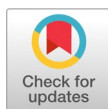


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A Bibliometric Analysis of Employee Polychronicity, Psychological Capital, and Employee Innovation Performance: Suggesting a Policy Framework for Organizations

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Abstract

This study is focused to identify the global research trends, themes, and research networks based on employee polychronicity, psychological capital (self-efficacy and emotional stability), and employee innovation. Bibliometric data of research articles published worldwide between 1983 and 2025 were extracted from the Scopus database. A total of 1032 papers were selected and reviewed. Descriptive analysis was conducted using RStudio to discover authors, the most productive institutions, nations, and periodicals. The most influential themes were identified via VOSviewer's keyword co-occurrence analysis and Bibliometrix (R package). Different bibliometric analysis techniques were used, such as annual scientific production, tree map analysis, Sankey diagram, and keyword co-occurrence network visualization. The results showed that China has contributed mostly in the literature of employee polychronicity, psychological capital, and innovation performance. There are four main clusters in the bibliometric analysis: i)- innovation, technology, and behavioural dynamics in organizations and education, ii)- competence, learning practices, education and innovation iii)- training and development and healthcare education, iv)- technology-enabled education and academic outcome. The limitation of this analysis is that it only considers one database, that is, Scopus. Still, it suggests areas for future research and provides research mapping to help identify the current advances in employee polychronicity, psychological capital, and innovation literature.

Keywords: emotional stability, employee polychronicity, innovation performance, psychological capital, self-efficacy

Introduction

Psychological capital is an employee's positive psychological resource theoretically associated with employee innovation and stress (Luthans et al.,

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[2007](#)). People with high psychological capital make deliberate efforts to come up with innovative ways to achieve their objectives. According to Avey et al. ([2009](#)), psychological capital is a higher-order element at the individual level that encourages change and is connected to constructive organizational transformation. People with significant psychological capital have a good outlook regarding the future (emotional stability), positive attribution, as well as the confidence (self-efficacy) required to achieve the desired goals. Therefore, by broadening their horizons and enabling them to use their willpower and way power to achieve their goals despite early failures and setbacks, these positive psychological resources may encourage employees to display innovative behaviours (Avey et al., [2009](#); Luthans et al., [2007](#)). Positive-minded workers may not only be able to come up with creative ideas, but they may also be able to get assistance from their peers to turn such ideas into practical workplace applications (Luthans et al., [2011](#)). Similarly, psychological capital is the positive attitude of employees that encourages them to expound innovative and unique ideas (Rego et al., [2012](#)). According to Abbas and Raja ([2015](#)), people with high psychological capital are also capable of coming up with innovative ideas, mobilizing support for them, and putting them into practice at work.

The practice of employees engaging in multiple but related tasks simultaneously is known as employee polychronicity (Jang & George, [2012](#)). According to a study on nurses by Anser et al. ([2022](#)), nurses with polychronic behaviour are in a position to better manage their work and resist challenging situations. So, employee polychronicity is an attitude of the employees that provides the bases for improvement in employee resilience. Indeed, multitasking ability (polychronicity) of employees makes them more resilient and they are able to bounce back from challenging situations in banking organizations (Samarin et al., [2024](#)). Further, employee polychronicity allows workers to handle a variety of complex activities simultaneously, which improves their resilience, tolerance, and patience (Schell & Conte, [2008](#)). According to a study conducted from the viewpoint of hospitals, nursing positions are extremely delicate and variations in workload are common; as a result, polychronic capacity is always crucial for novel ideas (Ding et al., [2019](#)).

According to Sanjram and Khan ([2011](#)), polychronicity provides a

behavioural framework that promotes the effective management of multiple activities simultaneously, enabling individuals to boost their creative processes and build new work routines that contribute to organizational effectiveness. Hence, bibliometric studies in the field of employee polychronicity, psychological capital, and employee innovation performance are needed to identify major research trends and directions for future researchers. Therefore, this study is aimed to find the answer of the following research questions:

RQ1: How have publishing patterns in studies on psychological capital, innovation performance, and staff polychronicity evolved over time?

RQ2: Who are the most prominent contributors (authors, journals, nations) and what are the most commonly used keywords in this field?

RQ3: What are the current research themes and future directions in the areas of employee polychronicity, psychological capital, and innovation performance?

In today's fast changing business climate, businesses must actively encourage employee innovation, which immediately improves performance and allows enterprises to remain competitive and adaptive (Tran et al., [2025](#)). So, it is necessary to identify the factors or forces that may enhance employee innovation. Therefore, the link between employee polychronicity, psychological capital, and innovation performance is to be identified with the help of bibliometric approach. The literature on employee polychronicity, psychological capital (self-efficacy, emotional stability), and innovation performance is limited and should be analyzed to identify future trends, themes, and global research networks to clearly suggest directions for future research.

Literature Review

Psychological Capital

According to Cole ([2006](#)), psychological capital includes emotional stability, control points, self-efficacy, and self-esteem. Psychological capital is defined as a mental condition in which a person can identify with themselves, believe in their knowledge and abilities, and enjoy a reasonably stable emotional state. This study distinguishes psychological capital into two distinct categories: emotional stability and self-efficacy (Liu et al., [2023](#)).

Self-efficacy (SE) is the level of confidence in one's own skills and aspirations for the future. People with a strong educational background and future educational plans can give themselves the confidence to overcome difficulties when they arise and the fortitude to tackle challenges head-on. Self-efficacy is the capacity to make the necessary effort to complete challenging tasks, according to Luthans et al. ([2007](#)).

Emotional Stability (ES)

The ability of an individual to maintain stability and balance in the face of stress, pressure, or adversity is known as emotional stability (McCrae, [2020](#)). It affects employees' job satisfaction, which causes them to pay attention to their own obligations and identify with and trust their respective leaders and organizations. Calmness, stress tolerance, and lack of enduring negative feelings are traits of emotionally stable people (Judge and Bono, [2001](#)).

Employee Polychronicity

Polychronicity is the degree to which people choose to engage in two or more tasks simultaneously (Bluedorn et al., [1999](#)). It is the propensity for multitasking, or the extent to which people wish to engage in two or more things at once (Lindquist & Kaufman, [2007](#)). Employees with polychronicity believe that they are better at doing multiple tasks at one time than doing just one and the term was initially used to explain why people prefer to do multiple tasks at the same time (Vizcaíno et al., [2021](#)). People that are polychronic like to work on multiple projects simultaneously and switch between them, rather than concentrating on one problem alone (Magen, [2017](#)). At any given moment, polychronic workers combine multiple tasks and handle associated interruptions to maximize productivity (Anser et al., [2022](#)). Arndt et al. ([2006](#)) gives cultural perspective of polychronicity and states that it is an individual and cultural tendency to perform multiple tasks at the same time.

Employee Innovation Performance

Individuals or groups can initiate innovation, which involves starting with an idea, improving it, and resulting in a novel product, process, or service (Thornhill, [2006](#)). Employee innovation performance, according to Janssen and Yperen ([2004](#)), is the deliberate creativity, development, and

implementation of creative ideas inside an employment position, group, or organization in order to improve job performance, group performance, or organizational performance. Companies in fast-paced contexts must quickly develop innovative products and services, necessitating strong implementation of innovation efforts (Wang & Hu, [2020](#)).

Following a sequence of inventive behaviors, innovation performance presents a comprehensive evaluation of the genuine effectiveness of innovative subjects (Nazari et al., [2021](#)). Ma and Wang ([2023](#)) highlighted that in today's society, innovation is critical to the success and survival of every firm. Employee innovation is a particularly important source of organizational innovation. In this regard, corporations and academics have repeatedly focused on innovation performance (Xu et al., [2023](#)). According to Yeşil and Doğan ([2019](#)), the complex and competitive nature of today's business environment drives organizations to prioritize innovation and innovation capabilities. Innovation must be both novel and beneficial in order to be adopted as a new company model. Since it is the primary means by which a company gains competitive advantage, it remains critical to its growth (Fernandez-Mesa & Alegre, [2015](#)).

The amount of research available on employee polychronicity, psychological capital (self-efficacy and emotional stability), and innovation performance has grown significantly, yet it remains conceptually fragmented and methodologically contradictory. Most studies take a narrow, variable-centered approach, focusing on single interactions while ignoring the field's larger intellectual structure and linkages. This has resulted in a dearth of cumulative information, inadequate theoretical integration, and ambiguity about major research issues and new directions. Furthermore, narrative reviews are frequently subjective and do not properly capture the growth of research patterns or the impact of significant contributors. Given these constraints, a bibliometric approach is both acceptable and required. By providing a systematic, clear, and empirical mapping of the available literature, bibliometric analysis allows for the discovery of knowledge gaps, theme development, and collaborative patterns, thus creating a solid platform to further employee innovation research.

The research on employee polychronicity, psychological capital, and innovation performance has grown significantly, yet it remains conceptually fragmented and methodologically contradictory. Most studies take a narrow, variable-centered approach, focusing on single interactions while ignoring

the field's larger intellectual structure and linkages. Although the current literature provides a thorough grasp of key concepts, such as employee polychronicity, psychological capital (self-efficacy and emotional stability), and innovation performance, there is a lack of a systematic synthesis of how these themes have evolved over time and across various research contexts. Given the rapid growth of studies conducted in this field, bibliometric analysis is especially useful to identify publishing patterns, key authors, annual research production, and emerging research issues. Hence, conducting a bibliometric study is justified in order to provide a comprehensive overview of the research ecosystem, revealing hidden patterns, and guiding future research paths in boosting employee innovation.

Methodology

Bibliometric analysis is an important technique to assess the scientific outcomes of research publications, organizations, authors, journals, keywords, and countries in any field of study. It also aids in comprehending the evolution of conceptual, social, and intellectual frameworks over time. Bibliometric analysis has gained popularity in academic research in recent years. It has a significant influence on research and is helpful in handling vast amounts of scientific data. Numerous factors contribute to this popularity, such as the development, accessibility, and availability of scientific databases including Web of Science, Scopus, and Google Scholar, as well as that of bibliometric tools including R studio and VOS viewer. Its widespread use has been significantly impacted also by its multidisciplinary influence, which extends from operational research to data science (Doulani, [2021](#)). Bibliometric analysis in scientific study can be defined as the endeavour to handle enormous volumes of data using conceptualization, illustrating trends and a field's structural composition. This assessment can be comprehensive in terms of intellectual structure, co-authorship patterns, and trends because it includes the quantitative aspects of the literature, such as citation counts. This approach seems especially appropriate for more thorough reviews based on an abundance of data, such as mapping a study field, identifying significant publications, authors, and journals that influence debate, and understanding how research topics emerge and evolve over time (Passas, [2024](#)).

Bibliometric analysis may methodically and comprehensively grasp the

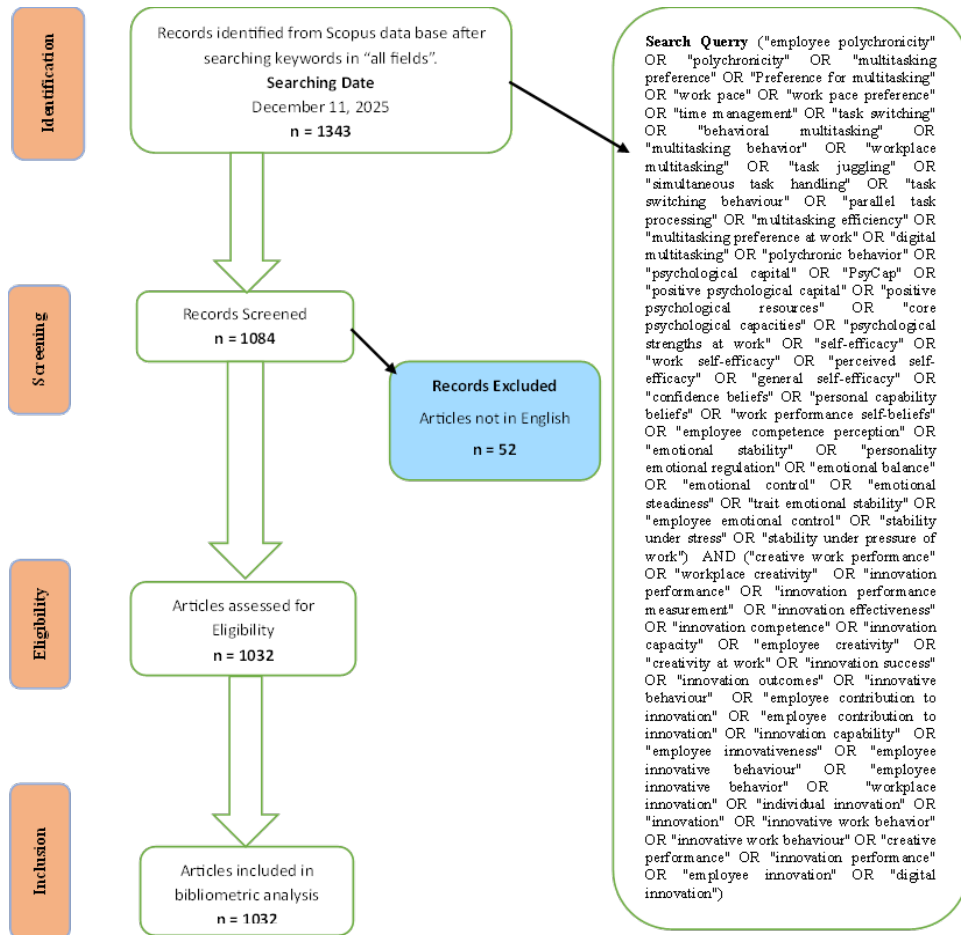
true structure of any field, its progressive shifts in evolution, the research clusters (themes) that describe it, developing trends, and a broader comprehension of the important concepts and their linkages within the field (Kraus et al., [2024](#)). As a result, bibliometry is becoming increasingly popular among academics. One of the most significant factors to conduct successful and reliable bibliometric analysis is careful keyword selection. For this reason, we began by collecting terms related to employee polychronicity, psychological capital (self-efficacy and emotional stability), and innovation performance. Next, the Boolean operator AND was used to combine the phrases in both directions before searching the Scopus database.

The query related to the study's key terms were searched in the Scopus database for authors, title, keywords, and abstract field. The data was retrieved on December 11, 2025 ("employee polychronicity" OR "polychronicity" OR "multitasking preference" OR "Preference for multitasking" OR "work pace" OR "work pace preference" OR "time management" OR "task switching" OR "behavioral multitasking" OR "multitasking behavior" OR "workplace multitasking" OR "task juggling" OR "simultaneous task handling" OR "task switching behaviour" OR "parallel task processing" OR "multitasking efficiency" OR "multitasking preference at work" OR "digital multitasking" OR "polychronic behavior" OR "psychological capital" OR "PsyCap" OR "positive psychological capital" OR "positive psychological resources" OR "core psychological capacities" OR "psychological strengths at work" OR "self-efficacy" OR "work self-efficacy" OR "perceived self-efficacy" OR "general self-efficacy" OR "confidence beliefs" OR "personal capability beliefs" OR "work performance self-beliefs" OR "employee competence perception" OR "emotional stability" OR "personality emotional regulation" OR "emotional balance" OR "emotional control" OR "emotional steadiness" OR "trait emotional stability" OR "employee emotional control" OR "stability under stress" OR "stability under pressure of work") AND ("creative work performance" OR "workplace creativity" OR "innovation performance" OR "innovation performance measurement" OR "innovation effectiveness" OR "innovation competence" OR "innovation capacity" OR "employee creativity" OR "creativity at work" OR "innovation success" OR "innovation outcomes" OR "innovative behaviour" OR "employee contribution to innovation" OR "employee contribution to innovation" OR "innovation capability" OR "employee innovativeness" OR "employee

innovative behaviour" OR "employee innovative behavior" OR "workplace innovation" OR "individual innovation" OR "innovation" OR "innovative work behavior" OR "innovative work behaviour" OR "creative performance" OR "innovation performance" OR "employee innovation" OR "digital innovation").

The database contained 1343 articles related to a study topic. The maximum search timeframe was from 1983 to 2025. The search timeframe included the most recent year, that is, 2025. The query was executed on December 11, 2025. The data extraction date was utilized to get early access to research publications, published articles, and articles available online. Social sciences were identified as the key scientific focus. Additionally, the search only included journal articles. Furthermore, the research only accepted documents in English. Finally, 1032 articles met the inclusion criteria of the study and were selected for further examination. Figure 1 depicts how articles were selected and arranged. After gathering and arranging bibliographic data, tools for analysis and visualization were utilized. These tools were used to extract patterns, relationships, and trends from bibliographic data and present them in a user-friendly visual format. VOSviewer is a popular tool used for creating bibliometric maps, also known for its broad visualization features and user-friendly interface. Bibliometrix, an open-source R tool, provides broad bibliometric analysis. It allows for subject grouping, citation analysis, co-citation mapping, and data filtering all in one framework (Kumar, [2025](#)).

Figure 1
Data Gathering Flow Chart (PRISMA Flow Chart)



Results and Discussion

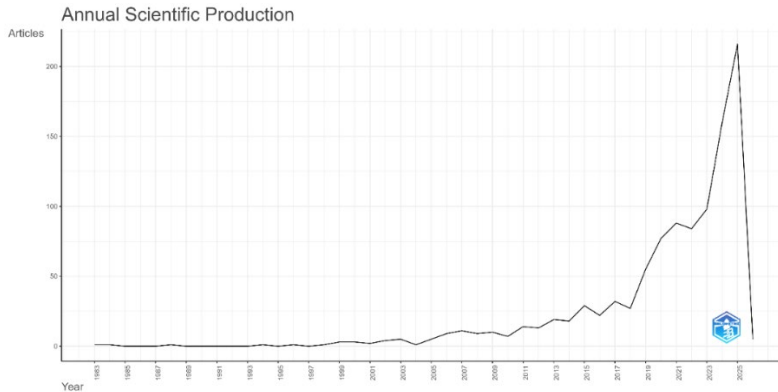
Annual Scientific Production of Research Articles

Annual scientific production (Figure 2) shows a clear upward trend, with limited output prior to 2004, modest development from 2004 to 2017, and a significant gradual rise after 2018. The peak publication production occurred in 2024, suggesting continued research interests in the topic. The apparent dip in 2025 is most likely due to inadequate data instead of a drop in research activities. Overall, the pattern depicts the field's evolution from an emerging issue to a widely recognized and rapidly developing area of

study.

Figure 2

Publication Trends on Employee Polychronicity, Psychological Capital, and Innovation Performance



Most Productive Countries

The visualization in Figure 3 depicts the research produced by several countries. Bold hues show the country with the most publications. China remains the major contributor in the field (645), closely followed by the USA (533), and distantly by Malaysia (145), Indonesia (148), Spain (140), the United Kingdom (105), India (86), Thailand (86), Australia (83), and the Netherlands (79). Table 1 provides further information regarding these outcomes.

Figure 3

Most Relevant Countries

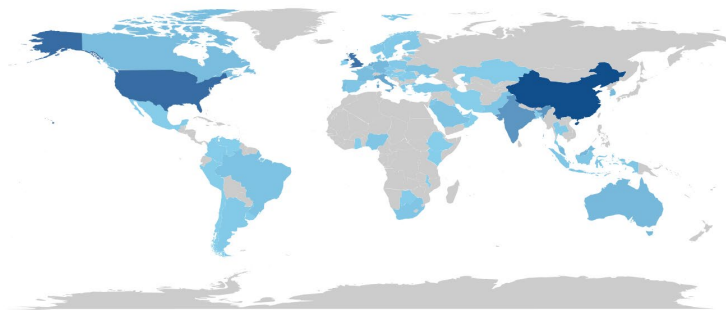


Table 1*Country Wise Number of Research Articles*

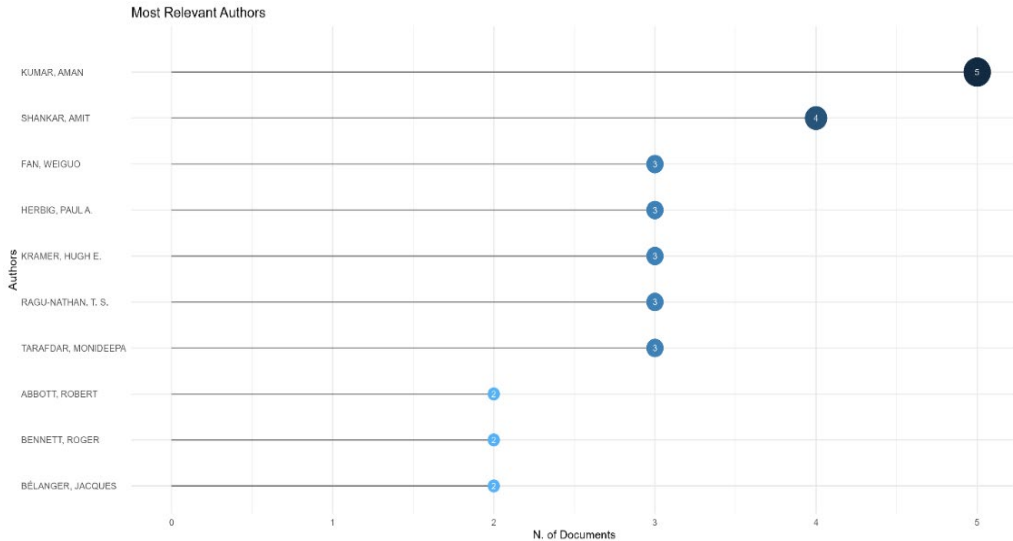
Country	No. Of Articles
China	645
Usa	533
Malaysia	175
Indonesia	148
Spain	140
Uk	105
India	86
Thailand	86
Australia	83
Netherlands	79

Table 1 displays the number of publications on employee polychronicity, psychological capital, and innovation performance. Asian and Western countries make up the majority of the scholarly contributions on the topic.

Most Relevant Authors

Figure 4 illustrates the most relevant writers or scholars. The graph reveals that Kumar, Aman has published 05 articles, Shankar, Amit has published 04 articles, Fan, Weiguo has published 03 articles, Herbig Paula has published 03 articles, Kramer, Hugh E has published 03 articles, Ragu-Nathan. T. S. has published 03 articles, Tarafdar, Monideepa has published 03 articles, Abbot Robert has published 02 articles, Bennet, Roger has published 02 articles, and Belanger, Jacques has published 02 articles in the field of employee polychronicity, psychological capital, and innovation performance.

Figure 4
Most Relevant Authors



Most Relevant Sources

Table 2 depicts the top 10 most productive journals in the field of employee polychronicity, psychological capital (self-efficacy and emotional intelligence), and innovation performance. The journal “Sustainability” with 64 articles is at the top in the ranking. The “Journal of Creative Behavior” has published 21 articles. Whereas, 19 articles have been published in the journal “Behavioral Sciences” and the same number of articles have been published in the journal “Nurse Education Today” and “Thinking Skills and Creativity” respectively. While, “International Journal of Management Education” has published 16 articles. Similarly, the journal “Frontiers in Education” has also published 16 articles.

Table 2
Most Productive Journals

Sources/Journals	No. of Articles
Sustainability (Switzerland)	64
Journal of Creative Behavior	21
Behavioral Sciences	19
Nurse Education Today	19

Thinking Skills and Creativity	19
International Journal of Management Education	16
Frontiers in Education	13
Education Sciences	12
Journal Of Open Innovation: Technology, Market, and Complexity	12
International Journal of Innovation And Learning	11

Most Cited Documents

Table 3 lists the most cited articles along with their overall number of citations. According to the chart, cooperation between Asian and western countries in the areas of employee polychronicity, psychological capital (self-efficacy and emotional stability), and innovation performance is important for scholars. Simultaneously, research in these areas remains critical for the development of multi-tasking, as well as a self-efficient, emotionally stable, and inventive workplaces.

Table 3

Articles with No. of Citations

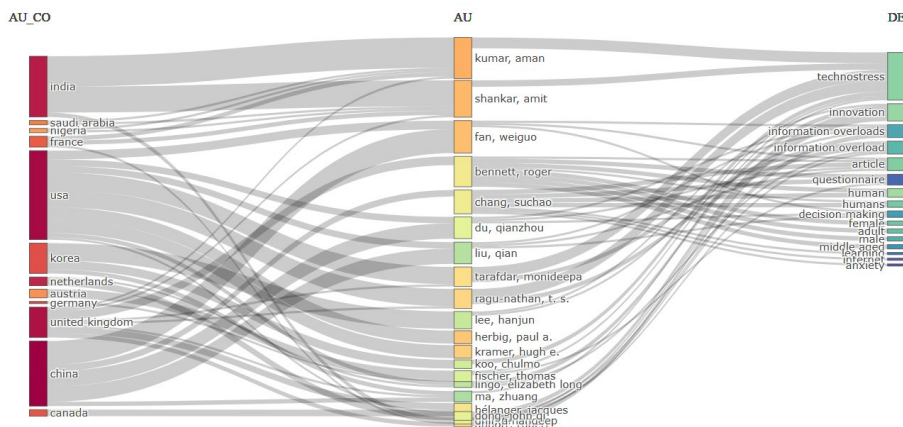
Paper Title	Total No. of Citations
Examining the students' behavioral intention to use e-learning in Azerbaijan? The General Extended Technology Acceptance Model for E-learning approach	421
Linking transformational leadership and employee creativity in the hospitality industry: The influences of creative role identity, creative self-efficacy, and job complexity	381
High-Fidelity Simulation and the Development of Clinical Judgment: Students Experiences	352
An empirical investigation of students' behavioral intentions to use the online learning course websites	335
Toward a Model of Explaining Teachers' Innovative Behavior: A Literature Review	321
Academic Leadership in a Time of Crisis: The Coronavirus and COVID-19	311
Adopting evidence-based practice in clinical decision making: nurses perceptions, knowledge, and barriers	306
Burnout and self-efficacy: A study on teachers beliefs when implementing an innovative educational system in the Netherlands	293
Helping to improve suggestion systems: predictors of making	291

Sankey Diagram

Investigating the relationships among essential keywords (or themes), nations, and authors can reveal valuable evidence. **Figure 5** shows a Sankey diagram that analyses three domains (keywords, authors, and countries) of the literature on employee polychronicity, psychological capital (self-efficacy and emotional stability), and innovation performance. This graph depicts the most significant links between the countries of the authors (on the left), the researchers (in the middle), and relevant keywords. The analysis reveals the most often used keywords used by writers and major countries in the selected fields.

Figure 5

Three-Field Plot Analysis: Link Between Keywords, Authors, and Countries.

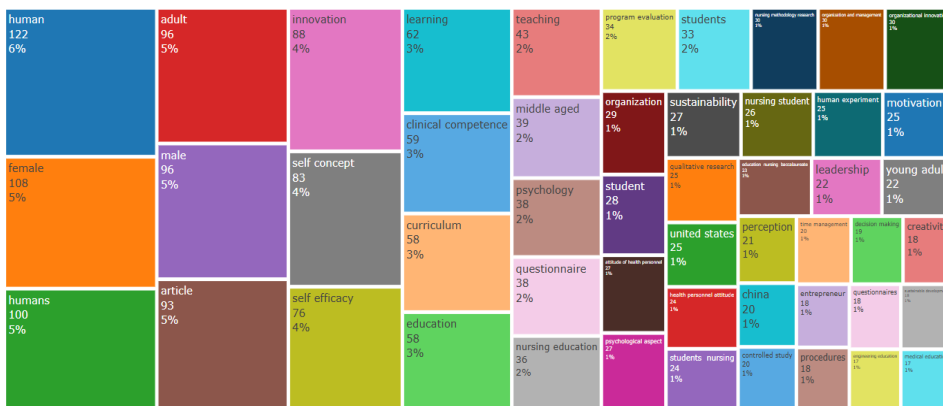


Tree Map Visualization

Tree Map analysis (Nailah & Rusydiana, 2020) is a technique used to display the most common key terms in the collected data. **Figure 6** depicts the Tree Map which illustrates the terms that appear often in the chosen research publications on employee polychronicity, psychological capital (self-efficacy and emotional stability), and innovation performance.

Keywords such as “human”, “female”, “humans”, “adult”, “male”, “article”, “innovation”, “self-concept”, “self-efficacy”, “learning”, “clinical competence”, “curriculum”, “education”, and “teaching” are the most recurrent words in the selected 1032 articles, appearing 122 times (6%), 108 times (5%), 100 times (5%), 96 times (5%), 96 times (5%), 93 times (5%), 88 times (4%), 83 times (4%), 76 times (4%), 62 times (3%), 59 times (3%), 58 times (3%), 58 times (3%), and 43 times (2%), respectively. These terms are frequently used, which indicates that employee polychronicity and psychological capital (self-efficacy and emotional stability) are linked to human adults, learning, and innovation. In the end, employee polychronicity and psychological capital (self-efficacy and emotional stability) are linked to the transmission of innovation among employees [A].

Figure 6
Tree Map Analysis

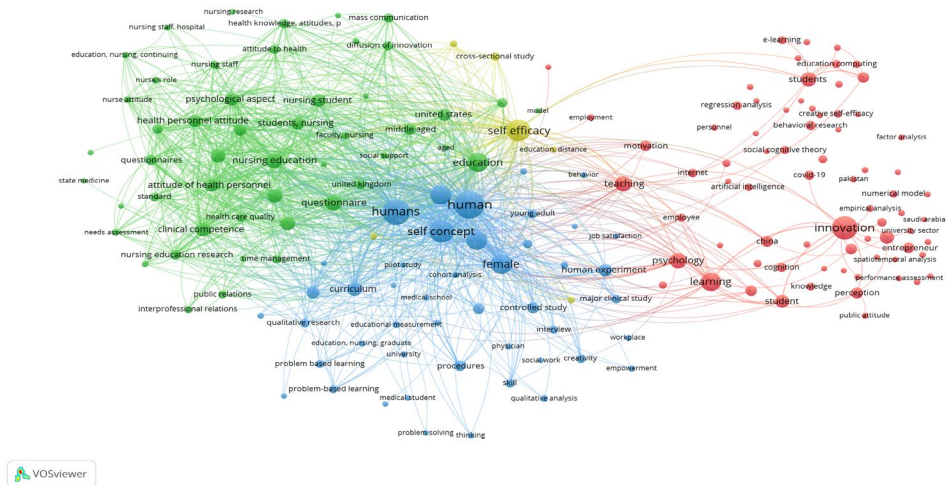


Thematic Analysis

Co-Occurrence of Key Words Analysis

Figure 7 illustrates a study of the keyword co-occurrence network (built in VOSviewer) based on how frequently a specific keyword appeared in the 1032 articles. The trending terms can be easily understood by examining keyword co-occurrence. This network is made up of four keyword clusters of the connected subjects, each with its own colour (Gao et al., 2021). The size of the circle in the co-occurrence network indicates the number with which a given term appeared in the articles. The wider the circle, the more frequently a word appears in the published works.

Figure 7
Keyword Co-Occurrence Network Analysis



Cluster 1 (Red) Innovation, Technology, and Behavioral Dynamics in Organizations and Education: The cluster incorporates behavioral and psychological constructs (e.g., e-learning, artificial intelligence, technological innovation, information technology, technology acceptance/adoption), educational research (e.g., academic performance, higher education, curriculum, teaching, students), and technology and innovation themes. A strong quantitative and empirical orientation, frequently based on well-established theoretical frameworks (conceptual framework, theoretical study), is indicated methodologically by the use of terms like regression analysis, structural equation modelling, factor analysis, questionnaire surveys, and empirical analysis. This cluster connects economic and sustainability issues, such as SMEs, industrial enterprises, employment, sustainability, and sustainable development, with innovation management (knowledge sharing, information management, innovation adoption, and innovativeness) and knowledge creation at the organizational and societal level. This cluster also highlights the link of literature with different countries including China, Pakistan, Saudi Arabia, and Taiwan. It indicates a comparative as well as emerging economies trend or perspective that highlights the applicability of the topic universally. Over all, this cluster depicts how innovation techniques in organizations and

digital technology adoption affect the behaviour of an individual in businesses and educational institutions. The cluster implies that technology (e.g., digital tools, artificial intelligence, e-learning platforms) serves as an enabling tool but its efficacy is determined by how individuals and organizations adopt and use it.

Cluster 2 (Green): Competence, Learning Practices, Education and Innovation: This cluster appears with green dots in **Figure 7**. It highlights the concentration of the literature on service organizations and healthcare education. Further, it elaborates constructs like “nursing students”, “nursing”, “nursing education”, “nursing staff”, “clinical competence”, and “nurse’s role”, which comprise the main themes of this cluster. These themes highlight the importance of the training of medical professionals, such as nursing staff. Similarly, this cluster also emphasizes attitudinal and psychological aspects including health professionals’ attitudes, decision-making, nurse attitudes and how their personal behaviors, beliefs, and attitudes influence the learning of employees. The emphasis of the cluster also remains on quality-oriented and evidence-based healthcare on the basis of terms like “evidence-based practice”, “health care quality”, “standard medicine”, “evaluation”, and “needs assessment”. The use of terms such as “innovation”, “diffusion of innovation”, and “learning” indicates that the healthcare sector is paying attention to learning and innovation practices, policies, and procedures. From the methodological perspective, the terms “assessments”, “questionnaire”, and “models” highlight the focus of the literature on quantitative or empirical research in health care systems and institutions. Furthermore, the terms “middle aged” and “aged” depict that most of the researchers in this field are either middle aged or belong to aged groups. This cluster also highlights some geographic indicators like “UK”, “California”, and “USA”. It indicates that the research in the field of employee polychronicity, psychological capital, and innovation performance is focused on middle aged and aged population of different countries like UK, USA, and the state of California. As a whole this cluster explains that literature focus remains on how healthcare quality suffers due to organizational, attitudinal, and educational elements and ultimately innovation affects. The clustering of competency, learning methods, education, and innovation shows a capability-driven perspective in which innovation results from continual knowledge acquisition and skill growth. According to the findings, competences (both at the organizational and human levels) form the foundation of inventive capacity, with organized

learning practices serving as the mechanism for developing and refining these abilities. The addition of education emphasizes the antecedent role of educational and training institutes in developing innovation capability, while emphasizing the importance of matching educational outcomes to industry demands. Furthermore, the interdependence of these factors shows a dynamic cycle in which learning promotes competence, competence permits creativity, and innovation, in turn, reinforces the learning process and develops new knowledge.

Cluster 3 (Blue) Training and Development and Healthcare Education: The keywords appearing in blue colour in Figure 7 including “male”, “female”, “adult”, “physician”, “medical student”, and “medical school” highlight that the cluster is focused on the students of medical or healthcare educational institutions. Similarly, the words “curriculum”, “mentoring”, “problem-based learning”, and “procedures” highlight that the literature is focused on medical education curriculum, learning, and mentoring. The focus of the cluster remains on learning practices and improving the performance of students by education and training in the healthcare sector. This cluster reveals a sector-specific road to innovation, with continual professional learning serving as a crucial driver of capability improvement. In contrast to clusters focused on general education, this theme highlights the value of continuous, practice-oriented training in turning knowledge into good healthcare results. According to the findings, adaptive training methods that allow professionals to constantly update their abilities in response to advances in technology and shifting clinical practices help to sustain innovation in healthcare. Furthermore, the use of technology in training, such as virtual reality and digital learning tools, demonstrates that innovation is incorporated not just in healthcare service but also in pedagogical approaches to professional preparation.

Cluster 4 (Yellow) Technology-Enabled Education and Academic Outcome: The keywords in this cluster are “adolescent”, “distance”, “computer-assisted instruction”, “cross-sectional studies”, “self-efficacy”, and “education”. These keywords highlight that most of the literature is focused on digital tools and technology-enabled education for middle or high schoolers. It also emphasizes that most of the researchers are familiar with distance learning, e-learning, and online learning with technological usage. The key term "cross-sectional studies" depicts that most of the

The Biblioshiny platform was used to find the most relevant terms and create a thematic map in the areas of employee polychronicity, psychological capital (self-efficacy and emotional stability), and innovation performance in 1032 articles. **Figure 8** depicts a Word Cloud analysis performed utilizing the Biblioshiny platform. The words that cover a large area in Figure 8 remain the most repeated keywords in the literature. These include “human”, “humans”, “innovation”, “learning”, “self-concept”, “self-efficacy”, “education”, “health personnel attitude”, “clinical competence”, “questionnaire”, and “article”. These terms depict that the literature is focused on quantitative studies on healthcare professionals and learning and innovation practices in the healthcare education sector.

Word Cloud of Employee Polychronicity, Self-efficacy, Emotional Stability, and Innovation (Generated with Biblioshiny)



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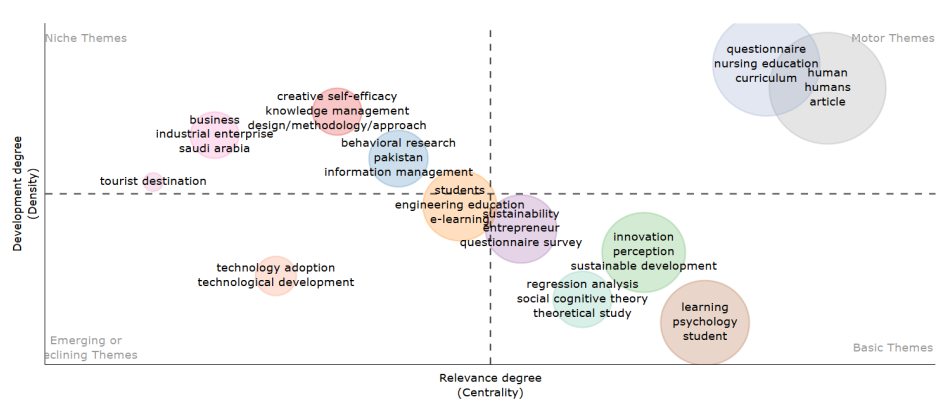
explicates that most of the research has been conducted on healthcare professionals, their attitudes, competences, and behaviors. Further, most of the studies remain quantitative and questionnaire-based.

Thematic Map

Thematic map in **Figure 9** shows four quadrants with high centrality and high density and low centrality and low density. The most common themes are “human”, “humans”, “questionnaire”, “curriculum”, “nursing education”, and “article”. These themes are well-developed and central with strong coherence to other subjects. These themes highlight that the literature is focused on research on nursing education and curriculum and most of the literature is quantitative in nature or questionnaire or survey based. The strong methodological direction toward empirical measurement of educational outcomes is reflected in motor themes which emphasize survey-based research on nursing education and curriculum as the predominant and the most developed area. The bottom right quadrant of Figure 9 depicts the themes with low density and high centrality. The themes are “innovation,” “perception,” “sustainable development,” “learning,” “psychology,” “student,” “regression analysis,” “social cognitive theory,” and “theoretical study.” These are basic ideas that are frequently linked in research but have not yet been theoretically solidified. Although these concepts are frequently used, they remain theoretically fragmented and present a significant opportunity for further conceptual development. This is demonstrated by the high relevance but low density of basic themes including innovation, student learning, perception, and sustainability. This is a research gap. The top left quadrant in Figure 9 depicts the niche themes with high concentration (density) and low importance (centrality). The themes are “creative self-efficacy,” “knowledge management,” “behavioural research,” “design/methodology/ approach,” “industrial enterprise,” “Saudi Arabia,” “Pakistan,” and “information management.” These themes are methodologically sound but remain context-specific, frequently managerial, or country-focused. Specialized study streams are suggested by niche themes such as knowledge management, creative self-efficacy, and country-specific studies (Pakistan, Saudi Arabia) that show strong internal development but little integration with the larger literature. The bottom left quadrant in Figure 9 shows the themes with low density and low centrality. The themes are “technology adoption,” “technological development,” and

“tourist destination.” These seem to be underdeveloped and poorly connected; they are either early-stage subjects or fields that are losing scholarly interest. Technology development and adoption seem to be new or possibly waning issues, suggesting either a lack of study focus in this area or early-stage investigation. Whereas, the central themes near the middle of the thematic map show the themes “students,” “engineering education,” “e-learning,” “sustainability,” “entrepreneur,” and “questionnaire survey.”

Figure 9
Thematic Map (Generated with Biblioshiny)



A developed and important research stream is indicated by the thematic map, which shows that survey-based nursing education and curricular studies make up the major themes. There are a lot of prospects for theoretical growth because basic subjects including innovation, student learning, perception, and sustainable development show considerable relevance but low conceptual density. Similarly, the thematic map also highlights niche themes including creative self-efficacy, knowledge management, and geographically diverse studies including studies from Saudi Arabia and Pakistan. At the end, the map also depicts underdeveloped themes or topics such as technological advancement and technological adoption that should be addressed in future research.

Research Implications and Policy Recommendations

Theoretical Implications

As mentioned earlier, bibliometric studies are very rare in the areas of

employee polychronicity, psychological capital (self-efficacy and emotional stability), and innovation performance. So, this study adds to the existing literature by providing a bibliometric analysis in the form of word cloud analysis, thematic map, Sankey diagram, most contributing countries, and co-occurrence of keywords analysis. It also highlights the significance of individual cognitive capabilities, especially creative self-efficacy, to develop an innovative culture in healthcare organizations as technologically driven organizations. Additionally, if the organizations want to promote an innovative work environment, then knowledge management and information management practices should be enhanced. Similarly, some themes like sustainability, digital learning, and entrepreneurship explain the literature's concerns about human capital development and the adoption of technological advancements.

Practical Implications

Based on themes like creative self-efficacy and innovation perception; organizations should focus to make efforts on policies which promote innovation by focusing on employee autonomy, psychological safety, and experimentation. To improve innovative behavior in organizations, the organizations should introduce creativity and innovation workshops, continuous mentoring programs, and acknowledgement schemes. They can also introduce skill development programs, training workshops, digital literacy seminars that are aligned with organizational objectives. For sustainable practices in organizations, especially in the educational sector, the focus should be on long-term innovation initiative rather than short-term practices, by best incorporating sustainability practices. Knowledge management, information management, and knowledge-sharing practices can be implemented in organizations to encourage cooperation among employees.

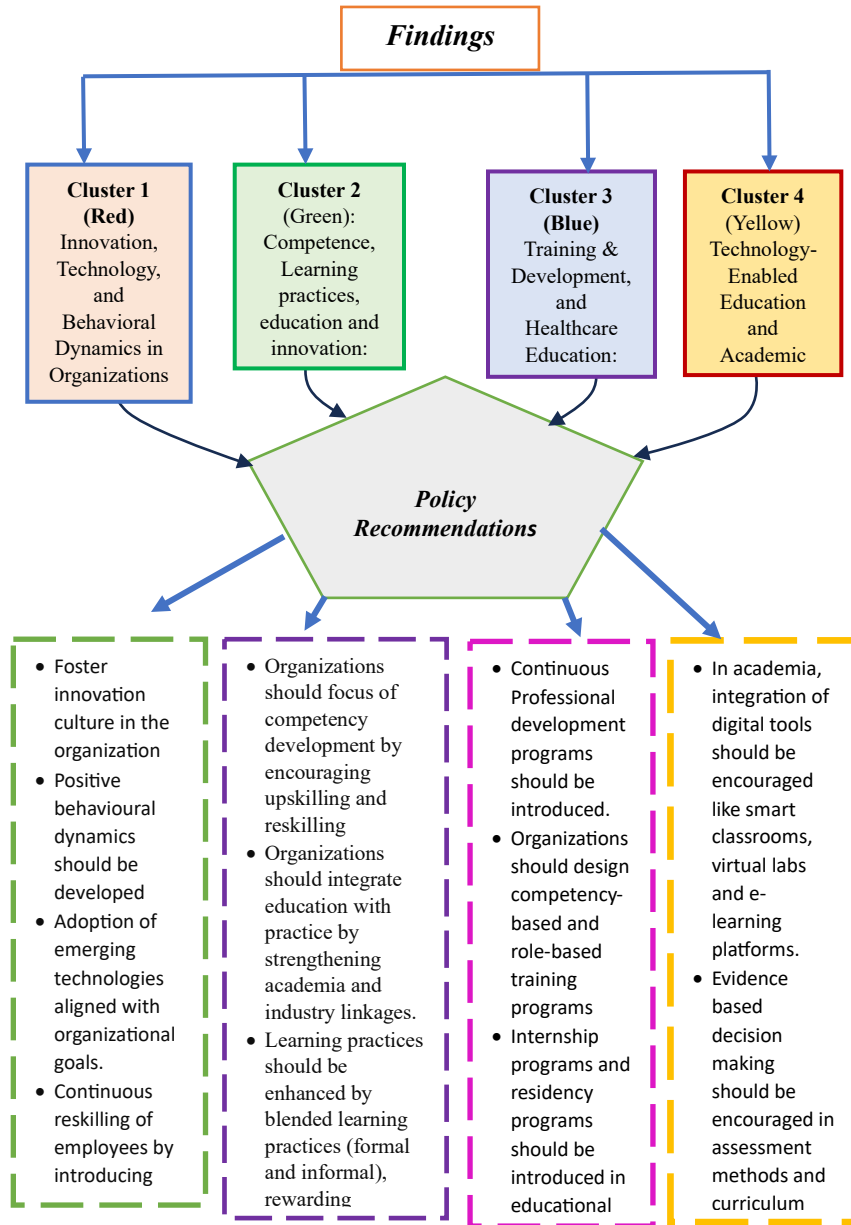
Policy Recommendations

With the help of this bibliometric study, a policy is recommended for organizations, especially for those organizations who are highly engaged in digital technology usage. By organizing the technological training mechanism and support system for employees, organizations are highly recommended to create policies for digital well-being, fostering innovation, and reducing digital stress. The organizations should focus to put efforts in

policies which promote innovation by focusing on employee autonomy, psychological safety, and experimentation. The knowledge management system and information management system should be promoted to support information exchange, organization learning, and skill development of employees. Employee-focused technological adoption strategy which improves employee participation in digital transformation can enhance innovation and lower stress at work.

Figure 10 highlights the overall findings and policy framework. Policymakers ought to concentrate on the development of comprehensive smart tourism models that align digital transformations with sustainability goals, such as AI, IoT, and data analytics, while also incorporating environmental policies and green practices into tourism planning. Governments must encourage cross-sector collaboration among tourism leadership, technology suppliers, and transportation systems in order to build effective, low-carbon, and digitally linked destinations. Capacity-building activities, such as training in digital skills for tourist stakeholders and assistance for innovation-driven businesses, are critical to increasing competitiveness and the implementation of smart solutions. Furthermore, targeted investment and incentives should be focused toward sustainable tourism initiatives, particularly in developing nations, in order to eliminate regional inequities and promote inclusive growth. Establishing uniform standards for data administration, monitoring the environment, and smart destination management would also help to ensure that technological advances contribute to long-term environmental sustainability and resilient tourism growth.

Figure 10
Finding and Policy Framework



Conclusion

This study aimed to identify the important areas of scientific literature regarding employee polychronicity, psychological capital (self-efficacy and emotional stability), and innovation performance and track their evolution using bibliometric analysis. It also provides the bases for future studies by highlighting the most contributing authors, as well as the most contributing sources/journals in the above fields. The results showed the dynamics of research and development in all elements of employee polychronicity, psychological capital, and innovation performance, with a focus on key scientific clusters and new research topics. The survey determined which countries had the most articles on the subject and assessed the extent of scientific research in the past few years. It also uncovered unexplored themes and possibilities for future research by finding the most commonly used phrases and trend subjects in the research journals selected for analysis.

Author Contribution

Zahida Parveen: Conception & Study Design, Data Collection & Processing, Data Analysis & Interpretation, Drafting of Manuscript. **Rab Nawaz Lodhi:** Data Collection & Processing, Data Analysis & Interpretation, Critical Review. **Muhammad Zeeshan Shaukat:** Data Analysis & Interpretation, Critical Review.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

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The data associated with this study is not available due to ethical, legal, or commercial restrictions.

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