# **A BIBLIOMETRIC ANALYSIS OF UNIVERSITY-TO-WORK IMPEDIMENTS**

**Abstract**

South Africa exhibits high unemployment rates, similar to several other African countries on the continent. Thus, adversely affecting the graduates pertaining to the African higher education system. Current research disparities entail the lack of a concise demographical landscape of African graduates' impediments and the increasing high unemployment rate. The significance lies in the necessity to identify interventions that have the potential to reduce the unemployment rates of graduates, improving economic morale through employability. This study executed a detailed bibliometric analysis as a segment of a systematic literature review, responding to a call for enhanced higher education research in Africa relating to graduates and the labour market. Consequently, the bibliometric analysis aimed to unravel the current outlook of literature pertaining to South African graduates and the labour market. Additionally, providing recommendations for future research avenues. A total of 2584 documents were extracted from the SCOPUS database and reviewed using VOSViewer. The results revealed that several research avenues and stances exist that necessitate further inquiry to combat university-to-work impediments. Such themes entail employability, psychological outlooks, and work-integrated learning in higher education.

**Keywords:** higher education, university, employability, unemployment, bibliometrics, graduates

**Introduction**

Several African countries are currently facing a high unemployment rate. Most affected by this are also graduates, the end product of the higher education system. For instance, studies have reported that only 25% to 30% of graduates are employable in India (Tilak, 2020, p. 57). In the United Kingdom, unemployment among graduates is approximately 47% (Mok & Jiang, 2018), whereas in Spain, it stands at around 15.5% (Statista Portal, as cited in Nghia, 2019). A similar situation has also been observed in the Middle East and North Africa (MENA) region, with 25.8% of youth unemployment in 2019 (Alazzawi & Hlasny, 2022). Significant variation in the unemployment rate has been noted across African countries, with an overall of 7% expected in 2024 (Statista, 2024). South Africa is noted to have the highest unemployment rate (Statista, 2024). Among these is a notable increase in the youth unemployment rate (OECD, 2024). The prevailing high unemployment rate among graduates (Harry et al., 2018; Harry & Chinyamurindi, 2019; Harry & Chinyamurindi, 2020) indicates a fundamental issue within the world's education systems whether it does not adequately prepare youth for the labour market (Choudhry & Pastore, 2023) or it fails to develop curricula that bridge the industry-specific skills gaps (Underdahl et al., 2023).

Nevertheless, the concern of employability has dominated higher education discourse, emphasising employability and acquiring skills that improve graduates’ capacity for a successful university-to-work transition (Mainga et al., 2022; Mgaiwa, 2021; Monteiro et al., 2020, 2022). The central emphasis of graduate employability was a gap created by the disconnect between the skills acquired in higher education and employability skills (Igwe et al., 2022). In the bibliometric analysis of the graduate employability research trends, Masduki et al. (2022) observed that from 2000 to 2010, the focus was on the role of higher education on employability. From 2011 to 2019, the emphasis shifted to employability skills, work-integrated learning, and curriculum designs that would enhance long-term graduate employability and its impact on career goals (Masduki et al., 2022). Another recent study that has mapped research on employability from 1972 to 2019 discovered that employers’ requirements and higher education institutions’ preparation, the antecedents of employability, and the role of work-integrated learning in enhancing employability are highlighted as the themes of research thought (Dinh et al., 2023). Overall, the literature indicates that research on graduate employability is increasing (Masduki et al., 2022; Noori & Azmi, 2021). In this instance, higher education is the most accurate predictor of undergraduate students' employability (Khaiser et al., 2023). However, research seeking to map the role of higher education practices in fostering graduate employability in sub-Saharan Africa is scarce (Mgaiwa, 2021).

Given the current employability challenges, it is evident that HEIs need to modify their curricula to close the skills gap by ensuring that graduates and the knowledge they acquire benefit the labour market, as well as the broader economy. Research validates a misalignment between the skills of the students graduating from university and the needs of the labour market (Walker & Fongwa, 2017; Williamson et al., 2021). This calls for strategies to improve curriculum delivery to prepare graduates for the labour market (Musitha & Mafukata, 2018). There are suggestions that HEIs need to transform their curricula and pedagogies to suit the continuously evolving world of employability (Mainga et al., 2022) and equip students with essential skills required by employers (Kastberg et al., 2020).

Despite the growing number of employability studies, there is a scarcity of studies investigating and analysing the effects of university-to-work transition on employability, highlighted as fraught with challenges (Zayts et al., 2023). Its effects are illuminated to have negative psychological outcomes (Zayts et al., 2023) and adverse mental health (Edmonds et al., 2024) on students as they face new challenges that shift the aspects of their lives, skills, mindsets, and financial standing (Reitz et al., 2020). The increasing research has paid more attention to the detrimental effects of transitioning on the mental health of students (Bowles et al., 2014; Cage et al., 2021; Meehan & Howells, 2018; Wrench et al., 2014) while the role played by universities in preparing students for successful transition is still unclear.

A few key employability factors that translate to a successful transition to work are the evidence of career plans, goals, and perceived competencies related to the degree (Tuononen & Hyytinen, 2022). Thus, higher education institutions (HEIs) are expected to initiate practises that better support students and graduates transitioning to working life. This raises concerns on the part of HEIs as transformational agents that play a pivotal role in equipping students with the knowledge, skills, and attitudes needed for transitioning into the job market (Izzo et al., 2022; Kastberg et al., 2020), especially in the African context (Magagula et al., 2020). Therefore, Izzo et al. (2022) regarded the theme of the university-to-work transition as a work-in-progress effort and will most likely continue for the foreseeable future. Given this, this study uses bibliometric analysis to explore higher education trends and future directions on university-to-work impediments. The research question comprises ‘*What is the current outlook of literature pertaining to South African graduates and the labour market?’*, to aid the refinement of strategies relating to the graduate labour force.

**The higher educational landscape of South Africa**

There are significant changes in the labour market driven by technological advancement, increasing globalisation, climate change, pandemic illness, and growing economic uncertainty and inequality (Blustein et al., 2019; Fraccaroli et al., 2024), which necessitate the need for HEIs to stay current with the skills and adaptability needed to prepare students for success in an often-unpredictable contemporary world of work. There is no doubt that disruptions in the labour market displace jobs and skills needed, resulting in the uncertainty of securing a job after graduation (Nghia, 2019; Oliver, 2015). The higher education landscape in South Africa is equally affected by continuous changes in the labour market. The effect of this changing era is illuminated by the consistent increase in graduates’ unemployment.

Currently, the unemployment rate has increased to over 32.7% for the first time in history, with the youth unemployment rate at approximately 61%, consequently reflecting negatively on higher education's credibility (Duma et al., 2023; OECD, 2024); Statistics South Africa, 2021). In addition, the high rate of youth unemployment is suggested to directly impact the employability of graduates in South Africa. Researchers link the high rate of graduate unemployment in South Africa to a range of aspects that may include the youth’s lack of graduate skills and employability attributes (Benson et al., 2014; Coetzee et al., 2012; Harry et al., 2018). Duma et al. (2023) echoed that the South African higher education context requires reorganising and evaluating the curriculum design and implementation to build graduates with relevant skills and competency for the labour market. At present, South Africa’s higher education system strives to encourage the delivery of vital skills required to improve the economy and social status of the people of South Africa (DHET, 2021). Therefore, research that seeks to explore issues related to the labour market and propose interventions (Maila & Ross, 2018) that will assist HEIs in thriving in the delivery of vital skills is important.

**Methodology**

The bibliometric analysis allows us to interpret research niches through a quantitative approach that requires attention and future development in order to contribute to comprehensive and modernised research in higher education. The purpose of conducting a bibliometric analysis is to identify what is required not only for future research avenues but to also identify the concept connections through visualisations (Williams, 2020). There will be a focus on two units of analysis, with the first unit of analysis entailing authorship and the second unit of analysis pertaining to keywords in South Africa as per the search terms university and work-focused publications. Thus, the significance lies in the intention to enhance employability and lower the unemployment rates among higher education learners within South Africa (Harry & Chinyamurindi, 2022). The primary objective of the study was to ascertain and map the literature on South Africa’s university-to-work landscape. Based on this, the secondary objectives entailed a) analysing research trends, b) determining emerging themes, and c) identifying key authors in the field.

For secondary data collection, emphasis is placed on the fact that both terms searched on the SCOPUS database are present in each document. The documents that the SCOPUS database will extract include concepts of the terms ‘university’ and ‘work’ within the document, keyword and abstract. If these words do not exist in a document and are freestanding, they will not be included in the data set. For this analysis, the following terms were used to ensure a broad theme of research documents and bibliometric data was collected. Looking at the abroad theme with broader terms allows us to identify if there are connections and the literature directions following the selected terms for the biometric data, giving us a broader and wider scope of such a concept with an African higher education Domain. The research terms used in the bibliometric analysis on the SCOPUS database entailed “university” AND “work”. By looking at these two specific terms separately, it identifies the documents and publications available and the authors of such publications. The terms “university” AND “work” are identified as a broader bibliometric search.

According to Pike-Bowles et al. (2022), a wider concept search extracts documents that contain both terms in no chronological order. A restricted SCOPUS search, such as “university to work”, extracts documents that are phrased exactly as per the search terms. The SCOPUS database was selected as it is currently the largest and most reliable peer-reviewed multidisciplinary content provider of bibliographical data in the world. A multidisciplinary database means there is content coverage of various subject fields from various authors that have been published in peer-reviewed journals (Rovelli et al., 2021). The preferred reporting items for systematic reviews and meta-analysis (PRISMA) guidelines were followed throughout the process of the SCOPUS database search as seen in Figure 1.

Records **identified** through searching SCOPUS database:

(“university” AND “work”)

(n= 224 087)

Initial SCOPUS filters:

* 1980- 2024 timeframe
* All subject areas
* All document types
* English language
* Final publication stage

Records excluded (n= 19 498)

Records **screened**:

(n= 204 589)

Additional SCOPUS boundary:

* Limited to South Africa

Records excluded (n= 202 005)

Full-text articles assessed for **eligibility**:

(n= 2584)

Total number of records **included**:

(n= 2584)

**Figure 1: PRISMA inclusion criteria**

**Data integrity**

Following the PRISMA guidelines, data robustness was ensured by identifying and eliminating documents during the SCOPUS database search as demonstrated in Figure 1 (Pike-Bowles et al., 2022). Here, four steps were followed, which entailed data identification, screening, eligibility, and inclusion. The data identification resulted in 224 087 documents found within the SCOPUS databases with no added filters. Data screening and eligibility entailed the addition of filters to our “university” AND “work” term search. The filters employed entailed 1980 to 2024, the locale of South Africa, the English language, and documents in the final publication stage. Furthermore, all subject areas and document types were taken into account which resulted in a total of 2584 documents included in this bibliometric analysis data set. Subsequently, after applying the SCOPUS filters, a total of 221 503 documents (224 087 – 2584) were not included in the final data set for this study.

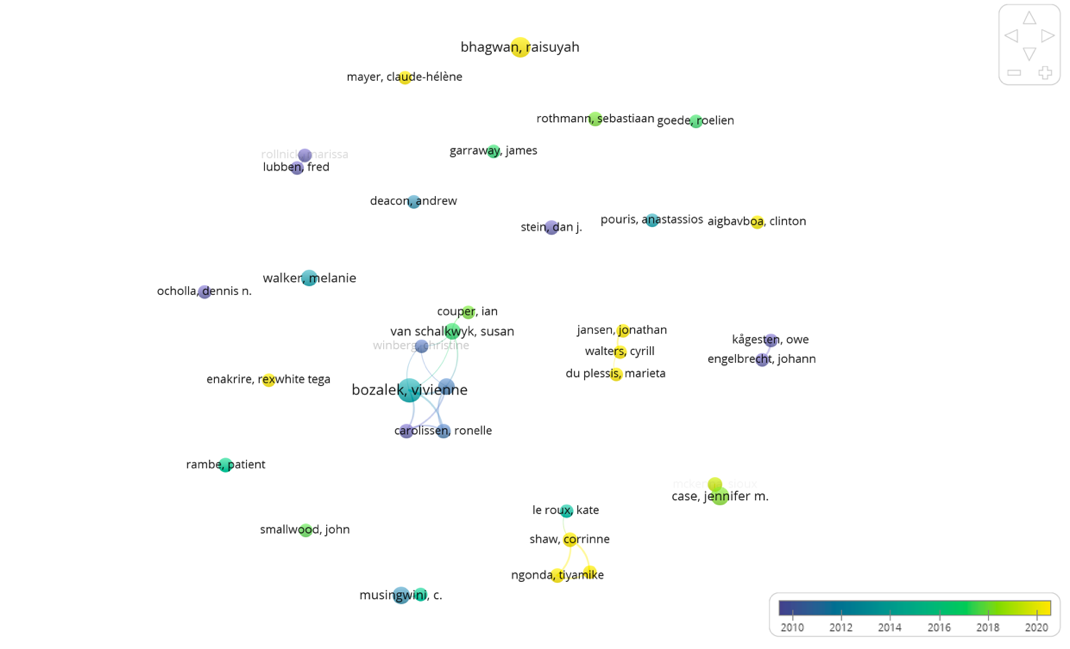
**Data analysis**

VOSViewer is the most prevalent software used to visualise biographical data across all disciplines. The software is used by millions of academics across all disciplines. We can visually analyse research trends based on bibliographical data (Pike-Bowles et al., 2022; Williams, 2020). Based on the imported SCOPUS bibliometric data, the co-authorship type of analysis and author unit of analysis were selected. An inclusion criteria was added where the minimum number of documents per author entailed five which resulted in 36 authors analysed within VOSViewer. Thirdly, the co-occurrence unit of analysis was selected with the inclusion of all keywords. A total of 13 130 keywords were identified; however, to enhance the prominent keywords, a minimum number of keyword occurrences was set at 15 across the documents. This resulted in a total of 164 keywords analysed to map the outlook of South African graduates and the labour force in the university-to-work transition.

**Research findings**

**Analysis one: authors**

The purpose of conducting an analysis and visualisation relating to the authors of university to work themed topics, allows us to identify who the prominent authors are relating to such research themes as well as their networks and collaborations. Figure 2 is presented in the overlay visualisation in VOSViewer, which indicates the various authors within the bibliometric database dataset of 2584 peer-reviewed documents. The key authors are Vivienne Bozalek, Raisuyah Bhagwan, Susan van Schalkwyk, Melanie Walker, and Dan Stein. This is illustrated through the larger author names. The larger author’s name indicates that these authors have higher quantities of citations and documents published within the academic domain and listed on the scopes database (Pike-Bowles et al., 2022). Figure 1 further highlights that the original search on the SCOPUS database, which had a filter of 1980 to 2024, is not entirely illustrated on the colour bar of the VOSViewer analysis.

Figure 2 illustrates the years pertaining to 2010 to 2020 were a key period in the publication of university-to-work research themes. This essentially means that authors published documents and had higher citations predominantly within this era. Within the colour cluster turquoise which represents the year 2014, had the most substantial author citations and documents published. Figure 2 and Table 1 indicate that various authors are focusing on the higher educational themes of work and university in South Africa. Few researchers have collaborated with the largest co-authorship being led by Vivienne Bozalek, networking with authors such as ****Susan van Schalkwyk and Ronelle Carolissen.

**Figure 2: Co-authorship of authors**

Table 1 aligns with Figure 2, where the authors with the most citations entailed Dan Stein with 272 citations and Vivienne Bozalek with 248 citations. However, in terms of documents published, Vivienne Bozalek had 15 documents, while Dan Stein had six published documents. Furthermore, Figure 2 illustrates that these two authors do not have an aligned co-authorship network, indicating a lack of collaboration.

**Table 1: Co-authorship of authors**

|  |  |  |
| --- | --- | --- |
| **Authors** | **Documents** | **Citations** |
| Stein, Dan, J. | 6 | 272 |
| Bozalek, Vivienne | 15 | 248 |
| Rothmann, Sebastiaan | 6 | 178 |
| Leibowitz, Brenda | 7 | 165 |
| Van Schalkwyk, Susan | 7 | 145 |
| Walker, Melanie | 7 | 140 |
| Winberg, Christine | 5 | 102 |

Source: Authors own work

Based on the number of document citations, Table 1 indicates publications from the top two authors, Dan Stein and Vivienne Bozalek. Table 2 presents data that was extracted from the SCOPUS database file. Table 2 entails the document title, year of publication, and source of the title, which are bibliographical aspects that aid literature reviews (Rovelli et al., 2021).

**Table 2: Stein and Bozalek's publications**

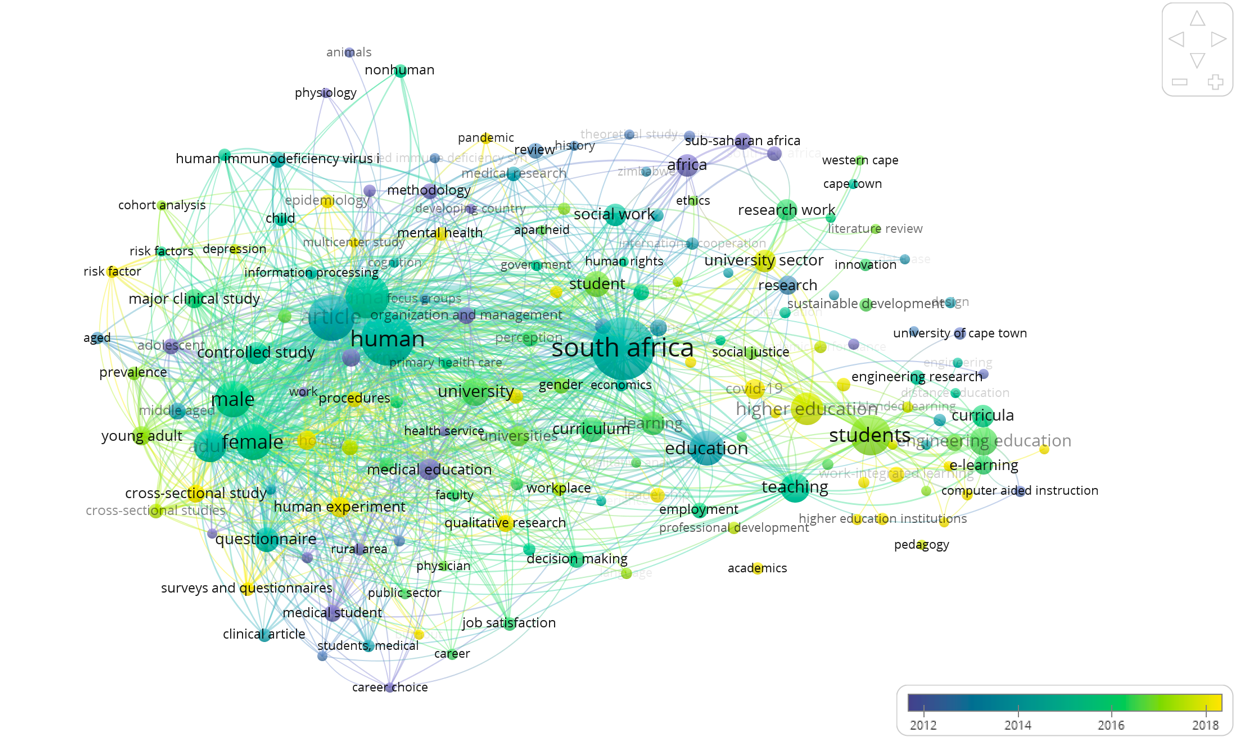
|  |  |  |  |
| --- | --- | --- | --- |
| **Authors** | **Title** | **Year** | **Source title** |
| Kuby C.R.; **Bozalek V**. | Pedagogy in the context of post foundational inquiry: Reading-writing-thinking-making together | 2023 | Post foundational Approaches to Qualitative Inquiry |
| Carolissen R.; **Bozalek V**. | Addressing dualisms in student perceptions of a historically white and black university in South Africa | 2017 | Race, Ethnicity and Education |
| **Bozalek V**.; Zembylas M. | Towards a response-able pedagogy across higher education institutions in post-apartheid South Africa: An ethico-political analysis | 2017 | Education as Change |
| Karyotaki E.; Cuijpers P.; Albor Y.; Alonso J.; Auerbach R.P.; Bantjes J.; Bruffaerts R.; Ebert D.D.; Hasking P.; Kiekens G.; Lee S.; McLafferty M.; Mak A.; Mortier P.; Sampson N.A.; **Stein D.J**.; Vilagut G.; Kessler R.C. | Sources of Stress and Their Associations With Mental Disorders Among College Students: Results of the World Health Organization World Mental Health Surveys International College Student Initiative | 2020 | Frontiers in Psychology |
| Cuzen N.L.; Fineberg N.A.; **Stein D.J**. | Unconscious habit systems in compulsive and impulsive disorders | 2014 | Behavioural and Brain Sciences |
| Matsunaga H.; Nagata T.; Hayashida K.; Ohya K.; Kiriike N.; **Stein D.J**. | A long-term trial of the effectiveness and safety of atypical antipsychotic agents in augmenting SSRI-refractory obsessive-compulsive disorder | 2009 | Journal of Clinical Psychiatry |

Source: Authors own work

Table 2 highlights two categories of specialisations for authors Dan Stein and Vivienne Bozalek. Author Dan Stein focuses on mental health aspects related to students, while Vivienne Bozalek directs their research towards education and students. Thus, both authors have placed attention on the university and work themes by aligning research variables to suit them.

**Analysis two: keyword trends and themes**

A large number of keywords are manifested between 2012 and 2016, the purple and the green colour circle nodes. The yellow colour nodes, representing 2018, indicate recent studies that require further investigation as the smaller node size designates lower levels of the keyword occurrence within the university-to-work theme. The colour bar illustrated in Figure 3 does not reflect the exact searched period, 1980 to 2024. Instead, the most relevant and stronger linked keywords are predominantly visualised between the years 2012 and 2018. This can mean two things: firstly, that the popular concepts relating to higher education and the workplace have decreased or that current investigations within the higher education field have followed alternative research themes.

****Figure 3 illustrates the presumed keywords in relation to university and work. These keywords are those illustrated within the larger circle nodes, such as South Africa, human, male, female, education, teaching, and students. Interestingly, keywords relating to curriculum, faculty, decision-making, and professional development can be identified within the smaller, more recent nodes, which could pose potential themes that require further exploration in relation to higher education.

Source: VOSViewer overlay visualisation

**Figure 3: Co-occurrence of all Keywords**

The co-occurrence of all keywords indicates that the notion of university and work is encompassed across publications in South Africa. This type of analysis visually indicates that employability and the higher education field are interlinked. Figure 3 indicates that academia is employing methodology pertaining to cross-sectional studies, experiments, and questionnaires. Quantitative logic is apparent in the university and work research theme. This is an interesting visualisation as we can see from Figure 3 that there have been minimal qualitative methodologies employed, such as focus groups and interviews in relation to university and work in South Africa. Furthermore, the type of document that authors are publishing relates to the article. This does not mean that the other document types are not being published in such a concept area. This finding indicates that academics should always refer to journal articles to keep up to date with trends in the field.

Figure 3 further illustrates that outliers within the bibliometric data set entailing academics and pedagogy. This finding indicates that there is a lack of network relations of these keywords in the broad university and work theme. The keyword, academics and pedagogy, has not received sufficient attention within the university and work focus as seen in the small yellow cluster within Figure 3. Table 3 indicates that the dominant keyword occurrence across all document titles, abstracts, and keywords in university and work-related publications in South Africa entails education. The education theme entails a link strength of 1202, with 168 keyword occurrences identified in the VOSViewer analysis.

Subsequently, education is a common keyword utilised in the university and work research theme, which further considers keywords such as university, student, curriculum, and learning. Moreso, there was a high usage rate of the keyword female with 186 occurrences and male with 181 occurrences across the 2584 document dataset. The results further indicate a focus on adults as primary participants in studies with a key focus on teaching and learning in higher education entailing universities and curriculum.

**Table 3: Co-occurrence of all keywords**

|  |  |  |
| --- | --- | --- |
| **Keywords** | **Occurrences** | **Link Strength** |
| South Africa | 548 | 3069 |
| Human | 382 | 3767 |
| Article | 291 | 2948 |
| Humans | 266 | 2897 |
| Students | 232 | 1025 |
| Female | 186 | 2333 |
| Male | 181 | 2226 |
| Education | 168 | 1202 |
| Adult | 154 | 2010 |
| Higher education | 152 | 447 |
| Teaching | 122 | 821 |
| Engineering education | 110 | 372 |
| University | 108 | 1012 |
| Student | 92 | 811 |
| Questionnaire | 85 | 1145 |
| Curriculum | 85 | 666 |
| Learning | 78 | 669 |
| Africa | 75 | 464 |

**Implications and contributions**

The results of this study provide implications for scholars and higher education institutions within a developing economy, such as South Africa based on the key gaps identified. A major finding of the study entailed the limited number of peer-reviewed publications relating to university and work in South Africa, as seen in Figure 1. Here, a total of 204 589 screened documents were attained on a global scale. After limiting the dataset to South Africa, the final number of documents eligible for final inclusion dramatically decreased to 2584. Indicating that there is a lack of reference to peer-reviewed publications pertaining to university and work within a South African context in comparison to the rest of the world.

Scholars can utilise this study’s findings when commencing with new research investigations relating to the higher educational field. This study indicates the future and past research trends, key authors, and the current outlook of the higher education system transition to work. Consequently, this indicates a methodological and theoretical contribution to the study. This broad bibliometric analysis has provided a visualisation of the current research patterns in relation to the publication keywords. The study contributes to the academic domain by distinguishing the overall outlook of university and work in South Africa, which has indicated that employment and curriculum obstacles are associated with higher education in South Africa. There should be a focus on enhancing employability to contest university-to-work impediments, channelling through career guidance (Tuononen & Hyytinen, 2022). The university-to-work bibliometric analysis has further provided a visual conceptualisation of research growth between 2012 and 2018, highlighting a need for new data to be generated to ensure curriculum relevance (Izzo et al., 2022).

Based on the findings, the following recommendations are made, which firstly include collaborating with leading authors in the field with a focus on themes pertaining to practical learning, employability, mental health, and decolonisation within education. Secondly, academics should use this bibliometric analysis as a foundation for literature reviews with similar themes to determine literature development. Thirdly, future research avenues should focus on qualitative methodologies as opposed to quantitative to gain the perceptions and the lived experiences of graduates in South Africa. Fourthly, based on the results, it is recommended that higher education institutions re-view the current curricula based on the identified emerging themes. This could be done by emphasizing research themes comprising work-integrated learning and career guidance practices (Tuononen & Hyytinen, 2022). Scholars should make further inquiries within the areas that are not receiving sufficient citations to identify further research gaps. Consequently, addressing current university-to-work impediments. This key finding is supported by key authors in the field, Vivienne Bozalek and Dan Stein.

**Conclusion**

Based on the literature published in the SCOPUS database, using the terms “university” AND “work” between 1980 and 2024 in South Africa, a comprehensive review was achieved through a co-authorship and author unit of analysis, as well as a keyword co-occurrence analysis. The results revealed that the authors with the most citations in this field are Dan Stein and Vivienne Bozalek, with the former author focussing on mental health aspects related to students and the latter author studying education and students. The dominant keyword was education, with mental health and pedagogy being an area gaining increasing attention.

There are a few aspects for improvement in this study. Only literature from the SCOPUS database was selected for this study, which could inevitably ignore relevant literature from other databases. Future studies could expand the data sources to other databases to obtain a more comprehensive analysis. Nevertheless, it should be noted that the authority and representativeness of the SCOPUS databases, to a certain extent, do ensure the results of this study are reliable.

Overall, the study conducted a comprehensive and systematic review of university-to-work research, which provided a valuable reference for future research, especially when understanding the impediments to the university-to-work transition has become so necessary.

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