

Integrating Social Skills into Higher Education Curricula: Preparing Students for Industry 5.0

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Abstract

Study explores the evolving nature of employability skills, particularly focusing on the integration of social skills within higher education curricula to enhance graduates' competitiveness in an increasingly dynamic labor market. Driven by the rise of the Industry 5.0 paradigm, which emphasizes human-centric collaboration with intelligent machines, this research highlights the growing demand for workers who not only possess technical expertise but also strong interpersonal competencies. Using bibliometric analysis, the study examines publications from 2016 to 2025, revealing a significant surge in research on employability skills, particularly after 2021. The findings underscore a notable shift in higher education, with increasing emphasis on the development of both technical and social skills, such as communication, leadership, and teamwork, which are critical for career success. Furthermore, this research identifies the pivotal role of work-integrated learning in preparing graduates for the workforce, suggesting that curricula must adapt to incorporate these practical experiences. The study contributes valuable insights for policymakers and educators, urging closer collaboration between the educational and industrial sectors to ensure curricula align with labor market demands. By fostering the integration of social skills alongside technical training, higher education institutions can better equip graduates to meet the challenges of the global workforce.

Keywords: employability skills, social skills, work-integrated learning, graduate competitiveness, higher education

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INTRODUCTION

The evolution of the labor market, driven by advancements in technology, globalization, and shifts in economic conditions, presents a new challenge for the educational sector (Coleman et al., 2025; Hermaszewski, 2026; Pandya & Boukareva, 2025). This is particularly evident with the emergence of the 5.0 Industrial Revolution, characterized by the collaboration between humans and intelligent machines, emphasizing a human-centric approach that prioritizes sustainability and resilience (Alsaoudi et al., 2025; Beng et al., 2025; Dávila-Laguna et al., 2025; Imjai et al., 2025). There is an increasing demand for workers who not only possess technical skills but also strong social competencies. In this context, the education system faces significant pressure to adapt its curricula in order to prepare graduates who are equipped to navigate and thrive in these dynamic changes (Gurjar et al., 2026; Kanar et al., 2025; Onodipe et al., 2025; Pham et al., 2025).

In this era, technical skills have become increasingly important, yet they are no longer sufficient on their own. The evolving complexity of the workforce demands a combination of both technical and social skills. Social skills such as effective, leadership,

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teamwork, and problem-solving have become critical determinants of an individual's success in navigating professional challenges (Chadwick et al., 2025; Haidar, 2025; Sugiuchi et al., 2025; Younus et al., 2025). Therefore, it is essential for educational institutions to integrate the development of social skills into higher education curricula, ensuring that graduates are not only technically proficient but also capable of adapting to the evolving social and professional dynamics (Dionisi-Vici et al., 2025; Hageman & Lynch, 2026; Lastimado, 2025; Onodipe et al., 2025).

Recent bibliometric analysis reveals a significant surge in research focusing on employability skills since 2021, reflecting a major shift in the higher education paradigm. Publications addressing this topic have seen rapid growth, with journals such as *Higher Education Skills and Work-Based Learning* playing a central role in directing research toward the relationship between education and the labor market (Carter et al., 2025; Geng et al., 2025; Yılık, 2025). This trend highlights that the development of skills directly relevant to the workforce has now become a primary focus in higher education research, underlining the increasing importance of preparing graduates for the evolving demands of the job market (Hermaszewski, 2026; Van et al., 2025). The importance of social skills and career development has increasingly been recognized in educational literature, leading to a shift toward curricula that are more oriented toward practical experience and real-world application (Hermaszewski, 2026; Lastimado, 2025). Previous studies indicate that graduates possessing a combination of technical and strong social skills are more likely to successfully adapt to the demands of the labor market and actively contribute within organizations. This highlights the need for higher education institutions to place greater emphasis on integrating social skills into their curricula, ensuring that graduates not only possess academic competence but also the practical skills required for success in the professional world (Aggarwal et al., 2025; Suppiah et al., 2025; Tello et al., 2026).

This study aims to deepen the understanding of the development of employability skills, with a primary focus on the role of social skills in enhancing graduates' competitiveness in the labor market. Through a bibliometric approach, this research will identify key trends, contributions of prominent authors, and central concepts emerging in the literature related to employability. In doing so, this study is expected to provide deeper insights into how education can integrate both social and technical skills into its curriculum to prepare graduates who are ready to face the increasingly competitive challenges of the workforce. As part of efforts to respond to the evolving demands of the labor market, higher education institutions must adapt their curricula to meet the increasingly complex and diverse skill requirements. This necessitates closer collaboration between the educational and industrial sectors to ensure that the curriculum taught is relevant to the needs of the workforce. This study also aims to explore in greater depth how work-based learning experiences and the development of social skills can enhance graduates' career readiness.

This study will not only provide an overview of the latest trends in the development of employability skills but also offer strategic recommendations for educational policies that are more responsive to the evolving demands of the global labor market. In the face of the challenges encountered by both the educational and industrial sectors, it is crucial for these two sectors to adapt simultaneously, ensuring that graduates acquire competencies aligned with the increasingly dynamic demands of the job market.

LITERATURE REVIEW

The theoretical framework of this research is rooted in the urgent need to align graduate competencies with the Industry 5.0 paradigm, which emphasizes a human-centric collaboration between people and intelligent machines. This phenomenon is explained through Bandura's Self-Efficacy Theory (1977), which serves as a fundamental pillar for understanding how individuals develop the social skills and confidence necessary to navigate complex professional environments. The theory posits that a person's success in challenging tasks is heavily dictated by their perceived interpersonal competence. In the context of a modern, competitive labor market, self-efficacy acts as a primary predictor of employability, where graduates must possess not only technical proficiency but also the mental resilience and social adaptability required to thrive in dynamic work settings.

The comprehensive literature review reveals a significant paradigm shift in employability research, characterized by a sharp surge in academic publications, particularly since 2021. Current scholarship identifies that while technical "hard skills" remain essential, social skills such as communication, leadership, teamwork, and problem-solving have emerged as the ultimate determinants of career success in the Industry 5.0 era. Bibliometric analysis spanning from 2016 to 2025 reinforces this trend, showing that prominent journals, such as *Higher Education Skills and Work-Based Learning*, are increasingly focusing on how higher education institutions can integrate experience-based curricula to bridge the persistent skills gap.

Furthermore, up-to-date academic discourse highlights the critical role of Work-Integrated Learning (WIL) as a strategic educational response. Studies demonstrate that experiential learning models allow students to bridge the gap between academic theory and professional practice, directly enhancing their global competitiveness. The necessity for this manuscript is driven by the reality that traditional, theory-heavy educational models are no longer sufficient to meet industry demands. Consequently, strategic collaboration between the educational sector and industry stakeholders is imperative to ensure that curriculum development remains synchronized with digital transformation, producing graduates who are both technically capable and interpersonally adept within the Industry 5.0 ecosystem.

METHODOLOGY

Materials

This study utilizes a comprehensive dataset obtained from the Scopus database, comprising 668 papers published between 2016 and 2025. The documents included in this research were selected based on carefully formulated keywords: TITLE-ABS-KEY ("employability skills" OR "Workplace Skills" OR "soft skills" OR "General Work Skills" AND "Career" OR "career adaptability"). The selection of these keywords was done to ensure the diversity of topics, covering various perspectives on the relationship between employability skills and careers. This methodology allows the study to not only focus on the direct impact of employability skills on careers but also explore the broader effects of employability skills on career development. As a result, the dataset encompasses a wide range of studies that provide deep insights into the complex aspects of employability skills.

With this approach, the dataset used in this research is ensured to represent relevant and up-to-date studies on the topic. The diversity of the research within this dataset provides a strong foundation for in-depth bibliometric analysis. This analysis offers a comprehensive understanding of how employability skills have influenced and continue

to impact careers. Therefore, this dataset serves as a valuable resource that can be utilized by academics and practitioners for further research and strategic decision-making.

Methods

This study employs Biblioshiny, an advanced bibliometric analysis tool integrated within R Studio, to analyze the complex dynamics and structure of research on employability skills and career development. This tool offers a comprehensive range of features that enable in-depth analysis of publication trends. It helps identify the most productive authors, leading publications, and the wide collaborative networks characteristic of this evolving field. By utilizing this method, the study successfully highlights key individuals who have made significant contributions to the discourse on employability skills and career development. This provides a better understanding of how knowledge is created, shared, and developed within this area.

Biblioshiny not only aids in identifying important authors and publications but also facilitates the visualization of co-authorship networks, citation patterns, and the evolution of research topics over time. These visualizations provide valuable insights into the relationships between academics and institutions, emphasizing the importance of collaboration within the field. Moreover, the tool reveals how the research community's focus has shifted over time by tracking the development of topics and citation trends, offering a clear picture of emerging research interests. This temporal analysis is crucial for understanding the evolution of the field and for guiding future research directions, especially in light of new challenges and opportunities that arise.

RESULT AND DISCUSSION

Publication trends

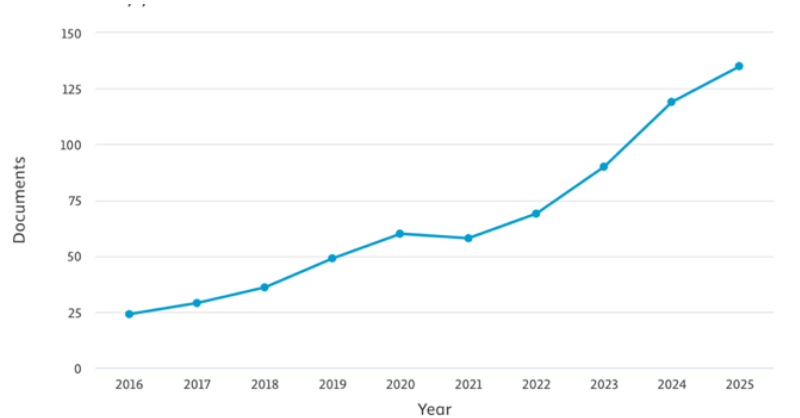


Figure 1 The number of published articles 2016-2025. **Source:** Scopus Database, 2025.

The graph presented illustrates the increase in the number of documents published from 2016 to 2025. In the early years, particularly in 2016, the number of documents published was relatively small, with only about 25 documents published. However, from 2017 to 2019, there was a steady growth, albeit slow, indicating a rise in interest or investment in the topic. This gradual increase continued into 2020, although at a slower pace compared to the subsequent years. Entering 2021, the trend showed a significant acceleration, with the number of documents published sharply increasing each year. This rapid growth indicates a surge in research activity or heightened interest in the topic, possibly driven by new developments, increased funding, or greater awareness of the subject. By 2025, the number of published documents exceeded 125, reflecting a substantial surge compared to previous years. This dramatic spike may indicate that the

field has reached a point of maturity or peak interest, leading to greater contributions from the academic and research community. Overall, this data not only reflects the increase in publication volume year by year but also signals a broader trend related to the growth of scientific activity, particularly with the rapid expansion since 2021. This increase may indicate a greater focus from institutions and academics on the topic, as well as broader engagement from the research community.

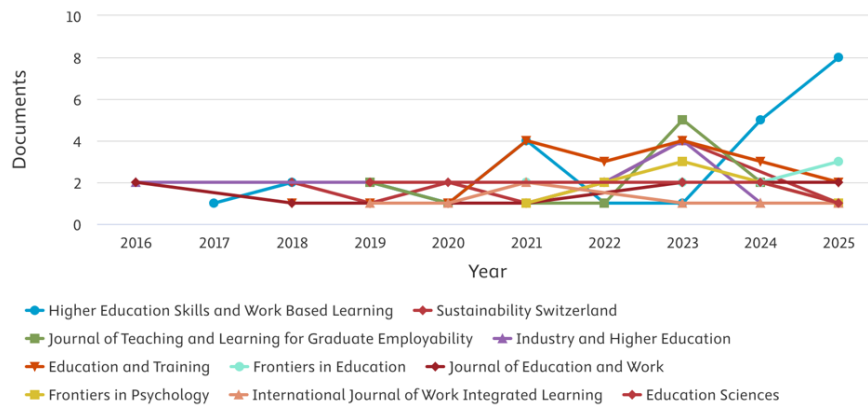


Figure 2 The number of citations articles from 2016-2025. **Source:** Scopus Database, 2025.

This graph illustrates the trend in the number of document publications in various academic journals from 2016 to 2025. Each line in the graph represents a different journal, with the number of published documents displayed on the vertical axis and the years on the horizontal axis. In the early period 2016–2019, most journals showed relatively stable and low publication numbers. Journals such as Sustainability Switzerland, Education and Training, Industry and Higher Education, and Journal of Teaching and Learning for Graduate Employability published between 1 and 3 documents per year, indicating limited contributions to scholarly publications during those years.

However, since 2020, a significant increase in publication numbers across most journals is evident. Notably, Higher Education Skills and Work-Based Learning experienced a sharp surge, reaching its peak in 2025 with a very high number of published documents, far surpassing other journals. Other journals like Frontiers in Psychology and Journal of Education and Work show a more gradual increase, with publications steadily rising from 2020 to 2025. Meanwhile, Sustainability Switzerland and Frontiers in Education experienced a significant growth around 2023, reflecting a growing interest in the topics addressed by these journals. Overall, this graph highlights a substantial increase in scholarly publications since 2021, indicating a rapidly developing trend in higher education, work-based learning, and related topics. The rapid growth of Higher Education Skills and Work-Based Learning reflects the emergence of the journal as a central source of publications in this field.

Source impact

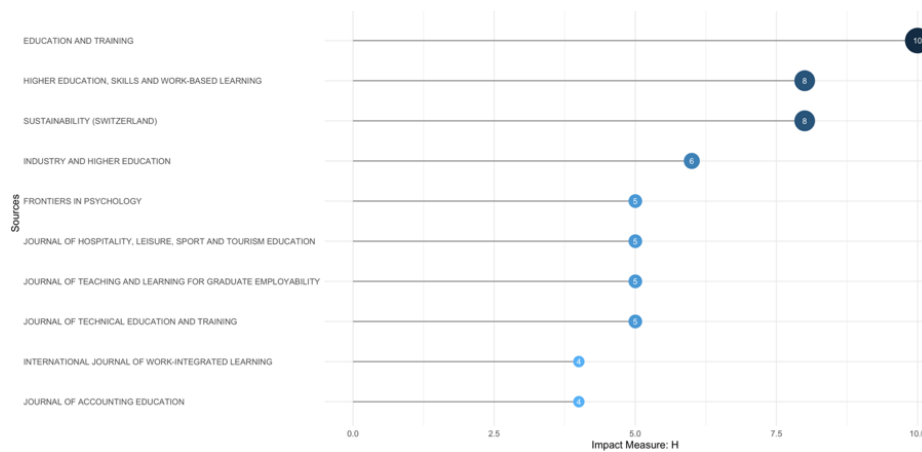


Figure 3 h-index values of each journal. **Source:** Scopus Database, 2025.

This graph illustrates the local impact of various publication sources in the field of education, measured by the H-index. The H-index is a metric that combines the number of publications with the frequency of citations they receive, reflecting the productivity and impact of a journal within the scientific community. In this graph, Education and Training shows the highest H-index value of 10, indicating that this journal has a significant influence in the field of education. A high H-index value reflects a large number of published articles that are frequently cited in related literature, suggesting that this journal plays a key role in shaping the development of scholarship in the field.

Other journals, such as Higher Education, Skills and Work-Based Learning, Sustainability (Switzerland), and Industry and Higher Education, each have an H-index of 8, indicating significant impact, though slightly lower compared to Education and Training. Despite having a lower score, these journals still make important contributions to the development of research and thought in the fields of higher education and work-based skills. Journals like Frontiers in Psychology, Journal of Hospitality, Leisure, Sport and Tourism Education, and Journal of Teaching and Learning for Graduate Employability have an H-index of 6, reflecting a more limited impact, though still relevant to the topics discussed. Journals with this score demonstrate ongoing contributions but may not have the same level of influence as those with higher H-index scores.

The journals with the lowest H-index, at 4, are Journal of Accounting Education and International Journal of Work-Integrated Learning. Although they have a smaller impact, these journals still play a role in the development of their respective fields, though their contributions are more limited compared to the other journals featured in the graph. Overall, this graph illustrates the variation in local impact generated by journals in the field of education. Some journals exhibit a very significant influence on research and scientific advancement, while others have a more focused impact, yet still contribute to the progress of scholarship within more specific areas.

Three-field plot

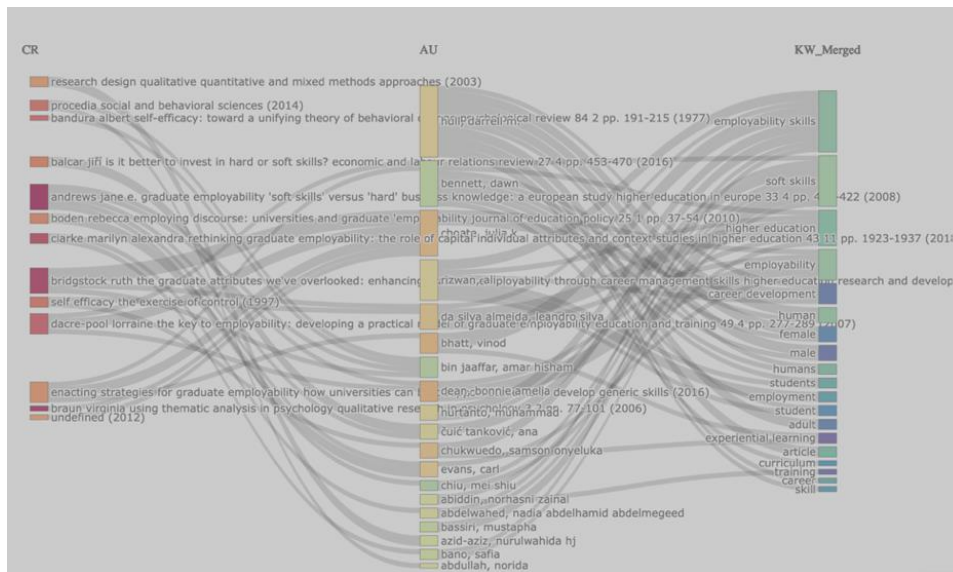


Figure 4 Illustration of a three-field plot consisting of a list of affiliations, countries, and topics. **Source:** Scopus Database, 2025.

The three-field plot above presents an analysis of the relationships between three key elements in bibliometric studies: references (CR), authors (AU), and keywords (KW), allowing us to visualize the connections between existing literature, authors' contributions, and dominant concepts in the field of skill development and employability among graduates. On the first axis, representing references (CR), we can identify fundamental works that are frequently cited in related research, such as Bandura Albert's Self-Efficacy (1977), which discusses the theory of self-efficacy and its role in social skill development. Other references, such as Enacting Strategies for Graduate Employability and The Graduate Attributes We've Overlooked, reflect important thinking about how the development of graduate attributes directly relates to employability.

The second axis, representing authors (AU), highlights the contributions of leading authors in the field. Authors like Bennett Dawn, Boden Rebecca, and Clarke Marilyn Alexandra have works that emphasize the importance of social skills (soft skills) in enhancing graduate employability. Additionally, other authors such as Bin Jaaffar Amar Hisham and Bhatt Vinod have contributed research on skill development through education and training. The third axis, representing keywords (KW), illustrates the key concepts that are central to this literature, such as Employability Skills, Soft Skills, Higher Education, Career Development, and Human. These keywords point to the core discussions, namely the importance of developing both technical and social skills among graduates through higher education and relevant career training.

Overall, this plot provides a comprehensive view of how the existing literature is interrelated, showing the connections between key theories, authors' contributions, and central concepts in research on employability. Thus, the plot not only maps the field but also reveals the trajectory of knowledge development in graduate skill enhancement necessary for entering an increasingly competitive job market.

Corresponding author's countries

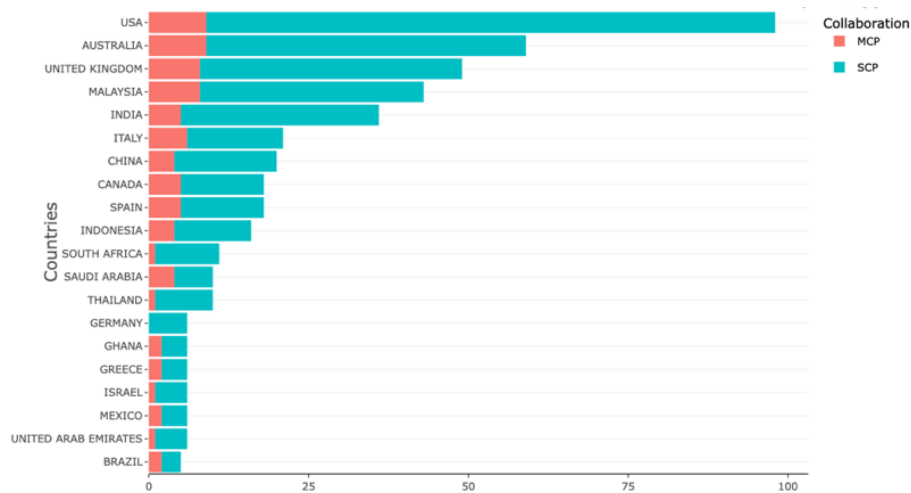


Figure 5 Corresponding author's countries. **Source:** Scopus Database, 2025.

This graph illustrates the distribution of the countries of corresponding authors based on the type of publication collaboration, namely MCP (Multiple Country Publication) and SCP (Single Country Publication). The horizontal axis shows the number of publications associated with each type of collaboration, while the vertical axis records the countries of the authors involved in these publications. The United States (USA) stands out as the country with the largest contribution to publications, dominating both in cross-country publications (MCP) and single-country publications (SCP). This indicates that the USA plays a central role in international scholarly publishing, both through global collaborations and domestic research. Australia and the United Kingdom also contribute significantly to international publications, with a notable number of publications in both types of collaboration.

Countries like Malaysia, India, and Italy show significant involvement in international collaborations, though their publication counts are slightly lower than those of the more dominant countries. In this case, cross-country collaboration (MCP) is more prominent than single-country publications (SCP), signaling an increasing participation of authors from these countries in joint research with authors from other nations. On the other hand, countries such as Indonesia, South Africa, and Saudi Arabia show a higher number of publications in the context of MCP, reflecting a greater tendency to engage in international collaborations compared to publications involving only authors from those countries (SCP).

Smaller countries like Ghana, Greece, Israel, Mexico, and others also participate in international collaborations, albeit with relatively limited publication numbers. This highlights an effort to contribute to global scientific research despite more limited resources. Overall, this graph provides a clear picture of the trends in international collaboration in scholarly publishing, where large countries like the United States, Australia, and the United Kingdom dominate the contributions, while other countries exhibit varied participation patterns in both cross-country collaboration and domestic publications.

Word cloud

publication quantity but also indicates a significant shift in research focus, highlighting an increasing recognition of the importance of graduate skills development for entering the increasingly competitive job market.

The analysis further highlights that concepts such as soft skills, career development, and work-integrated learning have become dominant themes in the literature on employability. The growing body of work addressing these topics reinforces the notion that social skills, such as communication, leadership, and teamwork, are essential for graduates to remain competitive in the global job market (Cheng et al., 2023; Huy & Tam, 2025; Onodipe et al., 2025; Shannaq, 2025; Tofighi, 2022). Prominent authors like Bennett Dawn and Boden Rebecca have long underscored the importance of soft skills development, and this analysis confirms that the need to integrate social skills into higher education curricula is becoming more widely acknowledged. The rapid rise in publications post-2021 also suggests that external factors, such as the COVID-19 pandemic and the digital revolution, have had a profound impact on labor market needs, spurring significant shifts in academic focus in this field (Beng et al., 2025; de Carlo et al., 2025; Imjai et al., 2025; Wang et al., 2025).

Additionally, co-citation and co-word analyses reveal a growing connection between the development of technical and social skills in higher education. Terms like "higher education" and "work-integrated learning" frequently appear as central concepts in the literature, indicating that many universities are now placing greater emphasis on providing learning experiences relevant to the workforce, rather than relying solely on theoretical instruction. Higher education is increasingly oriented toward preparing graduates to meet the evolving demands of the labor market, focusing on skills that can be directly applied in professional settings. These findings suggest that higher education must adapt to rapidly changing global dynamics and align its curricula with the needs of a dynamic labor market (Gao & Zhu, 2025; Moya-Loaiza et al., 2025; Shannaq, 2025).

The accelerated attention to employability skills after 2021 also reflects a response to transformations in the workforce and education. With many companies undergoing digital transformation and an increased demand for new skills, such as those related to technology and digital communication, education systems have been striving to keep pace (Chalmers & Spence, 2024; Lisá et al., 2019; Wang et al., 2025). The growing and diverse body of research demonstrates that educational institutions are increasingly aware of the importance of preparing graduates for the competitive job market. As such, the development of skills relevant to the labor market remains a critical area for continued research and implementation in higher education curricula (ElKhalifa et al., 2024; Kanar & Heinrich, 2024; Kronemann et al., 2024; Onodipe et al., 2025; Ragland et al., 2024).

This research contributes to the field by emphasizing the importance of collaboration between academia and industry in preparing graduates who are job-ready. The emergence of journals such as *Higher Education Skills and Work-Based Learning* as central hubs for employability research underscores the growing attention to work-based learning. This shift reflects a significant change in the paradigm of higher education, which now prioritizes the development of practical skills that can be directly applied in the workplace, rather than focusing exclusively on theoretical knowledge. Work-based learning allows students to gain hands-on experience in addressing real-world challenges, which is crucial in preparing them for the global job market.

However, this bibliometric analysis has its limitations. The sources used in this analysis are limited to data indexed in major databases like Scopus and Web of Science, which

may not cover all relevant research. Therefore, while this analysis provides a comprehensive overview of research trends, it is important to recognize that there may be significant articles not included in this dataset. Furthermore, bibliometric analysis only offers a quantitative snapshot of research trends and does not provide an in-depth understanding of the context or methodologies used in the studies. Further research is needed to gain a deeper understanding of the dynamics behind the trends identified in this bibliometric analysis.

Future research could focus on the development of employability skills in new contexts, such as digital skills and those related to Industry 5.0 advancements. This is important given the rapid pace of technological change that demands new skills from graduates. Additionally, a greater emphasis on work-based learning experiences could be an important area for future studies, with a focus on how these practical experiences influence career readiness. Research on the relationship between the development of social and technical skills, and how both contribute to graduates' preparedness for the workforce, is also highly needed. Based on the findings, several policy recommendations should be considered. Higher education institutions should increasingly integrate social skills development into their curricula and create more opportunities for students to engage in work-based learning. Additionally, it is crucial for governments and other stakeholders to support policies that strengthen collaboration between education and industry, as well as facilitate skill training programs that meet market demands. With these steps, higher education can become more effective in preparing graduates to face the evolving challenges of the labor market.

Overall, this analysis demonstrates that employability skills have become a dominant topic in higher education research. The shift from theory-based education to more work-integrated learning is an important step in ensuring that graduates are ready to face the challenges of the global labor market. The trends identified in this analysis provide valuable insights for the development of education policies that are more relevant and responsive to the needs of an increasingly dynamic labor market.

CONCLUSION

The results of this bibliometric analysis reveal that research on employability skills, particularly social skills and work-based learning, has garnered significant attention in academic literature. The surge in publications since 2021 reflects a response to significant shifts in the global labor market, which increasingly demands graduates to not only master technical skills but also possess social skills relevant to the dynamic demands of the workforce. This finding aligns with the growing emphasis on the development of employability skills in higher education, which has led to curriculum adjustments to incorporate skills that can be directly applied in professional contexts.

As a key finding, this study also highlights the critical role of journals such as *Higher Education Skills and Work-Based Learning*, which have emerged as leading platforms for research on employability. This signals a significant change in the perspective on higher education, which now increasingly prioritizes learning experiences directly tied to the workplace. However, it is important to acknowledge the limitations of the bibliometric approach used, such as the reliance on data indexed in large databases and its inability to capture the depth of methodology or context in existing studies. Therefore, further research is necessary to gain a deeper understanding of the dynamics between higher education and the evolving labor market needs, as well as the impact of work-based learning on graduates' career readiness.

Additionally, this research underscores the need for closer collaboration between educational institutions and the industry to ensure that higher education curricula remain responsive to the changing demands of the labor market. Such collaboration will significantly contribute to preparing graduates who possess not only academic competencies but also the practical skills required in the workforce. Future studies are expected to further explore the impact of both social and technical skills on employability and delve deeper into the effects of direct work experience on long-term career success.

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