Tracing the Progression of Motivated Learning Strategies: an In-Depth Bibliometric Analysis

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Abstract

Purpose: This research aims to map and analyze the development of studies on Education Strategies in publications indexed in Scopus.
Methods: The approach used is bibliometric analysis, exploring publications on 'Motivated Strategies of Learning' in the Scopus database from 1977 to 2023. The analysis process involved the use of tools such as Excel and R/R-Studio. Visual analysis was conducted using VOSviewer to visualize keyword occurrences and document citations simultaneously.
Result: In this study, 942 relevant publications meeting the specified criteria were identified. Findings indicate an annual growth rate of 9.5%, peaking in 2020. The United States emerged as the primary contributor in publications, with Middle East Technical University Turkey being the most productive affiliation. The most prolific author in the Motivated Strategies of Learning theme was Sungur, S.
Value: This research provides a comprehensive overview of the literature in the field of education, with recommendations for future research directions. This study will likely make a valuable contribution to understanding educational strategies.

Keywords: Motivation, Students, Learning system, Learning environment, Academic achievement.

Introduction

During the Industry 4.0 era we are currently experiencing (Waston, 2019), technological transformation and digitization have reshaped the educational landscape in unprecedented ways (Shakhmalova & Zotova, 2023). Amidst this rapid change, a profound understanding of learning strategies that can motivate students has become increasingly crucial (Cheema et al., 2019). One highly relevant field is "Motivated Strategies of Learning." This theme encompasses various approaches, methods, and strategies that can be applied in modern education to enhance students' motivation and engagement in learning (Sağlam, 2010).

In the Industry 4.0 era context, motivation plays a more significant role than ever before. With technologies such as Artificial Intelligence (AI), Virtual Reality (VR), and data analytics being utilized to transform the way we learn and teach, it is crucial to ensure that students remain motivated in the face of these new challenges (Cheng & Tsai, 2020). This theme focuses on academic aspects and the development of social skills and creativity required in an increasingly interconnected and dynamic workplace (Melian-Melian & Martin-Gutierrez, 2020).

Motivation in education is an internal force that drives individuals to participate, interact, and strive to achieve academic goals (Stegers-Jager et al., 2012). In learning, motivation encompasses psychological drives that influence how strongly someone is willing to learn and grow (Yousefi et al., 2022).). Motivation can stem from internal factors such as personal interests, a sense of achievement, and the desire for self-improvement. Conversely, external factors such as rewards, recognition, and social support can also impact students' motivation (Alem, 2019).

Understanding motivation in education is crucial because it impacts students' learning outcomes. Motivated students tend to be more engaged in learning, more persistent in overcoming challenges, and more enthusiastic about achieving success (Maun et al., 2020). Strong motivation can help students overcome learning obstacles and enhance the quality of their engagement in the learning process (Chiang et al., 2014). However, each student possesses a unique combination of motivational factors, and a profound understanding of these factors is essential for educators to design appropriate teaching strategies (Kovas, 1990).

In facing the Industry 4.0 era, where technology and innovation continue to evolve, further analysis related to the theme of "Motivated Strategies of Learning" becomes increasingly crucial (Suhendri & Kurniawan, 2022). This is because we need to understand how to enhance students' motivation amid the dynamic changes in the learning environment (Hands

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& Limniou, 2023). New technologies can also be leveraged to boost students' motivation and engagement in the learning process (Horverak et al., 2022). Additionally, the role of teachers and teaching methods needs to be explored in the effort to build sustainable motivation (Cook et al., 2011); these questions underscore the need for in-depth analysis of motivated strategies in education, enabling us to develop practical approaches in preparing students to face future challenges and opportunities.

Bibliometric indicators play a highly significant role in evaluating scientific research outcomes. They are used to measure publication impact and analyze the interaction between science and technology, delineate the mapping of various scientific fields, and track the development of new knowledge within specific disciplines (Li et al., 2023). Moreover, bibliometric indicators serve as valuable foundations in future strategic planning, assisting research institutions and academics in directing their resources more effectively and formulating evidence-based policies (Apriantoro & Wijayanti, 2022a). Thus, bibliometric indicators are essential tools in the research world, aiding in understanding, measuring, and planning the advancement of knowledge (Belmonte et al., 2020; Boquera et al., 2021; Zheng et al., 2019).

This study aims to examine the development and research trends related to the theme "Motivated Strategies of Learning" in publications listed in the Scopus database from 1977 to 2023. The choice of 1977 as the starting point for the study was based on the fact that it marked the first relevant publication recorded on this theme in the Scopus database.

Previous Research

In terms of the students' role, a study by Lee et al. (2020) highlighted the concept of "self-regulated learning," closely linked to motivation. This research demonstrated that students who can regulate and control their learning processes tend to have higher motivation (Chitkara et al., 2016). They can establish clear learning goals, manage their time effectively, and implement efficient learning strategies (Kesici et al., 2011).

Regarding the teacher's role, Susanti et al. (2023), in their research, explained the vital role of teacher support in motivating students. This study indicated that a positive relationship between teachers and students, along with the emotional support provided by teachers, can positively impact students' motivation (Cañabate et al., 2019). Teachers who support and care about students' development can boost self-confidence and intrinsic motivation (Senler & Sungur-Vural, 2013).

In academic support, research conducted by Vyas et al. (2017) emphasized the significance of academic support in enhancing students' motivation. This study delved into how interactions among teachers, peers, and the school environment can influence student motivation (Yousefi et al., 2022). The research findings indicated that academically supported students tend to be more motivated and positively perceive the learning process (Pratiwi & Suyatmini, 2019).

Regarding the role of technology, a study conducted by Arones et al. (2022) explored the relationship between technology and student motivation. They found that well-integrated technology usage in learning can enhance student motivation (Zhu et al., 2021). Interactive and engaging technologies can pique students' interest and provide a more enjoyable learning experience, thus contributing to higher motivation (Lara-Prieto et al., 2023).

From previous research on the Motivated Strategies of Learning themes, bibliometric analysis methods have yet to be utilized to map out scholarly publications across various fields.

Methodology

The bibliometric analysis method forms the foundation of this research (Apriantoro, 2023; Apriantoro, Herviana, et al., 2023; Apriantoro, Maheswari, et al., 2023; Apriantoro & Wijayanti, 2022b). Data were collected using a Boolean search engine, exploring the Scopus database from 1977 to 2023. August 5, 2023, at 09:30 AM WIB, was designated as the search timestamp. The researcher conducted the comprehensive analysis utilizing tools such as R and Rstudio, VosViewer, and Microsoft Excel. This approach dissected information regarding citations, document content, and relationships between the data. The researcher underwent three stages in processing the collected dataset.

In the **initial stage**, the researcher conducted a literature review to examine the topic's relevance to the upcoming bibliometric research. This step was essential to ensure the research's alignment with the discussed theme and identify suitable keywords to cover the research area comprehensively.

In the **second stage**, the researcher searched the Scopus database using the Boolean operator TITLE-ABS-KEY ("motivated AND strategies AND of AND learning"). This search yielded a total of 3,493 documents. Subsequently, a filtering process was applied using Boolean operators (LIMIT-TO (SRCTYPE, "j")) and (LIMIT-TO (SUBJAREA, "soci")) as well as (LIMIT-TO (DOCTYPE, "ar")) and (LIMIT-TO (LANGUAGE, "english")) to narrow down the documents to the scope of social sciences, specifically articles from journals, written in English. After this filtering process, a total of 942 relevant documents were obtained.

In the **third stage**, an in-depth analysis of the selected documents was conducted. Various tools such as Scopus Analyzer, R, and RStudio were employed to identify the number of documents published each year, analyze the pattern of document distribution over the years, and extract information about authors, authors' institutional affiliations, and the authors' countries of origin. Additionally, this stage involved analyzing the interconnection levels among documents with visualizations provided by VOSviewer. All the acquired data were further processed and analyzed using the Microsoft Excel application. The research steps are visually presented in the attached figure:
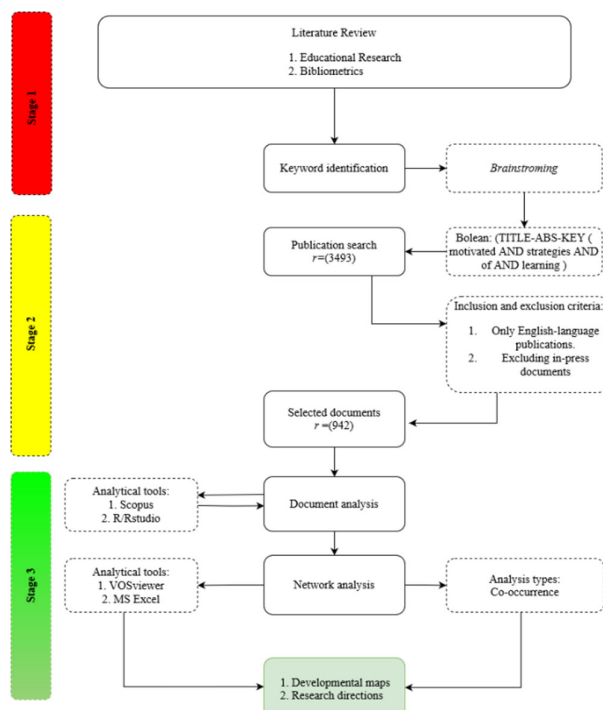
Figure 1. Research Workflow

Result and Discussion
Document Analysis
Primary Information about the Data
Table 1 presents a summary of 942 records accumulated during 46 years. Encompassing 2455 authors and 208 single authors, international authorship collaboration was observed at a rate of 14.86%. The references amounted to 38678, with the average citations per document totaling 19,74.

Table 1. Main Data Information

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	1977:2023
Sources (Journals, Books, etc)	492
Documents	942
Annual Growth Rate %	9,5
Document Average Age	7,46
Average citations per doc	19,74
References	38678
DOCUMENT CONTENTS	
Keywords Plus (ID)	1695
Author's Keywords (DE)	2551
AUTHORS	
Authors	2455
Authors of single-authored docs	208
AUTHORS COLLABORATION	
Single-authored docs	219
Co-Authors per Doc	2,81
International co-authorships %	14,86
DOCUMENT TYPES	
Article	942

Document by Year
The figure below illustrates the development of publications within the theme "Motivated Strategies of Learning" based on the year of publication. The first document emerged in 1977 with a single document. This article went through a period of stagnation from 1977 to 1996 and reached its publication peak in 2020 with 91 documents.
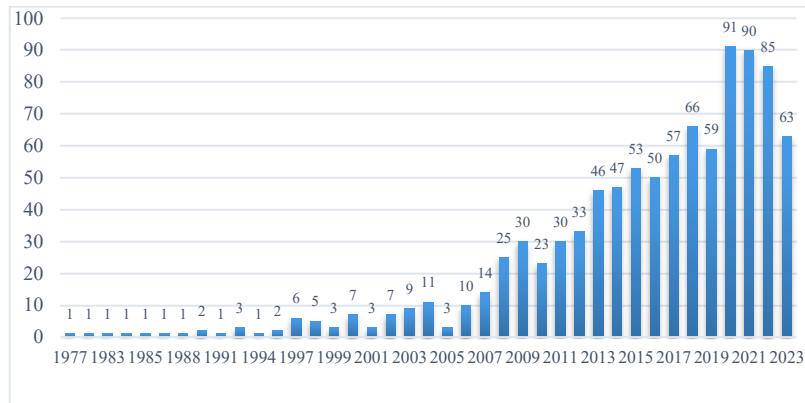
Firure 2. Document Publication Chart by Year

Most Relevant Authors

The chart below depicts the ten most influential authors in publications related to Motivated Strategies of Learning. Sungur leads with eight publications, followed by Csizér and Henning with five publications each.
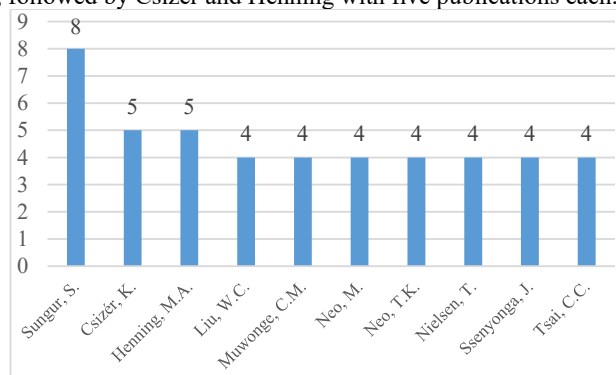

Figure 3. Chart of Author Publications

Document based on Affiliations

The chart below illustrates the ten most influential affiliations in publications related to Motivated Strategies of Learning. Researchers from Middle East Technical University lead in this area with 20 articles, followed by researchers from The University of Hong Kong with 11 articles.
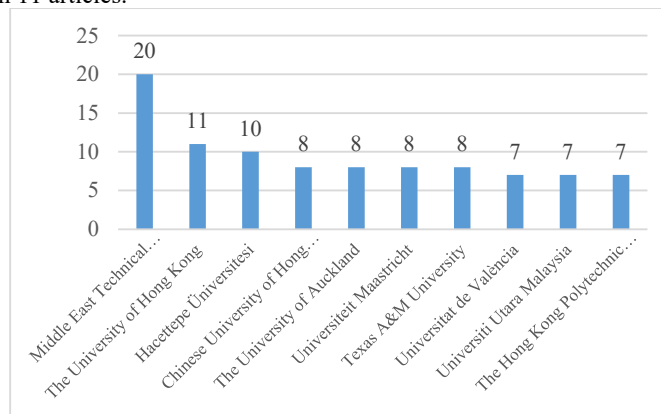

Figure 4. Chart of Publications by Affiliation

453

The figure above depicts the distribution of publications by country in the Motivated Strategies of Learning field. The United States leads with 253 documents, followed by the United Kingdom with 68 documents.
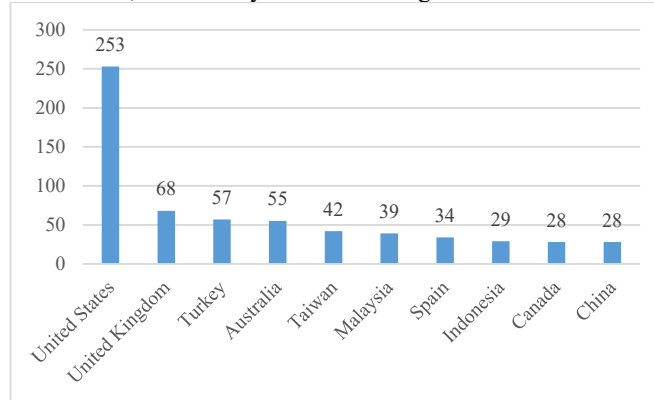

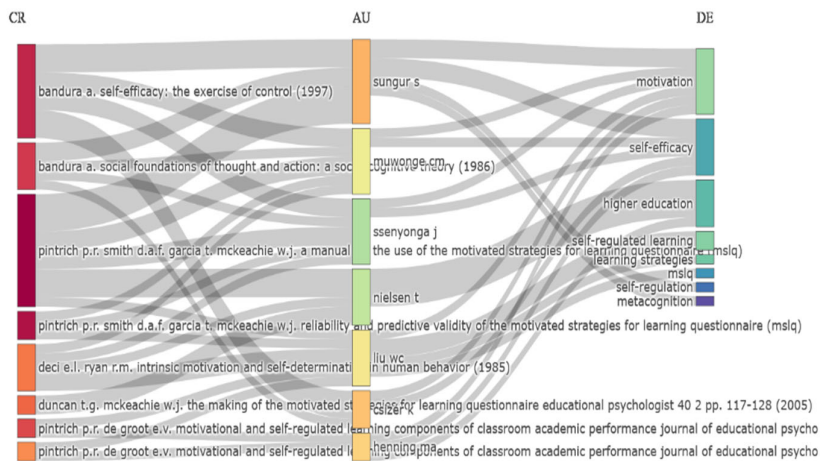**Figure 5.** Chart of Publications by Country

Three-Field Plot

Figure 6. Three-Field Plot (references, authors and keywords)

The first element contains references cited by authors while researching the related theme. Based on the above figure, there are eight cited references. The most frequently cited reference in research related to Motivated Strategies of Learning is "A Manual for the Use of the Motivated Strategies for Learning Questionnaire," highlighted in dark red and linked to several authors such as Sungur S, Muwonge Cm, Ssenyonga J, Liu Wc, and Nielsen T.

In the second element, there are nine authors. The size of the bar chart indicates the number of research publications by each author. Among these nine authors, those who have written the most articles on Motivated Strategies of Learning are Sungur S, Muwonge Cm, Ssenyonga J, Liu Wc, and Nielsen T.

In the third element, each research topic is connected with authors actively producing works related to Motivated Strategies of Learning. The analysis identified eight keywords, with "Motivation" and "Self-Efficacy" ranking the highest. This illustrates that both words strongly connect with Motivated Strategies of Learning research.

This analysis offers valuable insights into the core references, prolific authors, and prominent keywords in Motivated Strategies of Learning, providing a comprehensive overview of the essential components shaping research in this area.
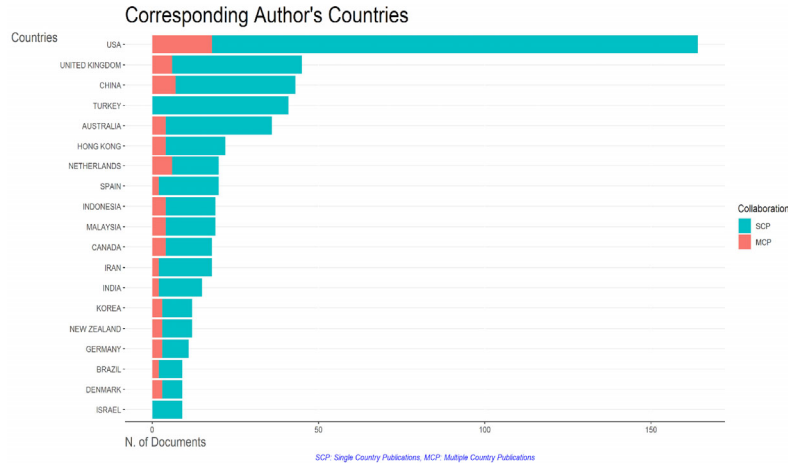
Corresponding Author's Countries

Figure 7. Chart of Corresponding Author's Countries

From the perspective of Multiple Country Publication (MCP) and Single Country Publication (SCP), the number of SCP is more significant than MCP. Regarding MCP, the United States (US) leads with the most publications, totaling 18 documents, followed by China with seven documents, and the United Kingdom and the Netherlands with six documents each. However, concerning SCP, the US also leads with a significantly more significant number of publications, totaling 146 documents. Turkey ranks second with 41 documents, while the United Kingdom is in third place with 39 documents. Regarding continents, Asia dominates with nine countries, while Europe holds the second position with five countries.

Most Global Cited Document

The paper with the highest Total Citations (TC) is "Park D-B, 2009, Tour Manage", with 466 citations. On the other hand, the paper with the highest TC per Year is "Broadbent J, 2017, Internet Higher Educ", with 48.71 citations per year.

Based on this data, TC (total citations) tends to influence TC per Year (citations per year). Generally, papers with higher TC also tend to have a significant TC per Year. However, it is only sometimes valid that papers with high TC will have higher TC per Year than others, and vice versa.

Interestingly, the publication year of the paper does not significantly influence TC. While there are some older papers with lower TC compared to newer ones, there are exceptions where older papers can also have high TC. Therefore, from the given data, no consistent relationship exists between the publication year and the number of citations (TC).

Table 2. Most Globally Cited Document

| Paper	Total Citations	TC per Year	Normalized TC
Park D-B, 2009, Tour Manage	466	31,07	8,02
Komarraju M, 2013, Learn Individ Differ	389	35,36	13,99
Chen Y, 2014, Comput Educ	367	36,70	14,39
Broadbent J, 2017, Internet Higher Educ	341	48,71	13,55
Sun A, 2016, J Inf Technol Educ Res	333	41,63	17,15
Cleary Tj, 2004, Psychol Sch	319	15,95	4,16
Guilloteaux Mj, 2008, Tesol Q	275	17,19	6,47
Credé M, 2011, Learn Individ Differ	272	20,92	10,88
Karabenick Sa, 2003, Contemp Educ Psychol	239	11,38	3,27
Artino Jr Ar, 2009, Internet Higher Educ	200	13,33	3,44
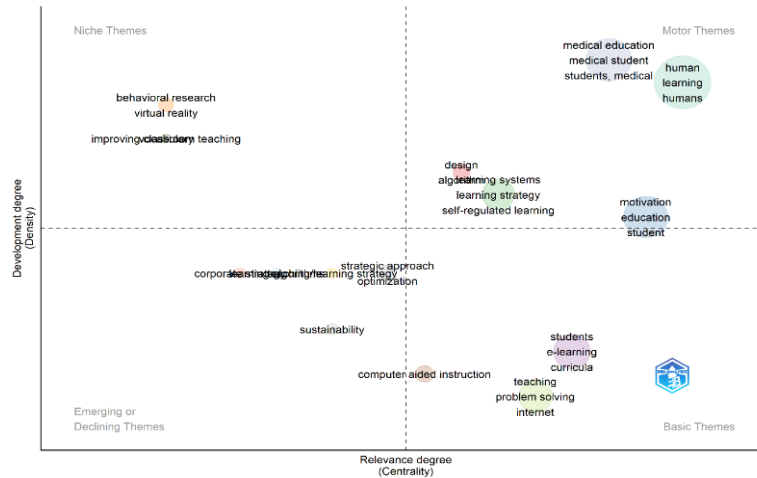
Figure 8. Thematic Map

The thematic map in Figure 8 consists of four categories: Basic Theme, Motor Theme, Niche Theme, and Emerging and Declining Theme.

Basic Theme: This category encompasses the fundamental themes of existing research. The cluster "Teaching" is an example of a basic theme in the given data. Basic themes often serve as the primary focus of research, receiving widespread attention from researchers.

Motor Themes: This category includes themes that act as drivers or catalysts behind research development. The "Human" cluster (Cluster 4) is an example of a motor theme in this data. Entrepreneurship is an actively researched theme that influences the direction and trends of research related to entrepreneurship. Motor themes often impact how research and publications evolve.

Niche Themes: This category comprises more specific and less common themes than basic and motor themes. An example of a niche theme in this data is the "Virtual Reality" cluster (Cluster 6). Themes like behavior fall into the niche theme category because they might have fewer research studies or may be of interest only to specific groups of researchers.

Emerging or Declining Themes: This category encompasses themes that are either emerging or declining in popularity within research or publications. In this data, the theme "Sustainability" (Cluster 14) can be categorized as an emerging theme because its occurrences and relevance in research are significant, although not as numerous as themes like "Teaching" (Cluster 12) or "Human" (Cluster 8). On the other hand, there are several themes with lower occurrences, such as "Corporate Strategy" (Cluster 9) and "Optimization" (Cluster 7), which can be categorized as declining themes because the number of research studies or publications related to these themes tends to decrease.

By analyzing this classification, we can understand the distribution and trends of themes within the existing research or publication data. This categorization aids in identifying dominant themes in specific research fields, themes that are currently emerging, and themes that might require more attention and further research. Understanding these dynamics is crucial for researchers, institutions, and policymakers to stay informed about the evolving research interests and priorities landscape.
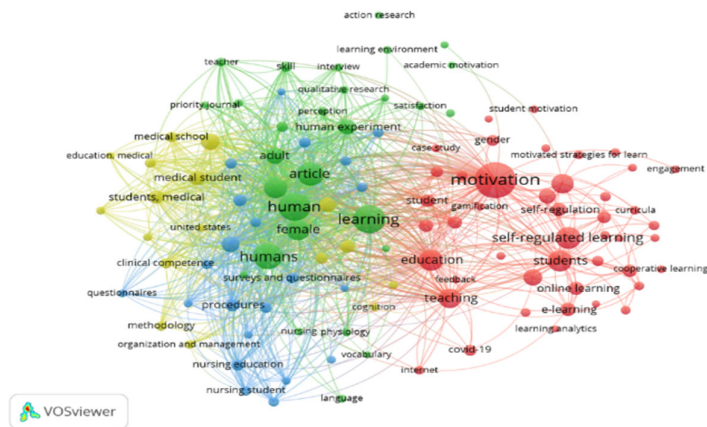
Network Analysis

Figure 9. Keyword Network Distribution based on Occurrence

In this figure, the analysis is conducted based on the occurrence of research on Motivated Strategies of Learning, with a minimum cluster size of 15. Four clusters are formed, with the following item counts: Cluster 1 with 45 items, Cluster 2 with 29 items, Cluster 3 with 22 items, and Cluster 4 with 17 items. The dominant keyword is "Motivation," with 192 occurrences and a link strength of 816.
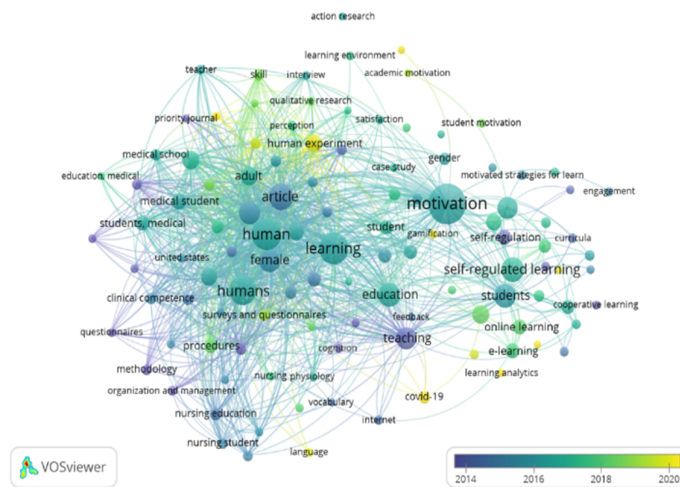

Figure 10. Keyword Network Distribution Based on Overlay

This figure displays the analysis of keyword networks based on overlay. It is evident that keywords like "Human Experiment," "Learning Analytics," and "Blended Learning" were predominantly used in the most recent years, around 2020. In contrast, keywords like "Teaching," "Problem-Solving," and "Cognition" have been in use for a relatively more extended period, around 2014.
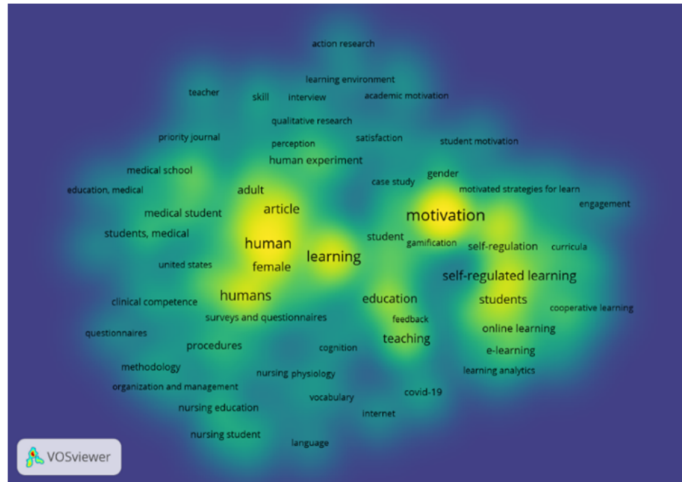
Figure 11. Keywor Network Distribution Based on Density

The density analysis reveals that keyword like "Human," "Learning," and "Motivation" have high density in the research on this theme. This indicates that the focus on these aspects plays a central role in the context of Motivated Strategies of Learning. On the other hand, keywords such as "Learning Environment," "Academic Motivation," and "Self-Directed Learning" are relatively less researched. However, further research on these less-explored keywords can provide valuable insights to explore elements that have yet to be fully explored.

Table 3. Keywords and Their Occurences in Each Cluster

Keyword	Occurrences	Cluster
1. Motivation	192	
2. Self-regulated learning	71	
3. Students	65	1
4. Learning strategies	57	
5. Self-efficacy	35	
1. Human	118	
2. Learning	116	
3. Professional development	9	2
4. Academic motivation	8	
5. Action Research	8	
1. Questionnaire	38	
2. Psychology	21	
3. Controlled study	16	3
4. Educational measurement	16	
5. Program evaluation	14	
1. Humans	96	
2. Curriculum	35	
3. Problem-based learning	23	4
4. Procedures	23	
5. Organization and management	12	

The table above displays occurrences in each cluster representing the main themes in the Motivated Strategies of Learning research field. The theme in the first cluster is Student Learning and Motivation, and the theme in the second cluster is Professional Development and Educational Improvement.

The theme in the third cluster is Research Methodology and Educational Assessment, and the theme in the fourth cluster is Curriculum Design and Learning Processes.

Conclusion

Publications with the Motivated Strategies of Learning theme peaked in 2020 with 91 documents. The most relevant author is Sungur, S, with eight publications. The institution with the most publications is Middle East Technical University, with 20 documents. The country with the most publications is the US, with 253 documents. The largest MCP is the US. "Park D-B, 2009, Tour Manage" has the highest number of citations at 466. The basic theme in research on Motivated Strategies of Education is Human, and "Motivation" is the dominating keyword with a link strength of 816. The keywords "Human Experiment," "Learning Analytics," and "Blended Learning" were used in 2020. There are four mainstream themes: Student

Learning and Motivation, Professional Development and Educational Improvement, Research Methodology and Educational Assessment, and Curriculum Design and Learning Processes.

The limitations of this research are that it only explores datasets indexed in Scopus and analyzes documents of the type "journal article" in English without considering other global indices, languages, or document types other than journal articles.

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