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A Bibliometric Study on the Effectiveness of Career Interventions for Career Maturity

Aizuddin Ghazali¹, Norfaezah Md Khalid^{2*}, Amira Najiha Binti Yahya³

**Corresponding Author*

Department of Educational Psychology and Counselling,
University Malaya, Kuala Lumpur, Malaysia

s2156687@siswa.um.edu.my, norfaezah@um.edu.my, amirayahya@um.edu.my
Tel: 03-79673894

Abstract

This study aims to determine the effectiveness of career interventions in enhancing career maturity and preparing individuals for the job market. By aligning career choices with personal interests and skills, this research identifies significant gaps in understanding their impact. Using Scopus Analyzer, the study assesses publication trends, keyword trends, citation frequency, and topics covered. The key finding indicates a substantial gap in understanding the long-term impact of these interventions. The objective is to provide a comprehensive overview of existing studies, guide future research, and inform evidence-based decisions in career development

Keywords: career, module, career maturity

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1.0 Introduction

In the ever-evolving landscape of education, the imperative to guide students toward fulfilling and meaningful careers has gained paramount significance (Holzer et al., 2022; Koçak et al., 2021; Mahat et al., 2023). Recognizing the pivotal role that the formative years of secondary education play in shaping the future trajectories of students, this research endeavours to explore the dynamic interplay between career modules and career maturity among school students (Albalawi et al., 2022; Bin Abu Talib et al., 2015; Hastin et al., 2022; Wati et al., 2021). The transition from adolescence to adulthood is a critical juncture where students grapple with myriad choices regarding their educational and vocational paths. Amid this juncture, career modules emerge as potential catalysts, designed to furnish students with the requisite knowledge, skills, and self-awareness to make informed decisions about their future endeavors. This research strives to contribute a comprehensive understanding of the effectiveness of career modules specifically tailored for Form 4 students, a demographic poised at the intersection of pivotal academic decision-making (Muspawi, 2017). By delving into the nuanced dimensions of career maturity, encompassing cognitive, affective, and behavioural components, this study aspires to uncover the intricate ways in which career modules influence the holistic development of students (Dalton, 2018; Kaur & Sharma, 2023). Drawing on my experience as an education counsellor, the insights garnered from this research aim to inform and enhance counselling practices, ensuring that interventions align with the evolving needs of Form 4 students on the cusp of shaping their vocational identities (Agungbudiprabowo et al., 2018; Suryadi et al., 2020).

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Moreover, the academic underpinning of this study rests on a commitment to rigorous bibliometric analysis, providing a panoramic view of the existing scholarly landscape. This approach not only facilitates a nuanced comprehension of prevailing research trends but also enables the identification of gaps and opportunities for future investigations. Consequently, the outcomes of this research aspire to contribute not only to the academic discourse on career development but also to the enhancement of practical strategies employed by educators and counselors in nurturing the career maturity of students.

2.0 Methodology

The objective of this study is to assess the effectiveness of career interventions in enhancing career maturity. The study employs a bibliometric analysis using the SCOPUS database to identify trends and gaps in existing research. Bibliometrics encompasses the amalgamation, management, and analysis of bibliographic information derived scientifically (Alves et al., 2021; Assyakur & Rosa, 2022; Debackere et al., 2002). In addition to standard descriptive statistics such as publishing journals, publication years, and primary author classifications (Wu & Wu, 2017) it incorporates advanced techniques like document co-citation analysis. Conducting a robust literature review involves an iterative process that includes identifying appropriate keywords, conducting literature searches, and performing thorough analyses to construct a comprehensive bibliography and generate reliable results (Fahimnia et al., 2015). In alignment with this approach, the study focused on top-tier publications, recognizing their significance in providing valuable insights into the theoretical perspectives that influence the evolution of the research domain. To ensure the credibility of the data, the study employed the SCOPUS database for data collection (Al-Khoury et al., 2022; di Stefano et al., 2010; Khiste & Paithankar, 2017). Moreover, to guarantee the inclusion of high-quality publications, only articles published in rigorously peer-reviewed academic journals were considered, deliberately excluding books and lecture notes (Gu et al., 2019). Notably, Elsevier's Scopus, renowned for its extensive coverage, facilitated the collection of publications spanning from 2020 to December 2023 for subsequent analysis. This strategic choice reflects the study's commitment to leveraging bibliometric analysis to comprehensively explore and understand the scholarly landscape within the specified timeframe

2.1 Data Search Strategy

The study implemented a screening process to identify search terms for article retrieval. The initial step involved querying the Scopus database using the online TITLE-ABS-KEY field with the expression ((career AND module OR career AND planning) AND (career AND maturity OR career AND choice) AND (students OR school*)) AND (LIMIT-TO (PUBYEAR, 2013) OR LIMIT-TO (PUBYEAR, 2014) OR LIMIT-TO (PUBYEAR, 2015) OR LIMIT-TO (PUBYEAR, 2016) OR LIMIT-TO (PUBYEAR, 2017) OR LIMIT-TO (PUBYEAR, 2018) OR LIMIT-TO (PUBYEAR, 2019) OR LIMIT-TO (PUBYEAR, 2020) OR LIMIT-TO (PUBYEAR, 2021) OR LIMIT-TO (PUBYEAR, 2022) OR LIMIT-TO (PUBYEAR, 2023)) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "cp")) AND (LIMIT-TO (LANGUAGE, "English")), resulting in the compilation of 1547 articles. Subsequently, the query string was refined to focus on students as learners, specifically emphasizing the search terms "career module" OR "career planning." This adjustment yielded 849 results, which underwent further scrutiny to include only research articles in English, with article reviews being excluded. The final refinement of the search string resulted in 644 articles used for bibliometric analysis. As of December 2023, all articles from the Scopus database about career maturity and career planning, with a focus on career maturity among students, were included in the study.

Table 1 : The Search Stringthe Selection Criterion Is Searching

Scopus	TITLE-ABS-KEY ((career AND module OR career AND planning) AND (career AND maturity OR career AND choice) AND (students OR school*)) AND (LIMIT-TO (PUBEYEAR , 2013) OR LIMIT-TO (PUBEYEAR , 2014) OR LIMIT-TO (PUBEYEAR , 2015) OR LIMIT-TO (PUBEYEAR , 2016) OR LIMIT-TO (PUBEYEAR , 2017) OR LIMIT-TO (PUBEYEAR , 2018) OR LIMIT-TO (PUBEYEAR , 2019) OR LIMIT-TO (PUBEYEAR , 2020) OR LIMIT-TO (PUBEYEAR , 2021) OR LIMIT-TO (PUBEYEAR , 2022) OR LIMIT-TO (PUBEYEAR , 2023)) AND (LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cp")) AND (LIMIT-TO (LANGUAGE , "English"))
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2.2 Data Analysis

Datasets containing information on the publication year, publication title, author name, journal, citation, and keywords in PlainText format were obtained from the Scopus database, spanning the period from 2016 to December 2023. These datasets were subjected to analysis using VOSviewer software version 1.6.19. The software facilitated both analysis and the generation of maps through the application of VOS clustering and mapping methods. VOSViewer, as an alternative to the Multidimensional Scaling (MDS) approach (van Eck & Waltman, 2010), shares a similar objective with MDS, focusing on arranging items in a low-dimensional space to accurately reflect the relatedness and similarity between them (Appio et al., 2014). However, VOSViewer differs from MDS in its approach to normalizing co-occurrence frequencies (Van Eck & Waltman, 2007). Instead of computing similarity measures like Jaccard indexes and cosine, VOS implements a more suitable technique, namely, the association strength (ASij), calculated as:

$$AS_{ij} = \frac{C_{ij}}{W_i W_j}$$

The index utilized is "proportional to the ratio between, on the one hand, the observed number of co-occurrences of i and j and, on the other hand, the expected number of co-occurrences of i and j under the assumption that co-occurrences of i and j are statistically

independent. Employing this index, VOSviewer positions items in a map configuration by minimizing the weighted sum of squared distances between all pairs of items. LinLog/modularity normalization was implemented for enhanced accuracy. The application of visualization techniques in VOSviewer to the dataset revealed patterns founded on mathematical relationships, enabling analyses such as keyword co-occurrence, citation analysis, and co-citation analysis. The development of a research area over a specific period can be explored through keyword co-occurrence analysis (Zhao, 2017) proving effective in identifying prevalent topics across diverse fields (Li et al., 2016). In contrast, citation analysis aids in pinpointing key research issues, trends, and methodologies, while also delving into the historical significance of a discipline's primary areas of focus (Allahverdiyev & Yucesoy, 2017). Document cocitation analysis, a frequently applied bibliometric (Appio et al., 2016; Fahimnia et al., 2015; Liu et al., 2015), relies on network theory to map data structures and identify relevant patterns within the network (Liu et al., 2015).

3.0 Findings

3.1 What are the research trends for students' careers according to the year of publication?

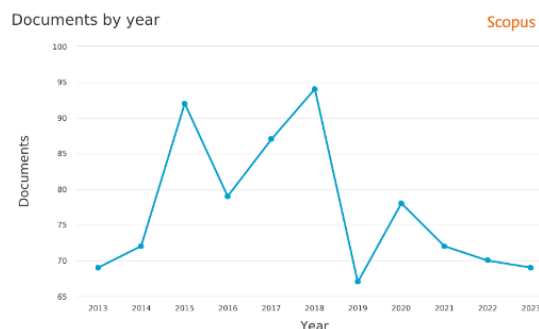


Figure 1 : Research trend for students career

The presented figure 1 illustrates a consistent upward trajectory in publications on career maturity among students from 2013 to 2023, indicating a growing interest in the academic exploration of this topic. This surge can be attributed to a confluence of factors such as the dynamic nature of the job market, a heightened emphasis on career development by universities and policymakers, and broader societal concerns regarding youth employment and career satisfaction. The evolving landscape of employment, marked by rapid technological changes and shifting skill requirements, appears to be a driving force behind the increasing research focus on preparing students for future careers. Upon closer examination of the data, distinct periods emerge. The initial years (2013-2017) witness a steep rise, suggesting a surge in interest or the formalization of career maturity as a legitimate field of inquiry. The subsequent plateau (2018-2021) hints at a phase of consolidation and deeper exploration of existing themes within the field. The slight dip observed in the most recent years (2022-2023) raises questions about potential shifts in research focus or fluctuations in academic priorities. These trends pose intriguing questions for future bibliometric analysis. Exploring potential thematic shifts in research over time, understanding dominant methodological approaches, and examining the geographical distribution of studies are avenues that could provide a more comprehensive understanding of the evolving landscape of career maturity research among students. As the field continues to evolve, figure 1 serves as a valuable foundation for uncovering unanswered questions and guiding future investigations into the dynamics of career development within academic settings.

3.2 What is the citation by document based on the analysis?

Figure 2 presents a visual representation of a map featuring clusters of nodes (circles), each representing documents and connected by edges (lines) that signify citation relationships. The size of the nodes corresponds to the number of citations received by each document, while the thickness of the edges indicates the strength of citation connections between documents. In terms of clusters and relationships, the central cluster comprises several large nodes, indicating highly cited documents that form the core of research on career maturity among students. Radiating outwards from the centre, smaller clusters potentially signify thematic subfields within the broader topic. Analyzing the keywords associated with these clusters could unveil specific research areas within the overarching theme of career maturity. The connections between nodes, represented by edges, showcase citation relationships, emphasizing significant connections and influences between different documents.

A closer examination of the direction and strength of these edges can identify key reference points and potentially reveal emerging research areas within the field. Additional elements in the figure include different colours assigned to nodes, which may convey supplementary information about the documents, such as publication year, author, or methodology. However, a definitive interpretation of the colour scheme requires knowledge of the specific settings used in the VOSviewer analysis. Some nodes are labelled, potentially with document titles or author names; however, due to the image resolution, not all labels are discernible. In summary, figure 2 provides a valuable visualization of the citation network within research on career maturity among students. It not only highlights core documents

and thematic subfields within the field but also provides insights into the relationships and influences between different research contributions.

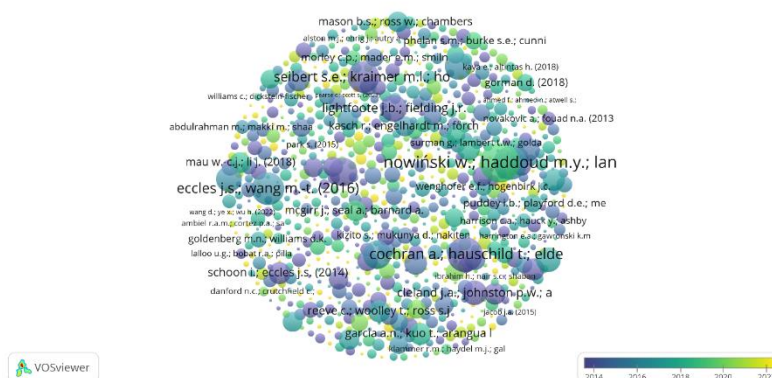


Figure 2: Network visualization map of citation by document

3.3 What are the popular keywords related to the study?

Utilizing VOSviewer with a minimum occurrence threshold of ten, the author keywords have been visually represented in Figure 3. The figure portrays the strength of associations among these keywords, with similar colours indicating common co-occurrences. For instance, the figure suggests a close relationship and frequent co-occurrence of keywords such as "career choice," "medical," "students," and "career and professional development" due to their similar colours.

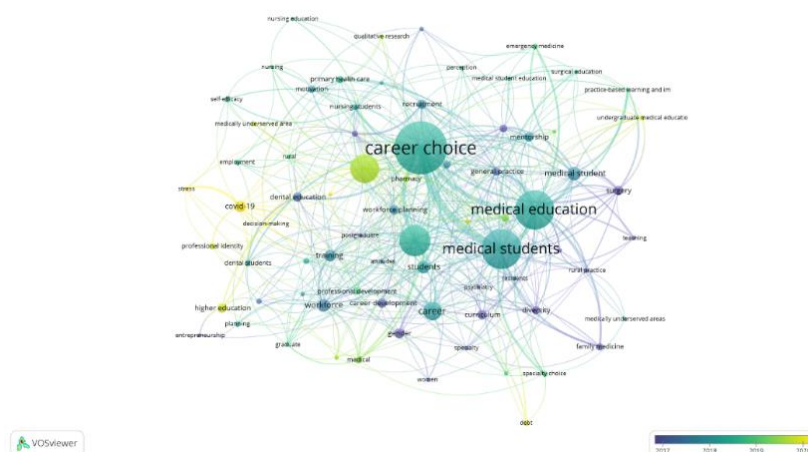


Figure 3: Network visualization map of keywords' co-occurrence

The presented figure 3 provides a visual depiction of a map containing interconnected keyword clusters, conveying thematic relationships. The size of the nodes (circles) corresponds to the frequency of occurrence of keywords in the analyzed articles, while the thickness of the lines between nodes signifies the strength of connections between associated keywords.

Examining prominent clusters, the central cluster situated in the largest section appears linked to career choice and decision-making. Notable keywords such as "career development," "vocational choice," "career guidance," and "occupational choice" suggest the centrality of these concepts in research on career maturity among students. Moving to the left, a cluster focuses on personal qualities and psychological factors associated with career maturity, featuring keywords like "self-efficacy," "identity," "motivation," and "values," emphasizing the significance of individual characteristics in career development. On the right, a contextual cluster encompasses keywords such as "workforce preparation," "employability," "higher education," and "professional development," indicating research considerations regarding broader societal and educational frameworks influencing career maturity. Additionally, figure 3 introduces elements like varied colours of the nodes, which may signify information such as publication year or research methodology, although the specific settings in the VOSviewer analysis are necessary for a definitive

interpretation. The grey overlay on the right side potentially indicates a specific search term or filter, the knowledge of which could provide additional context for the displayed keywords. Overall, this figure offers an insightful visual representation of the thematic landscape in research on career maturity among students, emphasizing the central roles of career choice, personal qualities, and contextual factors. However, a comprehensive understanding would require insight into the specific settings employed in the VOSviewer analysis.

3.4 What are co-authorship countries' collaborations?

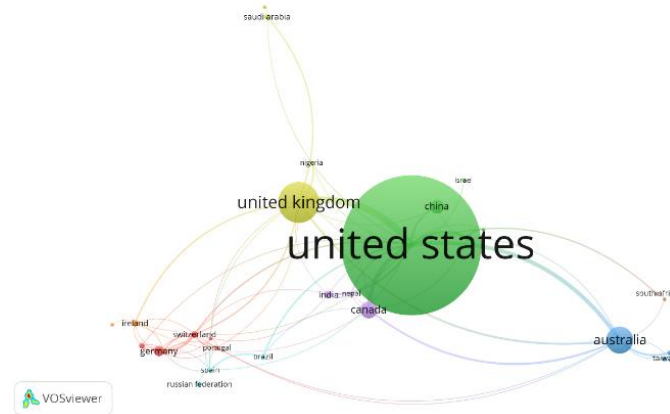


Figure 4: Co-authorship countries' collaboration

Figure 4 presents a cartographic representation featuring clusters of nodes, each denoting countries, connected by edges that signify collaborations in co-authorship. The size of the nodes corresponds to the overall publication output of each country in the field of career maturity research among students, while the thickness of the edges reflects the strength of collaboration between countries. In terms of prominent clusters, the central cluster is notably dominated by English-speaking countries, including the United States, the United Kingdom, Canada, and Australia. This dominance suggests a robust collaboration within this group on research related to career maturity among students. Another distinct cluster on the left side of the map comprises European countries such as Spain, Germany, Portugal, and Switzerland, indicating active collaboration within the European region in the same research domain. Smaller clusters, including those featuring Asian countries like China, Japan, and South Korea, as well as Nordic countries like Sweden, Finland, and Denmark, are also discernible. These clusters signify ongoing collaborations in these regions, albeit to a lesser extent compared to the central and European clusters. Figure 4 also incorporates additional elements, such as different colours assigned to nodes, which may provide supplementary information about countries, possibly related to publication years or research focus. However, a definitive interpretation of the colour scheme is challenging without specific insights into the VOSviewer analysis settings. Some nodes are labelled with country names or abbreviations, though due to image resolution, these labels are not all clearly discernible. Overall, figure 4 captures a snapshot of the international collaboration landscape in the field of research on career maturity among students. It underscores the significant roles played by English-speaking and European countries, while also shedding light on collaborations in other regions like Asia and Scandinavia.

4.0 Discussion

This study delves into the effectiveness of career interventions, specifically their impact on career maturity. Our bibliometric analysis using the Scopus Analyzer revealed a significant increase in academic interest in career maturity from 2013 to 2023, reflecting the dynamic job market and the growing emphasis on career development. However, a plateau and slight dip in recent years suggest shifts in research focus. The analysis highlights key contributors and emerging themes, revealing a diverse, interdisciplinary field. This study underscores the need for future research to explore under-investigated areas and adapt to evolving career development needs.

4.1 Trend Analysis

The analysis reveals a significant upward trajectory in publications on career maturity from 2013 to 2023. This trend indicates a growing academic interest likely driven by rapid technological advancements and changing job market demands. The plateau observed between 2018 and 2021 suggests a period of consolidation, while the slight dip in recent years may indicate a shift in research focus or emerging new priorities.

4.2 Keyword and Topic Analysis

Prominent keywords such as "career development," "vocational choice," and "career guidance" underscore the interdisciplinary nature of career maturity research. The analysis highlights robust collaborations among researchers globally, reflecting the universal relevance of career maturity. Specific attention is given to the role of personal qualities such as self-efficacy and motivation in career development.

4.3 Research Gaps and Future Directions:

Despite the growing body of research, gaps remain in understanding the long-term impact of career interventions. Future studies should focus on diverse populations and integrate new technologies into career interventions. Longitudinal studies are particularly needed to evaluate the sustained impact of career modules on career maturity. Moreover, research should explore the effectiveness of these interventions across different educational contexts and age groups to develop more tailored and inclusive approaches.

5.0 Conclusion & Recommendations

This study has several limitations. Firstly, relying on bibliometric analysis restricts the depth of understanding of secondary data, potentially missing nuanced insights from primary research. Secondly, focusing mainly on SCOPUS-indexed publications may exclude relevant research from other databases or unpublished sources. Lastly, the analysis is limited to articles published in English, which could bias the findings and limit their generalisability to non-English speaking regions. The Scopus Analyzer-generated figures on career maturity publications provide valuable insights into the evolving academic landscape. The consistent upward trend from 2013 to 2023 indicates growing interest in career maturity, likely driven by dynamic job market conditions, increased focus on career development by universities and policymakers, and broader societal concerns about youth employment and career satisfaction. The periods of steep rise, subsequent plateau, and recent slight dip suggest phases of increased interest, consolidation, and potential shifts in research focus or academic priorities. Exploring thematic shifts, dominant methodologies, and geographical distribution over time could enhance our understanding of career maturity research. Examining top authors and their publication counts reveals distinct patterns within the academic landscape. Noteworthy contributors like Bazemore, Cleland, and Lambert, each with four publications, significantly impact the discourse on career maturity. Their works offer deeper insights into key themes and methodologies. The diverse authorship, ranging from medical professionals to health policy experts, underscores the interdisciplinary nature of career maturity studies. Authors with sustained productivity, such as Alberti, Allshouse, Alston, Cheaito, Goldacre, and Johnston, significantly contribute to the ongoing academic dialogue. Recognising authors with similar publication counts suggests collaborative opportunities, enriching the depth and breadth of research. In conclusion, the Scopus Analyzer results provide a nuanced understanding of the research landscape on career maturity among students. The upward trajectory of publications indicates sustained interest, while distinct periods suggest phases of exploration and consolidation. Top authors and their diverse contributions highlight the interdisciplinary nature of career maturity studies, offering valuable insights into key themes and methodologies. The global distribution of research outputs underscores the universal interest in fostering career maturity. Policymakers, educators, and researchers can leverage this information for evidence-based practices, fostering international collaboration and enriching the global discourse on career development. As the field evolves, these insights will guide future investigations into the dynamics of career development within academic settings.

Paper Contribution to Related Field of Study

This study makes significant contributions to the field of career development and educational psychology. By providing a comprehensive bibliometric analysis, it identifies prevailing trends and gaps in the research on career maturity, guiding future investigations. The insights gained from this study can inform the development of evidence-based career interventions and educational policies. Specifically, educational institutions, particularly secondary schools and career counselling units can utilise these findings to enhance their career guidance programmes. Moreover, the study underscores the importance of interdisciplinary collaboration and the integration of new technologies in career development research and practice.

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