

## Career resilience in TVET: a bibliometric analysis of trends and implications (1969-2024)

Sangin Juat<sup>1</sup>, Amalia Madihie<sup>1</sup>, Salleh Amat<sup>2</sup>

<sup>1</sup>Department of Counseling, Faculty of Cognitive Sciences and Human Development, University of Malaysia Sarawak, Kota Samarahan, Malaysia

<sup>2</sup>Centre of Educational Diversity Studies, Faculty of Education, National University of Malaysia, Bangi, Malaysia

### Article Info

#### Article history:

Received Nov 20, 2024  
Revised Aug 29, 2025  
Accepted Sep 30, 2025

#### Keywords:

Bibliometric analysis  
Career adaptability  
Career resilience  
Employability  
TVET  
Vocational education  
Workforce development

### ABSTRACT

Through a comprehensive bibliometric analysis, this study investigates the evolution of career resilience research in technical and vocational education and training (TVET) from 1969 to 2024. Using data from 1019 articles retrieved from Scopus, the study examines publication trends, influential authors, prominent journals, co-authorship networks, and keyword co-occurrence patterns. Key themes identified include career adaptability, psychological factors such as self-esteem and life satisfaction, workplace dynamics like job satisfaction and engagement, and the pivotal role of education in promoting resilience. The analysis highlights a significant increase in research output during global disruptions, such as the COVID-19 pandemic, underscoring the growing relevance of career resilience in addressing contemporary challenges. By leveraging tools like biblioMagika® and VOSviewer, this study provides critical insights into the interplay between career resilience and vocational education, offering actionable recommendations for integrating resilience-focused strategies into TVET curricula. These findings aim to support educators, policymakers, and researchers in enhancing graduate employability and adaptability in dynamic labor markets.

*This is an open access article under the [CC BY-SA](#) license.*



### Corresponding Author:

Amalia Madihie  
Department of Counseling, Faculty of Cognitive Sciences and Human Development  
University of Malaysia Sarawak  
Datuk Mohammad Musa Road, 94300 Kota Samarahan, Sarawak, Malaysia  
Email: mamalia@unimas.my

## 1. INTRODUCTION

The fast changes in global economies and the growing need for skilled workers make technical and vocational education and training (TVET) important for improving employability and economic development [1]. However, TVET institutions face several problems, such as adopting new technologies, solving skill gaps, and handling disruptions like the COVID-19 pandemic. These problems show that many TVET graduates are not ready for career challenges because they lack career resilience.

Past studies have looked at information and communication technology (ICT) use in teaching, educator skill gaps [2], and factors affecting student enrolment [3]. However, the role of career resilience in TVET and how it affects employability is still not well studied. Career resilience is important because it helps individuals adjust, bounce back, and progress in their careers despite challenges in today's unpredictable job market [4]–[6]. Despite its value, we still do not fully understand how career resilience is developed in TVET and how it relates to better job outcomes [7], [8].

Career resilience and vocational education are shaped by technological change, economic shifts, and global events like the pandemic. Resilience helps people handle workplace problems and transitions, and can be improved through training and tools such as career resilience inventories [9], [10]. While vocational education helps graduates enter the workforce, it also faces problems like outdated skills and changing industry needs [11]–[13]. Reforms now focus on lifelong learning, flexible curricula, and adaptability to meet changing job demands [14]–[17].

Psychological traits like optimism, adaptability, and self-regulation are important for building resilience and staying well during career changes [18]–[20]. Resilience also connects with career adaptability, work engagement, and mental health, especially in high-stress fields like nursing and corporate work [21]–[23]. Tools such as resilience tests and school-based programs help young professionals become more resilient [24], [25]. Career counseling plays a key role in improving resilience and adaptability. It links traits like emotional stability with career satisfaction [26], [27]. Resilience is also strongly connected to career adaptability traits like control and curiosity [28]. Mentoring and tools like the career construction interview are useful for young people and those in high-risk groups to handle transitions well [29]. External job challenges also affect career resilience. Workers must update their skills to keep up with fast-changing technologies. High turnover and skill shortages create stress, and career stagnation reduces motivation. While internal career growth helps build resilience, external job moves can reduce it [30]. Strategies are needed to help workers adapt and succeed in today's workplaces.

More researchers are now focusing on career resilience because of its value in solving both personal and job-related challenges. Foundational ideas from Savickas [30] and practical interventions by Koen *et al.* [31] support career development. Recent studies by Törn-Laapio *et al.* [32] and Chye *et al.* [33] show that resilience helps people handle complex job paths.

TVET can help build this resilience. For example, Leagile frameworks help TVET institutions stay flexible in times of disruption like COVID-19 [34]. TVET also fits well with national strategies and has improved youth employment and overall well-being [35], [36]. Despite ongoing progress, several challenges remain. Digital technologies and flexible learning models are essential to ensure continuous education during disruptions. Policymakers are encouraged to invest in these tools, adapt global strategies to local contexts, and support initiatives that promote literacy and inclusion [37].

This study conducts a bibliometric analysis to examine research trends in career resilience and its connection to vocational education and employability. It systematically analyzes publications indexed in Scopus from 1969 to 2024, focusing on citation patterns, core journals, influential publications, and keyword co-occurrence to uncover thematic clusters and knowledge structures in the field. Specifically, the study addresses the following research questions: i) how have publication trends and citation counts in resilience research evolved from 1969 to 2024? ii) which journals are the most productive and influential in career resilience? iii) what are the most highly cited documents, and what are their contributions to the field? and iv) what are the dominant keywords, and how do they reflect research themes in this domain?

## 2. METHOD

This study employs a bibliometric approach, systematically organizing, coordinating, and analyzing data from scientific publications [38]–[40]. The bibliometric analysis includes both basic indicators, such as publication years, author categories, and journal sources, as well as advanced methods like document co-citation analysis, which reveal patterns and connections in the literature [41]–[45]. To ensure reliable results, the study involved three main steps: identifying relevant keywords, conducting a comprehensive literature search using the Scopus database, and analyzing high-quality publications to provide accurate insights [46]–[52]. Advanced tools like biblioMagika® and VOSviewer were used for data visualization and trend analysis, offering a detailed understanding of the structure and development of research in career resilience.

### 2.1. Data source and search strategy

The bibliometric data for this study were collected from the Scopus database, known for its broad global coverage of high-quality academic content, as noted by Baas *et al.* [53] and Maulani and Widuri [54]. To ensure the study's validity, a specific query was carefully designed to identify articles on career resilience published between 1969 and 2024. The initial query used the keywords "CAREER" AND ("RESILIENCE" OR "ADAPTABILITY" OR "MALLEABILITY" OR "DUCTILITY" OR "PLIANCY" OR "BENDABILITY"), which retrieved 3,763 articles. After refining the search terms, the final query was TITLE("CAREER" AND ("RESILIENCE" OR "RESILIENT" OR "ADAPTABILITY" OR "ADAPTABLE" OR "FLEXIBILITY" OR "FLEXIBLE" OR "DURABILITY" OR "DURABLE" OR "AGILITY" OR "AGILE")), narrowing the results to 1019 articles suitable for analysis.

This dataset included key information such as publication years, document types, source titles, and citation counts, which were used to analyze publication trends. Keywords from the dataset enabled a co-occurrence analysis, identifying frequently used terms and revealing emerging themes in career resilience research. The analysis also identified the most productive journals and highly cited articles, offering a comprehensive overview of influential research in the field. This structured approach ensured reliable and insightful findings.

## 2.2. Data cleaning and preparation

In line with established bibliometric methods, this study used biblioMagika® [55] and VOSviewer [56] for data analysis and visualizing co-occurrence networks. The data cleaning process included removing duplicates, standardizing keywords, and ensuring consistency across the dataset. This step is essential to ensure the accuracy and reliability of the analysis. The approach aligns with previous bibliometric studies on employability skills and vocational education, where tools like OpenRefine and manual inspections were used to clean and refine data for precise results [57]. This process ensures a high-quality dataset for meaningful and trustworthy findings.

## 2.3. Bibliometric analysis

The bibliometric analysis in this study used two primary tools: biblioMagika® developed by Ahmi [55] and VOSviewer [58]. To ensure comprehensive and reliable results, biblioMagika® was applied for descriptive analysis, identifying the most productive authors, influential institutions, and key publications on career resilience. The analysis also measured publication impact using established performance metrics like h-index, g-index, and m-index, ensuring a validated evaluation of the field's contributions.

VOSviewer, a user-friendly tool developed by van Eck and Waltman [59], was utilized to visualize keyword co-occurrence networks. The visual maps created by VOSviewer clearly illustrated the relationships between central concepts such as career construction theory, career adaptability, and career resilience. These visualizations are particularly useful for identifying major themes, tracing the progression of research over time, and uncovering connections across related topics.

This combined approach provided validated and interactive visualizations, allowing researchers to systematically map the intellectual structure of career resilience research. The use of these tools ensured the analysis was robust, reliable, and aligned with established bibliometric methodologies. This process also highlighted emerging trends, core themes, and research clusters, offering clear insights into the development of career resilience research over time.

## 2.4. Interpretation of findings and research insights

The findings from the bibliometric analysis were systematically interpreted using key indicators such as publication trends, influential journals, highly cited documents, and keyword co-occurrence. This approach highlighted the evolving patterns in career resilience research, identifying dominant journals, impactful publications, and key themes like “career adaptability” and “job satisfaction”. The analysis provided valuable insights into the most influential works and emerging trends in the field over the past 55 years, offering a comprehensive understanding of the progression and focus areas in career resilience research.

## 3. RESULTS AND DISCUSSION

This section explains the results of the research and at the same time gives the comprehensive discussion. Results will be presented in figures, graphs, tables, and others that make the reader understands easily as 3.1 until 3.4.

### 3.1. Total publication and citation by year

Figure 1 illustrates the annual trends in publications and citations for career resilience research from 1969 to 2024. Research on career resilience has shown steady growth, particularly after 2015, with 2023 recording the highest number of publications (141 articles). Similarly, citations have increased, reflecting the rising academic interest and importance of this topic. This demonstrates the growing recognition of resilience as a key skill for adapting to challenges such as technological changes and economic uncertainties.

The findings suggest that career resilience is crucial in addressing global challenges, including the COVID-19 pandemic. Seminal works, such as those by Savickas [30] and Spurk and Straub [60], highlight the role of resilience in ensuring employability and adaptability during uncertain times. Integrating resilience-building strategies into TVET programs can better prepare graduates for future uncertainties. The increasing number of publications and citations further underscores the importance of resilience in career development.

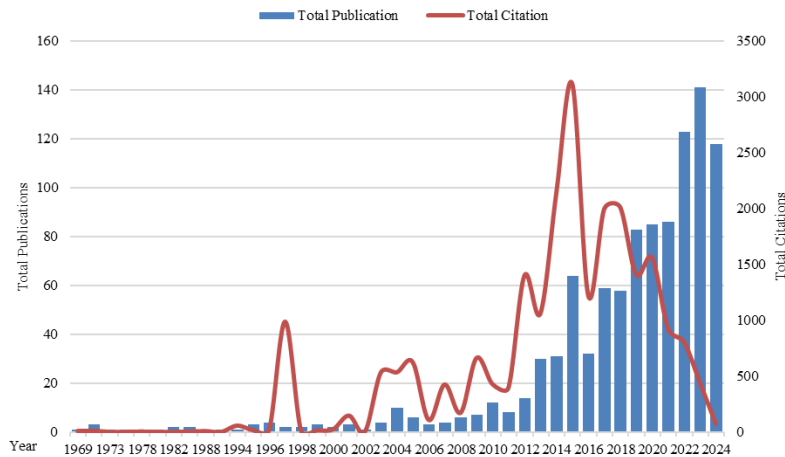


Figure 1. Annual trends in publications and citations for career resilience research

**3.2. Most productive source title**

Table 1 presents the top journals publishing career resilience research, ranked by total publications, citations, and impact indices. The Journal of Vocational Behavior leads the field with 97 publications, 9448 citations, and an h-index of 58. It demonstrates a dominant influence in advancing theoretical and practical knowledge of career resilience.

Other notable journals include Frontiers in Psychology and the Career Development Quarterly, which have contributed significantly to the literature. Compared to these journals, the Journal of Vocational Behavior has a superior impact, highlighting its pivotal role in the field. Highly cited works, such as those by Savickas [30] and Rudolph *et al.* [61], emphasize the importance of resilience in addressing career challenges and align with trends observed in these leading journals. The findings indicate that resilience-focused research is well-supported by high-impact journals. These sources not only shape theoretical frameworks but also provide practical insights for improving resilience and adaptability in vocational contexts.

Table 1. Top journals publishing ranked by total publications, citations, and impact indices

Source title	TP	NCA	NCP	TC	C/P	C/CP	h	g	m
Journal of Vocational Behavior	97	369	96	9448	97.40	98.42	58	97	2.417
Frontiers in Psychology	47	166	38	468	9.96	12.32	13	20	1.444
Career Development Quarterly	37	114	31	1680	45.41	54.19	17	37	0.607
Journal of Career Development	33	102	32	869	26.33	27.16	17	29	0.708
Journal of Career Assessment	25	86	23	1243	49.72	54.04	17	25	0.850
Psychology of Career Adaptability, Employability and Resilience	21	43	21	270	12.86	12.86	8	16	1.000
Sustainability (Switzerland)	18	55	18	157	8.72	8.72	8	11	1.333
Current Psychology	17	57	12	85	5.00	7.08	6	9	1.200
International Journal for Educational and Vocational Guidance	16	51	11	105	6.56	9.55	6	10	0.857
Journal of Psychology in Africa	13	40	13	109	8.38	8.38	7	10	0.467

Note: TP=total number of publications; NCA=number of contributing authors; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; g=g-index; and m=m-index.

**3.3. Top 10 highly cited documents**

Table 2 highlights the top 10 highly cited works in career resilience research. Savickas’s 1997 paper [30], with 932 citations, provides a foundational framework integrating career adaptability and resilience. Rudolph *et al.*’s 2017 meta-analysis [61], with 431 citations, validates the pivotal role of resilience in achieving career success across diverse contexts. These highly cited works underscore the importance of resilience in navigating career transitions and adapting to global challenges. Spurrk and Straub’s [60] findings further emphasize resilience as a critical skill during crises like the COVID-19 pandemic. These results suggest that foundational theories remain essential in shaping interventions aimed at improving employability and adaptability. Incorporating such insights into TVET curricula can enhance the preparedness of graduates for dynamic and uncertain job markets.



studies exploring resilience in diverse professional and demographic settings. These findings provide a roadmap for future research, highlighting the need to explore underrepresented groups and innovative strategies in fostering resilience.

**4. CONCLUSION**

This study relied solely on data from the Scopus database, potentially omitting relevant studies available in other sources. Additionally, the bibliometric tools used primarily identified trends and patterns but did not delve into the specific methodologies or theoretical frameworks of the analyzed studies. This limitation restricts a deeper understanding of the contextual and practical applications of career resilience in TVET.

To address these gaps, future research should incorporate data from multiple databases to ensure a more comprehensive and inclusive analysis. Further studies could also examine how career resilience is applied across different regions and investigate targeted interventions to strengthen resilience among TVET students. Longitudinal research would be beneficial in understanding how career resilience evolves over time and its long-term impact on employability. These efforts would provide valuable insights for enhancing TVET programs to better equip students for the rapidly changing job market.

The growing body of research underscores the significance of career resilience in preparing TVET graduates to navigate an increasingly dynamic labor market. Findings from this study highlight the rising academic interest in career resilience and its crucial role in enhancing employability and adaptability. Integrating resilience-building strategies into TVET curricula can drive meaningful change by equipping graduates with the necessary skills to manage technological advancements and workforce disruptions. Moving forward, continued emphasis on career resilience as a core competency in vocational education will be essential in fostering a workforce that is both adaptable and future-ready.

**ACKNOWLEDGMENTS**

We extend our sincere gratitude to the Department of Counseling and Guidance, University of Malaysia Sarawak and also Centre of Educational Diversity Studies, National University of Malaysia.

**FUNDING INFORMATION**

This research was funded by the Ministry of Education Malaysia through the *Hadiah Latihan Persekutuan* (KPM.BBP.700-30/21/36(2)) scholarship awarded to postgraduate students.

**AUTHOR CONTRIBUTIONS STATEMENT**

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Sangin Juat	✓	✓	✓		✓	✓	✓	✓	✓		✓			✓
Amalia Madihie	✓	✓		✓						✓		✓		
Salleh Amat	✓	✓		✓						✓		✓		

C : **C**onceptualization  
M : **M**ethodology  
So : **S**oftware  
Va : **V**alidation  
Fo : **F**ormal analysis

I : **I**nvestigation  
R : **R**esources  
D : **D**ata Curation  
O : Writing - **O**riginal Draft  
E : Writing - Review & **E**ditng

Vi : **V**isualization  
Su : **S**upervision  
P : **P**roject administration  
Fu : **F**unding acquisition

**CONFLICT OF INTEREST STATEMENT**

Authors state no conflict of interest.

**DATA AVAILABILITY**

Data available on request.

## REFERENCES





- [1] R. H. Hassan, M. T. Hassan, S. Naseer, Z. Khan, and M. Jeon, "ICT enabled TVET education: a systematic literature review," *IEEE Access*, vol. 9, pp. 81624–81650, 2021, doi: 10.1109/ACCESS.2021.3085910.
- [2] W. Y. Leong, "TVET for all: fostering social equity through inclusive skills education," in *2024 International Conference on TVET Excellence & Development (ICTeD)*, Dec. 2024, pp. 284–288, doi: 10.1109/ICTeD62334.2024.10844604.
- [3] C. M. Hong, C. K. Ch'ng, and T. R. N. Roslan, "Analytic hierarchy process: a case study of students' tendency in enrolling TVET programme," in *The 5th ISM International Statistical Conference 2021 (ISM-V)*, 2023, doi: 10.1063/5.0110001.
- [4] M. Makgato and G. Afeti, *New models for technical and vocational education and training*. Hershey: IGI Global, 2021, doi: 10.4018/978-1-7998-2607-1.
- [5] J. Papier, "21st century competencies in technical and vocational education and training: rhetoric and reality in the wake of a pandemic," *Journal of Education (South Africa)*, no. 84, 2021.
- [6] G. V. Joseph *et al.*, "Enhancing industry 5.0 resilience among management professionals through technical competency and organizational leadership," in *2023 IEEE Technology & Engineering Management Conference-Asia Pacific (TEMSCON-ASPAC)*, Dec. 2023, pp. 1–8, doi: 10.1109/TEMSCON-ASPAC59527.2023.10531436.
- [7] C. M. Hong, C. K. Ch'ng, and T. R. N. Roslan, "Predicting students' inclination to TVET enrolment using various classifiers," *Pertanika Journal of Science and Technology*, vol. 31, no. 1, pp. 475–493, 2023, doi: 10.47836/pjst.31.1.28.
- [8] S. R. Ahmad *et al.*, "Enhancing employability and empowerment: unveiling factors within PERDA-TECH for sustainable development," *Journal of Technical Education and Training*, vol. 15, no. 3 Special Issue, pp. 235–244, 2023, doi: 10.30880/jtet.2023.15.03.021.
- [9] S. Mainhagu, "Career resilience attitudes in the context of a health crisis," (in French), *@GRH*, vol. 48, no. 3, pp. 65–85, Aug. 2023, doi: 10.3917/grh.048.0065.
- [10] L. Ma and X. Tang, "The development of career resilience for early career engineers in China: a grounded theory study," *ASEE Annual Conference and Exposition, Conference Proceedings*, 2023, doi: 10.18260/1-2--44088.
- [11] I. Scheuch, N. Peters, M. S. Lohner, C. Muss, C. Aprea, and B. Fürstenau, "Resilience training programs in organizational contexts: a scoping review," *Frontiers in Psychology*, vol. 12, 2021, doi: 10.3389/fpsyg.2021.733036.
- [12] M. Arame, J. Handa, Y. Goda, M. Toda, M. Itoh, and S. Kitazaki, "Development of a short-form career resilience inventory for online learning: verification based on analysis results of online learning," in *2022 IEEE International Conference on Teaching, Assessment and Learning for Engineering (TALE)*, Dec. 2022, pp. 615–621, doi: 10.1109/TALE54877.2022.00106.
- [13] T. Denham and P. Fairbrother, "Vocational education for regional health: the role of training in economic transitions," *Journal of Vocational Education and Training*, vol. 77, no. 3, pp. 746–767, 2024, doi: 10.1080/13636820.2024.2302173.
- [14] L. Li, "Reskilling and upskilling the future-ready workforce for industry 4.0 and beyond," *Information Systems Frontiers*, vol. 26, 2022, doi: 10.1007/s10796-022-10308-y.
- [15] B. Mustafa and S. Lleshi, "The impact of lifelong learning and investments in employee development on employee productivity and performance," *Multidisciplinary Reviews*, vol. 7, no. 8, 2024, doi: 10.31893/multirev.2024175.
- [16] V. Kovalchuk, S. Maslich, N. Tkachenko, S. Shevchuk, and T. Shchypyska, "Vocational education in the context of modern problems and challenges," *Journal of Curriculum and Teaching*, vol. 11, no. 8, pp. 329–338, 2022, doi: 10.5430/jct.v11n8p329.
- [17] OECD, *Promoting better career mobility for longer working lives in the United Kingdom*. OECD Publishing, Paris, Dec. 2024, doi: 10.1787/2b41ab8e-en.
- [18] M. K. Grabarski and M. Mouratidou, "Rise up: career empowerment, adaptability and resilience during a pandemic," *Canadian Journal of Administrative Sciences*, vol. 41, no. 1, pp. 7–22, 2024, doi: 10.1002/cjas.1740.
- [19] W. N. W. Othman, W. M. W. Jaafar, Z. N. Zainudin, and Y. M. Yusop, "Resilience and psychological well-being among career women," *Health Education and Health Promotion*, vol. 12, no. 2, pp. 261–271, 2024, doi: 10.58209/hehp.12.2.261.
- [20] I. Šverko and T. Babarović, "Protective and risk factors in career development and possible interventions in the school context," *Psihologijske Teme*, vol. 29, no. 2, pp. 357–377, 2020, doi: 10.31820/pt.29.2.8.
- [21] Z. Meng, L. Zhang, H. Zan, and J. Wang, "Psychological resilience and work engagement of Chinese nurses: a chain mediating model of career identity and quality of work life," *Frontiers in Psychology*, vol. 14, Nov. 2023, doi: 10.3389/fpsyg.2023.1275511.
- [22] M. J. W. McLarnon, M. G. Rothstein, and G. A. King, "Resiliency, self-regulation, and reemployment after job loss," *Journal of Employment Counseling*, vol. 57, no. 3, pp. 115–129, 2020, doi: 10.1002/joec.12149.
- [23] M. E. Balocchi, "Resilience does matter: a meta-analysis of trait resilience outcomes in the organizational setting," *Academy of Management Annual Meeting Proceedings*, 2020, doi: 10.5465/AMBPP.2020.127.
- [24] S. N. Halimi, D. Rowett, and K. Luetsch, "A realist review of programs fostering the resilience of healthcare students: what works, for whom and why?" *Research in Social and Administrative Pharmacy*, vol. 21, no. 1, pp. 22–31, 2025, doi: 10.1016/j.sapharm.2024.10.006.
- [25] S. Srivastava and P. Madan, "The relationship between resilience and career satisfaction: trust, political skills and organizational identification as moderators," *Australian Journal of Career Development*, vol. 29, no. 1, pp. 44–53, Apr. 2020, doi: 10.1177/1038416219886317.
- [26] B. Ahmad, S. Nasir, M. Hai, and S. Bilal, "Do career adaptability and employee-employer fit relate to career resilience? A collaborative effort to depart from the state of 'silos' to 'mutuality' in academia," *Kybernetes*, vol. 52, no. 11, pp. 5621–5639, Nov. 2023, doi: 10.1108/K-04-2022-0617.
- [27] A. Russo, A. Zammiti, G. Santisi, and P. Magnano, "The relationship between psychological flexibility and career adaptability as resources to promote well-being," *British Journal of Guidance and Counselling*, vol. 52, no. 2, pp. 286–295, 2023, doi: 10.1080/03069885.2023.2212856.
- [28] G. Ma, W. Wu, C. Liu, J. Ji, and X. Gao, "Empathetic leadership and employees' innovative behavior: examining the roles of career adaptability and uncertainty avoidance," *Frontiers in Psychology*, vol. 15, 2024, doi: 10.3389/fpsyg.2024.1371936.
- [29] T. W. Greer and S. E. Minnis, "Using developmental relationships to navigate career transitions: implications for diverse populations," *HRD Perspectives on Developmental Relationships: Connecting and Relating at Work*, pp. 15–39, 2022, doi: 10.1007/978-3-030-85033-3\_2.
- [30] M. Savickas, "Career adaptability: an integrative construct for life-span, life-space theory," *Career Development Quarterly*, vol. 45, no. 3, pp. 247–259, 1997.
- [31] J. Koen, U. C. Klehe, and A. E. M. Van Vianen, "Training career adaptability to facilitate a successful school-to-work transition," *Journal of Vocational Behavior*, vol. 81, no. 3, pp. 395–408, 2012, doi: 10.1016/j.jvb.2012.10.003.

- [32] A. Törn-Laapio, M. Ekonen, and P. Heilmann, "Tourism and hospitality industry employees' experiences of career shocks and career resilience," *Proceedings of the International Conference on Tourism Research*, vol. 7, no. 1, pp. 419–425, 2024, doi: 10.34190/ictr.7.1.2197.
- [33] S. M. Chye, Y. Y. Kok, Y. S. Chen, and H. M. Er, "Building resilience among undergraduate health professions students: identifying influencing factors," *BMC Medical Education*, vol. 24, no. 1, 2024, doi: 10.1186/s12909-024-06127-1.
- [34] E. M. Gideon, "Building resilience and mitigating impacts of uncertainties in technical and vocational education and training in Kenya," *International Journal of Information and Communication Technology Education*, vol. 19, no. 1, pp. 1–14, Nov. 2023, doi: 10.4018/IJICTE.333860.
- [35] Y. Shi and M. Bangpan, "Young people's participation experiences of technical and vocational education and training interventions in low- and middle-income countries: a systematic review of qualitative evidence," *Empirical Research in Vocational Education and Training*, vol. 14, no. 1, Aug. 2022, doi: 10.1186/s40461-022-00136-4.
- [36] C. Selane and K. O. Odeku, "An analysis of how TVET is playing a significant role in fostering students' skills and competencies in South Africa," *Journal of Educational and Social Research*, vol. 14, no. 3, pp. 293–305, 2024, doi: 10.36941/jesr-2024-0074.
- [37] O. Kalinin, V. Gonchar, N. Abliazova, L. Filipishyna, O. Onofriichuk, and M. Maltsev, "Enhancing economic security through digital transformation in investment processes: theoretical perspectives and methodological approaches integrating environmental sustainability," *Natural and Engineering Sciences*, vol. 9, no. 1, pp. 26–45, 2024, doi: 10.28978/nesciences.1469858.
- [38] W. M. Lim, S. Kumar, and N. Donthu, "38 How to combine and clean bibliometric data and use bibliometric tools synergistically: guidelines using metaverse research," *Journal of Business Research*, vol. 182, 2024, doi: 10.1016/j.jbusres.2024.114760.
- [39] D. S. Assyakur and E. M. Rosa, "Spiritual leadership in healthcare: a bibliometric analysis," *Jurnal Aisyah: Jurnal Ilmu Kesehatan*, vol. 7, no. 2, 2022, doi: 10.30604/jika.v7i2.914.
- [40] J. L. Alves, I. B. Borges, and J. De Nadea, "Sustainability in complex projects of civil construction: bibliometric and bibliographic review," *Gestao e Producao*, vol. 28, no. 4, 2021, doi: 10.1590/1806-9649-2020v28e5389.
- [41] Y. Liu and M. Avello, "Status of the research in fitness apps: a bibliometric analysis," *Telematics and Informatics*, vol. 57, 2021, doi: 10.1016/j.tele.2020.101506.
- [42] A. Tavassoli, S. M. Gharejedaghi, M. Abedi, S. M. Jamali, and N. A. Ebrahim, "Secondhand smoking and the fetus: a bibliometric analysis," *Medical Journal of the Islamic Republic of Iran*, vol. 37, no. 1, 2023, doi: 10.47176/mjiri.37.135.
- [43] N. Donthu, S. Kumar, D. Mukherjee, N. Pandey, and W. M. Lim, "How to conduct a bibliometric analysis: an overview and guidelines," *Journal of Business Research*, vol. 133, pp. 285–296, 2021, doi: 10.1016/j.jbusres.2021.04.070.
- [44] L. R. Yan, A. R. Liu, L. Y. Jiang, and B. G. Wang, "Non-coding RNA and hepatitis B virus-related hepatocellular carcinoma: a bibliometric analysis and systematic review," *Frontiers in Medicine*, vol. 9, 2022, doi: 10.3389/fmed.2022.995943.
- [45] L. Wang, W. Feng, J. Duan, and J. Liang, "Pharmacovigilance bibliometrics: visualizing thematic development in the category of pharmacology and pharmacy in Web of Science," *Frontiers in Pharmacology*, vol. 12, 2021, doi: 10.3389/fphar.2021.731757.
- [46] R. Marvi and M. M. Foroudi, "Bibliometric analysis," in *Researching and Analysing Business*, P. Foroudi and C. Dennis, Eds. London: Routledge, 2023, pp. 43–54, doi: 10.4324/9781003107774-4.
- [47] A. Montazeri, S. Mohammadi, P. M. Hesari, M. Ghaemi, H. Riazi, and Z. Sheikhi-Mobarakeh, "Preliminary guideline for reporting bibliometric reviews of the biomedical literature (BIBLIO): a minimum requirements," *Systematic Reviews*, vol. 12, no. 1, 2023, doi: 10.1186/s13643-023-02410-2.
- [48] K. I. Bougioukas *et al.*, "Global mapping of overviews of systematic reviews in healthcare published between 2000 and 2020: a bibliometric analysis," *Journal of Clinical Epidemiology*, vol. 137, pp. 58–72, 2021, doi: 10.1016/j.jclinepi.2021.03.019.
- [49] T. Y. Khaw, A. Amran, and A. P. Teoh, "Factors influencing ESG performance: a bibliometric analysis, systematic literature review, and future research directions," *Journal of Cleaner Production*, vol. 448, 2024, doi: 10.1016/j.jclepro.2024.141430.
- [50] U. Farooq, A. Nasir, and K. I. Khan, "An assessment of the quality of the search strategy: a case of bibliometric studies published in business and economics," *Scientometrics*, vol. 128, no. 8, pp. 4855–4874, 2023, doi: 10.1007/s11192-023-04765-8.
- [51] Saïd Echchakoui, "Why and how to merge Scopus and Web of Science during bibliometric analysis: the case of sales force literature from 1912 to 2019," *Journal of Marketing Analytics*, vol. 8, pp. 165–184, 2020.
- [52] A. Al-Khoury *et al.*, "Intellectual capital history and trends: a bibliometric analysis using Scopus database," *Sustainability (Switzerland)*, vol. 14, no. 18, 2022, doi: 10.3390/su141811615.
- [53] J. Baas, M. Schotten, A. Plume, G. Côté, and R. Karimi, "Scopus as a curated, high-quality bibliometric data source for academic research in quantitative science studies," *Quantitative Science Studies*, vol. 1, no. 1, pp. 377–386, Feb. 2020, doi: 10.1162/qss\_a\_00019.
- [54] A. Maulani and R. Widuri, "Bibliometric analysis: adoption of big data analytics in financial auditing," *Business Informatics*, vol. 18, no. 2, pp. 78–89, 2024, doi: 10.17323/2587-814X.2024.2.78.89.
- [55] A. Ahmi, "biblioMagika." [Online]. Accessed Sep. 03, 2024h. Available: <https://bibliomagika.com/>
- [56] R. De Jong and D. Bus, "VOSviewer: putting research into context," *Research Software Community Leiden*, 2023, doi: 10.21428/a1847950.acdc99d6.
- [57] S. van Hooland, R. Verborgh, and M. D. Wilde, "Cleaning data with OpenRefine," *The Programming Historian*, no. 2, Aug. 2013, doi: 10.46430/phen0023.
- [58] J. Li and R. Wei, "VOSviewer application status and its knowledge base," *Journal of Library and Information Science in Agriculture*, vol. 34, no. 6, pp. 61–71, 2022, doi: 10.13998/j.cnki.issn1002-1248.21-0843.
- [59] N. J. van Eck and L. Waltman, *VOSviewer manual: manual for VOSviewer version 1.6.14*. Leiden, The Netherlands, Jan. 27, 2020.
- [60] D. Spurk and C. Straub, "Flexible employment relationships and careers in times of the COVID-19 pandemic," *Journal of Vocational Behavior*, vol. 119, no. 103435, 2020.
- [61] C. W. Rudolph, K. N. Lavigne, and H. Zacher, "Career adaptability: a meta-analysis of relationships with measures of adaptivity, adapting responses, and adaptation results," *Journal of Vocational Behavior*, vol. 98, pp. 17–34, 2017, doi: 10.1016/j.jvb.2016.09.002.
- [62] S. McArdle, L. Waters, J. P. Briscoe, and D. T. (Tim) Hall, "Employability during unemployment: adaptability, career identity and human and social capital," *Journal of Vocational Behavior*, vol. 71, no. 2, pp. 247–264, 2007, doi: 10.1016/j.jvb.2007.06.003.
- [63] R. DeMartino and R. Barbato, "Differences between women and men MBA entrepreneurs: exploring family flexibility and wealth creation as career motivators," *Journal of Business Venturing*, vol. 18, no. 6, pp. 815–832, 2003, doi: 10.1016/S0883-9026(03)00003-X.
- [64] A. Hirschi, "Career adaptability development in adolescence: multiple predictors and effect on sense of power and life satisfaction," *Journal of Vocational Behavior*, vol. 74, no. 2, pp. 145–155, 2009, doi: 10.1016/j.jvb.2009.01.002.
- [65] L. M. Leslie, C. F. Manchester, T.-Y. Park, and S. A. Mehng, "Flexible work practices: a source of career premiums or penalties?" *Academy of Management Journal*, vol. 55, no. 6, pp. 1407–1428, Dec. 2012, doi: 10.5465/amj.2010.0651.





- [66] P. J. Rottinghaus, S. X. Day, and F. H. Borgen, "The career futures inventory: a measure of career-related adaptability and optimism," *Journal of Career Assessment*, vol. 13, no. 1, pp. 3–24, 2005, doi: 10.1177/1069072704270271.
- [67] H. Zacher, "Career adaptability predicts subjective career success above and beyond personality traits and core self-evaluations," *Journal of Vocational Behavior*, vol. 84, no. 1, pp. 21–30, 2014, doi: 10.1016/j.jvb.2013.10.002.

## BIOGRAPHIES OF AUTHORS







**Sangin Juat**     is a lifelong member of the Malaysian Educational Counselors Association (LM4125) and also a licensed and registered counselor (K.B:04207; P.A:03502) with the Malaysian Board of Counselors. He is presently enrolled at the University of Malaysia Sarawak to pursue his Doctorate in Counseling under the sponsorship of the Ministry of Education of Malaysia. Despite having more than 13 years of experience in the vocational college setting, managing the employability (tracer study) of his students, his enthusiasm persisted as he pursued further education in career counseling under the sponsorship of the Ministry of Education Malaysia. He is more engaged in career counseling now as he realizes the importance of career maturity and career resilience. He can be contacted at email: sanginjuat83@gmail.com.



**Amalia Madihie**     is a counselor educator. She is a registered counselor (K.B:0305; P.A:0200) with the Malaysian Board of Counselors and a lecturer in the Counseling Programme, Faculty of Cognitive Sciences and Human Development, University of Malaysia Sarawak, and currently serves as dean. She actively pursues her research interests in resilience studies with local and international partners, and her extensive contributions to research, publications, innovation, and commercialization. She has made significant strides in her field as the author of Resilient Therapy Intervention and REBT Therapy Intervention focusing on self-concept among adolescents. She can be contacted at email: mamalia@unimas.my.



**Salleh Amat**     is a lecturer of counseling at the School of Education, National University of Malaysia. He is a respectable counselor educator. He earned a Bachelor of Education and Master of Education in Counseling from the University Putra Malaysia and National University of Malaysia. He got his PhD in Counseling Supervision from Wyoming University in 2006. He has been member of the Malaysian Board of Counselors since 2013. He is a licensed and registered counselor (KB:01469; PA:01099) in Malaysia. He conducts research on mental health and emotional well-being and community service. He directs the Career Advancement Centre (UKM-Karier), which helps university students find jobs, set career objectives, and network. He can be contacted at email: sallehba@ukm.my.