

A Bibliometric Analysis of the Employability Skills Research Trends in Vocational Education

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Abstract. Employability skills are the skills needed to acquire, retain, and do a good job. Employability skills are essential in helping prepare students to increase competitiveness and work productivity. The world of work wants graduates to be competitive and technically competent with skills relevant to technological developments. This study aims to analyze research trends related to employability skills in vocational education. We use bibliometric analysis procedures on 1123 published articles in the Scopus database. The results of this study reveal citation, co-authorship, co-citation, and keyword analyses producing a pattern of research maps in vocational education. The findings identify publication trends, widely cited articles, contributing countries, productive journals, and obtain information for future research on employability skills.

Keywords: Employability skills, education, vocational education, bibliometric analysis, VOSviewer

INTRODUCTION

Graduate employability is a global issue covering the entire field of study and academic discipline (Lord, et al., 2019). The job market is increasingly demanding graduates to compete and need to have a wide range of academic skills and qualifications (Kamaruddin, et al., 2021). The phenomenon of unemployment occurs due to the lack of soft skills development in the education system (Hanapi, et al., 2020). One form of soft skills is job skills which are the main need in producing competent graduates (Pusriawan & Soenarto, 2019). The industry wants technically competent graduates with job skills relevant to technological developments (Nugraha, et al., 2020). The challenge that must be faced is the quality of job skills which are still considered low. The three job skills considered very important by the industry are interpersonal, thinking skills, and personal quality skills

One way to improve job skills is through quality education. The quality of the education system is the main factor that determines the quality of the workforce (Triyono, Trianingsih, & Nurhadi., 2018). The application of learning strategies with a scientific approach specifically strengthens work skills (Yudiono, et al., 2021). The recruitment of graduates not only prefers potential employees who have a good attitude, are pleasant, can do a good job, work hard and show a good fit with the organization, but employers are looking for employees who have good communication skills, emotional intelligence, teamwork skills, work experience, and leadership (Small, Shacklock, & Marchant., 2018).

Employability skills are important in helping people adapt to change and increase career opportunities in the workplace (de Guzman & Choi, 2013). Skills-based education is becoming particularly relevant today as the industry expects the new workforce to have competent technical skills and employability skills (Tiwari & Malati, 2020). Participation in extracurricular activities can improve the perception of graduates' employment skills (Pinto & Ramalheira, 2017). According to Singh and Tolessa (2019) competencies related to work ability include: (1) learning; (2) technology; (3) communication; (4) teamwork; (5) problem solving; (6) initiative and entrepreneurship; (7) planning and organizing; and (8) self-management. Graduates of vocational education must have knowledge that is specific to a particular discipline and have the necessary practical skills (Roepen, 2017).

This study aims to obtain an overview of employability skills in vocational education. The review will focus on the following research questions:

- What are the publication trends on employability skills in vocational education.
- The most cited article on employability skills in vocational education.
- Countries that contribute most to employability skills in vocational education.
- Frequently published journals related to employability skills in vocational education.
- The top keywords researchers use is about employability skills in vocational education.
- Gaps and further research related to employability skills in vocational education.

The questions in this research are composed of methodology, results and discussion, conclusions, and research recommendations based on selected articles about employability skills in vocational education.

METHODS

Bibliometric analysis study was used in our research. Bibliometric analysis is defined as a statistical method used to assess the quality and quantity of published articles to study research trends, citation analysis, journal analysis, and contributions in a particular field (Sweileh, 2017). The bibliometric analysis uses data (articles) from publication databases (Scopus) to describe the structure of the scientific field (Zupic & Cater 2013), by providing a more objective and reliable analysis (Aria & Cuccurullo 2017). Bibliometric analysis can build a strong foundation to advance a field in a new and meaningful way (Donthu, et al., 2021). The design of the research methodology can be seen in Figure 1.

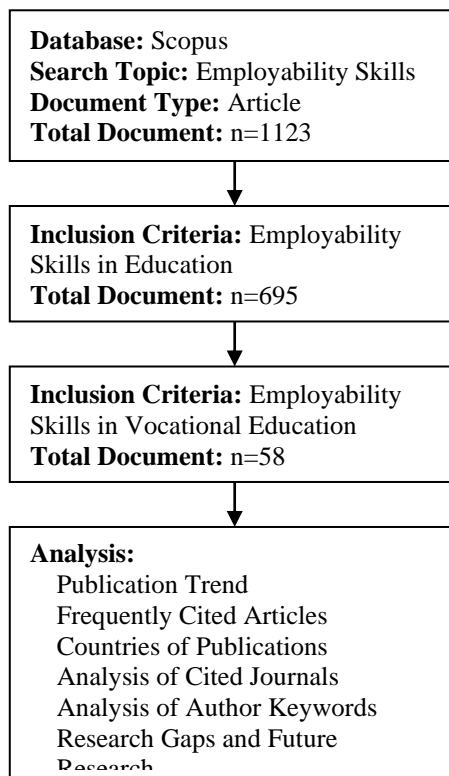


Figure 1. Study Desain of Research Method

Data collection in the form of published articles come from the Scopus database. The main topic of this study is a research article that has a title, abstract, and keywords about employability skills. The initial search used the search word "employability skills" with the results of 1123 articles. The next stage of the article was reviewed against the inclusion criteria with the search word "employability skills in education" with the results of 695 articles. The final result stage of the article was reviewed against

the inclusion criteria with the search word "employability skills in vocational education" with the results of 58 articles.

Bibliographic maps containing years of publication, countries, journals, citations, authors, keywords, titles, and abstracts are used to display bibliometric analysis using the VOSviewer application program (version 1.6.17). VOSviewer is a java program used to analyze and visualize the co-citation of references and co-occurrence of keyword (Huang, et al., 2020). VOSviewer has visualizations capable of loading and exporting information from many sources (Moral-Muñoz, et al., 2020). VOSviewer is applied to group topics into different groups, where each cluster is marked with a different color (Van Nunen, Reniers, & Ponnet, 2018). VOSviewer is used to analyze and evaluate networks among widely cited article publications (Shah, et al., 2020). The analysis used in this study was in the form of Co-occurrence analysis and Bibliographic coupling in the VOSviewer program.

RESULTS AND DISCUSSIONS

1. Publication Trend of Employability Skills in Vocational Education Topic

Research articles for the last 41 years on the topic of employability skills indexed by Scopus are 1123 articles. The initial publication was founded in 1982 and most recently in 2022 seen in Figure 2, showed significant growth from 1982 to 2019 but decreased from 2020 to early 2022. 58 research articles on the topic of employability skills in vocational education began to be published in 1999 entitled "modeling change in a national he system using the concept of unification"; 2 articles in 2000; 1 article in 2003; 1 article in 2005; 2 articles in 2009; 3 articles in 2010; 2 articles in 2011; 1 article in 2012; 5 articles in 2013; 2 articles in 2014; 2 articles in 2015; 1 article in 2016; 5 articles in 2017; 3 articles in 2018; 10 articles in 2019; 10 articles in 2020; 5 articles in 2021; and 2 articles in 2022.

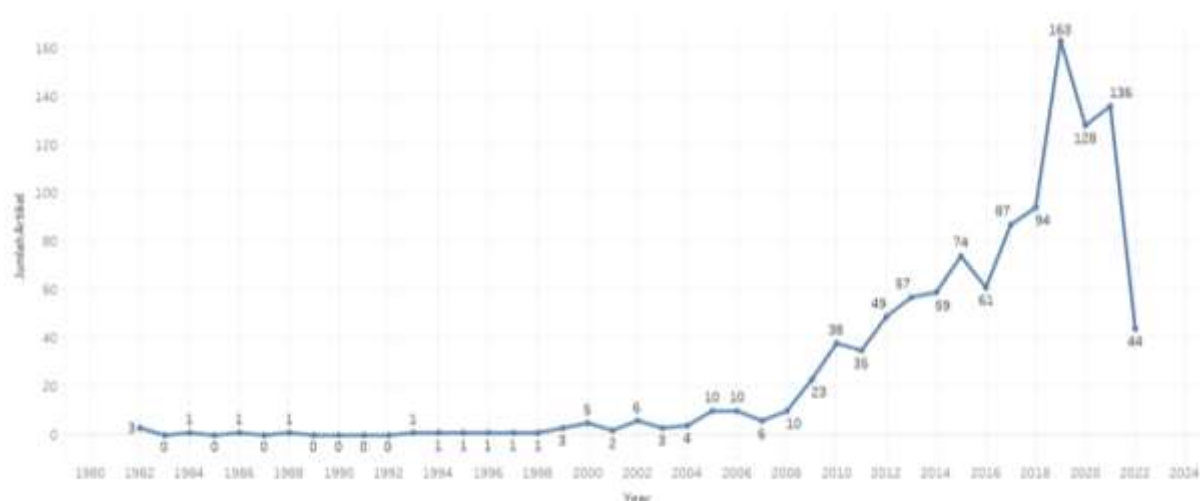


Figure 2. Articles Published Per Year

2. Frequently Cited Articles

The most cited articles are essential to help identify and influentially provide an overview of the topic of employability skills. Indicators are identified based on the number of most cited articles. Researchers tend to refer to the most cited articles because they are considered significant sources. The article on employability skills (n=1123 articles) presents 11,470 citations. Figure 3 shows the 10 most cited articles on the topic of employability skills. The article with the highest number of citations was written by McQuaid R.W., Lindsay C. in 2005 under the title "The Concept of Employability" in *Urban Studies* (563 citations) (McQuaid & Lindsay, 2005). Furthermore, the article titled "Enhancing Graduate Employability: Best Intentions and Mixed Outcomes" (301 citations) (Cranmer, 2006) and an

article titled "The Student Perspective on Employability" (277 citations) (Tymon, 2013). Another article that has produced more than 132 citations is seen in Figure 3.

The most cited article on the topic of employability skills in vocational education was written by Taylor A in 2005 entitled "What Employers Look for: The Skills Debate and the Fit with Youth Perceptions" in the Journal of Education and Work (51 citations) (Smith, 1987). Furthermore, the article titled "A Disciplinary Perspective of Competency-Based Training on the Acquisition of Employability Skills" (22 citations) (Boahin & Hofman, 2013); "Psychological Quality of Life and Its Association with Academic Employability Skills Among Newly-Registered Students from Three European Faculties" (19 citations) (Baumann, Ionescu, & Chau 2011); "Factors Influencing the Acquisition of Employability Skills by Students of Selected Technical Secondary School in Malaysia" (13 citations) (Dania, Bakar, & Mohamed, 2014); "A Case for Advanced Skills and Employability in Higher Education" (13 citations) (Holmes & Miller, 2000); "Approaches to Work-Integrated Learning and Engaging Industry in Vocational ICT Courses: Evaluation of an Australian Pilot Program" (12 citations) (Armatas & Papadopoulos, 2013); "Higher Education and Employment: Opportunities and Limitations in The Formation of Skills in A Mass Higher Education System" (12 citations) (West, 2000); "The Effect of Supervised Work Experience On the Acquisition of Employability Skills Among Malaysian Students" (11 citations) (Kamaliah, 2018); "Modelling Change in A National He System Using the Concept of Unification" (11 citations) (Jackson, 1999) and "The Effects of Peer Tutoring Interview Skills Training with Transition-Age Youth with Disabilities" (10 citations) (Bobroff & Sax, 2010).

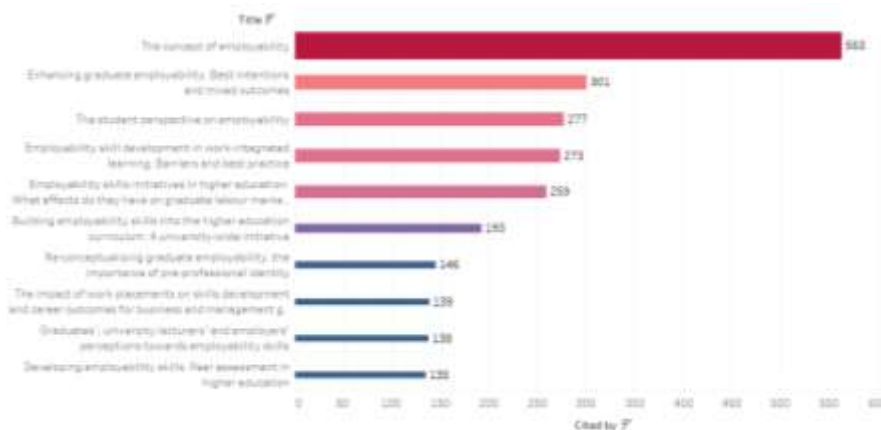


Figure 3. Top 10 most cited articles

3. Countries of Publications

Figure 4 shows the top 10 most productive countries contributing to research on the topic of employability skills such as the United Kingdom, Australia, Malaysia, India, United State, South Africa, Spain, Indonesia, Canada, and Nigeria. Furthermore, the United Kingdom ranked highest in research publications (n=268), followed by Australia (n=184), Malaysia (n=128), India (n=118), United States (n=82), South Africa (n=52), Spain (n=32), Indonesia (n=32), Canada (n=26), and Nigeria (n=25). Meanwhile, research on the topic of employability skills in vocational education in the top 10 countries such as Malaysia (n=14), followed by the United Kingdom (n=7), Indonesia (n=6), Nigeria (n=6), Australia (n=5), United States (n=5), India (n=3), South Africa (n=2), Canada (n=1), and Spain (n=1).

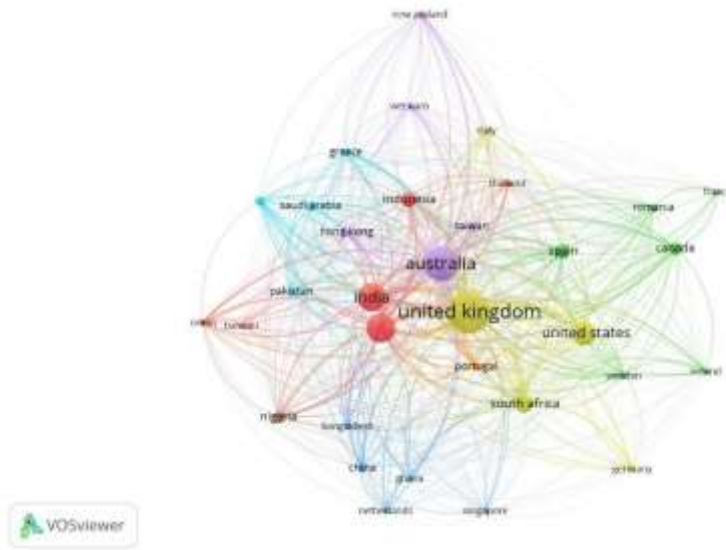


Figure 4. Bibliographic Coupling of Countries

4. Analysis of Cited Journals

Articles on the topic of employability skills have been published in 601 journals. Figure 5 shows the top 10 journals based on the criteria for a minimum of 12 articles. Journal of Education and Training in the first place (34 articles); followed by Journal of Higher Education, Skills and Work-Based Learning (28 articles); Journal of Higher Education Research and Development (15 articles); International Journal of Recent Technology and Engineering (15 articles); Journal of Education and Work (14 articles); Journal of Technical Education and Training (14 articles); ASEE Annual Conference and Exposition, Conference Proceedings (13 articles); Industry and Higher Education (12 articles); Journal of Teaching and Learning for Graduate Employability (12 articles); and Studies in Higher Education (12 articles).

Meanwhile, articles on the topic of employability skills in vocational education have been published in 44 journals with the top 10 journals being the Journal of Technical Education and Training (6 articles); Journal of Vocational Education and Training (3 articles); 4th International Conference On Vocational Education and Training, ICOVET 2020 (2 articles); Education and Training (2 articles); International Education Studies (2 articles); Journal of Education and Work (2 articles); Journal of Engineering Science and Technology (2 articles); Journal of Learning for Development (2 articles); Journal of Teaching and Learning for Graduate Employability (2 articles); 2009 1st International Conference On Information Science and Engineering, ICISE 2009 (2 articles).

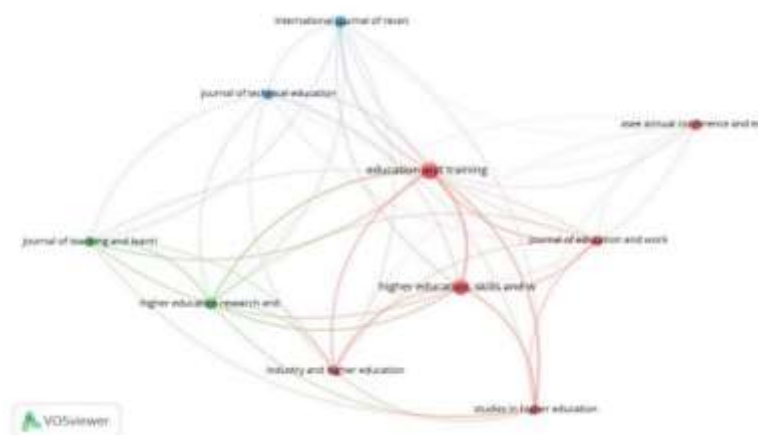


Figure 5. Bibliographic Coupling of Sources

5. Analysis of Author Keywords

A total of 2405 author keywords were obtained from the Scopus database from publications on the topic of employability skills. Co-occurrence analysis in the VOSviewer application program was chosen to examine the emergence of researchers' keywords so that they understand the prevailing research trends in the field of employability skills. To generate a better co-occurrence network of frequently used author keywords, the minimum number of author keyword occurrences is limited to 20 keywords resulting in 14 frequently used author keywords. The co-occurrence network of author keywords can be seen in Figure 6.

Meanwhile, for publications related to the topic of employability skills in vocational education, 162 authors' keywords were obtained with the minimum number of authors' keywords being limited to 3 keywords, 7 authors' keywords were often used, such as employability skills; vocational education; employability; experiential learning; skills; technical skills; and technical and vocational education.

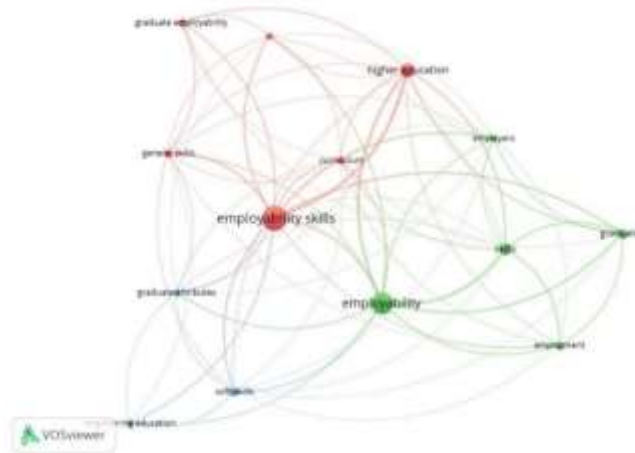


Figure 6. Co-Occurrence Network of Author Keywords

6. Research Gaps and Future Research Directions

This study applies bibliometric analysis research methods to help reveal research progress and proposes several future research lines in the field of employability skills in vocational education. This study displays the trend of publications, citation articles, publications in several countries, citation journals, and author's keywords in the field of employability skills in vocational education. Research in the field of employability skills in vocational education has been carried out in various countries such as Malaysia, the United Kingdom, Indonesia, Nigeria, Australia, the United States, India, South Africa, Canada, and Spain.

There is little literature on the topic of employability skills in vocational education that applies qualitative studies to help generate new scales in expanding existing models. Future research can address this problem by applying qualitative studies in the area of employability skills in vocational education. The keywords most often used by researchers to explore employability skills in vocational education in Figure 6 are employability skills; vocational education; employability; experiential learning; skills; technical skills; and technical and vocational education. Keywords such as student social support as an influential factor in students' employability skills are still not applied in research. Future researchers may consider social support in developing students' employability skills in vocational education

CONCLUSION

This study uses bibliometric analysis with article data related to employability skills in vocational education indexed by the Scopus database from 1982 to early 2022. The publication trend seen in Figure 2 shows significant growth from 1982 to 2019 but decreased from 2020 to early 2022. The most cited

article on employability skills in vocational education was written by Taylor A in 2005 entitled “What Employers Look for: The Skills Debate and the Fit with Youth Perceptions” in the *Journal of Education and Work* with 51 citations. Research in the field of employability skills in vocational education has been carried out in various countries such as Malaysia, the United Kingdom, Indonesia, Nigeria, Australia, the United States, India, South Africa, Canada, and Spain. Articles on employability skills in vocational education have been published in 44 journals. The author's keywords are often used in the topic of employability skills in vocational education such as employability skills; vocational education; employability; experiential learning; skills; technical skills; and technical and vocational education. Future research can apply qualitative studies in the field of employability skills in vocational education by considering social support in developing employability skills of students in vocational education.

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