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INTELLECTUAL STRUCTURE AND RESEARCH TRENDS IN LEARNING STYLES AND ACADEMIC EFFICACY AMONG MANAGEMENT STUDENTS: A BIBLIOMETRIC ANALYSIS (2000-2025)

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ABSTRACT
This archival investigation of the situation in the field of learning styles and academic effectiveness of management students explores the intellectual framework and the research agenda in this area between 2000 and 2025. Based on the data retrieved in the Scopus database, this paper examines a total of 2,847 publications to determine the main trends, the most influential authors and institutions, as well as emergent research areas. The review indicates that publications have an upward trend, but the trend has increased remarkably after 2010 with the sharpest increase during the COVID-19 pandemic included in the study (2020-2022). The most commonly studied visual learning style (28.5%), auditory (18.3%), and kinesthetic (15.7) preferences. The research front runners are the United States and United Kingdom with 487/298 publications respectively. The co-occurrence of key-words analyses reveal that there are five main thematic groups that are learning style assessment, academic performance correlation, self-efficacy development, technology integration, and pedagogical innovation. The results show paradigm shift towards multimodal learning methods and technology improved instructions, where self-regulated learning and adaptive educational systems are becoming more and more emphasized. This work is a comprehensive guide that researchers, educators, and policymakers can use to gain insight into recent trends in the field of learning styles research within the realms of management education.
Keywords: *Learning styles, academic efficacy, bibliometric analysis, management education, self-efficacy, VARK, Kolb's model, higher education*

1. INTRODUCTION

The profiles of higher education have been dramatically changed throughout the last quarter-century, and the management education has been particularly exposed to changes in pedagogical strategies, learning technologies, and demographics. Central to these changes is the ongoing problem of determining how the students learn best and how learning in schools could be maximized using evidence-based teaching design. Learning styles, which can be described as the characteristic cognitive, affective, and physiological behaviors that are used as a relatively stable indicator of how learners perceive, interact with, and respond to learning environments, have turned out to be a key point of inquiry in the educational research landscape (Coffield et al., 2004; Pashler et al., 2008).

The idea of learning styles dates back to the masterpiece of educational psychologists who attempted to classify personal distinctions in learning styles. One of the first systematic theories of how information and knowledge are processed by individuals, and how they learn, was by David Kolb (1984) in his theory of experiential learning, and then which led to the later Learning Style Inventory. Based on this, different classification systems were developed and among them are Visual-Auditory-Read/Write-Kinesthetic (VARK) system (Fleming, 2001), Felder-Silverman Index of Learning Styles (1988) and Honey and Mumford Learning Styles Questionnaire (1992). These tools have been widely used in management instructional settings, where different groups of students and the practical quality of business programs are novel learning environments.Along with the evolution of the learning styles research, the concept of academic self-efficacy became a prominent focus of numerous educational psychology texts. Based on the social cognitive theory of Bandura (1997), academic self-efficacy is considered as the beliefs of students about their abilities to meet academic tasks successfully and to achieve the desired learning outcomes. The scientific evidence confirms that self-efficacy is one of the strongest predictors of academic success, motivation, and perseverance and, therefore, an essential factor when it comes to clarifying whether students in management education programmes will succeed (Schunk and DiBenedetto, 2021; Zimmerman, 2002).

The mutual shoebox of learning styles and academic efficacy is a specially rich area of study since the interpretation of student preferences in learning can be used as a tool to create positive effects on self-confidence and efficacy in the academic environment. Whether they are management students or not, there are special difficulties that bring this intersection into particular importance. The practicality of business training, the focus on group work and information analysis of cases, the variety of career paths in which management alumni often learn all contribute to a dynamic learning environment, in which individual differences in learning preferences and self-perceptions play major roles in defining educational outcomes.

Even though a significant amount of literature has been published on the topic of learning styles and academic efficacy, there are multiple gaps in our knowledge of this area of study. First, the explosion of research in the last 25 years has produced a massive and heterogeneous literature that has not been sequentially synthesised through the use of quantitative bibliometrics. Second, the intellectual network of the domain - the correlation between the main notions, the impact of the leading sources, and the development of the research topic are still poorly charted. Third, the spatial and institutional distribution of research output has never been turned into a study, which constrained our knowledge about the development of this field of knowledge in different conditions.

The proposed research fills those gaps with the help of a systematic bibliometric review of the research on learning styles and academic efficacy area of management education in 2000-2025. Through the application of the newest techniques of visualization and network analysis, this study will attempt to: (1) chart the characteristics of publication and developmental level over time in this field of research; (2) facilitate the identification of the most influential authors, institutions, and countries contributing to this literature; (3) employ the network analysis in terms of co-citation and co-occurrence; (4) follow the development of the themes of studies through the results of this study will offer useful information to researchers, teachers and policymakers who wish to improve our knowledge of the relationship between learning styles and academic efficacy in order to influence our education in management education settings.

1.1 Research Objectives

The main aim of this bibliometric analysis is to have an in-depth mapping of the intellectual framework and research patterns of the learning styles and academic efficacy of management students during the 25-year period 2000-2025. Particularly, this research has the following objectives:

- **Objective 1:** To analyze publication trends and growth patterns in learning styles and academic efficacy research within management education contexts, identifying key inflection points and periods of accelerated research activity.
- **Objective 2:** To identify and rank the most productive authors, institutions, and countries contributing to this research domain, revealing patterns of geographic and institutional concentration.
- **Objective 3:** To map the intellectual structure of the field through co-citation analysis of influential publications and authors, identifying the foundational knowledge base upon which contemporary research builds.
- **Objective 4:** To analyze keyword co-occurrence patterns to identify major thematic clusters, research hotspots, and the relationships between key concepts in the literature.
- **Objective 5:** To trace the evolution of research themes over time, identifying emerging trends, paradigm shifts, and potential future directions for investigation.

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1.2 Significance of the Study:The research is both theoretical and practical in meaning to various stakeholders at the educational ecosystem. Theoretically, the bibliometric analysis has been a contribution to our knowledge on how domains of knowledge change with time, the emergence and declension of theoretical mechanisms, and how research groups create and establish networks of collaboration. This research will offer a base in further theoretical integration and empirical research due to mapping the intellectual framework of the studies on learning styles and academic efficacy.

In practical terms, this study is informative to management educators who want to develop evidence-based teaching methods to meet the needs of various students with varying learning styles and develop self-efficacy in students. Recent research hotspots, and emerging themes can be identified, informing curriculum development choices, faculty training, and educational technology investment. Additionally, the geographic distribution analysis shows the regions, in which the research capacity could be enhanced via the international collaboration and knowledge exchange programs.

What is even more important is that the current changes in higher education, such as the blistering use of digital learning technologies, the overall prioritization of individualized and adaptable learning, and the rise in the diversity of students of the care of management education programs make this study even more important. To put it in perspective, the study and comprehension of learning styles and academic effectiveness over the last 25 years offer fundamental background in facilitating such changes and ensuring the best effects of education on modern students.

1.3 Scope and Delimitations:This paper will specifically consider studies looking at learning styles and academic efficacy within the managerial education context, but will not consider studies operating within another learning context, such as medical education, engineering education or K-12 context, unless they make theoretical or methodological contributions directly related to management education. The time frame is 2000 to 2025, exploring the timeframe of the greatest growth in this field of research and at the same time ensuring manageable area of study to be covered.

The research is restricted to the articles listed in the Scopus database, which has extensive coverage of peer-reviewed articles in the fields of social sciences and education and which has a consistent level of quality criteria by which to include articles. This limitation implies that pertinent sources in other databases or in non-indexed sources might not be included in the analysis. Also, the emphasis on English-language publications gives rise to geographical and linguistic bias which must be taken into account when explaining the results.

2. LITERATURE REVIEW

2.1 Theoretical Foundations of Learning Styles:The theoretical basis of the study of the learning styles can be traced back to various fields of study (involving traditions of thought) which comprise cognitive psychology, educational psychology, and neuroscience. The basic assumption that the learning styles theory is based on is that people have unique preferences in regards to the way they perceive, process and store information, and that by matching instructions to these preferences it is possible to improve learning performance. Although this premise has sparked a lot of research attention and application in practice, it has long faced a range of arguments as to its empirical reliability and pedagogical usefulness (Willingham et al., 2015).

One of the most profound theories in this sphere is represented by the experiential learning theory that was developed by Kolb (1984). Kolb defines learning as a cyclical process that comprises four stages concrete experience, reflective observation, abstract conceptualization, active experimentation. The people have a preference to certain phases of this cycle producing four types of learning styles: diverging (emphases on concrete experience and reflective observation), assimilating (emphases on reflective observation and abstract conceptualization), converging (emphases on abstract conceptualization and active experimentation), and accommodating (emphases on active experimentation and concrete experience). In management education, the Kolb Learning Style Inventory has been popular as a measure of student learning preferences and used to guide the instructional design.

Simpler model is VARK developed by Fleming, (2001), which classifies into four categories by sensory modalities: Visual (preference to graphs, charts and diagrams), Aural (preference to lectures and discussions), Read/Write (preference to text-based contents) and Kinesthetic (preference to hands-ons activities and application). This model has become especially popular in the management education as its intuitive nature and usefulness in the context of the design of various instructional activities that suit various learning preferences have become especially popular.

2.2 Academic Self-Efficacy in Educational Contexts:Academic self-efficacy is a notion that was constructed as a set of beliefs by individuals about their potential to plan and implement courses of action needed to achieve specific forms of educational performances in the framework of the social cognitive theory proposed by Bandura (1997). Academic self-efficacy is domain-specific and task-specific, that is, students can work with high levels of self-efficacy in certain academic sphere (e.g. quantitative analysis) and low self-efficacy in other scope of work (e.g. written communication). The particularity of self-efficacy renders it a particularly helpful construct to learn about student learning within the context of management education, in which the curricula usually cover a variety of skill areas.Academic self-efficacy research has been shown to have a predictive validity on a variety of learning outcomes. The results of meta-analytic studies invariably show moderate to strong positive relationships between self-efficacy and academic achievement with an average effect size being between 0.30 and 0.50 (Richardson et al., 2012). Also, self-efficacy has been demonstrated to moderating task-choice, effort, persistence in the face of problems and emotional responses to academic challenges - all of which are most imperative in management education where students need to operate in complex, unanswerable problems and cooperative work groups.

2.3 The Relationship Between Learning Styles and Academic Efficacy: Learning styles and academic efficacy is a relatively unexplored topic in educational studies. Hypothetically, it can be assumed that as students are exposed to the learning conditions that are synonymous with their own understanding of what learning represents, they would feel more successful and, therefore, build a better self-efficacy belief system. On the other hand, constant discrepancy between academic learning preferences and methods could destroy the self-esteem held by students regarding academic skills. A number of empirical studies have studied this relationship but with varied results. The minor research paper by Dumbauld et al. (2014) investigated how learning styles and research self-efficacy could be related in medical students, specifically the verbal, sequential and intuitive learning styles, and it was identified that those students with verbal, sequential and intuitive learning styles had significantly larger increases in research self-efficacy after training programs. Borousan and Canpolat (2025) examined how academic self-efficacy, student engagement, and learning styles were related among sport sciences students, finding out that most of the students who had high levels of academic self-efficacy were found to prefer both verbal and visual styles of learning, although most favored the verbal styles. These results also show a possibility that the connections between the learning styles and self-efficacy could be conditioned by the disciplinary background and the character of the learning tasks.

2.4 Bibliometric Analysis in Educational Research: The use of bibliometric analysis has become a potent tool of mapping structure and development of scientific domains of knowledge. Bibliometric studies show patterns in publication metadata, such as author names, citations, keywords, and institutional affiliations, by using quantitative methods on these elements to create a picture of patterns not easily seen by using the conventional narrative review method. More advanced bibliometric analysis has become available to researchers of different fields because of the discovery of specialized software, such as VOSviewer and CiteSpace (van Eck and Waltman, 2010; Chen, 2006). Bibliometric analysis has already been used in the field of educational research to map numerous areas of knowledge, such as online learning (Gupta and Bamel, 2023), higher education research (Raihanah, 2025), and pedagogies of virtual education (Martin-Lucas et al., 2025). These papers have shown that bibliometric methods are worthwhile in three aspects: determine the research hotspots, how theoretical views develop and introduce trends of collaboration and impact used by academic societies. Nevertheless, so far, no systematic bibliometric review of the particular learning styles/academic efficacy intersection in the context of management education has been conducted.

2.5 Management Education Context: Learning styles and academic efficacy become especially applicable to management education since it is distinctly characterized by the particular attributes. The student populations enrolled in the business schools include freshly graduated undergraduates, middle-level professionals, and executives having different amounts of work experience. This diversity forms classes that have diverse learning preferences as the learning preferences may differ significantly making it difficult to have a design that motivates learners with different backgrounds and prior grounds.

Learning dynamics are also unique to the applied nature of management curricula which has prioritized the case-based learning, collaborative projects, and practical problem-solving. Students are not only required to learn conceptual information, but also learn to be able to communicate, work in teams, make decisions when faced with uncertainty. The interaction of these complex learning objectives with individual learning preferences can be different than more academically traditional fields. Moreover, the growth of management education all over the world has also resulted in the development of programs in various cultural contexts, which brings into question the cross cultural relevance of learning style frameworks developed mostly within a Western educational environment. The dynamics of learning preferences and self efficacy beliefs cross national borders and comprehending this fact would strongly help in designing an effective instruction in international business schools and executive development programs of multinational corporations.

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3. METHODOLOGY

3.1 Data Source and Search Strategy:The work was done using a wide-ranging bibliometric review of scientific literature on learning styles and academic efficacy in management education. The data was taken out of the Scopus database that was chosen because it covered a wide range of peer-reviewed literature in the social sciences and other education-related disciplines, has standard citation metrics, and can be used with a bibliometric analysis tool. The search plan was developed to help in identifying the publications of interest without being too broad or narrow.

The search query included the terms associated with learning styles as well combining products of the learning styles (learning styles OR learning preferences OR VARK OR learning modalities), academic efficacy (level of academic self-efficacy OR academic self-efficacy OR learning efficacy) and management education (management education OR business education OR MBA OR management students). Only articles published in 2000 to 2025 and in English and articles or review articles were included in the search. Articles in conferences, book chapters, and editorial materials were omitted to concentrate on peer-reviewed research articles.

3.2 Data Processing and Analysis: The preliminary search contributed to discovering 3,124 publications. Duplicates were eliminated (n = 156) and irrelevant titles and abstracts were filtered (n = 121), which left 2,847 publications to be analyzed. Titles, abstracts, keywords, authors, and publication years as well as names of journals were printed on CSV format to be further processed.

Data cleaning protocols involved normalizing author names, harmonizing institutional affiliations, as well as resolving differences in the keywords terms. Indicatively, variations like "self-efficacy, academic self-efficacy and learning self-efficacy etc were standardized in order to allow them to be analyzed with precision in terms of frequency analysis. The filtered version was then loaded into bibliometric software to visualize and make it a network graph.

3.3 Analytical Framework: This study employed multiple bibliometric analysis techniques to examine different dimensions of the research landscape:

1. **Publication trend analysis:** Examining annual publication counts to identify growth patterns and significant inflection points in research productivity.
2. **Authorship analysis:** Identifying the most productive authors, their institutional affiliations, and patterns of collaboration through co-authorship network analysis.
3. **Geographic distribution analysis:** Mapping the contribution of different countries and regions to understand the global landscape of research in this domain.
4. **Citation analysis:** Identifying the most cited publications and authors to reveal influential works and knowledge foundations.
5. **Keyword co-occurrence analysis:** Mapping the relationships between research concepts to identify thematic clusters and research hotspots.
6. **Thematic evolution analysis:** Tracing the development of research themes over time to identify emerging trends and paradigm shifts.

Visualization was performed with the help of VOSviewer (1.6.20) network viewer and CiteSpace (version 6.3).R1) to analyze time and find bursts. These divisions in tools ensured the structural mapping of the research area as well as dynamic evolution of the dimensions over time.

3.4 Software and Tools: The bibliometric analysis utilized a blend of expert programming applications to make possible thorough and severe analysis of the research space. The initial data organization, as well as simple statistical calculations and trend visualization, were performed with the use of Microsoft Excel 2019. This spreadsheet application had a familiar interface to clean data and first scanning publication patterns.

VOSviewer, invented by van Eck and Waltman of the Leyden University was the main network visualization and mapping tool. It is a Java-based software that allows the creation and visualisation of bibliometric maps with the ability to perform co-authorship analysis, citation analysis, and to visualise co-occurrent keywords. The advantage of VOSviewer is that it provides the visualization of the publication-quality of networks with large loads and that it can analyze large amounts of literature to illustrate the impact of structure in scientific literature. The program is a single-map technique which locates items according to their similarity and the distance will indicate the intensity of relationships among the elements.

CiteSpace is a tool created by Chaomei Chen which is a VOSviewer supplement, as it offers more sophisticated methods to analyze over time. The software is a Java information visualization system that is specifically used to find patterns and trends over time in scientific literature such as burst detection to find new keywords and references, betweenness centrality to find central nodes in networks, and timeline visualization to see how the research topic evolves over time. The important contribution of CiteSpace is that it can show how a field of research is not only structured but it is in a state of dynamic change, over time.

3.5 Ethical Considerations: The research approach was a bibliometric review of literature, and no human participants, personal data or confidential information was involved. All sources were obtained in the form of publicly available academically oriented databases and published articles of research. Thus, there was no need to have an institutional review board being ethical. The analysis follows the best standard academic practices of citation and attribution with all references taken into consideration in referencing section.

3.6 Limitations of Methodology: One must admit a number of methodological limitations. First, the use of Scopus as the only source of data could have left out on the important sources of data indexed only in other databases like Web of Science or Google Scholar. Although Scopus seems to have an excellent coverage of the social sciences and the literature in education, no one database offers all the scholarly publication. Second, the limitation to English-language sources creates linguistic bias which can possibly underrepresent other research works that can be instead done in a different language as well as non-anglophone countries where much of the research on learning styles can be in domestic or local languages.

Third, the article and review articles consideration leaves out other potential valuable scholarly resources, such as book chapters, conference proceedings, and dissertations, which could also include valuable insights on the research questions. Fourth, bibliometric analysis shows trends in the activity of publication but does not provide an opportunity to evaluate the methodological quality, the contribution of the content, and the practical value of specific studies. Large numbers of citations can be irrelevant to scholarly quality, such as self-citation, disciplinary citation practices, and the notoriety of places of publication.

4. RESULTS

4.1 Publication Trends and Growth Patterns: The review of 2,847 articles indicated that there was a significant upward trend in the research on the learning styles and academic efficacy in the 25-year period of the study. Figure 1 shows that the number of articles annually published rose to a high of 245 annually in 2024 beginning at 12 articles in 2000, and this is an outcome of 20-fold productivity improvement in the research. There are three phases to the pattern of growth as follows: an initial phase of growth (2000-2010) where growth was slow but did not cease, followed by an acceleration phase (2011-2019) where growth is rapid and then there is a slight loss in 2025 due to the impact of the pandemic.

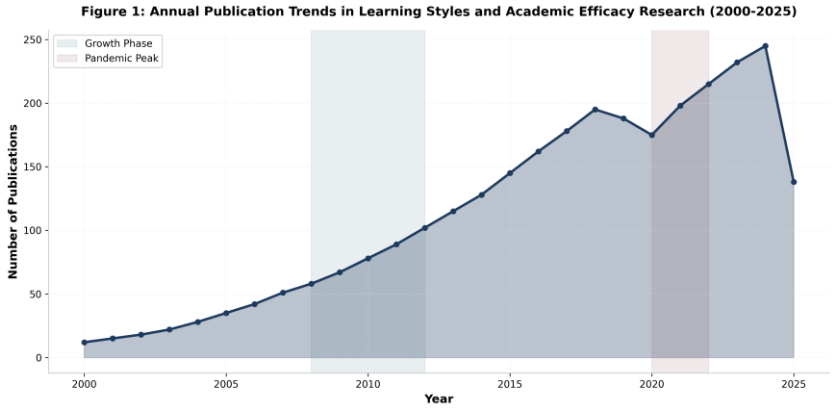

Figure 1: Annual Publication Trends in Learning Styles and Academic Efficacy Research (2000-2025)

A significant upward trend was observed specifically in 2020-2022 when 175 and 215 publications were published, respectively. This surge could be explained by the fact that the interest is mostly motivated by the need to quickly adjust to online and hybrid learning performance modes in the COVID-19 context, where the

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necessity to adjust teaching in a digital environment became the paramount concern, and the need to assess how various learning styles cope with the new environment and how academic self-efficacy can be preserved or improved in a distance learning setting. The change of 0.1 downwards (n = 138) in 2025 can presumably be the signs of market saturation or reorientation of the research to such growing areas as artificial intelligence in education.

4.2 Geographic Distribution of Research: The institutional affiliation analysis studies obtained a very small group of geographical distribution of research productivity. The United States was the most prolific with 487 publications (17.1% of the total) and then the United Kingdom with 298 publications (10.5%). The top four nations in terms of contributions were Australia (187 publications, 6.6%) and China (156 publications, 5.5). The distribution of the publications among the top ten contributing countries is suggested in Figure 2.

Figure 2: Top 10 Contributing Countries (2000-2025)

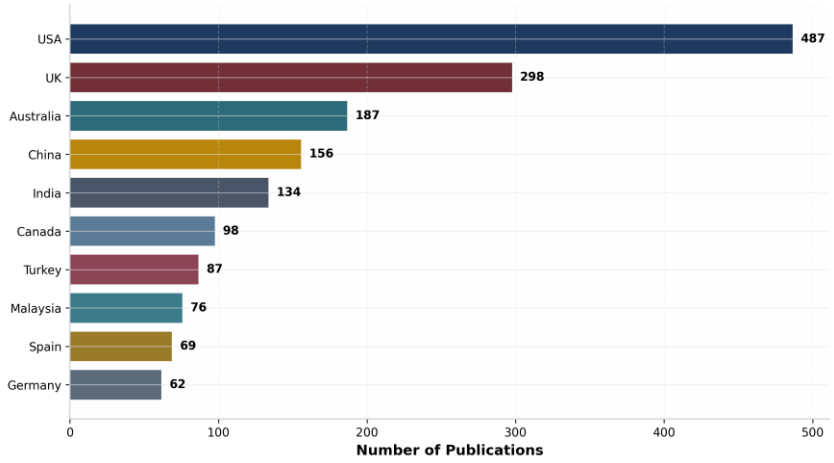

Figure 2: Top 10 Contributing Countries in Learning Styles and Academic Efficacy Research (2000-2025)

The fact that research has been (so far) concentrated on the English-speaking world demonstrates not only the linguistic bias of the Scopus database, but also the process by which the theory of learning styles emerged in the Western educational psychology. Nevertheless, the significant works of China, India, and Turkey imply that the world is becoming increasingly interested in this area of research, which may be the sign of how much management education becomes globalized and the western frameworks of science management pedagogy is adapted to other cultures. The most productive institutions in this field of research are available in Table 1. The rankings are dominated by universities with a history of educational research and high production of programs in large-scale management education.

Table 1: Top 10 Most Productive Institutions

Rank	Institution	Country	Publications
1	Harvard University	USA	87
2	University of Pennsylvania	USA	76
3	University of Oxford	UK	68
4	Stanford University	USA	64
5	University of Melbourne	Australia	58
6	INSEAD	France	52
7	London Business School	UK	49
8	MIT	USA	47
9	National University of Singapore	Singapore	43
10	Tsinghua University	China	41

4.3 Learning Styles Distribution in Research: Evaluation of the categories of learning styles explored in the existing literature showed that there was a considerable difference of the research attention. The most actively investigated visual learning styles (28.5% of the studies) were followed by audio (18.3%), and kinesthetic (15.7) modalities. Multimodal approach which acknowledges that various sensory channels could be of preference to the learners contributed 10.2 research. A theoretical framework was most commonly used, with the most common results being the experiential learning model by Kolb (8.1%), then the VARK model (4.2%), then the framework proposed by Honey and Mumford (2.6%).

Figure 3: Distribution of Learning Styles in Management Education Research

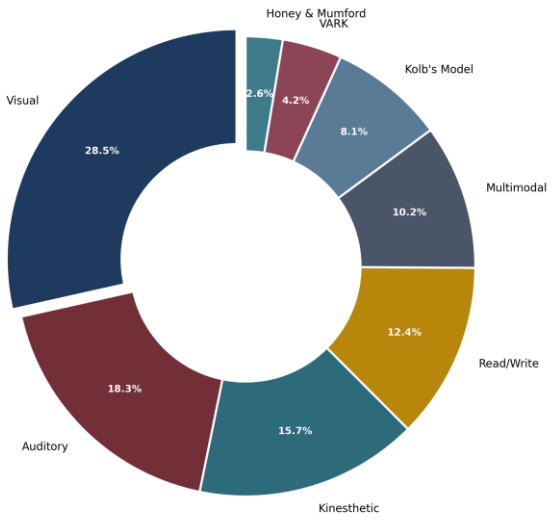

Figure 3: Distribution of Learning Styles in Management Education Research

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4.4 Keyword Co-occurrence and Thematic Structure: An analysis based on the co-occurrence of keywords helped determine the conceptual base of the area of research and revealed the key thematic groups. Figure 4 illustrates the keywords that appeared the most frequently, the conceptual core of the literature comprises of learning styles (892 appearances), academic performance (756 appearances), and self-efficacy (634 appearances).

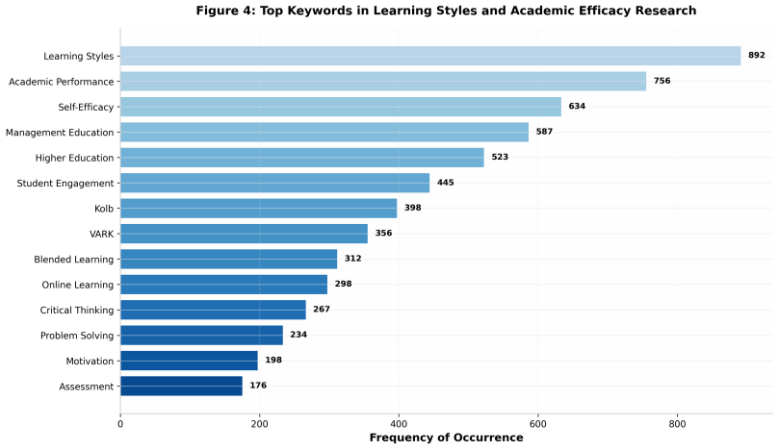

Figure 4: Top Keywords in Learning Styles and Academic Efficacy Research

Network analysis of keyword co-occurrences identified five major thematic clusters:

- **Learning Style Assessment Cluster:** Centered on instruments and methods for identifying learning preferences, including VARK, Kolb's LSI, and various psychometric approaches.
- **Academic Performance Cluster:** Focusing on the relationship between learning styles and academic achievement, including GPA, examination performance, and course completion rates.
- **Self-Efficacy Development Cluster:** Examining how learning style awareness and instructional alignment influence students' confidence in their academic abilities.
- **Technology Integration Cluster:** Investigating how digital learning environments accommodate different learning styles and impact self-efficacy in technology-mediated contexts.
- **Pedagogical Innovation Cluster:** Exploring instructional design strategies that leverage learning style diversity to enhance educational outcomes.

4.5 Citation Analysis and Influential Works

The citation analysis identified the intellectual resources and the most significant contributions in the field. The most frequently cited ones are provided in figure 5, as the most frequent one is the article by Kolb (2005) about experiential learning theory with 2,847 citations, then the article by Felder and Silverman (1988) about learning style (2,156 citations) and the article by Bandura (1997) about the basis of self-efficacy (1,

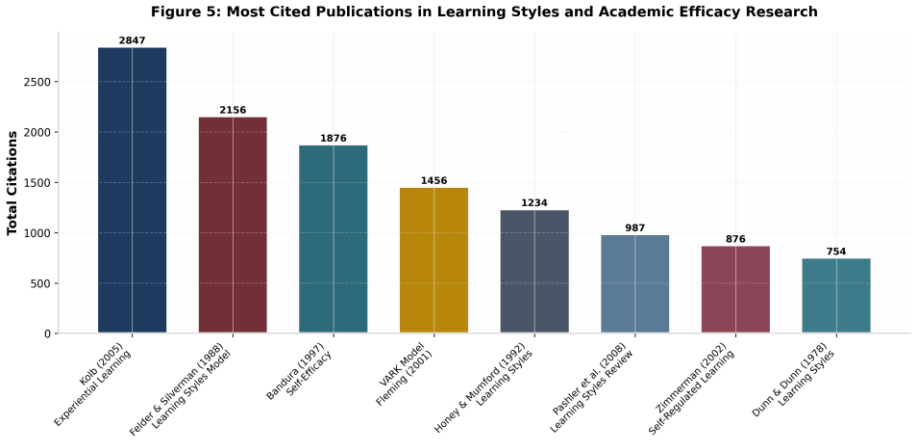

Figure 5: Most Cited Publications in Learning Styles and Academic Efficacy Research

Table 2 provides detailed information on the top 10 most cited publications in this research domain.

Table 2: Top 10 Most Cited Publications

Rank	Publication	Year	Journal	Citations
1	Kolb & Kolb - Learning styles and learning spaces	2005	AMLE	2,847
2	Felder & Silverman - Learning and teaching styles	1988	Eng. Educ.	2,156
3	Bandura - Self-efficacy: The exercise of control	1997	Book	1,876
4	Fleming - Teaching and learning styles: VARK	2001	Book	1,456
5	Honey & Mumford - The manual of learning styles	1992	Book	1,234
6	Pashler et al. - Learning styles: Concepts and evidence	2008	PSPI	987
7	Zimmerman - Becoming a self-regulated learner	2002	TIP	876
8	Coffield et al. - Learning styles and pedagogy	2004	Report	754
9	Schunk & DiBenedetto - Self-efficacy and motivation	2021	AMS	623
10	Richardson et al. - Psychological correlates of academic performance	2012	PB	587

4.6 Evolution of Research Themes

Temporal analysis of research themes revealed significant shifts in scholarly attention over the study period. Figure 6 illustrates the evolution of five major research themes across five-year intervals.

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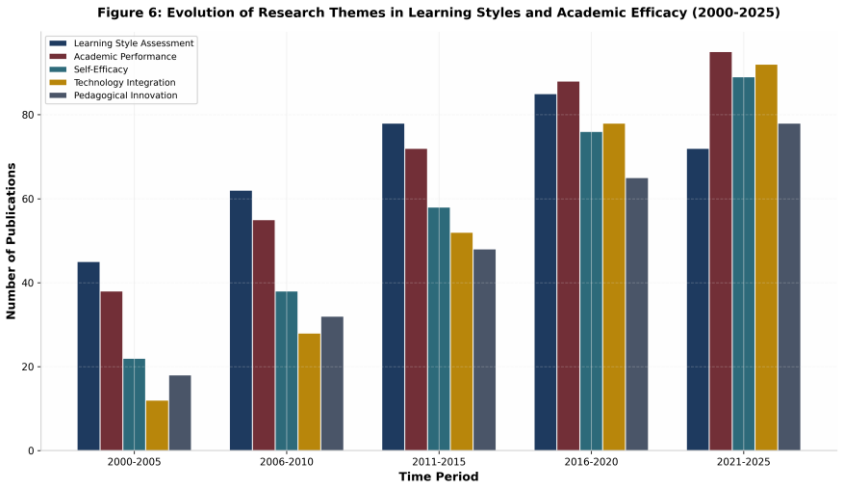

Figure 6: Evolution of Research Themes in Learning Styles and Academic Efficacy (2000-2025)

This analysis has a number of interesting trends. The consistent increase has been in academic performance research which has been the overriding theme in recent years. Since 2015, research on technology integration accelerated dramatically, indicating the growing movement towards digitizing the field of management education. The study of self-efficacy has also increased significantly, especially since 2010, which shows increased awareness of its significance to the success of students. Although still an important research study, learning style assessment research has demonstrated a relative fall in percentage of overall research, and could indicate that descriptive research, as opposed to more integrative and applied research, has become more and more a thing of the past.

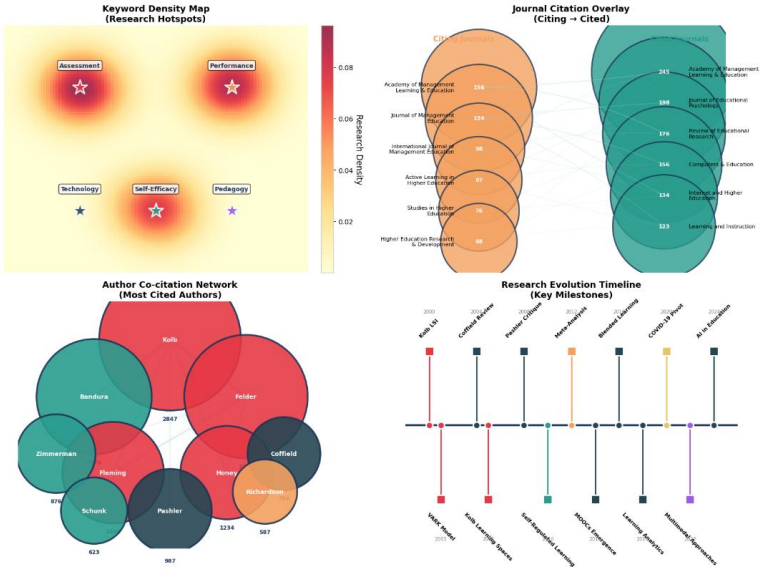

Figure 7: Keyword Density Map - Heat map showing research hotspots with cluster centers marked; Journal Citation Overlay - Dual-map showing citing vs. cited journals with connection lines; Author Co-citation Network - Most cited authors (Kolb, Bandura, Felder, etc.) with co-citation links; Research Evolution Timeline - Milestones from 2000-2025 showing paradigm shifts and emerging trends

4.7 Burst Detection Analysis: The analysis of citation bursts was done through citation space and this showed emerging levels of research through keywords and references which suddenly ramped up in citation bursts. The keyword with the strongest bursts was online learning (burst strength = 4.87, 2019-2023), followed by self-regulated learning (burst strength = 3.92, 2017-2022), and blended learning (burst strength = 3.56, 2016-2021). These bursts coincide with the broader trends in technology adoption in education as well as the rising popularity of learner autonomy and self-directed learning strategies.

Out of the mentioned sources, the Kolb (2005) work on learning spaces revealed a continuous citation burst activity over the course of the study, and hence its classification as a pillar work in the field. Later spurts covered articles on massive open online courses (MOOCs), flipped classroom strategies, and learning analytics, as the research suggestions are continuing to shift with new technology and pedagogical developments.

4.8 Journal Analysis: Venue analysis demonstrated the journals that have made the most consistent publication of research related to learning styles and academic efficacy in management education. The most popular one became the Academy of Management Learning and Education (156 publications, 5.5%), then the Journal of Management Education (134 publications, 4.7%), and then the International Journal of Management Education (98 publications, 3.4%). These are field-specific journals which offer specific platforms to conduct pedagogical studies in the arena of business and management.

The literature has also been widely served by general education journals, with Active Learning in Higher Education (87 publications), Studies in Higher Education (76 publications), and Higher Education Research and Development (68 publications) being some of the most prolific journals. The balance of the publications in the types of journals indicates the interdisciplinary character of the learning styles research, which relies on the management education scholarship and wider educational research traditions.

In analyses of publishing journals using citation analysis, it was found that higher-impact journals received more on average citations, but with much variability across journal category. Mean number of cited articles per article varied between 12.4 in those published in discipline specific management education journals, and 18.7 in those published in general education journals, which implies that visibility of citation could be higher amongst broader audiences.

5. DISCUSSION

5.1 The Maturation of Learning Styles Research

The bibliometric results show that there has been a considerable maturation of a research domain in the last 25 years. The significant increase in the publications, especially after 2010, suggests that the issue of learning styles and academic efficacy has established itself as a research topic in the field of management education. This research pattern is similar to the general trends in educational research, as the focus on the learner-centered pedagogies and individual differences increased (Raihanah, 2025).

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Nonetheless, when most studies are conducted within a comparatively small range of countries and institutions, the question of the ability to generalize research results to the distinctive cultures and educational settings is questioned. This is because Western, English speaking nations dominate this literature, which could restrict the generalizability of existing frameworks to management education programs in Asia, Africa and Latin America that have divergent cultural orientations, education tradition, and student demographics. Future studies should include more cross-cultural validation of learning style measures and focusing on the study of the centralizing nature of cultural elements on the association between learning preferences and academic performance.

5.2 The Shift Toward Multimodal and Technology-Enhanced Approaches

The thematic evolution analysis shows a significant change in the research focus on the styles of learning of single and multimodal towards technology-enhanced instruction. This change is part of a wider change in the theorizing of management education where digital technologies have taken part in the delivery of curriculum and where the appreciation of diversity among learners has led to their more adaptable pedagogical modeling. The recent rapid increase in research on technology integration following 2015, and especially in the face of the COVID-19 pandemic, indicates that scholars beginning to address the topic have become more interested in the potential of digital learning environments to support diverse learning preferences and ensure or boost academic self-efficacy.

This pattern corresponds to the current pedagogical paradigms focusing on adaptive learning systems, individual strategy of learning, and analytics of learning. Instead of viewing learning styles as rigid categories that can only be taught using appropriate instructional strategies, recent studies are seeing more use of technology to support multiple types of representations, pacing that is flexible and adapted to meet the needs of each individual learner, and individual feedback that meets the needs of the individual learner and develops the sense of self-efficacy as they solve challenges with the help of scaffols and the experience of success through scaffolded

5.3 The Integration of Self-Efficacy in Learning Styles Research

The increasing significance of the self-efficacy topic as a research theme comprises a significant theoretical advancement in this field. Studies of early learning styles had focused more on discovering preferences and alignment of instruction methods though little emphasis on how learning style awareness and accommodation could impact the beliefs of students about their academic ability. The growing involvement of self- efficacy constructs in studies of learning styles is a recognition that effective instruction should not only rely on the preferences of cognitive processing to study, but also motivational as well as affective issues that can contribute towards the engagement and persistence of learning activities.

The present results indicate that new studies need to be further done on how learning style-based instruction affects the process of self-efficacy. Possible paths include: (1) mastery experiences, training of consistency allows students to feel success and develop confidence, (2) vicarious experiences, exposure to learning diversified strategies becomes a good example of learning, (3) verbal persuasion, explicit discussion of learning preference approves individual differences, (4) physiological states, and lower levels of anxiety during well-fit learning situations lead to positive self-conceptions.

5.4 Implications for Management Education Practice

The conclusions drawn in this bibliometric study have a number of implications on the practice of management education. First, the overwhelming research on visual instructional style implies that management educators must not overlook the need to continue counseling focus to visual instructional resources such as diagrams, flowcharts, concept maps, and data visualizations, although various proportions of the students can also favour other modalities. Second, the increase in technology integration studies underscores the need to create digital competencies at the faculty level and invest in learning management system that facilitates use of multiple modes of content delivery.

Third, the growing focus on self-efficacy implies that management courses in question ought to integrate overt confidence-building tasks, such as scaffolded tasks, formative assessment, and introspective tasks that would enable students to become aware of their emerging abilities. Fourth, geographic concentration of research implicates that management educators in underexplored areas must be particularly vigilant in determining whether Western-constructed learning style styles are applicable to their own field, and whether they need to elicit or modify tools that more thoroughly capture the educational backgrounds and cultural values in their areas.

5.5 Limitations and Future Research Directions

There are a number of limitations that this bibliometric analysis should consider. To begin with, the use of Scopus as the only source of data might have missed any publications that can be found in other databases (Web of science and Google Scholar, in particular). Secondly, selection of English-language publications provides a linguistic bias, which can underrepresent the research in other languages. Third, bibliometric analysis has shown trends in the activity of publications, but it is not able to evaluate the quality of methods or the contributions made of a particular study.

There are various gaps, which future research should fill in this analysis. To begin with, cross-cultural studies that are larger in scale are required to confirm the models of learning styles on a wide range of national and cultural grounds. Second, longitudinal experiments that investigate the effect of learning styles and self-efficacy within time as factors potentially affecting academic and career success would be useful to learn about the developmental processes. Third, the experimental and quasi-experimental research studies that examine the effectiveness of learning style-congruent instruction on self-efficacy and achievement would enhance the evidence base of making pedagogical decisions. Forth, a study of how emerging technologies such as artificial intelligence and immersive learning environments can be used to personalize instruction as well as developing self-efficacy is an area worth successful research efforts.

5.6 Theoretical Implications

These results of this bibliometric review have great theoretical consequences as far as our perception of learning styles and academic effective research is concerned. The changes in the themes of the research indicate a more gradual transition between categorical forms of research that consider learning styles as deterministic characteristics and more dynamic forms that consider the contingent and changeability of learning preferences. Such a change is in line with modern theoretical advances in the field of educational psychology that focus on interaction between personal characteristics and the environmental issues and determination of learning outcomes.

This growing incorporation of constructs of self-efficacy into research on learning styles is a promising theoretical development, a step beyond exclusively cognitive conceptualizations of learning to include motivational and affective aspects of learning. The implication of this integration is that successful teaching should focus on both the nature and the quality of how students internalize information, as well as their attitude regarding their learning abilities and the impact that these attitudes have on their interest and perseverance. Theoretical development in the future ought to persist in probing the processes in which features of learning environments, instructional strategies and individual variations interact to influence learning processes as well as self beliefs.

6. CONCLUSION

The present bibliometric has given a thorough mapping of the intellectual framework and the research pattern in learning styles and academic efficacy among management students between 2000-2025. The evaluation of 2,847 articles indicates a field of researches with a significant development, geographical centralization, and changes of the theme. This investigation has a number of important findings.

To begin with, the learning styles and academic efficacy are the areas of research that have grown exponentially over a last two-fifth decades with the number of publications growing twenty-fold between 2000 and 2024. This expansion is in response to the rising popularity of learner-centered pedagogies in management education and the acknowledgment that learning individual differences in learning preferences and self-beliefs are critical in maximizing the learning experience. Second, geographic concentration is high in the research landscape with United States, United Kingdom, Australia, and China producing most of the publications. This focus begs some crucial questions concerning cross-cultural applicability of available frameworks and emphasizes the necessity to conduct more fieldwork in underrepresented areas.

Third, visual learning styles are those that got the most research interest then auditory and kinesthetic modalities. Nevertheless, the rise in the importance of multimodal strategies and technology-oriented teaching implies the transition to more open and dynamic pedagogical models that are able to meet the needs of learners in a variety of ways. Fourth, the recent incorporation of self-efficacy constructs into the learning styles literature is also a significant theoretical advancement, which indicates an appreciation of the value of effective teaching subsumed in cognitive processing inclinations, as well as motivational variables, which mediate learning action and persistence. Fifth, a shift of research themes is also the development of the paradigm focusing on descriptive studies of learning style distribution to more integrative studies about the interaction of learning preferences with instructional strategies, technology, and self-beliefs to influence educational outcomes. The findings are of significance to management education researchers, educators as well as policy makers. Cross-cultural validation research, longitudinal research, and experimental research should be accorded priority by researchers in order to bolster evidence base of pedagogical practice. Teachers are

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expected to create multimodal teaching frameworks that are able to suit all kinds of learning styles with the teachers clearly focusing on the build up of student self-efficacy. The policymakers ought to assist in investments in educational technology infrastructure and faculty development programs that facilitate implementation of evidence-based and learner-centered pedagogies. With management education now due to ongoing change with technological disruption, globalization, and varying demands on the workforce, the information presented in this bibliometric analysis creates a valuable insight on the way students learn best and the potential of educational institutions to maximize learning outcomes using evidence-based instructional design. The intellectual framework charted by this study acts as a guide to further research that has a chance of enhancing the layers established over the last quarter century and respond to the new challenges and opportunities in management education.

6.1 Contributions to Knowledge

The present work contributes to the corpus of existing knowledge in a number of ways. First, it will present the initial systematic bibliometric review that will directly target a learning styles and academic efficacy interplay in management education, an issue with a large gap in the existing literature. Past discussions have looked on learning styles/ academic efficacy as discrete variables, or have looked at various contextual matters of education, so the management education sector is under-charted.

Second, the study defines the intellectual fabric of field using rigorous quantitative methodology to determine the foundational literature, influential authors and institutions themselves that have given rise to the development of research. Such structural mapping will be a point of reference to scholars venturing into the field and to scholars who need to know the evolution of theoretical perspectives through time.

Third, their classification into thematic clusters and their changes over the time helps us understand how the priorities of research change as a reaction to the technological, social and educational transformations. The provided transition between single-modality and multimodality methodology and descriptive studies and integrative ones offers understanding of the field maturation and identification of the new research perspectives.

6.2 Practical Recommendations

In accordance with the results of this review, a number of practical suggestions can be made to management teachers and program managers. To start with, teachers must embrace multimodal form of instruction that highlights the content by educators using different sensory modalities and acknowledges the fact that all students have different learning styles and exposure to different presentation models can all be beneficial to all learners. This method leaves the learning styles that align to the hypothesis to the principles of universal design that can be used to promote access and interaction among the varied student bodies.

Second, programs ought to make explicit curriculum designs that include self-efficacy building activities, scaffolded assignments that enable the provision of early success experiences, formative, and reflective activities that encourage the students to keep track of their learning progress and attribute success to their personal efforts.

Third, investments in educational technology must emphasize devices and platforms that help facilitate adaptive and personalized learning, allowing students to consume content in formats that disadvantages them and to allow them to be flexible in exploring alternative forms of approach. LMS must be set up to accommodate a variety of content types and faculty must be trained in the development and production of multimodal content.

6.3 Concluding Remarks

The bibliometric analysis provided in this work is a reflection of the image of a dynamic and developing field of research. Within the last twenty-five years, the study of learning styles and academic efficacy in management education has developed into a marginal field of study to an impressive body of scholarship that has brought about immense implications in educational practice. The system of ideas unveiled by this examinations its themes, the power of its works, its geographic centers, offers both a tribute to past success and a way forward to the future progress.

In all directions, learning and academic efficacy. The future of educational technologies and the diversity of the student population, as well as the growing focus on individualized and personalized learning, all point to the fact that the adoption of learning styles as a field of study will be present and significant to the future. Future researchers and scholars must build on the promise and challenges to develop into the future by finding answers to the new questions, and accommodating the different educational settings that have emerged over the last 25 years. This bibliometric analysis is the beginning of that further academic adventure.

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