education regarding collaboration skills, yet this topic has received limited attention in the context of learning. As a result, a bibliometric analysis was undertaken to assist scholars in identifying the trends of research pertaining to collaboration skills in the context of global learning and to offer guidance for subsequent research.

2. METHODOLOGY

A data search was conducted by retrieving data from the Scopus database with the keywords "Collaboration Skills" AND "Learning process", and yielded a total of 3176 documents The remaining 740 articles were restricted according to the following criteria: publication year (2019-2023), document type (article), source type (journal), publication stage (final), and language (English). Afterwards, the data were represented graphically with Vosviewer. As a bibliometric analysis tool, VOSviewer was utilised to display networks composed of keywords, authors, countries, and journals (13,14).

3. RESULTS AND DISCUSSIONS

Topics of Collaboration Skills in the Learning Process Published Between 2019 and 2023

Based on an analysis of 740 articles from the Scopus database, Figure 1 illustrates the number of publications from 2019 to 2023.

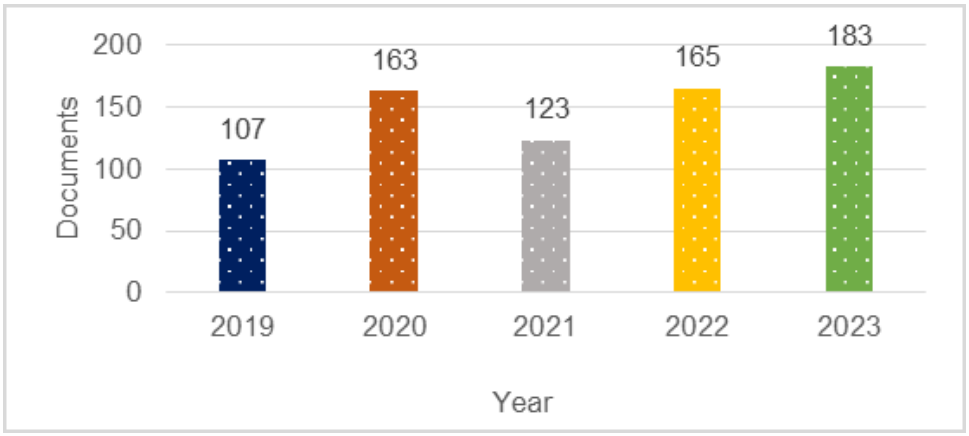

Figure 1: The number of publications per year on collaboration skills in learning process.

Figure 1 illustrates the quantity of publications pertaining to collaboration skills in the learning process during the period of 2019-2023. The data presented in Figure 1 indicates that the quantity of publications has experienced an upward trend, albeit with a decline observed in 2021. Consistent findings with previous research indicate that the annual volume of publications grows in this domain. For instance, studies on collaboration skills and learning models (15) and 4C skills (16) have verified a similar trend.

Research Publication Distribution Pattern Regarding Collaboration Skills in the Learning Process based on the Source (Journal)

Figure 2 presents a list of the 10 journals that published the most research articles pertaining to collaboration skills in the learning process between 2019 and 2023, as determined by the analysis results.

Top ten journals that have published the most on collaboration skills in the learning process (2019-2023) are depicted in Figure 2. As shown in Figure 2, journals that publish articles on collaboration skills in the learning process are predominately those in the quartile Q1 such as (1) BMC Medical Education, (2) Sustainability Switzerland, (3) Education and Information Technologies, (4) Journal of Interprofessional Care, (5) IEEE Access, and (6) Thinking Skills and Creativity. In addition to education and learning periodicals, Figure 2 shows that the collaboration skills topic is also published by Health

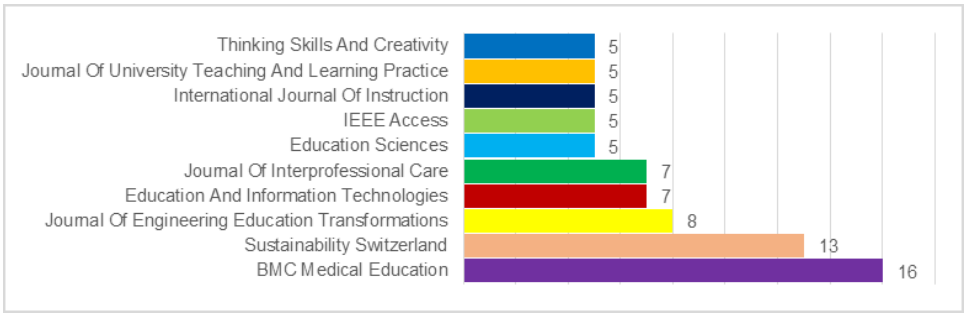

Figure 2: Top ten journals that have published the most on collaboration skills in the learning process (2019-2023).

Information and Libraries Journal (17), Data-Centric Engineering (18), and Humanities and Social Sciences Communications (19).

Distributional Patterns of Research Publications Regarding Collaboration Skills in the Learning Process based on country

Figure 3 illustrates the ten countries that produced the most research articles on collaboration skills in the learning process between 2019 and 2023 according to the findings of the analysis.

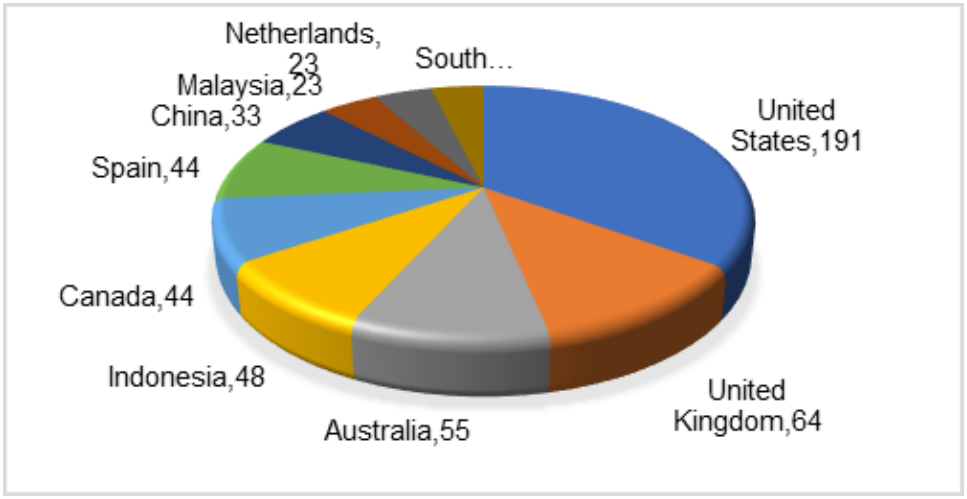

Figure 3: Ten productive countries have published extensively on collaboration skills in the learning process.

Figure 3 indicates that the countries that dominantly publish articles on collaboration skills in the learning process are as follows: (1) United States (20,21), (2) United Kingdom (22), (3) Australia (Carrera et al., 2023), (4) Indonesia (25), (5) Canada, (6) Spain, (7) China (26,27), (8) Malaysia, (9) Netherlands, and (10) South Africa.

Distributional Patterns of Research Publications Regarding Collaboration Skills in the Learning Process based on Subject Area

Figure 4 presents a compilation of research publications pertaining to collaboration skills in the learning process, organized by subject area, spanning the years 2019 to 2023, as determined by the analysis outcomes.

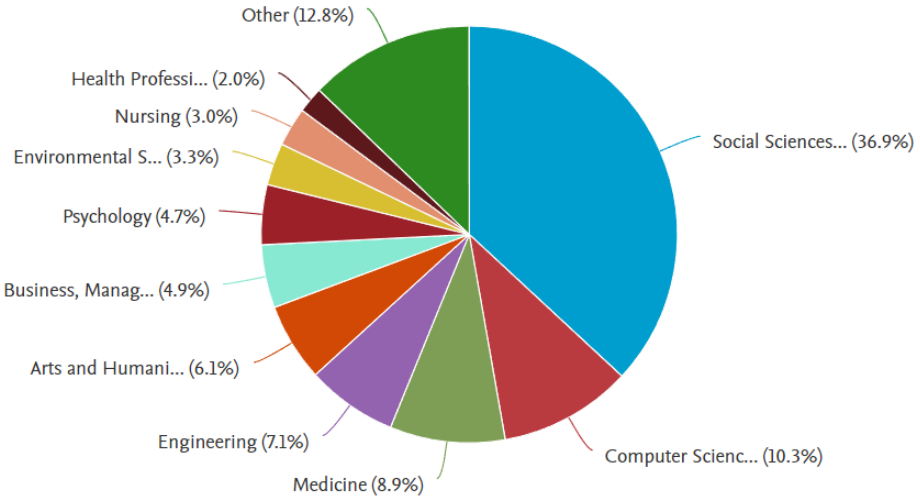

Figure 4: Research Publications Regarding Collaboration Skills in the Learning Process based on Subject Area.

Figure 4 shows that the subject area on research publications regarding collaboration skills in the learning process is dominated by the social sciences (28), computer sciences (29), medicine (30), and other.

Visualization of Research Trends in Collaboration Skills in the Learning Process

Figure 5 illustrates the data visualization of collaboration skills in the learning process spanning the years 2019 to 2023, as determined by the analysis results.

Figure 5 indicates that the publications regarding collaboration skills on learning process are connected with red cluster namely artificial intelligence, computer aided instruction, education computing, students, design thinking, collaborative learning (22), problem solving (31), creativity (25), critical thinking (32), curriculum (33), assessment (34), teaching (35), and e-learning (36). The blue cluster is associated with patient care, occupation, interprofessional education, teamwork, public relations, cooperative behavior, cooperation, communication (37), and interpersonal communication (38). The green cluster relates to adult, child, humans, male, female, perception, skill, learning, interview, professional development, controlled study, clinical article (39), and qualitative research (40). The last is the yellow cluster which associating to questionnaire, education, problem based learning (41), and training (42).

Figure 6 illustrates the overlay for collaboration skills in the learning process from 2019 to 2023, as determined by the results of the analysis conducted with VOSviewer.

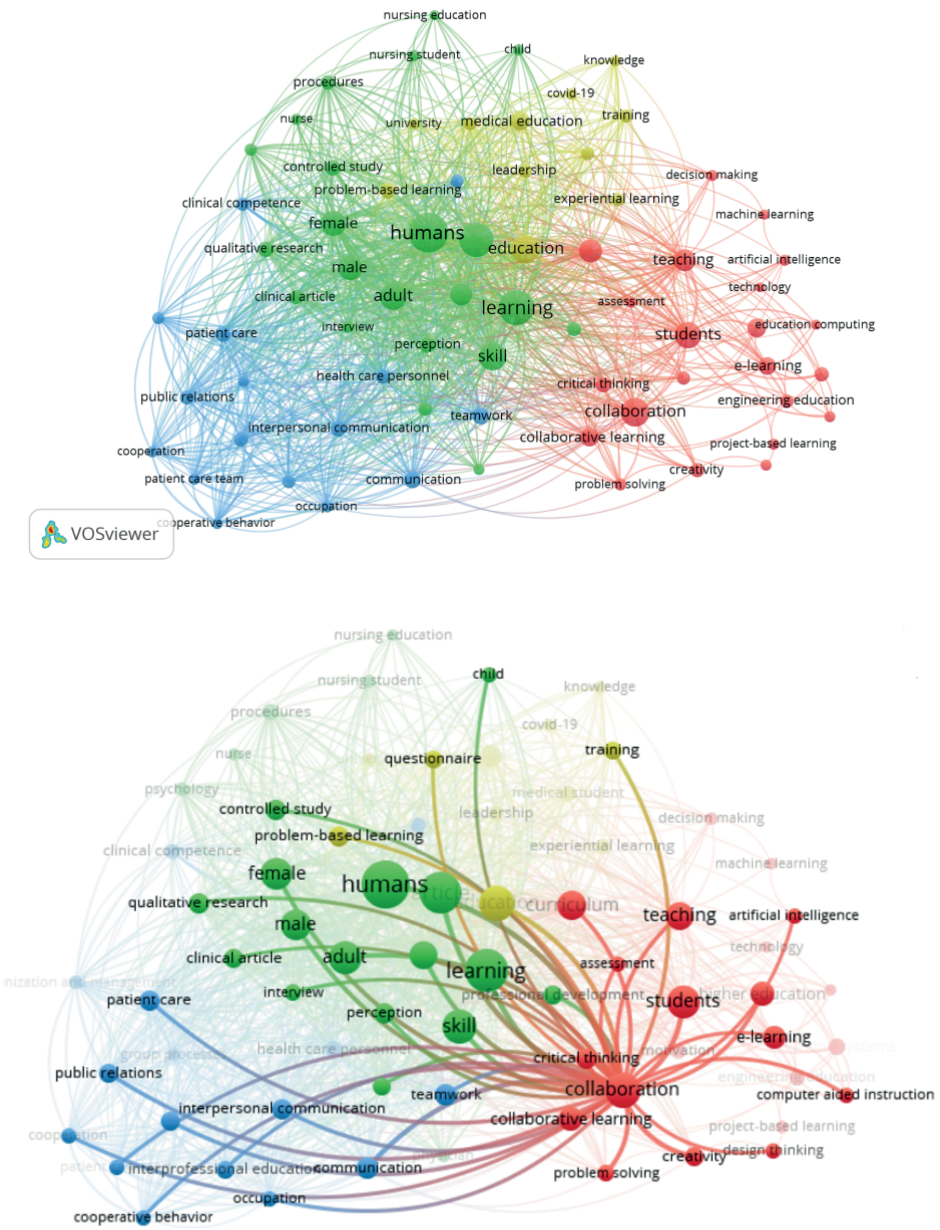

Figure 5: Network visualization of Research Trends in Collaboration Skills in the Learning Process.

According to the data presented in Figure 6, collaboration skills in the learning process have been associated with the following over the past three years: artificial intelligence, occupation, questionnaire, clinical article, controlled study, teamwork (39), teaching (35), and training (42).

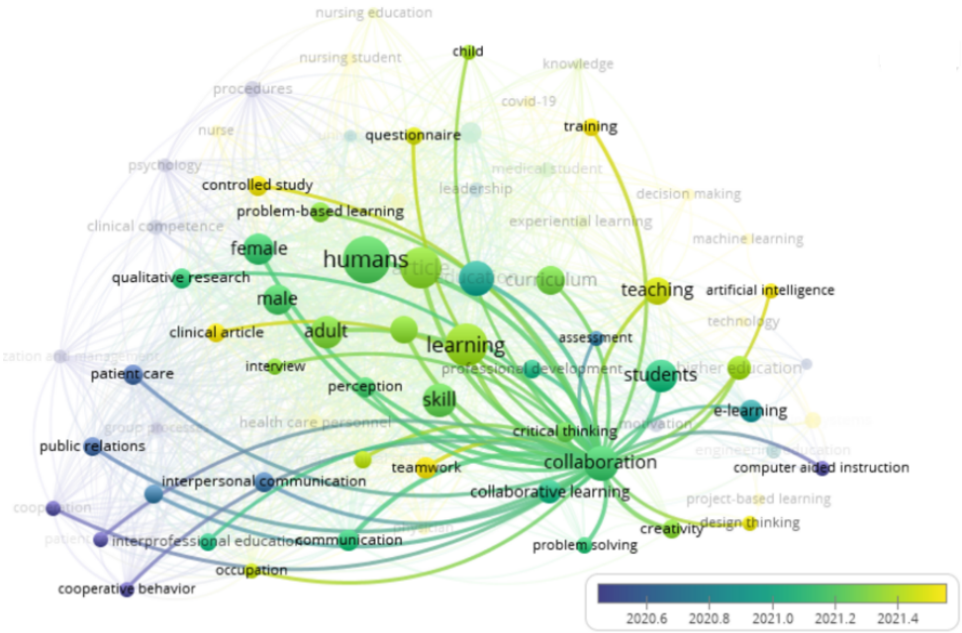

Figure 6: Overlay visualization for collaboration skills in the learning process.

4. CONCLUSION

More research is conducted annually on the topic of collaboration skills in the learning process. Research contributions are highest in the United States, followed by Indonesia in fourth place. Upon visualizing the research trends of collaboration skills in learning from 2019 to 2023, four distinct clusters become apparent. The results of this research may offer insights for future research and aid scholars in examining the role of global collaboration skills in gaining knowledge of research trends. This analysis provides a good foundation for developing future research on collaboration skills.

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