

Research on Trends in Vocational Training and Employability: A Bibliometric Analysis and Future Direction

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Abstract

Due to changes taking place in the job market around the world, scholars have started taking a deeper interest in the field of vocational training and employability. This study evaluates the trends in this field from 2004 to 2024 using bibliometric analysis. Also, the objective of this study is to find out the publication trends in this field, influential authors, most productive journals and top 10 country-wise contributions by using 132 articles from the Scopus database. The results show that research publications are continuously developing, in which countries like Spain, the USA and Malaysia are playing an important role. At the same time, the role of digital skills, dual vocational training and industry support is important for enhancing employability in the key areas identified through analysis. This bibliometric analysis also sheds light on the understanding and increasing impact of the conceptual structure of vocational training and employability research. Additionally, after doing keyword analysis, it is found that there is a shift in the research direction on personnel training, apprenticeships and employability skills among the factors affecting the employment outcome. Future research directions point towards skill development with the integration of AI and policymaker strategies for improving vocational training programs in developing countries. Also, this study is important for researchers and policymakers who want to keep pace with the labour market by exploring trends in vocational training and employability. It can also increase the importance of vocational education and employability.

Keywords: Vocational Training, Employability, Trends, Bibliometrics

Introduction

The career success of graduates became a growing concern in the early 2000s, prompting policymakers and researchers to re-evaluate the quality of education, the availability of job markets and the importance of practical skills for future employment (Benitez et al., 2005). Thus, the quality of vocational education is mainly reflected in the achievements of graduates, which shows the importance of developing skills as per the requirements of practical work (M. Mulder, 2018). Influential institutions believe that continuous learning plays a crucial role in maintaining competitiveness among students and preparing them well for future jobs. Additionally, they should offer opportunities for intensive learning, including continuous vocational training and distance learning programs. In addition, the sources of funding received for education also have a significant impact on their thinking about the quality of education. This means that capable teachers, better facilities and better resources improve the overall education experience. Ultimately, these factors directly impact the employability and

career success of graduates, highlighting the important relationship between educational quality, compensation and the need for the workforce (Hogan et al., 2013).

Employability is an important aspect for the development of the workforce. This includes the ability of an individual to find a job and to stay in that job for a long time (Pool & Sewell, 2007). It revolves around the concepts of skills and competence that enable individuals to move successfully in the labour market and change according to changing job market conditions. (Acemoglu & Autor, 2011; Mamaqi et al., 2011). Furthermore, in today's labour market, which is developing at a modern pace, the skill of learning new things and keeping pace with the changing circumstances has now become more important than the stability of the job to get employment. (Jagannathan et al., 2019). Looking at the employment opportunities, we come to know about the important challenges. Today, there is a disparity in skills among most of the youth. The qualifications of the majority are not in accordance with the market demand, and unemployment is the result of not getting equal opportunities and underemployment. Apart from this, the possibility of getting desired work decreases further due to a lack of proper guidance and proper access to the career network. (Lichy & Khvatova, 2019; Moore & Morton, 2015; Pauw et al., 2008). The rapid changes taking place in technological advancement are significantly changing the employment scenario. Today's fast-paced environment is shaping the employment market in new ways, as digital innovations and operations are rapidly taking off. People have to constantly update their knowledge and skills to remain competitive. As a result, educational institutions are actively adjusting and amending their paths to better cope with the needs of the changing job market. So that it can be ascertained that the students are adequately prepared for the challenges and opportunities of the future.

Globally, in the labour market, vocational training has become an important factor along with dynamic and development, which increases the employment opportunities and fills the gap between education and the job market (Powell & Solga, 2010). Meanwhile, Vocational training is becoming essential for today's modern labour market as it teaches people the skills in demand to get a job (Rao, 2014). As a result, this develops the economy of the country and also provides manpower as per the demand in the job market to fill many different positions (Kebede et al., 2024). It's due to the development of new technologies, changes in the working methods of people who were already working, and an increase in jobs has become possible due to the demand for trained workers (OECD, 2019). Some researchers have observed how vocational training helps in getting a job and found that it not only makes it easier for people to get a job, but it also helps them do the job better than untrained people and move ahead in life (M. Mulder, 2018).

According to Triyono et al. (2023), there is a growing focus at the international level on employability skills under vocational training, as found by a bibliometric analysis of 1070 documents conducted between 2003 and 2022. This programme highlights a significant growth in research, emphasising the importance of transforming educational programmes to suit industry demands. Additionally, Emphasis is given to better prepare students for the emerging workforce by developing soft skills such as problem-solving, communication and teamwork. This practice is known worldwide for the important role of skills in enhancing career success and employment opportunities, and reflects the growing interest in this subject over the last 7 years.

There has been a significant increase in the research on bibliometric analysis of the role of vocational training and employability since 2018. This growing scientific interest highlights the increasing popularity of vocational training in improving employment prospects and enhancing skills, which reflects its important contribution to economic development. At the same time, there is a need to pay attention to how to teach skills and provide employment when working methods are changing due to the advent of new technologies (Van Laar et al., 2022). The Traditional education approach has a new look due to artificial intelligence technologies and emerging digital platforms (Chassignol et al., 2018). This means that now people will have to learn new skills to get new jobs and succeed in them (Ciarli et al., 2021). As the global economy evolves and technology-driven and knowledge-based norms rise, it is becoming important to analyse research trends for employment outcomes and current vocational training (Kolade & Owoseni, 2022; Reiman et al., 2023). Both formal and informal education are involved in acquiring skills in the workplace, and this is considered an important factor. On the other hand, it also shows the ability of any individual to get employment and stay in it. This affects ability, education, employment capacity and labour market (Scandurra et al., 2023; Tymon, 2011). Very few bibliometric analyses have been conducted on vocational training and employability. To provide a liberal perspective, this paper is the first study to use bibliometric analysis to examine major research trends in this field. Also, this study looks at a lot of information using pictures and charts to help researchers understand how different ideas are related, where research is going, and how much progress has been made in a particular field (Zupic & Čater, 2014; Rafiq et al., 2023). Bibliometric analysis is crucial for assessing the contributions of researchers, organisations, and countries within academia. They reveal national and international collaboration networks that demonstrate how partnerships enhance collective knowledge and authorship collaboration (Munoz et al., 2016; Isfandyari-Moghaddam et al., 2021). Furthermore, these analyses cultivate a culture of knowledge-sharing across various sectors, encourage innovation, and spread best practices among vocational field trainees (Mehner et al., 2024). Bibliometric analysis highlights prevailing research trends and provides insights that can shape future directions and scholarly efforts.

The present study attempts to answer the following research questions (RQ) by analysing previous studies to achieve the above research objectives:

1. What are the publication trends related to employability and vocational training?
2. Which countries, institutions, and journals have the highest research focus on vocational training and employability?
3. What are the most frequently used keywords in research on vocational training and employability in the selected papers?
4. What are the future research directions in this research?

Research Methodology

Bibliographic analysis is like a special tool that helps researchers understand how different topics are being studied by looking at the number of books and articles written about them. This allows them to see which topics are popular and how they change over time (Sweileh et al., 2017). In contrast to the review paper, this bibliometric paper takes a different approach to information (Linnenluecke et al., 2019). It's about taking a close look at how often certain topics and keywords are mentioned together in books and articles, where these studies are taking place worldwide, and what new ideas may be coming next. This helps researchers share their work with other people who are interested in their field and gives them the

opportunity to work together to solve problems. (Zupic & Čater, 2014; Fauziah & Tjahjono, 2024).

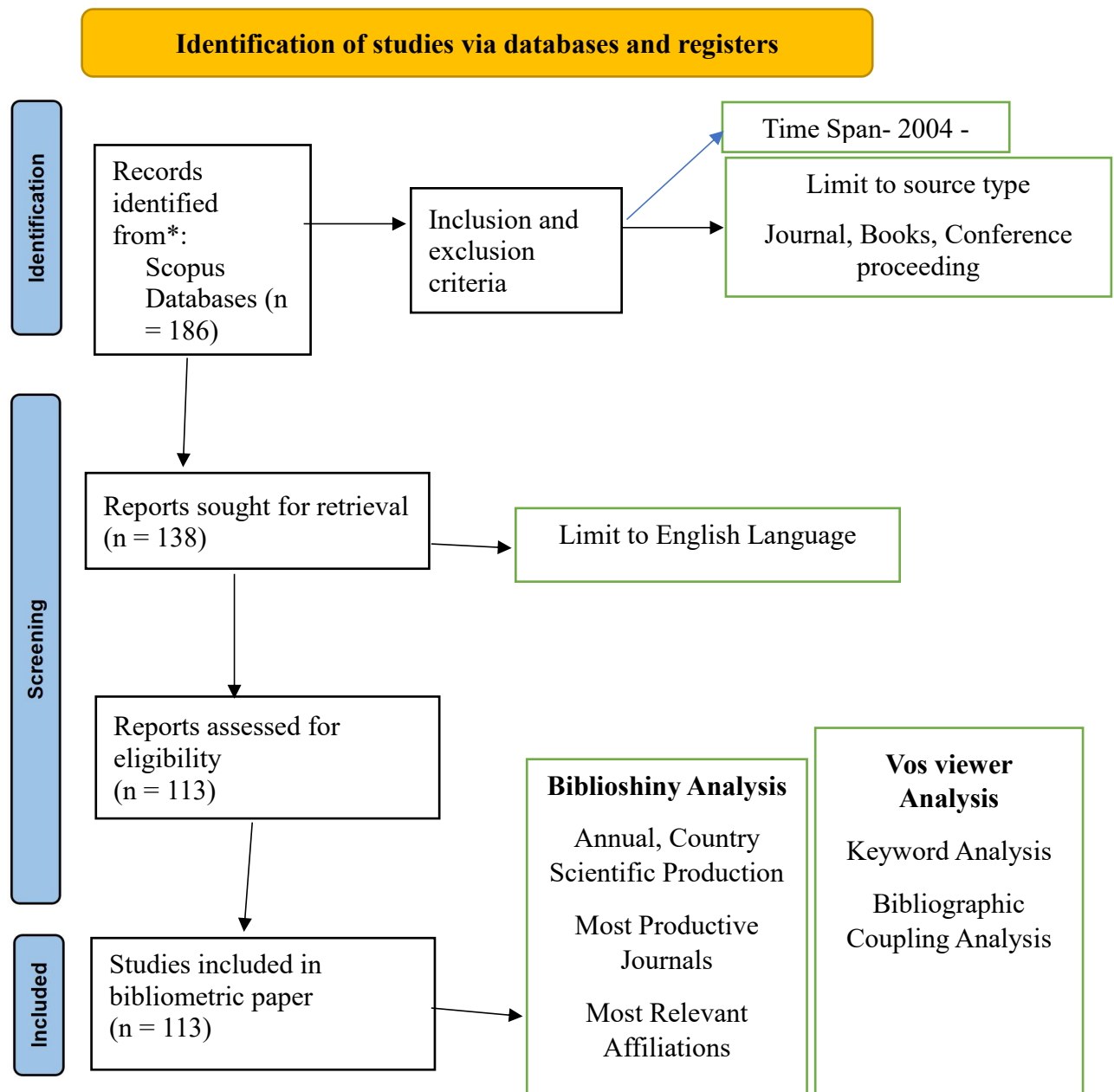
Data Source

In this study, bibliometric analysis is done using the Scopus database, as this database is known to be curated and subscription-based, unlike free-access platforms like Google Scholar, and provides a comprehensive collection and clarity of scholarly articles, which increases the reliability and quality of the findings obtained during the research (Pranckutė, 2021). Apart from this, Google Scholar lacks quality control, whereas Scopus is more comprehensive, mainly in the social sciences (Martín-Martín et al., 2018). Finally, Scopus is more suitable than Google Scholar for bibliometric analysis.

This study follows the PRISMA-based review process, which is structured systematically to investigate the literature. Initially, on 30 April 2025, the researchers identified the keywords "Vocational Training" and "Employability" to further the search. After this, using the Scopus database, a total of 186 documents were extracted from these keywords between 2004-2024. This formed the basis of the review of this study and allowed us to reach a detailed series of pedagogical literature. This multidisciplinary research has integrated the findings of this study to ensure that different perspectives are obtained on the relationship between vocational training and the outcomes of everyday interactions (Mongeon & Paul-Hus, 2015). As well as, the search is carefully filtered so that only articles published within a specified time limit are included. This study begins by searching for questions in the Scopus database and then collects the results of the search. The search string and Boolean operator combinations are TITLE-ABS-KEY ("Vocational Training" AND "Employability") AND PUBYEAR > 2004 AND PUBYEAR < 2024 AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "ECON") OR LIMIT-TO (SUBJAREA , "PSYC")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (LANGUAGE , "English"))

Result Visualisation and Indicators

An appropriate combination of descriptive, relational indicators and bibliometric techniques has been used to analyse this field in depth. By identifying factors such as country, institution and language, this study has highlighted the vocational training and employability context that influences the research process and development. the figures of annual publications help in understanding and determining the different phases of the field's development, which reveals the development pattern, the views of researchers and their interest in the field, as well as keyword analysis is used to uncover the relationships between different ideas that may be useful in the future. The details of key contributors and main journals help identify the top researchers in this field and the main articles they have published. Additionally, the depiction of these relationships and patterns provides a visual and analytical structure. Together, this multifaceted approach has provided an understanding of the evolution of the field, key authors, key countries, influential publications and top institutions.



Source: ((Page et al., 2021)

Result and Discussion

This study analysed 186 documents taken from the Scopus database from 2004 to 2024 and also ensured that no document was counted twice. When doing an article review, the study first compiles the findings of these studies and what other researchers have discovered.

This research approach enables us to examine significant books and articles, social media, and related documents to see what topics people are discussing. We gather a lot of data on a certain subject and determine its level of popularity by using bibliometric analysis. The frequency of citations and the location of the work help us understand what researchers are working on and where they are conducting their studies (Bornmann & Daniel, 2008). The development of research trends on vocational training and employability (VT & E) from 2004 to 2024 is shown in Table 1. Vocational Training and employability (VT & E) study has

produced 132 journal article publications. The compound annual growth rate of research output during the entire 20-year period is 3.63 percentage. There are 551 authored papers and 46 single-authored publications among the 118 sources (books, journals, etc.) that contain the VT & E research works. There are 6.763 citations on average per document. The datasets offered to VT & E scientific production are thoroughly summarised in Table 1.

Trends Publication across two decades in the field (RQ1)

This study examines vocational training and employability, exploring how it helps individuals meet labour market demand. Although not many studies have been done on it before, more and more articles have been written about it recently, especially between 2015 and 2022. However, fewer articles have been published in 2021, 2023, and 2024. The researcher began by looking at the background and challenges of the study. This article discusses the research publications, authors, keywords, and research groups on vocational training and employability. Over the past twenty years, 186 articles have been published on this (VT&E) after removing duplicates from the combined data of the two large databases, Web of Science (WoS) and Scopus, as shown in Figure 2(a).

Table 1. Detailed summary of vocational training and employability in selected publications.

Description	Results	Description	Results
MAIN INFORMATION	-----	Authors of single-authored doc	46
Timespan	2004:2024	COLLABORATION	-----
Sources (Journal, Books, etc.)	161	Single-authored per doc	47
Documents	186	Co-authored per doc	3.04
Annual Growth Rate %	3.36	International co-authorship%	16.13
Document Average Age	7.04	DOCUMENTS TYPES	-----
Average citations per doc	6.763	Article	132
References	7275	Book	2
DOCUMENT CONTENTS		Book chapter	19
Keyword Plus (ID)	612	Conference paper	21
Authors' Keyword (DE)	623	Editorial	1
AUTHORS	-----	Review	9
Authors	551	Note	2

Sources: - Biblioshiny 2024

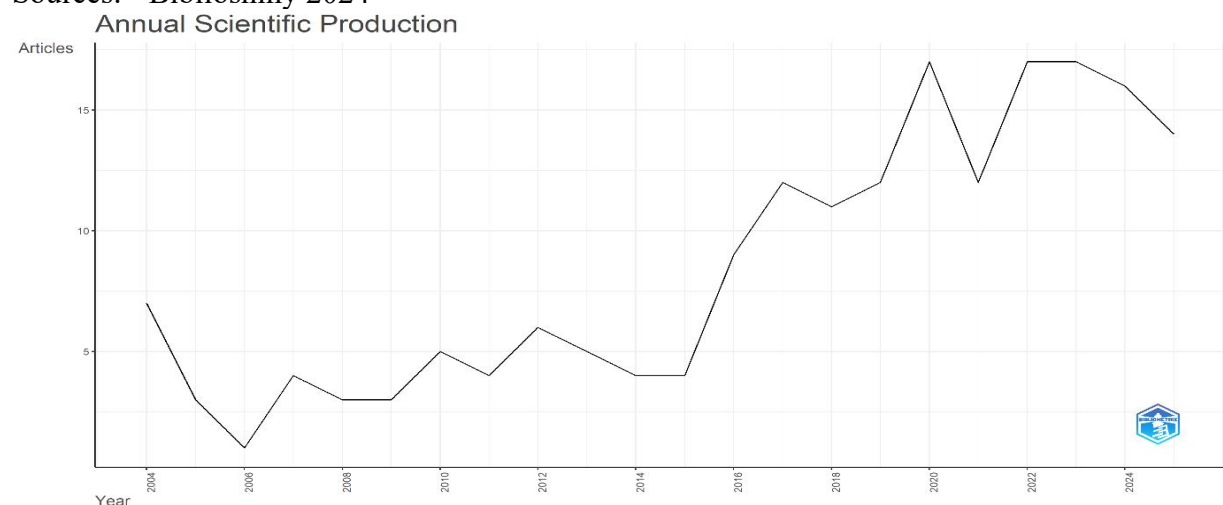


Fig. 2(a): Annual Scientific Production in the field of Vocational Training and Employability

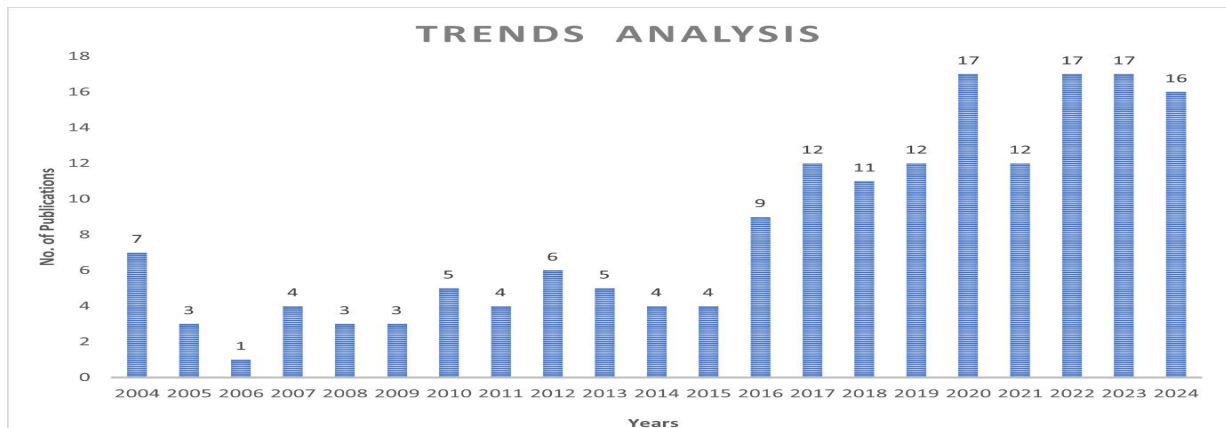


Fig. 2(b) Trends Analysis of Publications on “Vocational Training” and “Employability”
From 2004-2024

Bibliographic analysis of publications related to vocational training and employability from 2004 to 2024 shows a significant increase in research activity, especially after 2016. In the early years, the volume of publications remained relatively modest, with annual output limited to only 1 to 6 papers as of 2015. However, after the year 2016, there was a significant increase in scholarly interest, leading to a substantial increase in the publication count in 2019 (11 publications), 2020 (14 publications), and 2022 (18 publications). This change can be attributed to various factors, which include a growing awareness of the importance of vocational training in the context of emerging job markets and rising unemployment rates. As the demand for skilled labour continues to increase, researchers are focusing more on exploring innovative approaches to enhance employability through effective vocational education, Fig. 2(b).

Top 10 most productive journals in the field of vocational training and employability.

Source	Publisher	NP	TC	Indexing	H-Indexing	Impact Factor/Score	PY - start
1. INTERNATIONAL JOURNAL OF MANPOWER	Emerald Group Publishing	3	36	ABDC “A” & Scopus	2	4.6/2.4	2010
2. HIGHER EDUCATION, SKILLS AND WORK-BASED LEARNING	Emerald Group Publishing	3	34	ABDC “C” & Scopus	3	2.10/3.8	2018
3. JOURNAL OF VOCATIONAL EDUCATION AND TRAINING	Taylor & Francis Group	2	25	ABDC “B” & Scopus	3	1.9	2012
4. INTERNATIONAL JOURNAL OF ENGINEERING EDUCATION	Tempus Publication	3	28	Scopus	2	0.611/0.92	2018
5. INTERNATIONAL JOURNAL OF TRAINING	Taylor & Francis	2	16	Scopus	2	0.6	2019

RESEARCH	Group						
6. EUROPEAN JOURNAL OF TRAINING AND DEVELOPMENT	Emerald Group Publishing	2	13	Scopus	2	---	2012
7. INDUSTRY AND HIGHER EDUCATION	Sage Publications Ltd	2	46	Scopus	2	-----	2004
8. JOURNAL OF VOCATIONAL REHABILITATION	IOS Press	2	15	Scopus	2	0.506	2008
9. SUSTAINABILITY	MDPI	2	13	Scopus	2	3.889	2021
10. TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING	Springer	2	11	Scopus	2	0.87	2015

Most Productive Journal in this field (RQ 2)

The bibliometric analysis of journals publishing research on vocational training and employability reveals key insights into their impact and productivity. The International Journal of Manpower stands out with the highest h-index (3) and total citations (TC = 36), indicating its influence in this field. Higher Education, Skills and Work-Based Learning and the International Journal of Engineering Education also show strong productivity, each with an h-index of 3 and 2, and TC = 34 and 28, reflecting a steady contribution. In terms of emerging journals, Sustainability, despite being a newer entrant (PY-start: 2021), exhibits a notable h-index (2), suggesting rapid impact. The Industry and Higher Education journal, with TC = 46, has significant reach despite a moderate h-index (2). This analysis underscores that research on vocational training and employability is dispersed across interdisciplinary platforms, with a growing presence in sustainability-focused journals, hinting at future directions integrating vocational education with sustainable development goals.

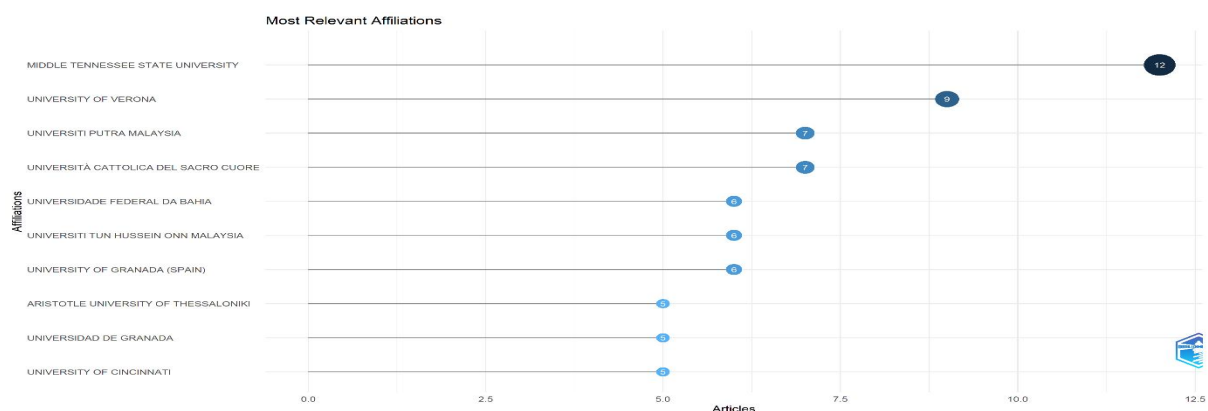


Fig. 3: Most Relevant Affiliations

Figure 3 illustrates that the bibliometric analysis of research focused on vocational training and employability has identified the top 10 leading institutions that have significantly contributed to this field. Middle Tennessee State University, University of Verona, and Universtiputra Malaysia stand out as top contributors, producing an impressive 12, 9 and 7 publications. Apart from these major universities, other important institutions such as the

University of Granada (Spain) and the University of Cincinnati have also played an important role in advancing knowledge in vocational training and employability. This analysis highlights collaborative efforts and diverse geographic representation in research aimed at enhancing workforce readiness and skills development.

Country Scientific Production

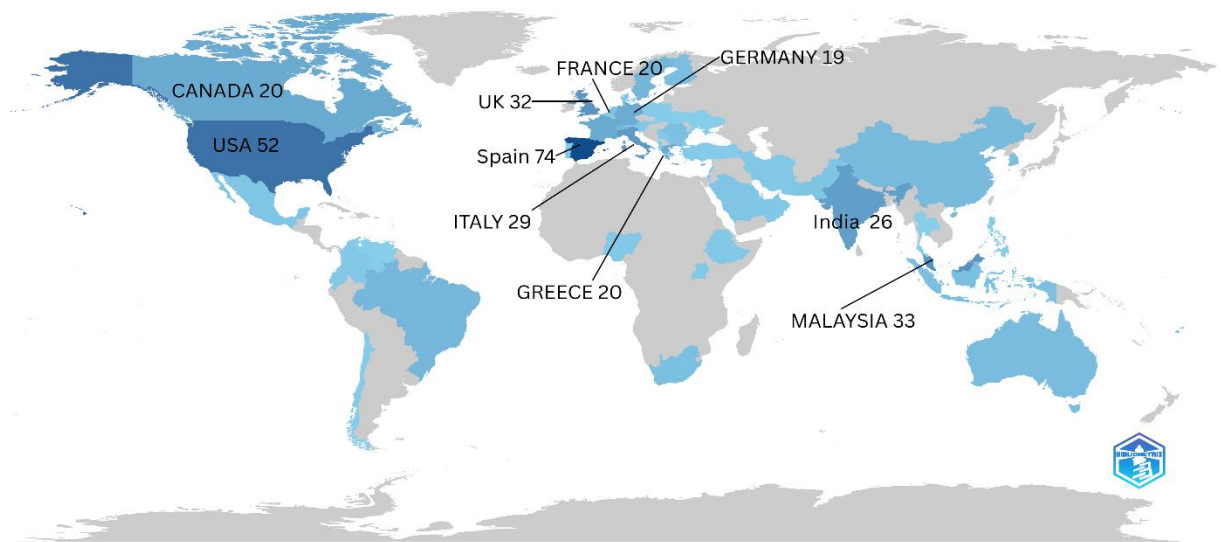


Fig. 4: Country-Wise Scientific Production

According to the bibliometric examination of country-wise research production (from highest to lowest) in vocational training and employability, as cited above, Spain leads with 74 publications, followed by the US and the UK, each with 54 and 32 publications, respectively. In this area of research, Malaysia (33 publications), Italy (29), India (26), and Germany (19) also exhibit a high level of research activity. Other significant contributors are Canada (6), France, and Greece, all published 20 publications in this particular area of research. Most of the European countries, including Spain, have concentrated on this theme, followed by the USA, focusing on employability research and vocational training policy. This worldwide distribution opens the door for comparative research and cross-national policy analysis in vocational education by indicating a high level of interest in workforce development, skill advancement, and economic adaptability.

Furthermore, analysis shows that vocational training and employability revealed significant relationships among the top 10 countries. Larger nodes in the network diagram indicate a higher number of training programs and employment opportunities, highlighting their influential role in shaping global workforce dynamics and promoting international collaboration in vocational education. (See fig.5)

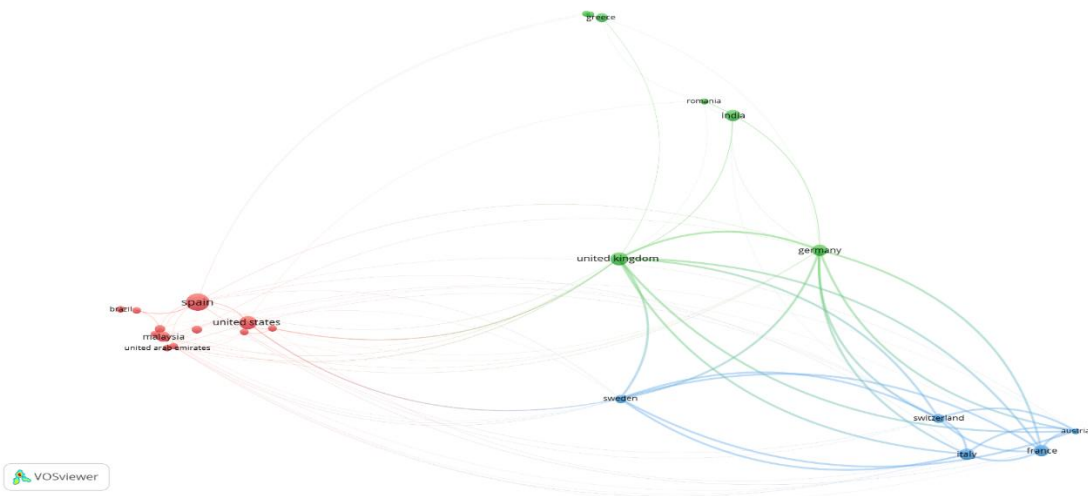


Fig. 5. Bibliographic coupling of the top countries

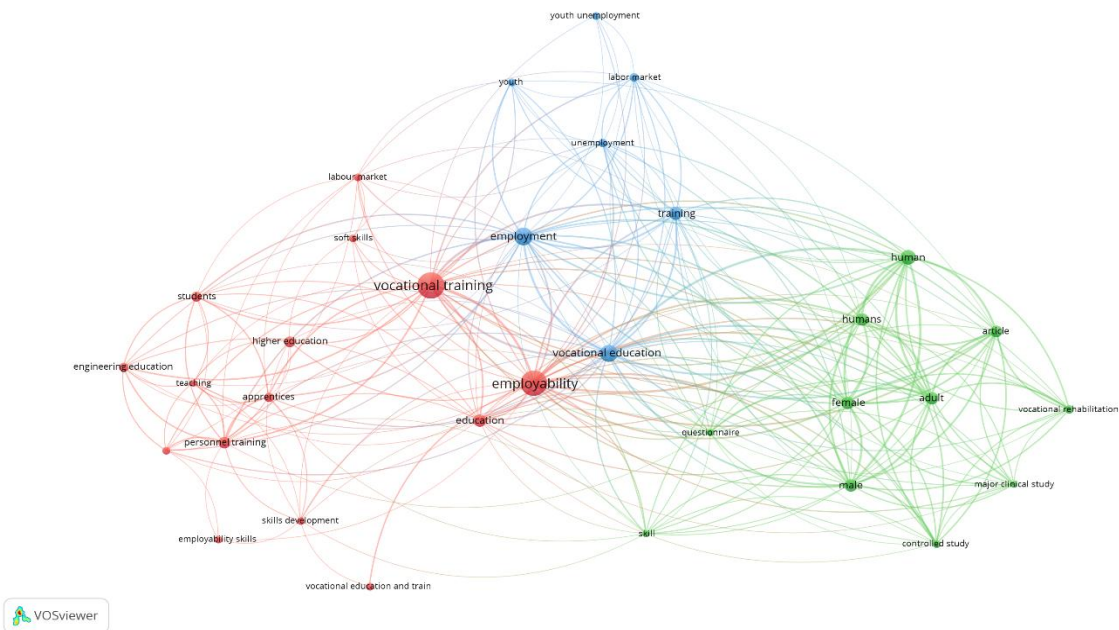


Fig. 6. Analysis of keywords

Most frequently used keywords (RQ 3)

Keyword analysis identifies and examines important keywords in various texts to effectively enhance search engine optimisation strategies (Nagpal & Petersen, 2020). This study examines twenty-two documents relating to vocational training and employability. It focuses on key themes such as “employability skills”, “training programmes” and “career development” and identifies common keywords by analysing these Keywords. This research aims to uncover prevailing trends and insights that can inform future strategies to enhance workforce readiness and employment prospects. The analysis of keywords is shown in Figure 6.

education,” “personnel training,” “skills development,” and “higher education” appeared prominently, thereby illustrating the interrelationships of these topics and providing a clear overview of the key areas explored in the literature.

Future Research Direction (RQ 4)

Research on vocational training and employability is currently restricted to specific geographical areas, limiting wider understanding (most of the papers are published in Spain, the UK, the USA, Malaysia, etc.). However, there is significant potential to extend this research to a global level, incorporating diverse contexts and practices. The paper highlights important areas and topics that require further research. Additionally, Future studies should examine new developments, including the integration of the gig economy, digital skill acquisition, and gender-specific effects, to match vocational training with changing job environments.

Table: Future Research Direction

Latest Topics	Future Research Direction	Sources
Integration of Digital Tools	Use of VR, AR, AI, and IoT in vocational education for immersive learning experiences	(Ghosh & Ravichandran, 2024; Muskhair et al., 2024)
Focus on Employability Skills	Emphasis on critical thinking, communication, and problem-solving skills	(Maharbid & Kustiawan, 2022; Acemoglu & Autor, 2011; Pool & Sewell, 2007)
Industry Collaboration and Work-Based Learning	Partnerships between educational institutions and industries for practical training	(Fam et al., 2024; Omar & Kamaruzaman, 2024)
Sustainable Employability and Green Skills	Integration of sustainability and green skills into vocational education curricula	(Latif et al., 2024; Arokiasamy et al., 2024)
Global Publication Trends	Increase in publications from developed and emerging economies	(K et al., 2022; Majid et al., 2022; Akbar & Widowati, 2024)
Need for Empirical Studies in Developing Regions	Lack of research in developing regions and specific populations	(Majid et al., 2022; Ahmad-Don et al., 2024)
Incorporation of 21st-Century Skills	Focus on creativity, collaboration, and digital literacy in vocational education	(Hidayat et al., 2024; Dongna & Amiruddin, 2024)
Policy and Governance	Importance of policy frameworks, funding, and global standards for TVET	(Fam et al., 2024; Omar & Kamaruzaman, 2024; Majid et al., 2022)

Conclusion

In recent years, several bibliometric analyses have revealed a substantial and growing focus on research related to vocational training and employability. Researchers expect that

publication trends in this field will continue to rise, emphasising the increasing importance of this area. The study of all these major topics has involved the role of researchers, the development of related qualifications, as well as new training models. In addition, software, especially Biblioshiny and Vos Viewer, has enhanced research efforts and expanded the field. Such training is effective; it helps policymakers better understand the needs of the labour market and aligns with the best workforce development strategies in the world.

Additionally, bibliometric analysis provides important information about recent trends in vocational training and employability research, which is a critical area for working on researchers and policymakers to focus on and improve vocational training programs. It serves as a guide for them. Apart from this, it also highlights the importance of integrating vocational training with employability. It aims to acquire more skills so that the workforce can develop, which contributes to economic growth and development. And from this study, it is known that prominent researchers like AR Barkar, S Nurami, B Marcano and C Mayombe have made important contributions in their field, due to which they have received recognition all over the world. Also, International Journal of Manpower, Higher Education, Skills and Work-Based Learning and Journal of Vocational Education and Training, etc., are the journals that publish the most papers in this field, and Spain, the USA and the UK are the most productive countries. The results of this analysis help to analyse and uncover important ideas in this field through the map knowledge. It serves as a valuable resource for researchers and policymakers. It also helps them to develop vocational training programmes and shape policies, which results in better employment opportunities and a strong workforce that works according to market demands.

Abbreviations

VT & E: Vocational Training and Employability

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Author Contributions

Vicky Raaz wrote the manuscript, provided data and analysis, and Dr. Ravish Chandra Verma provided feedback on the article.

Conflict of Interest

The authors declare no conflicts of interest

Ethical Approval

Not applicable

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