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# Science Mapping Research on Career Guidance for Grade IX Junior High School Students: A Bibliometric Analysis from Scopus Database (2019–2025)

**Laila Purwaningsih[1], Abna Hidayati[2], Jasrial[3], Rahmi Pratiwi[4], Anggi Prasetia[5]**
Department of Educational Technology, Universitas Negeri Padang, Padang, Indonesia[1-5]
E-mail Corresponding: lailapurwaningsih7@gmail.com

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**Abstract**
Global social changes, post-pandemic digitalization in education, and increasing demands for career readiness have accelerated the development of career guidance (CG) research. This study examines the epistemological structure, developmental trends, and scientific dynamics of CG research using a bibliometric approach based on science mapping techniques. Scopus-indexed publications from 2019–2025 were analyzed quantitatively using VOSviewer. The findings indicate that CG publications follow an S-shaped logistic growth pattern, reflecting an early acceleration phase. Publication output increased significantly from 2022 to 2025, driven by rising interest in technology-based career services. Citation analysis shows that scientific impact peaked in 2022, while subsequent declines were likely caused by citation lag rather than reduced research quality. The analysis projects a saturation point of approximately 4,020 documents, with peak productivity estimated at 180 publications annually by 2035. The dataset included 34,476 references, demonstrating the field's strong theoretical and multidisciplinary foundations. Thematic mapping identified three dominant themes: psychological dimensions of counseling, learner-centered education, and technology integration in career services. Overall, this study provides strategic insights into the future development of career guidance research and adaptive career services in 21st-century education.

**Keywords:** Bibliometric Analysis; Career Adaptability; Career Guidance; Scopus Database

## INTRODUCTION

Changes in the educational landscape over the past decade indicate that career guidance services can no longer be positioned as an add-on, but rather as a fundamental component of the educational framework. At the junior high school level, particularly in ninth grade, students are in a crucial transition phase, encountering various continuing education options that will significantly shape their future career paths. This process constitutes a crucial segment of adolescent career development, during which educational decision-making emerges as a determinant that can influence an individual's academic and professional path in subsequent years (Mayada Pratiwi & Sawitri, 2025). Furthermore, during early adolescence, learners begin to navigate the complexities of ambivalence in career decision-making, suggesting that this period is a critical juncture in the development of career preferences and the formation of self-identity (He et al., 2025). Consequently, this developmental stage underscores the need for appropriate career information, sufficient resources, and systematic guidance, which are increasingly crucial for student growth (Sevciuc et al., 2024; Magallón-Olivardía, 2025).

Conversely, empirical evidence suggests that career guidance services offered in educational institutions remain inadequate to meet students' diverse needs. Numerous studies have shown that career guidance services continue to be influenced by traditional methodologies

that emphasize the provision of basic information, thereby making them less effective at fostering students' competencies in career decision-making (Ritonga & Wangid, 2022; Kusumanegara et al., 2024). Furthermore, in the digital era, technology has not been systematically incorporated into career guidance services, even though digital transformation is crucial to address the increasing complexity of students' career requirements (Priyono et al., 2025). This disparity becomes even more pronounced when students are tasked with making complex career choices. At the same time, available services have not been sufficiently adapted to align with the evolving dynamics of the labor market and the unique needs of individual students (T. H.-H. Pham et al., 2024; Yılmaztürk & Yılmaz, 2025).

The situation has undergone a profound transformation since the onset of the COVID-19 pandemic in late 2019. According to Prasetia (2023) research, the educational landscape in the COVID-19 era was disrupted, and the education system had to adapt quickly through digitalization. Guidance and counseling services, including career counseling, have also shifted from traditional face-to-face interactions to online platforms (Gomez, 2025; Masi et al., 2025; Rahmah Tursina et al., 2025). In a short time, several innovative methodologies have emerged, ranging from web-based applications and virtual consultation services to the use of digital media to disseminate career-related information. Furthermore, the integration of technologies such as digital systems and interactive media enables the provision of career services in a more flexible, personalized, and accessible manner than traditional methodologies (Astuti et al., 2022; José-García et al., 2023)

These modifications have had an indirect impact on the trajectory of research in the career guidance domain. While previous research primarily emphasized traditional methodologies, the pandemic has brought increased scrutiny to the integration of digital technologies in career services, including digital career counseling and virtual advisory sessions. Empirical findings indicate that the COVID-19 pandemic catalyzed a marked transition toward online career guidance services, in which online counseling interventions have been shown to improve students' career adaptability, resilience, and prospective career prospects (Santilli et al., 2022). Furthermore, the ongoing digital evolution in career guidance services is further enhanced by the emergence of platform-based digital systems and technologies, which not only expand access but also enhance the efficacy of services in facilitating career decision-making (Putri Angelina Ginting et al., 2024). Consequently, the COVID-19 pandemic has transcended its role as a mere crisis event, evolving into a pivotal moment that accelerated digital transformation and simultaneously revealed new avenues for research in technology-driven career guidance (Šapale et al., 2021; Borbély-Pecze et al., 2023).

However, the increasing number of publications in a particular domain does not always correspond to a comprehensive understanding of the trajectory of progress in that scientific inquiry. Extant literature is often scattered across multiple sources and has not been systematically categorized, complicating researchers' ability to discern prevailing themes, collaboration patterns, and persistent research gaps. In this regard, bibliometric methodology is significant because it can provide a quantitative examination of the architecture and dynamics of a scientific discipline, encompassing publication trends, inter-author relationships, and the evolution of research topics, both visually and systematically (Moral-Muñoz et al., 2020; Donthu et al., 2021). Consequently, bibliometric analysis can facilitate the generation of a more holistic knowledge map while guiding future research efforts(Kumar, 2025; Vaishya et al., 2025).

Furthermore, empirical research specifically focusing on career guidance at the secondary education level, particularly on ninth-grade students navigating the critical phase of educational decision-making, remains relatively rare. The majority of extant bibliometric studies are general in nature and do not sufficiently explore specific educational-level contexts or learner developmental attributes. Furthermore, bibliometric analyses have not explicitly correlated the dynamics of research trends with the impact of the past COVID-19 pandemic. Indeed, the period from 2019 to 2025 was highly dynamic, marked by rapid acceleration of digital transformation and significant changes in the implementation of technology-mediated career guidance services

across diverse educational settings (OECD, 2021; Herath et al., 2024). This scenario underscores the need for more focused, context-specific analyses to achieve a comprehensive understanding of the development trajectory of career guidance research.

Given these circumstances, there is an urgent need for a systematic scientific mapping of career guidance research in the post-pandemic era, particularly in secondary education. This mapping is crucial not only for distinguishing trends in publications and research themes but also for understanding the dynamics of scientific progress influenced by global transformations such as the COVID-19 pandemic. Studies based on bibliometric analysis have shown that examining publication data in the Scopus database can shed light on patterns of research expansion, collaborative networks, and the development of research topics in a methodical manner, encompassing shifts in research emphasis during the post-pandemic phase characterized by heightened concerns about career adaptability and digital transformation (Parrey & Kour, 2024). Consequently, the application of scientific mapping emerges as an important tool in providing a holistic picture of the research development trajectory while simultaneously identifying remaining research opportunities in the career guidance discipline.

Consequently, this study examined the development of career guidance research using a bibliometric approach, drawing on Scopus-indexed publications from 2019 to 2025. This method enables the systematic identification of publication trends, scholarly structures, and collaboration networks by quantitatively analyzing publication metadata. Previous studies have shown that Scopus-based bibliometric analysis is effective in explaining research trajectories, dominant themes, and the overall direction of disciplinary development (Zupic & Čater, 2015; Berger, 2023; Arruda et al., 2022). Through this analysis, the study aims to provide a more comprehensive understanding of the dynamics of career guidance research and to identify potential directions for future studies, particularly in developing adaptive and relevant career guidance services for ninth-grade secondary school students.

## METHODS

Scopus was selected as the primary data source because of its extensive coverage and strong citation indexing in the social sciences field (Hallinger & Chatpinyakoop, 2019; M. T. Do et al., 2025). The bibliometric data were collected from Scopus-indexed publications published between 2019 and 2025. The search strategy used the primary keyword “career guidance” alongside related terms, including “career counseling,” “career development,” “career education,” “vocational guidance,” and “career exploration,” to ensure comprehensive coverage of the literature. These keywords were searched within article titles, abstracts, and author keywords to capture variations in terminology commonly used in global career guidance research (Johnson & Walsh, 2021; Hooley et al., 2024). The inclusion criteria consisted of English-language journal articles indexed in Scopus and directly related to career guidance in educational contexts. Duplicate records, non-relevant publications, conference proceedings, and incomplete metadata were excluded from the dataset. After filtering, the bibliographic data were exported to CSV and analyzed using VOSviewer.

The analysis procedures included data cleaning, keyword extraction, co-occurrence analysis, citation analysis, and network visualization. Author keywords and index keywords were standardized to reduce inconsistencies in terminology. In the VOSviewer analysis, minimum occurrence thresholds were applied to identify the most relevant terms and research clusters. The generated visualizations were used to examine publication trends, collaboration networks, thematic structures, and emerging topics in career guidance research. The overall procedure of data retrieval, filtering, and bibliometric analysis is illustrated in Figure 1.

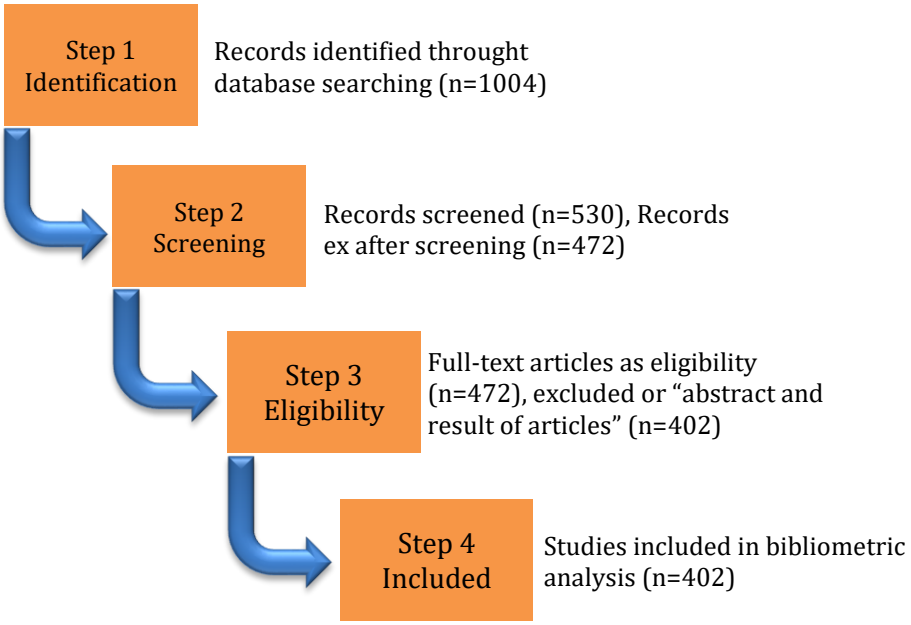


**Figure 1.** PRISMA diagram of the cleaning process of the scientific studies list for Bibliometric analysis

Step 1-Identification: Our initial search query turned up 1004 studies with the search command. TITLE-ABS-KEY ("career guidance" OR "career counseling" OR "career education" OR "career development") AND ("junior high school" OR "middle school" OR "secondary school" OR "K-12"). Step 2-Screening: To ensure that the selected articles met the research objectives, we conducted a screening process. In the first screening stage, we excluded articles without abstracts or those that only listed the author's name but no title. A total of 530 publications were eliminated, and 472 publications were retained for further screening. Step 3-Eligibility: At this point, the research team was tasked with scrutinizing the titles and abstracts of each scientific article to ensure their relevance to career guidance (CG) in school education. This evaluation was conducted methodically to ensure alignment between the research emphasis and the predetermined inclusion criteria. An initial screening methodology involving titles and abstracts is a critical phase in bibliometric investigations and systematic reviews, facilitating the efficient identification of research relevance (Page et al., 2021; Alhuay-Quispe et al., 2022). For articles whose relevance remained undetermined at this initial stage, the researchers engaged in collaborative discourse by examining the abstracts with greater scrutiny and, if deemed necessary, reading the entire article to reach a more precise final determination. This protocol is consistent with practices observed in systematic reviews and bibliometric research, which underscore the importance of a step-by-step evaluative process to enhance the validity and reliability of data selection mechanisms (Kitchenham et al., 2009; Aksnes et al., 2019). Step 4-Included: Ultimately, the aggregate data set eligible for inclusion in the analysis consisted of a total of 402 scholarly works, including articles, monographs, conference proceedings, and book chapters for review.

Bibliometric analysis, a concept originally introduced by Pritchard (1969), is one of the most widely used methodologies for statistical scrutiny, analytical evaluation, and comprehensive assessment of scientific literature aligned with a common thematic focus or defined by specific characteristics (Passas, 2024). This methodological framework allows researchers to describe longitudinal research trajectories and to predict and advocate for viable and promising future research avenues (de Oliveira et al., 2019). In this study, we employed bibliometric analysis to examine the dataset, highlighting the investigation of co-authorship dynamics, the frequency of shared keywords, inter-citation patterns among authors, and the sources used. Analyzing co-authorship relationships among researchers can illuminate scholars' collaborative efforts and provide a comprehensive picture of the collaborative landscape across countries within a specific research domain (Demir et al., 2025; Lazarides et al., 2023).

Co-citation, a phenomenon that occurs when two different documents receive references from the same third document, offers valuable insights into the intellectual relationships and connections between published works (Robledo-Giraldo et al., 2023). Specifically, when two authors are consistently cited by different authors, this is called co-citation and indicates a tendency for intellectual similarity (Hsiao & Chen, 2022). Through the utilization of keyword co-occurrence analysis, it has been shown that common keywords indicate documents discussing analogous subject matter (Liao et al., 2014; Zhou et al., 2022). By examining trends in keyword occurrence in the scientific literature over time, scholars can identify interconnected topics, reveal the underlying structure of these subjects, and determine emerging research trajectories within the discipline (You et al., 2021; Suryani et al., 2026).

Through descriptive statistical analysis, in conjunction with the utilization of VOSViewer software, this methodological approach can explain publication productivity, publication impact, and interdisciplinary collaboration between scholars, groups of scholars, academic institutions, and countries. This methodological framework is widely used in various research domains. In the education sector, many scholars have utilized this approach to facilitate their investigative efforts J. Ang and J. Ren (2020), Vuong et al., (2020), and Rodliyah et al. (2025) especially in the realm of public school research Kovačević and Hallinger (2019) and Brika et al. (2021) in the context of higher education research Hallinger and Chatpinyakoop (2019), and Ghani et al. (2022), and Ani et al. (2022) lifelong learning initiatives and Do et al. (2021) in the scientific community (Lorimer, 2011; T. H.-H. Pham et al., 2024). In the domain of Science, Technology, Engineering, and Mathematics (STEM) Education by Jamali et al. (2022) and Tas and Bolat (2022), and in the field of International Vocational Education by Yu and Zhou (2016).

## RESULT AND DISCUSSION

### *Result*

This section presents the findings of a bibliometric analysis of career guidance publications indexed in the Scopus database from 2019 to 2025. The analysis aims to explain publication trends, thematic structures, and the development of research in career guidance, particularly within educational contexts. Using a bibliometric and science-mapping approach, the study quantitatively examines the scientific literature through keyword analysis, citation metrics, and collaboration networks. Keyword co-occurrence analysis was visualized using VOSviewer to identify research clusters, dominant themes, and relationships among research topics (Arruda et al., 2022). The findings provide an overview of the development of career guidance research and highlight major thematic areas and emerging trends within the field. This section also discusses the theoretical and practical implications of the identified research patterns (Prasetia, 2023), with a high emphasis on career guidance services (Guan, 2020). Consequently, this section not only articulates descriptive findings but also examines the theoretical and practical consequences of the identified research advances (Sevgi et al., 2025). The discussion is organized into several subsections, including publication trends, keyword analysis, research cluster mapping, and identification of research gaps and future research directions.

### *Dynamics of Scientific Growth*

The increasing volume of career guidance (CG) publications during the 2019–2025 period indicates that the field is undergoing a significant phase of academic expansion and conceptual development. Although publication output fluctuated between 2019 and 2023, the overall upward trend suggests that career guidance is evolving into a more established and multidisciplinary area of research. These fluctuations may reflect shifting educational priorities, differences in research focus, and the gradual consolidation of the field within broader educational and counseling studies (Kumar Banik, 2026). The substantial increase in publications in 2025 demonstrates that career guidance is gaining stronger recognition as an important response to contemporary educational and workforce challenges (Zhao et al., 2022; Tokzhigitova et al., 2025).

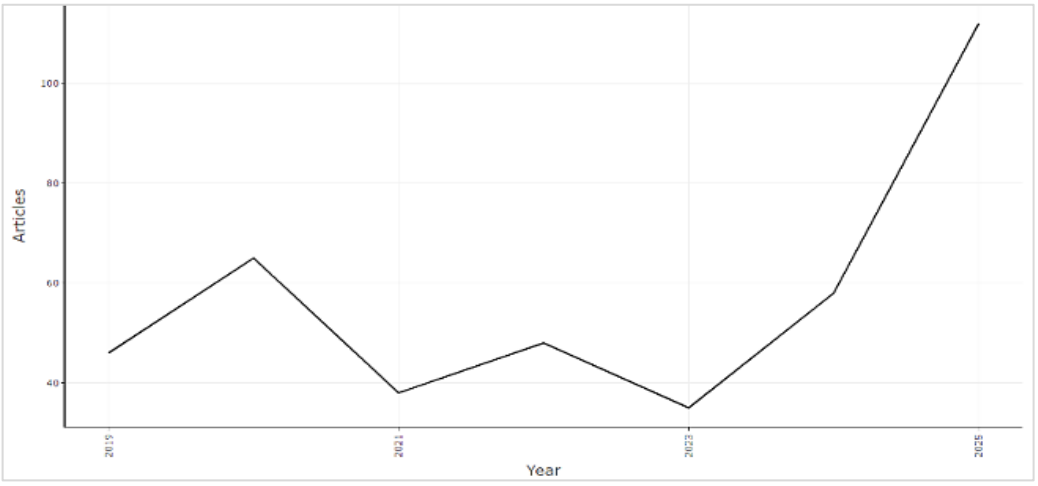


**Figure 1.** Annual Career Guidance Publication Trends (2019–2025)

The findings also indicate that career guidance research is no longer limited to conventional topics such as career choice and vocational decision-making. Instead, recent studies increasingly emphasize career adaptability, employability, student resilience, and the integration of technology into counseling practices. This shift suggests a transformation in the field's theoretical orientation, in which career guidance is viewed not only as a support service but also as a strategic educational intervention to prepare students to navigate uncertain career pathways and rapidly changing labor-market demands. In this respect, the results extend previous studies by demonstrating how career guidance research has become more interdisciplinary and responsive to social and educational change (Oraiopoulou et al., 2024). This lays a strong foundation for advancing cutting-edge research, particularly in secondary education, the primary focus of this study.

Another important implication of these findings is the growing attention to secondary education contexts, particularly students at transitional stages of academic decision-making. The growing focus on adaptability and career readiness underscores the need for career guidance models that are flexible, student-centered, and aligned with adolescents' developmental needs. This finding confirms earlier studies emphasizing the importance of early career intervention and suggests that future research should pay greater attention to technology-supported, context-sensitive guidance services. Nevertheless, this study has several limitations. The analysis was restricted to Scopus-indexed publications and English-language documents, potentially excluding relevant studies published in other databases or languages. In addition, bibliometric analysis primarily identifies publication patterns and thematic relationships rather than evaluating the substantive quality of each study. Therefore, future research could integrate systematic review or meta-analysis approaches to provide a deeper interpretation of theoretical and practical developments in career guidance research.

### *Exploration of Citation Patterns and Their Relevance to Scientific Impact*

In addition to monitoring the increase in the volume of scientific publications, the assessment of scientific quality and impact in the field of career guidance (CG) research is also conducted through citation analysis. Citations serve as a critical metric in bibliometric investigations, as they signal the degree of recognition, relevance, and contribution of a scientific work to the advancement of scientific knowledge. Within this framework, average annual citations were used to examine trends in the scientific influence of CG publications over the period 2019-2025. The analysis findings revealed that average annual citations exhibited a variable trajectory, characterized by an upward trend until reaching a peak around 2022, followed by a gradual decline towards 2025. This observed trend suggests distinct time frames during which CG publications attract increasing interest from the scientific community, likely catalyzed by the importance of the research themes to contemporary global challenges.

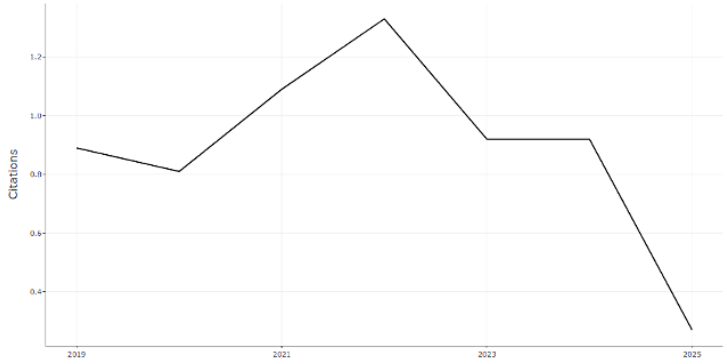


**Figure 2.** Average Annual Citations of Career Guidance (2019–2025)

As illustrated in Figure 2, the observed surge in citations in 2022 can be interpreted as an indication of increased demand for career guidance research during the transitional phase of the global education landscape. This phase aligns with the post-COVID-19 recovery period, characterized by accelerated digital transformation in the education sector and an increased focus on students' career preparedness amid prevailing labor-market uncertainty. Consequently, papers published in the preceding years (2019–2021) began to garner increased citations due to their relevance to the prevailing global context. However, the observed decline in average citations during the 2023–2025 period should not be hastily interpreted as a decline in scientific quality or scholarly contribution. This phenomenon may be better explained by the citation lag framework, which shows the temporal delay between an article's dissemination and the citations it receives. Newly published papers typically require time to be comprehensively read, recognized, and cited by peers. They thus will inherently exhibit lower citation counts during the initial phase of their release. Beyond temporal variables, citation dynamics are also influenced by shifting research priorities within the career guidance (CG) domain. As emerging themes such as digital-centric career guidance, career adaptability, and technology integration into counseling services evolve, academic oversight is becoming increasingly fragmented across a myriad of subfields (Manta, 2026).

This phenomenon may culminate in a more equitable allocation of citations, thereby avoiding a concentration on a limited set of publications with increasing citation counts. Furthermore, these variable citation trends demonstrate an inherent attribute of the computational graphics domain as a nascent and developing discipline. In areas that have not yet reached full maturity, citation trends are often volatile due to ongoing investigations into concepts, methodologies, and theoretical frameworks. To contrasts with established disciplines, where citation trends typically exhibit greater stability and organization. Collectively, the examination presented in Figure 2 illustrates that the scientific impact of computational graphics research remains at a relevant level, despite temporary fluctuations (Zhao et al., 2022). The observed citation decline in recent years more accurately reflects the natural dynamics of the scientific publication cycle than a signal of declining quality (Yu & Zhou, 2016). Consequently, interpreting citation data requires a contextual approach that considers temporal factors, shifting research themes, and global conditions shaping the trajectory of scientific progress (Ghani et al., 2022).

### *Cumulative Growth Trend Analysis in Scientific Literature*

To achieve a deeper understanding of the long-term trajectory of progress in the career guidance (CG) research domain, the examination concentrates not only on the annual publication frequency but also on the aggregate accumulation of scientific papers. This methodological approach is crucial because it facilitates a more consistent and systematic depiction of the development of the research discipline, while simultaneously allowing for the distinction of different phases in the evolution of scientific inquiry across temporal intervals. In bibliometric investigations, cumulative growth patterns are typically examined using the logistic growth model, which describes the evolution of a scientific discipline in an S-shaped (sigmoid) curve.

This theoretical framework posits that the progress of scientific knowledge does not unfold along a linear trajectory; rather, it traverses various stages: an initial phase, an accelerated growth phase, a deceleration phase, and a saturation phase (Fortunato et al., 2018).

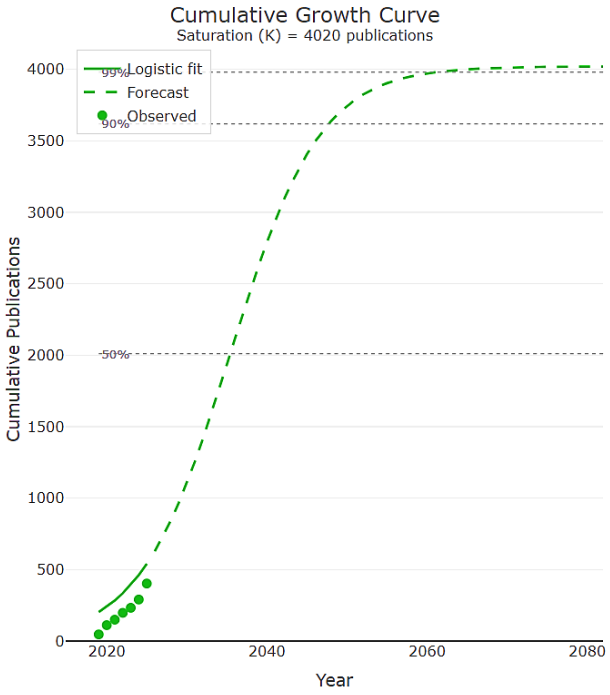


**Figure 3**. Cumulative Growth Curve of Career Guidance Publications

As illustrated in Figure 3, the cumulative growth trajectory of CG publications follows a distinct S-shaped curve, indicating that this domain is progressing in line with the overall dynamics of scientific inquiry. During the initial phase (2019–2021), the curve exhibits a relatively pronounced slope, indicating an exploratory phase characterized by a limited number of publications and a less focused research focus. Moving into the subsequent interval (2022–2025), a marked increase in the curve's steepness becomes apparent, marking the beginning of an acceleration in scientific output. This surge suggests that the CG discipline is beginning to attract broader interest from the scientific community, coinciding with the growing demand for research on career guidance amid pervasive global social and economic transformations (Paslan et al., 2025). According to the modeling results, the carrying capacity for CG publication growth could approach 4020 documents. Furthermore, the point of maximum growth (inflection point), which marks the phase when the growth rate peaks before beginning to slow, is expected to occur in the coming decade. This suggests that the CG field currently remains rooted in the early growth phase on its way to the acceleration stage and has not yet transitioned to the maturity phase (Van Woesik & Cacciapaglia, 2021).

These findings indicate that career guidance (CG) research still has substantial opportunities for further development, both theoretically and practically. The field is still evolving, allowing researchers to develop more adaptive and context-relevant approaches (Van Woesik & Cacciapaglia, 2021). In addition, global changes following the COVID-19 pandemic have accelerated the transformation of education systems and increased the need for flexible, technology-based career guidance services (Sharma & Khurana, 2020). This condition has also contributed to the rapid growth of scientific publications in the CG field, as reflected in the increasing cumulative publication trend (Gálvez, 2024).

However, the logistic model used in this study has limitations, especially in predicting long-term publication growth. The moderate coefficient of determination ($R^2$) shows that the model cannot fully explain all data variations. Therefore, the estimated saturation point and maximum growth should be viewed as projections rather than exact predictions (Shmueli, 2010). Overall, the cumulative growth pattern in Figure 3 indicates that career guidance research is still

developing and has strong potential for future expansion. The S-shaped curve reflects not only increasing publication output but also the field's evolving, adaptive nature in response to global changes (Y. Wang et al., 2024).

***Research Life Cycle***

To enhance the analysis of cumulative growth and achieve a more nuanced understanding of the developmental status of the career guidance (CG) domain, a research life cycle analysis was conducted. This methodological framework seeks to describe the stages of evolution of a scientific field based on the temporal dynamics of publication output, thus enabling scholars to ascertain whether a discipline is in its infancy, expansion, plateau, or regression. Theoretically, the research life cycle typically consists of four main stages: (1) an initiation phase, characterized by a scarcity of publications; (2) a growth phase, during which there is a significant escalation in scientific output; (3) a maturity phase, during which growth begins to slow and reaches stability; and (4) a decline phase, characterized by reduced research engagement (Markard, 2020; Tattershall et al., 2021). Using this methodology, the dynamics of CG development can be examined in a more systematic and prognostic manner (Maree, 2021).

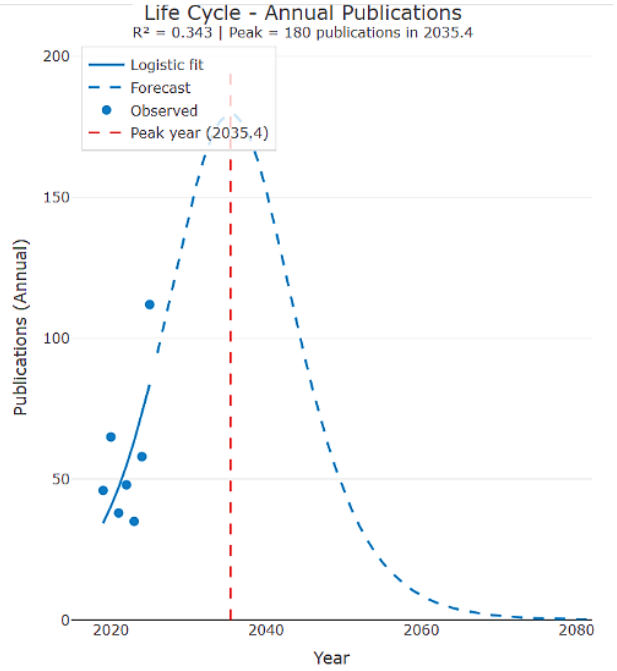


**Figure 4.** Annual Publication Life Cycle and Predicted Peak of Career Guidance Research

As illustrated in Figure 4, the CG research life cycle curve shows a growth trajectory that has not yet peaked, with estimates suggesting that peak publication output will occur around 2035, corresponding to an anticipated annual production of approximately 180 publications. This forecast aligns with the findings of previous analyses using logistic curve modeling, which indicated that the CG domain is still traversing an active growth trajectory. Such a trend suggests that CG research is currently undergoing a transition phase, shifting from early growth to an acceleration phase. During this interval, there has been a marked surge of interest from the scientific community, characterized by increased publication volume, the proliferation of collaborative networks, and the diversification of research themes. However, the domain has not yet reached maturity, which is typically characterized by stabilization in publication volume and the prominence of a particular paradigm (Zeng et al., 2023; da Silva et al., 2026).

Furthermore, this transitional phase also signifies a process of knowledge consolidation, in which a series of theoretical and methodological frameworks is rigorously examined and refined. In the realm of career guidance (CG), this phenomenon is manifested through a growing body of scholarly inquiry that emphasizes not only traditional dimensions such as career choice but also encompasses contemporary challenges such as job readiness, career adaptability, and the incorporation of technological advancements into career guidance services (Testa et al., 2026).

External determinants also play a significant role in accelerating the development of this domain. A major contributing factor is the COVID-19 pandemic, which has triggered significant changes in the educational landscape and the labor market (Ren et al., 2023). This transformation has increased demand for more adaptive, flexible, and technology-driven career guidance services, catalyzing research efforts within the CG discipline.

However, it is important to acknowledge that the anticipated results derived from the life cycle analysis have inherent limitations, primarily because they are based on a relatively limited data set from 2019 to 2025. Consequently, the projected peak growth for 2035 should be interpreted as a tentative estimate. Modifications in educational policies, technological advancements, and fluctuations in the global labor market may significantly affect this growth trajectory in the coming years. In summary, the life-cycle analysis illustrated in Figure 4 provides a strategic perspective on the developmental status of career guidance research in the international scientific arena. These results validate that the career guidance domain is currently in a favorable growth phase, indicating significant potential for further development before reaching maturity (Alexander & Fuqua, 2026). Such a situation presents ample opportunities for rigorous research, conceptual advancement, and the evolution of career guidance methodologies better aligned with the requirements of 21st-century education (Donald et al., 2024; Xiaoqing & Bin Zainudin, 2025).

### *Bibliometric Statistics Summary*

To enhance the explanation of the analysis findings and to provide a comprehensive examination of the dataset's attributes, key descriptive statistics for career guidance (CG) publications cataloged in the Scopus database for the period 2019–2025 are presented. These statistics provide a quantitative foundation for examining trends, citations, growth, and collaborative frameworks outlined in the previous section.

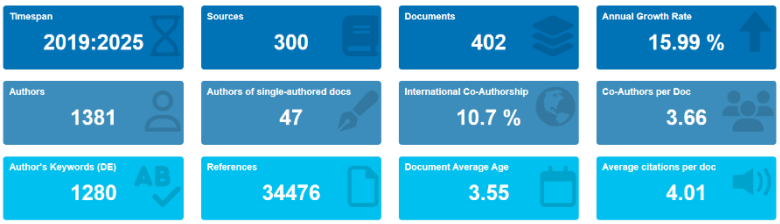


**Figure 5.** Summary of Bibliometric Statistics of Career Guidance Research (2019–2025)

As illustrated in Figure 5, the empirical dataset under review comprises 402 documents across 300 publication sources, including journals, conference proceedings, and various other scholarly repositories. The relatively large number of sources compared to the number of documents indicates that research on career guidance (CG) is widely disseminated across numerous scholarly platforms, reflecting the inherent multidisciplinary nature of this field. In particular, career guidance research transcends the boundaries of educational discourse, as it is simultaneously intertwined with domains such as psychology, sociology, and employability research (Calva et al., 2024; Ghazali et al., 2024). In terms of authorship, 1,381 authors contributed to the creation of the 402 documents, yielding an average of 3.66 authors per manuscript. These statistics indicate that CG research is characterized by a collaborative framework that generally reflects the increasing complexity of research themes and the need for interdisciplinary methodologies. Such collaboration can also be interpreted as an attempt to combine various perspectives, encompassing theoretical and practical dimensions, in the exploration of the career guidance phenomenon (Akkermans et al., 2024; M. Pham et al., 2024).

However, despite generally increasing levels of collaboration, the proportion of international collaborations is only 10.7%, indicating that cross-border collaboration remains relatively limited. This phenomenon suggests that most career guidance (CG) research remains oriented toward local or national contexts, potentially limiting the global applicability of its findings. This insufficient level of international collaboration further underscores the disparity in the distribution of knowledge production (Muhammad, 2023; Rahman & Indreswari, 2025),

with countries with advanced research capacities tending to exert greater dominance compared to developing countries, such as Indonesia. Furthermore, an examination of keywords revealed 1,280 Author keywords, indicating a high level of diversity and complexity within the research domain. This wide variety of keywords indicates that the field of CG is not homogeneous but rather encompasses numerous, evolving subthemes. It also indicates a strong conceptual dynamism, with researchers continually exploring new methodologies to understand and improve career guidance practice (Healy et al., 2026).

Furthermore, the total of 34,476 citations referenced throughout this document demonstrates the breadth and depth of the extant literature on CG research. This substantial number of citations indicates that inquiries in this domain are not solely empirical but are also supported by a strong theoretical framework and demonstrate integration with many other academic disciplines. In essence, the evolution of CG is not a solitary endeavor but rather the manifestation of accumulated, collaborative knowledge. When juxtaposed with previous findings, these bibliometric metrics support several significant conclusions. First, concerning quantitative aspects, the CG domain demonstrates a remarkable capacity for scholarly output and consistent growth. Second, regarding structural elements, clear patterns of collaboration signal a trend toward increasingly complex, multidisciplinary research endeavors. Third, from a global distribution perspective, the observed low levels of international collaboration underscore the need for increased cross-border research networks to broaden perspectives and improve the overall quality of research.

***Network Visualization and Thematic Structure of Research***

As the concluding phase of the bibliometric analysis, the conceptual framework for career guidance (CG) research was delineated using a science-mapping methodology based on keyword co-occurrence analysis, facilitated by VOSviewer software. This methodological approach aims to elucidate the interrelationships among various concepts, categorize research themes into distinct groups, and reveal the intellectual architecture that underpins the evolution of the CG domain.

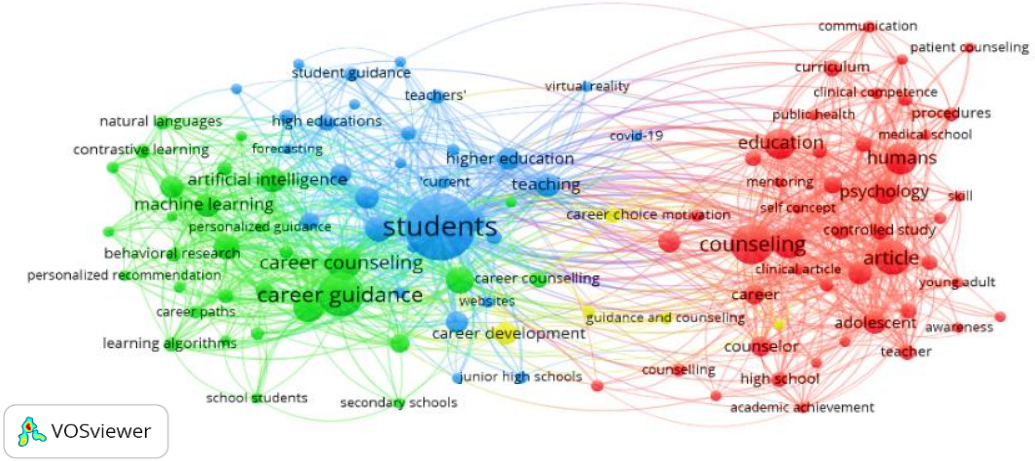


**Figure 6.** Network Visualization

Next, a visual representation of the data shows three main clusters that summarize the research framework in the career guidance domain. The first cluster (marked in red) emphasizes the psychological and methodological dimensions of counseling, with dominant terms including counseling, education, psychology, adolescence, and clinical skills. This cluster illustrates the deepening of career guidance research across psychological and educational paradigms, particularly in the domains of individual development, counseling services, and school-based interventions. This phenomenon is closely related to the attributes of secondary school students, particularly those in ninth grade, who navigate the early adolescence stage and simultaneously engage in the process of developing their self-identity while beginning to confront further educational alternatives (OECD, 2024; Parola et al., 2024; Söner & Gültekin, 2025). The next

cluster, represented in blue, focuses on education and learner dynamics, encompassing keywords such as students, pedagogy, student guidance, and higher education. The prominence of the term "student" as the most substantive node indicates that learners are the primary focus of career guidance research. In the context of ninth-grade high school students, this point is crucial because they are at a crucial transition point, particularly in making decisions regarding their educational continuation to high school, junior high school, or alternative educational trajectories (Frilian et al., 2025; D. Wang & Wang, 2025). Consequently, career guidance services during this phase should not only be informative but also intentionally facilitate students' understanding of their abilities, interests, and prospective opportunities (Huda et al., 2024).

Meanwhile, the third cluster (green) reflects the growing use of technology in career guidance, including themes such as artificial intelligence, machine learning, and digital career services. This finding indicates a shift toward more adaptive, technology-oriented career guidance practices aligned with current educational needs (McMahon & Patton, 2019; Sarmurzin et al., 2026). For ninth-grade secondary school students, who are generally familiar with digital technology, these approaches offer greater accessibility and flexibility in receiving career guidance services. The relationship among keywords such as career counseling, career development, guidance and counseling, and artificial intelligence also demonstrates that career guidance is increasingly integrating psychological, educational, and technological dimensions (Bankins et al., 2024; Wong, 2024).

Theoretically, this finding expands the understanding of career guidance as an interdisciplinary field that no longer relies solely on conventional counseling approaches but also incorporates digital innovation to support student decision-making. In practice, these findings highlight the need for schools and policymakers to develop digital-based, personalized career guidance services, particularly for junior high school students at an important stage of educational and career decision-making (Dodd et al., 2022; Sowa et al., 2024). Many students still experience limited access to career information, low self-understanding, and insufficient individualized guidance services (Sart & Aslan, 2022; Iswahyudi et al., 2023). Therefore, the development of web-based career guidance platforms and technology-supported counseling programs can become a concrete strategy to improve career readiness and student adaptability in the future.

Adaptive career guidance websites provide important features such as interest and aptitude assessments, educational recommendations, career information, and online consultations with guidance counselors (Devanshu et al., 2024; Keshma et al., 2025). Their main advantage is flexible access, allowing students to receive career guidance anytime, anywhere, as needed. In addition, integrating artificial intelligence can support more personalized recommendations based on student data and interests, helping students make more informed educational and career decisions. These findings indicate that digital-based career guidance is no longer only a complementary service, but has become an important support system for ninth-grade junior high school students during educational transitions. In practice, this approach can help improve career readiness, reduce uncertainty in educational pathway choices, and support more rational decision-making (Hirschi, 2018; Kadiyono & Utami, 2023). From a policy perspective, schools need to strengthen accessible and technology-supported career guidance programs that are responsive to students' developmental needs. Overall, the network structure identified in this study confirms that the future of career guidance lies in integrating psychological, educational, and technological approaches. Therefore, developing flexible, adaptive, website-based career guidance services is a strategic way to support junior high school students in the digital era.

### *Discussion*

The findings of this study demonstrate that career guidance research for grade IX junior high school students is undergoing a substantial phase of scientific expansion, conceptual diversification, and technological reorientation. Based on Scopus-indexed publications from 2019 to 2025, this study identified 402 scholarly documents distributed across 300 publication

sources, involving 1,381 authors and 34,476 cited references. These bibliometric indicators show that career guidance is no longer positioned as a marginal topic within educational counseling, but has become a multidisciplinary research domain supported by a broad theoretical and empirical foundation. The annual growth rate of 15.99% further indicates that scholarly attention to career guidance has increased significantly, particularly after 2022. This increase is not merely quantitative; rather, it reflects a deeper transformation in the orientation of career guidance research, from conventional career information services toward more adaptive, student-centered, and technology-mediated career guidance models.

The publication growth pattern identified in this study can be interpreted in relation to post-pandemic educational transformation, uncertainty in the labor market, and the increasing demand for students' career readiness. The citation analysis showed that the scientific impact of career guidance research peaked around 2022, while the decline in citations from 2023 to 2025 should not be interpreted as a decline in scholarly relevance. Instead, this pattern is more appropriately understood through the concept of citation lag, because newly published articles generally require time to be read, disseminated, and cited by other researchers. Donthu et al. (2021) emphasize that bibliometric indicators need to be interpreted contextually because citation accumulation is influenced by publication age, field maturity, and disciplinary dissemination patterns. In this study, the fluctuation in citation trends reflects an evolving field that is still consolidating its theoretical boundaries, methodological approaches, and digital applications. The S-shaped cumulative growth curve further strengthens this interpretation, indicating that career guidance research is still in the acceleration phase and has not yet reached maturity. The projected saturation point of approximately 4,020 documents and the estimated peak productivity of around 180 publications annually by 2035 suggest that this field will continue to expand over the next decade.

These findings are consistent with global studies published between 2020 and 2025, which show that career guidance has increasingly become a strategic educational intervention rather than a merely informational service. Dodd et al. (2022) demonstrated that career guidance can contribute to students' career readiness when measured through validated indicators of preparedness, confidence, and transition planning. Similarly, Gati and Kulcsár (2021) argued that contemporary career decision-making should be understood as a complex process shaped by uncertainty, information overload, and students' readiness to evaluate alternatives. Van der Horst et al. (2021) also found that compact career-adaptation interventions can support school-to-work transitions by strengthening students' adaptive resources. These studies support the present finding that career guidance research increasingly emphasizes career adaptability, decision-making, employability, and transition readiness. However, unlike some international studies that focus primarily on higher education or school-to-work transitions, the present study places specific emphasis on grade IX junior high school students, who are still in an early educational transition phase. This context is important because students at this level are not only preparing for employment in the long term, but also making immediate educational pathway decisions that may influence their later academic and career trajectories.

The results of this study are also aligned with international research on online and technology-assisted career guidance. Chen et al. (2022) found that online career intervention significantly improved Chinese high school students' career readiness and reduced career decision-making difficulties. Van Schalkwyk et al. (2022) showed that self-directed career guidance intervention was feasible and acceptable for South African secondary school learners during severe COVID-19 restrictions. Herath et al. (2024) further reported that computer-assisted career guidance tools have increasingly been used to support students' career path planning through digital assessment, information systems, and personalized recommendation mechanisms. In addition, José-García et al. (2023) developed an artificial intelligence-based career guidance system that connects student skills with occupational pathways through machine learning and network visualization. These global studies confirm the relevance of the technology-oriented cluster found in this study, which includes artificial intelligence, machine

learning, and digital career services. Nevertheless, the findings also indicate that technology should not be treated merely as a technical instrument. Digital career guidance must remain grounded in counseling principles, ethical data use, adolescent development theory, and students' psychosocial needs.

In the Indonesian context, the findings resonate with studies showing that students' career readiness and career choices are influenced by educational, psychological, and digital factors. Astuti et al. (2022) found that digital modules were effective in improving junior high school students' career planning, indicating that structured digital media can support students' understanding of future educational and occupational options. Mahfud et al. (2020), in a study of vocational high school students in North Lampung, found that readiness for selecting careers was influenced by teaching quality and psychological capital, while social capital contributed indirectly through its relationship with psychological capital and teaching quality. Kadiyono and Utami (2023) also showed that vocational students still experience career decision-making difficulties influenced by school climate and contextual conditions. More recently, Kusumanegara et al. (2024) reported that digital-based guidance and counseling services are increasingly relevant for students' career planning in the digital era, while Kholifah et al. (2025) found that digital competence and psychological well-being influence vocational students' career choice through self-efficacy. These Indonesian studies support the present bibliometric findings by showing that career guidance in Indonesia is shaped by the interaction between student development, school support, digital competence, and psychological readiness.

The local relevance of this study is particularly important because grade IX junior high school students in Indonesia face educational pathway decisions at a relatively early age. They must choose between general senior high school, vocational high school, Islamic senior high school, or other educational alternatives, often while still developing self-concept, academic confidence, and awareness of future career possibilities. This explains why the learner-centered cluster in this study is highly meaningful. The prominence of keywords related to students, pedagogy, guidance, and education suggests that career guidance research increasingly places learners at the center of the guidance process. However, Indonesian students may experience unequal access to career information, uneven digital infrastructure, limited counselor availability, and varying levels of family support. Therefore, the integration of digital career guidance should be context-sensitive and inclusive. It should not merely reproduce global models, but should be adapted to local educational structures, school resources, students' socioeconomic backgrounds, and the cultural role of family in career decision-making.

Theoretically, this study strengthens the understanding of career guidance as an integrative and developmental field that combines psychological counseling, learner-centered education, and technological innovation. The emergence of three dominant clusters indicates that career guidance is moving beyond the traditional matching model, in which students are simply directed toward occupations based on interest or aptitude. Instead, contemporary career guidance increasingly reflects a developmental and constructivist orientation, where students actively build self-understanding, interpret educational and occupational opportunities, and construct future identities. These findings support the broader direction of career construction and life-design perspectives, while also extending them by showing that digital infrastructures now mediate how students access information, evaluate alternatives, and form career aspirations. Thus, future theoretical models of career guidance need to incorporate digital agency, media literacy, algorithmic awareness, self-efficacy, and ethical technology use as part of students' career development process.

Pedagogically, the findings suggest that schools need to design career guidance services that are systematic, interactive, reflective, and developmentally appropriate for grade IX students. Career guidance should not only provide information about educational pathways, but also help students develop self-reflection, emotional well-being, media literacy, and decision-making competence. Digital platforms, websites, and e-modules can be used to increase student engagement by providing self-assessment tools, interest inventories, reflective worksheets,

career exploration tasks, educational pathway simulations, and online consultation features. From a policy perspective, the findings imply that educational authorities need to strengthen school-based career guidance systems by providing digital infrastructure, counselor training, ethical guidelines for technology-assisted counseling, and student data protection mechanisms. Policies should also ensure that digital career guidance does not widen inequalities between students with strong technological access and those from disadvantaged contexts. Therefore, digital career guidance should be embedded within broader policies on educational transition, adolescent mental health, digital behavior, and inclusive student support.

The novelty of this study lies in its specific focus on mapping career guidance research for grade IX junior high school students through a Scopus-based science mapping approach covering the post-pandemic period of 2019–2025. While previous studies have examined career readiness, digital career counseling, online interventions, or career guidance policy separately, this study provides a broader bibliometric picture of how the field has developed, how its citation patterns have changed, and how its thematic structure is organized. Methodologically, this study contributes by combining publication trend analysis, citation analysis, cumulative growth modeling, research life-cycle projection, and keyword co-occurrence mapping. Substantively, it contributes by showing that career guidance research is moving toward the integration of psychological counseling, learner-centered education, and technology-based services. This integrated perspective is particularly relevant for students in transitional educational stages, because their career development requires not only information access, but also emotional support, self-understanding, decision-making assistance, and digital literacy.

Despite these contributions, several limitations should be acknowledged. First, this study relied exclusively on the Scopus database and English-language documents, which may have excluded relevant studies indexed in Web of Science, Dimensions, ERIC, Google Scholar, Garuda, SINTA, or regional databases. Second, the search strategy was limited to selected keywords related to career guidance, career counseling, career education, career development, and secondary education; therefore, studies using different terminology may not have been captured. Third, bibliometric analysis can identify publication patterns, citation trends, and thematic networks, but it cannot fully evaluate the methodological quality, theoretical depth, or practical effectiveness of each article. Fourth, the projected saturation point and peak productivity should be interpreted cautiously because long-term bibliometric forecasting may change due to policy shifts, technological disruption, curriculum reform, and labor-market transformation. Future research should combine bibliometric analysis with systematic literature review, qualitative content analysis, or meta-analysis to provide deeper substantive interpretation. Further studies are also encouraged to compare multiple databases, examine country-specific trends, and empirically test digital or technology-supported career guidance models for junior high school students in real educational settings.

## CONCLUSION

This study demonstrates that career guidance research is experiencing continuous scientific development and remains in a dynamic growth phase. The bibliometric analysis of Scopus-indexed publications from 2019 to 2025 shows a significant increase in scientific output, particularly after 2022, indicating growing academic attention toward career readiness, adaptability, and technology integration in educational counseling services. The findings suggest that career guidance is no longer viewed merely as an informational service, but as a strategic approach to preparing students with adaptive competencies needed to face future educational and labor-market challenges. In addition, the S-shaped cumulative growth pattern indicates that the field has not yet reached maturity and still offers broad opportunities for theoretical and methodological development.

However, this study has several limitations. The analysis relied exclusively on the Scopus database, which may not fully reflect the full body of global publications on career guidance. Relevant studies indexed in other databases such as Web of Science (WoS), Dimensions, or

Google Scholar (GS) were not included, potentially limiting the breadth of bibliometric coverage. Furthermore, bibliometric analysis mainly focuses on publication patterns and scientific relationships rather than evaluating the substantive quality of individual studies. Therefore, future studies are encouraged to incorporate multiple databases to obtain broader bibliometric results. Further research could also employ longitudinal analyses, comparative bibliometric approaches, and more advanced science mapping techniques to explore the evolution of career guidance research in greater depth. These approaches would strengthen understanding of research trends, collaboration networks, and emerging themes in career guidance, particularly within secondary education contexts.

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