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The impact mechanism of teacher positive leadership on study engagement: A visual analysis based on knowledge mapping

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Abstract

To address the critical issue of insufficient student engagement in higher education, this study maps the intellectual landscape of how "Teacher Positive Leadership," a proactive evolution from "teacher support" empowers students. Using a scientometric approach, we conducted a visual analysis with CiteSpace on 243 core articles from the Web of Science (2005–2025). The analysis identified research hotspots, foundational theories, and emerging frontiers. Results show that research in this domain centers on a core pathway: "teacher leadership → student psychological mechanisms (e.g., self-efficacy, motivation) → study engagement/achievement," with achievement goal theory and study engagement theory as its primary theoretical foundations. A dynamic trend was also identified, showing a research evolution from focusing on academic outcomes to a deeper concern for students' psychological processes and well-being. We conclude that the shift to a "teacher positive leadership" framework is a necessary evolution in educational research and highlight a promising future direction: developing integrated models that explore multiple psychological mechanisms, such as psychological capital and achievement goals, in diverse cultural contexts.

Keywords: CiteSpace, Knowledge mapping, Study engagement, Teacher positive leadership.

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1. Introduction

In the era of globalization and the knowledge economy, enhancing the quality of higher education has become a national strategy for countries to strengthen their core competitiveness [1]. As a key indicator of educational quality and the effectiveness of talent cultivation, study engagement, defined as the time, effort, and psychological resources students

invest in the learning process has garnered significant attention from both the academic community and policymakers [2]. Research has confirmed that high levels of study engagement not only significantly improve students' academic achievement and innovative abilities but also have a profound impact on their mental health, subjective well-being, and future career development [3, 4]. However, alongside the rapid development of higher education, there is a widespread phenomenon of insufficient study engagement among college students worldwide, such as lack of learning motivation, low classroom participation, and academic burnout, which are becoming increasingly prominent [5]. This challenge is particularly severe in China, where traditional educational models and rapid social transformation have combined to cause some students to experience a sense of aimlessness and a lack of value upon entering university, forming a phenomenon known as "hollowing out," which severely hinders the cultivation of high-quality talent [6]. When exploring the factors influencing study engagement, the academic community generally agrees that, in addition to individual student factors, the classroom learning environment centered on teachers plays a crucial role [7]. Teachers are not only knowledge transmitters but also key shapers of students' learning motivation, emotional experiences, and value beliefs. Previous studies have primarily focused on the "teacher support" perspective and confirmed its positive impact on study engagement [8]. However, the concept of "support" is relatively passive and insufficient to fully capture the proactive and positive role teachers can play in unlocking students' potential and guiding their value development. In recent years, the concept of "Teacher Positive Leadership," derived from positive psychology and organizational behavior, has provided a new theoretical perspective. This theory emphasizes that teachers systematically empower students by creating a positive atmosphere, establishing positive relationships, engaging in positive communication, and assigning positive meaning, thereby stimulating their intrinsic potential and growth motivation [9, 10]. Although this concept demonstrates great explanatory potential and practical value, related research is still in its infancy, presenting problems such as inconsistent conceptual definitions, scattered empirical studies, and unclear mechanisms of action. The academic community lacks a macro, systematic, and objective picture of the knowledge structure, research hotspots, and evolutionary trajectory of the core issue of "how teacher positive leadership affects student study engagement."

Traditional literature reviews often rely on the subjective experience of researchers when summarizing the current state of a field, making it difficult to comprehensively and objectively reveal the complex internal connections and dynamic evolution trends within a knowledge domain. To overcome this limitation, this study will adopt the scientific knowledge map (Scientometrics) method and utilize the visualization analysis software CiteSpace to conduct a quantitative bibliometric analysis of the field of "teacher positive leadership and student study engagement." This method can convert massive amounts of literature data into intuitive knowledge network maps through mathematical algorithms and visualization techniques, thereby clearly identifying the knowledge base (cited literature and authors), research hotspots (high-frequency keywords), and cutting-edge trends (research fronts) within the field [11]. To construct a high-quality, highly relevant literature database, this study selected the Web of Science (WoS) Core Collection as the data source, as it contains high-quality literature and complete citation data, making it an ideal choice for scientific knowledge map analysis. The literature search followed the principles of comprehensiveness and precision and was constructed using modularized subject terms. The search time span was set from 2005 to 2025, and the document types were limited to "Article" and "Review." The retrieval logic is as follows: first, the teacher influence module (independent variable) was constructed, including keywords such as "teacher positive leadership," "teacher support," and "transformational leadership"; second, the student engagement module (dependent variable) was constructed, including keywords such as "study engagement," "student engagement," and "academic engagement"; finally, to ensure the study focuses on core mechanisms, a psychological mechanism module (mediating variable) was constructed, including keywords such as "psychological capital," "achievement goal," "motivation," and "self-efficacy." By combining the Boolean logic (teacher influence module) AND (student engagement module) AND (psychological mechanism module), we screened a total of 243 English-language articles highly relevant to the research topic, which were selected as the data sample for this visualization analysis.

This study aims to systematically map the knowledge landscape of research on teacher positive leadership, related psychological mechanisms, and student study engagement worldwide from 2005 to 2025 using CiteSpace software. Specific objectives include:

Identify research hotspots and core themes: Through keyword co-occurrence and cluster analysis, identify the main research content and structure of the field.

Explore knowledge foundations and academic schools of thought: identify seminal literature, authoritative scholars, and major academic communities in the field through literature and co-citation analysis.

Revealing research frontiers and evolving trends: Through keyword salience analysis, track the dynamic changes in hot topics in the field and predict future research directions.

2. Literature Review

2.1. Perceived Teachers' Positive Leadership

The concept of Positive Leadership, rooted in positive psychology and modern leadership theories, was systematically proposed by Cameron [12] and Cameron [9]. It is defined as a leadership paradigm that centers on fostering extraordinary performance ("positive deviance"), focusing on members' strengths and potential, and cultivating virtuousness [9]. This approach moves beyond traditional leadership models by emphasizing not just organizational goals but also the holistic development and well-being of individuals. Cameron [12] and Cameron [9] identified four core dimensions that constitute Positive Leadership:

Positive Climate: Creating a supportive, caring, and optimistic environment that fosters a sense of security and belonging.

Positive relationships: Building networks of mutual trust, respect, and cooperation that enhance emotional support.

Positive communication: Employing affirmative, encouraging, and supportive language to provide constructive feedback.

Positive Meaning: Helping individuals discover the value and purpose of their work, thereby inspiring intrinsic motivation.

In the educational domain, this concept is adapted as Perceived Teachers' Positive Leadership. It reflects students' subjective perceptions of their teachers' positive behaviors. In the Chinese context, scholars like [13] have localized this theory, emphasizing that such leadership involves influencing students through positive thinking and emotional intelligence, showing care and empathy, and creating an optimistic class climate to encourage students' self-confidence and vision for growth. As a key component of the learning environment, Perceived Teachers' Positive Leadership serves as a critical external factor that can significantly shape students' psychological states and learning behaviors [8, 14].

2.2. The Mediating Roles of Psychological Capital and Achievement Goals

The influence of the external learning environment on student behavior is often mediated by internal psychological mechanisms. This study focuses on two such mechanisms: Psychological Capital and Achievement Goals.

Psychological Capital (PsyCap), a core concept from Positive Organizational Behavior, is defined as an individual's positive psychological state of development characterized by four dimensions: (1) self-efficacy (confidence to take on and put in the necessary effort to succeed at challenging tasks); (2) optimism (making a positive attribution about succeeding now and in the future); (3) hope (persevering toward goals and, when necessary, redirecting paths to goals); and (4) resilience (when beset by problems and adversity, sustaining and bouncing back and even beyond to attain success) [15]. As a "state-like" resource, PsyCap is malleable and can be developed through external support, such as positive leadership. Empirical studies have confirmed that PsyCap effectively enhances students' study engagement by strengthening their internal beliefs and reducing negative emotions like academic burnout [16, 17].

Achievement goals refer to the purpose or motivational orientation an individual adopts in an achievement context, which in turn guides their cognitive, emotional, and behavioral responses [18, 19]. The most widely applied framework includes three types of goals:

Mastery Goals: Focused on developing competence and mastering the task.

Performance-Approach Goals: Focused on demonstrating superior ability relative to others.

Performance-Avoidance Goals: Focused on avoiding the demonstration of incompetence.

Teachers' positive leadership can foster more adaptive goal orientations, particularly mastery goals, by emphasizing effort and personal growth over social comparison [20]. Research consistently shows that mastery goals are strong predictors of deep learning strategies and sustained engagement [21, 22].

2.3. Study Engagement and Its Antecedents

Study engagement is the ultimate dependent variable in this research. It is a multidimensional construct that reflects the quality of a student's participation in learning activities. Following the widely accepted model by Fredricks et al. [3] it comprises three key dimensions:

Behavioral Engagement: Involves participation in academic and extracurricular activities, such as paying attention in class and completing assignments.

Emotional Engagement: Encompasses affective reactions in the classroom, including interest, a sense of belonging, and valuing the subject matter.

Cognitive engagement refers to the psychological investment in learning, including the willingness to exert effort to comprehend complex ideas and to use self-regulatory strategies.

The literature provides strong evidence linking the aforementioned variables. Perceived teachers' positive leadership, as a supportive environmental factor, directly fosters study engagement by creating a safe and motivating classroom climate [23, 24]. This relationship is further explained by the mediating pathways. On one hand, positive leadership cultivates students' Psychological Capital, providing them with the internal resources (e.g., confidence, hope) needed to engage fully in their studies [25]. On the other hand, it helps shape students' achievement goals toward mastery and learning, which is a powerful driver of deep and sustained engagement [26]. Thus, the effect of positive teacher leadership on student engagement is both direct and indirect, operating through the activation of students' internal psychological resources and motivational orientations.

3. Results and Discussion

3.1. Keyword Co-Occurrence

Keyword co-occurrence analysis is a core method that reveals major research hotspots and their interrelationships within a discipline by counting the frequency of co-occurrence of keywords in literature. High-frequency keywords represent research hotspots in a field over a period of time, while high-centrality keywords are usually "bridges" or "hubs" connecting different research topics, reflecting the knowledge structure of the field.

The keyword co-occurrence network generated in this study contains 341 nodes (N=341) and 987 links (E=987), with a network density of 0.017. The Modularity Q of the network is 0.6865, far exceeding the critical value of 0.3, indicating that the community structure in this research field is highly significant. The Mean Silhouette is 0.8662, far exceeding the high homogeneity standard of 0.7, suggesting that the clustering results of this network segmentation are of extremely high quality with strong internal homogeneity.

Figure 1 shows the keyword co-occurrence map, where the size of the nodes represents the frequency of keyword occurrence. To extract the core concepts in this field, Table 1 lists the top 10 keywords in terms of frequency and their centrality.

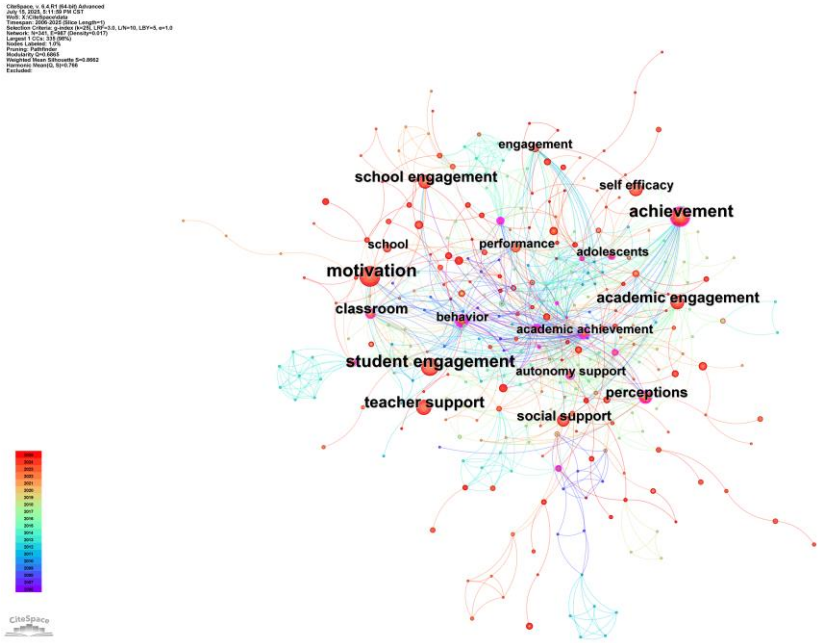

Figure 1.
Keyword co-occurrence network diagram.

Table 1.
Top 10 frequently used keywords in research fields.

Rank	Keywords	Frequency	Centrality
1	Motivation	116	0.00
2	Student engagement	99	0.04
3	Achievement	91	0.17
4	Teacher support	67	0.01
5	Academic engagement	60	0.07
6	School engagement	56	0.03
7	Classroom	44	0.14
8	Perceptions	42	0.17
9	Social support	39	0.01
10	Self-efficacy	30	0.00

From the high-frequency keywords (Table 1), "motivation" (116 times) is the most frequently used word, followed by a series of engagement-related words, such as student engagement (99 times), academic engagement (60 times), and school engagement (56 times). How to effectively motivate students and promote their deep engagement at different levels is the core issue of greatest concern to scholars in this field. In terms of influencing factors, teacher support (67 occurrences) is the most frequently mentioned teacher-related variable, while achievement (91 occurrences) is the most closely examined outcome variable. The high-frequency terms form a research pathway: teacher support → student motivation and engagement → academic achievement.

From the perspective of highly central keywords, "achievement" (0.17) and "perceptions" (0.17) demonstrate a "bridge" role. In particular, the high centrality of "perceptions" reveals an important theoretical perspective: whether it is teacher support or the classroom environment, neither acts objectively and directly on students, but must exert its influence through the subjective "perceptions" of students. Additionally, the frequent appearance of "self-efficacy" suggests its crucial role as a mechanism connecting external support with internal effort in this process.

To visually demonstrate the concentration of research hotspots in this field, a keyword heatmap was generated (see Figure 2). The heatmap uses color depth and temperature to represent keyword density and research intensity; colors ranging from green (low intensity) to yellow and then to red (high intensity) mark the "core zones" of research. As seen in the figure, the areas with the highest research intensity (the red and orange zones) are significantly concentrated in a core area centered around keywords such as "achievement," "academic engagement," "student engagement," "teacher support," and "self-efficacy."

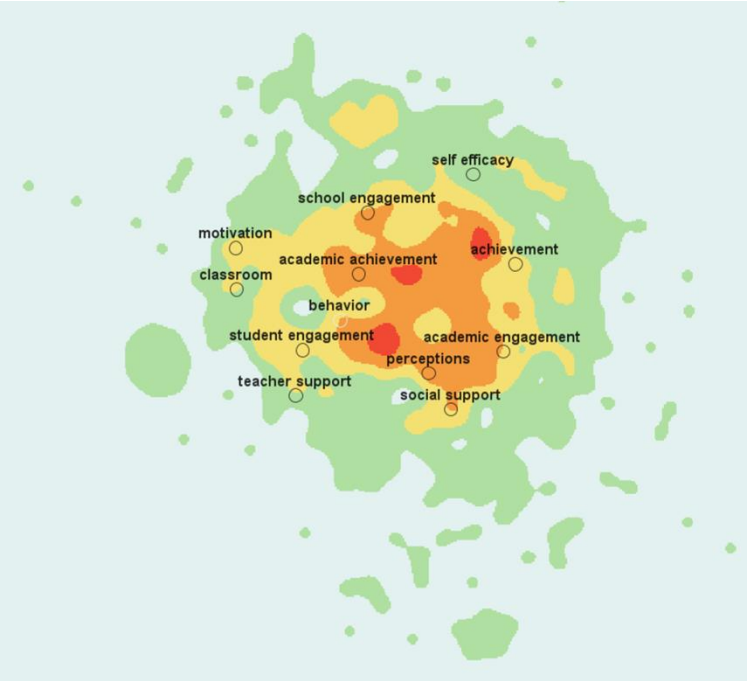

Figure 2.
Keyword Co-occurrence Heatmap.

3.2. Keyword Clustering

Keyword clustering analysis can organize hot keywords into meaningful "thematic clusters," thereby revealing the research structure and core issues of the field at a deeper level. This study used the LLR algorithm to cluster the keyword network and interpreted the eight largest clusters (see Figure 3 and Table 2). The network structure generated by this analysis is robust and reliable, with a Modularity Q of 0.6865, far exceeding the critical threshold of 0.3, indicating that the community structure in this research field is highly significant. Additionally, the network's Mean Silhouette is 0.8662, far exceeding the high homogeneity standard of 0.7, indicating that the clustering results are of extremely high quality, with strong consistency among keywords within each cluster.

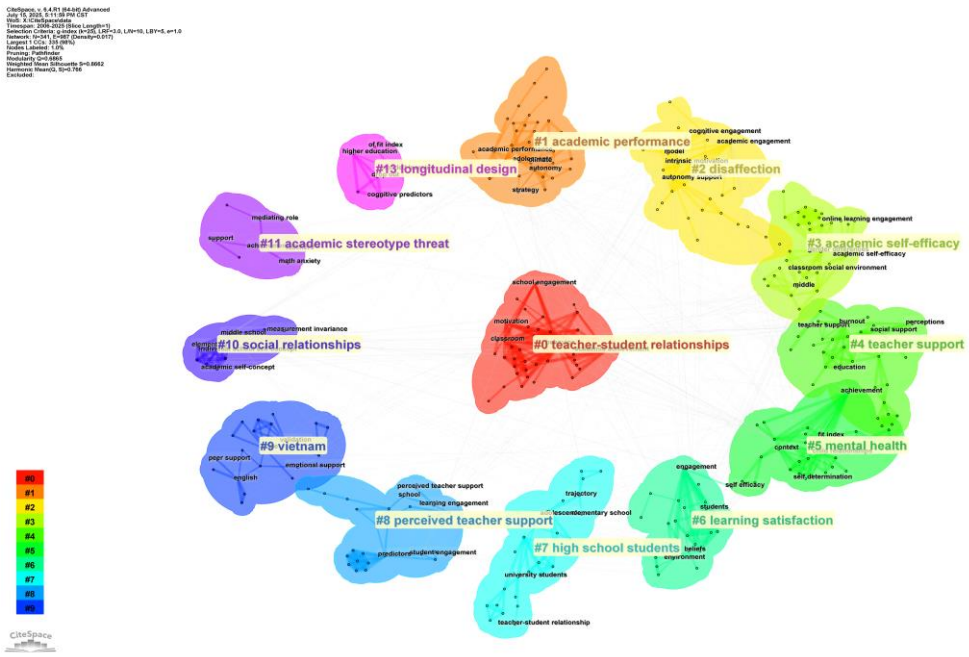

Figure 3.
Clustering of research hotspots in the areas of teacher support and student engagement.

Table 2.
Cluster Analysis of Research Hotspots in the Areas of Teacher Support and Student Engagement.

#	Size	S	LLR Label	Core Keywords	Interpretation & Refined Label
#0	62	0.86	Teacher-student relationships	Teacher-student relationship, support, classroom, motivation, context	Teacher Support & Relationship Building
#1	55	0.79	Academic performance	Academic performance, academic achievement, goal, and social support	Academic Achievement & Outcome Measurement
#2	54	0.88	Disaffection	Disaffection, student engagement, motivation, and self-determination theory	The Opposite of Engagement: Disaffection & Burnout
#3	49	0.81	Academic self-efficacy	Academic self-efficacy, self-efficacy, motivation, performance, college student	Student Agency & Psychological Resources
#4	42	0.92	Teacher support	Teacher support, perception, identity, predictor, emotional support	Perception and Impact of Teacher Support
#5	38	0.89	Mental health	Mental health, well-being, stress, depression, resilience	Student Well-being & Mental Health
#6	35	0.95	Learning satisfaction	Learning satisfaction, satisfaction, online learning, quality	Learning Satisfaction & Quality Assessment
#8	29	0.97	Perceived teacher support	Perceived teacher support, peer support, social support, and belonging	Multiple Social Support Systems

Clusters #0, #4, and #8 collectively form the core set of independent variables in this field of research. Cluster #0, "Teacher Support and Relationship Building," is the largest cluster, indicating that "teacher-student relationships" and "teacher support" are the most classic paradigms for exploring teacher influence. Clusters #4 and #8 further deepen this theme, emphasizing the importance of students' subjective "perception" and placing teacher support within a broader "social support" system (such as peer support). This indicates that research is shifting from focusing on teachers' objective behaviors to focusing on how students perceive and interpret these behaviors.

Clusters #1, #2, and #6 constitute the core set of dependent variables in this field of research. Cluster #1, "Academic Achievement and Outcome Measurement," represents traditional research outcomes focused on academic performance. Clusters #2, "The Opposite of Study Engagement: Disengagement and Burnout," and #6, "Learning Satisfaction," represent a focus on students' process-oriented states and emotional experiences. The emergence of "disaffection" in Cluster #2 directly corresponds to "engagement," confirming that "study engagement" itself is a core issue in this field.

Clusters #3 and #5 are the most insightful psychological mechanism clusters in this analysis. Cluster #3, "Student Individual Agency and Psychological Resources," centers on "academic self-efficacy" and precisely targets the "psychological capital" construct of this study. Self-efficacy is the most important component of psychological capital, and the emergence of this cluster provides a solid literature foundation for exploring the mediating role of psychological capital in this study. Cluster #5, "Student Well-being and Mental Health," reveals another important psychological mechanism pathway. The keyword "resilience" resonates with the dimensions of psychological capital, indicating that enhancing students' positive psychological resources is a crucial pathway for promoting their comprehensive development.

3.3. Keyword Burst Detection

Keyword Burst Detection can identify terms that suddenly gain significant attention from scholars within a specific time period, thereby revealing the dynamic evolution of research frontiers. This study utilized CiteSpace's burst algorithm to identify the four keywords with the highest burst intensity, including their burst start and end years and intensity shown in Figure 4. "Middle school" was the earliest and longest-lasting (2006-2017) burst keyword, indicating that early research in this field was highly concentrated on the middle school education stage. As research deepened, "classroom" emerged as a new frontier in 2013, marking a shift in research focus from the macro level of educational stages to the micro level of teacher-student interaction. "Context" emerged strongly in 2016 and continued until 2020, reflecting theoretical deepening in the field—scholars began to transcend the single classroom environment and increasingly emphasized the influence of broader social and cultural contexts on teacher-student interaction and student development, providing strong cutting-edge support for this study's focus on "contextualized" research in a specific region of China (Guizhou). "School engagement" emerged as the latest term, with its popularity peaking from 2017 to 2021, indicating a shift in research focus from

traditional "academic achievement" to a comprehensive concern for students' "engagement" status. The evolution of research frontiers reflects a deepening process from specific educational stages to micro-classroom settings, then to macro-contexts, and finally to the process-oriented indicator of "study engagement".

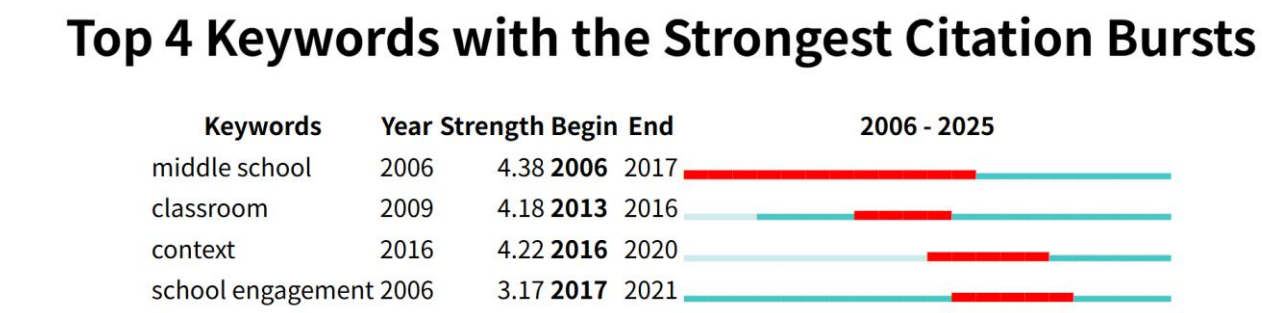

Figure 4.
Keyword Burst Detection.

3.4. Timeline View Chart

The keyword clustering timeline view combines clustering analysis with a time dimension to intuitively show the emergence, development, and decline of various research topics (clusters) and reveal the inheritance and evolution relationships between topics. Figure 5 shows the timeline map of the main clusters in this research field.

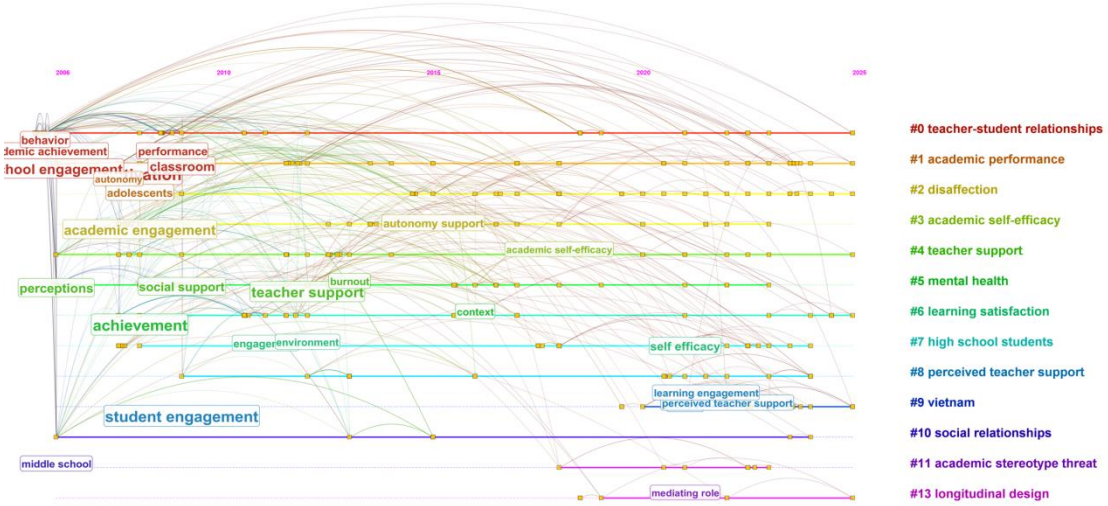

Figure 5.
Timeline view.

From Figure 5, a clear evolutionary trajectory can be observed. In the early stages of the study (approximately 2006–2012), research topics were highly concentrated on teacher-student relationships, academic performance, and disaffection. This indicates that the foundational research in this field mainly focused on the basic interactive relationship between teachers and students and its direct impact on students' academic achievement and engagement.

During the development phase of the research (approximately 2013–2018), new research themes began to emerge and grow. #3 academic self-efficacy and #4 teacher support became the core issues of this period. This marked a deepening of the research: on the one hand, researchers began to explore the psychological mechanisms connecting teacher behavior and student outcomes, shifting from macro-level relationships to micro-level psychological processes, with "self-efficacy" emerging as a widely recognized core mediating variable; on the other hand, research on teacher influence shifted from the broad concept of "teacher-student relationships" to the more specific and actionable concept of "teacher support."

In the most recent research phase (approximately 2019 to present), the research frontier has shown a trend toward further differentiation and deepening. The emergence of themes such as #5 mental health and #6 learning satisfaction reflects a shift in research focus from traditional academic outcomes to a greater concern for students' subjective well-being and overall mental health. Meanwhile, themes such as #11 academic stereotype threat, which address issues of educational equity, have begun to appear, demonstrating the humanistic concern and social responsibility of the research.

3.5. Author Collaboration Network Analysis

The author collaboration network map (Figure 6) shows the publication status and collaboration relationships of all authors in the sample of this study (243 papers). The size of the nodes in the figure represents the number of publications by the author, with larger nodes indicating higher academic output in the field. The lines between the nodes represent the collaboration relationships between authors.

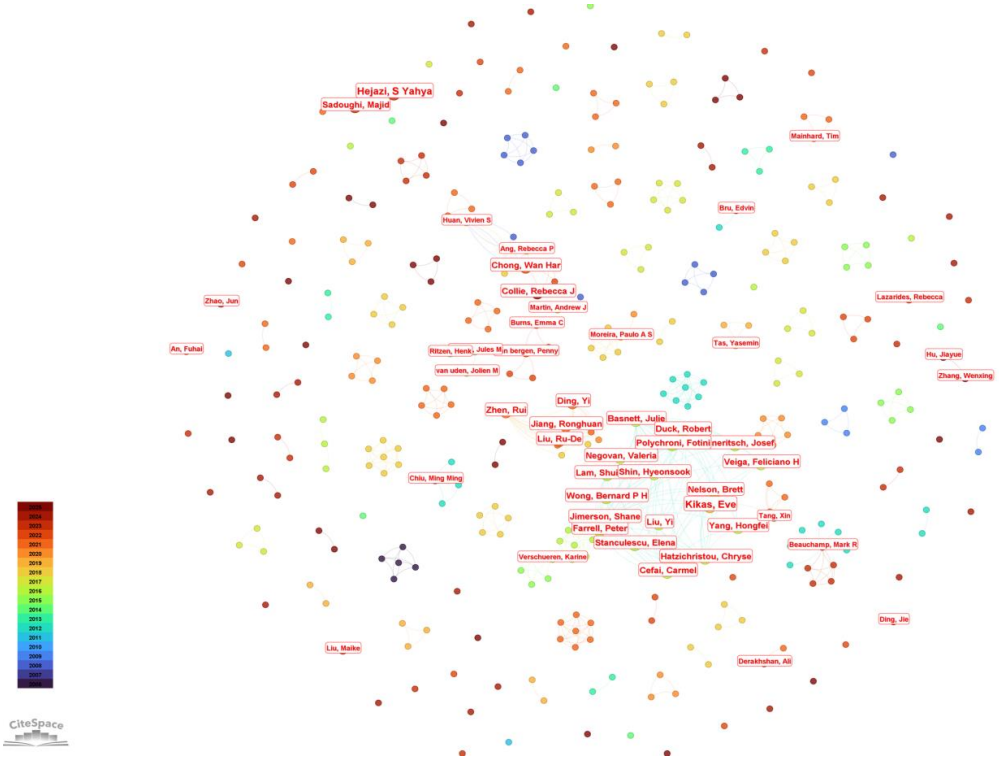

Figure 6.
Author Collaboration Network.
Source: Hejazi [27], Sadoughi and Hejazi [28], Huan, et al. [29], Ang, et al. [30], Chong, et al. [31], Collie, et al. [32],Martin and Marsh [33], Burns, et al. [34], Ritzen [35], Pieters and Ritzen [36], Van Bergen, et al. [37], Van Uden, et al. [38], Zhen, et al. [39], Ding and Lee [40],Jiang, et al. [41], Liu, et al. [42], Moreira, et al. [43], Bassnett [44], Duck and McMahan [45], Polychroni, et al. [46], Zollneritsch, et al. [47], Negovan, et al. [48], Lam, et al. [49], Shin, et al. [50], Wong, et al. [51], Jimerson [52], Farrell [53], Liu, et al. [42], Stănculescu [54], Verschueren [55], Hatzichristou, et al. [56], Cefai [57], Veiga [58], Kikas, et al. [59], Yang, et al. [60], Tang and Hu [61], Beauchamp, et al. [62], Chiu, et al. [63], Tas, et al. [64], Lazarides, et al. [65], Mainhard, et al. [66], Bru [67], Zhang [68], An, et al. [69], Liu [70], Hu, et al. [71], Zhang [68], Derakhshan [72] and Huan, et al. [29].

Figure 7 generally presents a structural feature of "prominent core but loose overall." This indicates that research in this field is currently being explored primarily by a large number of independent scholars or small research teams, and has not yet formed several large-scale, closely cooperative, absolutely dominant academic communities. This "blossoming everywhere" pattern not only reflects the openness and activity of the field but also suggests a huge potential for future cooperation between different research teams. To more clearly identify the core research forces, Table 3 lists the authors with the highest number of publications in this study's data sample. As can be seen from the table, Kikas et al. [59] and Hejazi [27] are the scholars with the highest number of publications in this field. In addition, a group of scholars represented by Collie et al. [32]and Martin and Marsh [33] constitutes the core force of research in this field.

Table 3.
Statistical Table of High-Yield Authors in Research Fields.

No.	Author	Year	Number of posts	No.	Author	Year	Number of posts
1	Hejazi [27]	2021	4	26	Liu, et al. [73]	2012	3
2	Kikas et al. [59]	2012	4	27	Ritzen [35]	2013	2
3	Jimerson [52]	2012	3	28	Burns et al. [34]	2018	2
4	Collie et al. [32]	2018	3	29	Martin and Marsh [33]	2008	2
5	Veiga [58]	2012	3	30	Tang and Hu [61]	2019	2
6	Duck and McMahan [45]	2012	3	31	Mainhard et al. [66]	2014	2
7	Bassnett [44]	2012	3	32	Chiu et al. [63]	2012	2
8	Stănculescu [54]	2012	3	33	Pieters and Ritzen [36]	2013	2
9	Cefai [57]	2012	3	34	Tas et al. [64]	2016	2
10	Yang et al. [60]	2012	3	35	Moreira et al. [43]	2018	2
11	Masjedi et al. [74]	2021	3	36	Beauchamp et al. [62]	2012	2

12	Liu et al. [42]	2018	3	37	Huan et al. [29]	2008	2
13	Shin et al. [50]	2012	3	38	Zhao et al. [75]	2024	2
14	Polychroni et al. [46]	2012	3	39	Ang et al. [30]	2008	2
15	Lam et al. [49]	2012	3	40	Hu et al. [71]	2025	2
16	Farrell [53]	2012	3	41	Zhang [68]	2025	2
17	Ding and Lee [40]	2018	3	42	Lazarides et al. [65]	2023	2
18	Hatzichristou et al. [56]	2012	3	43	Bru [67]	2012	2
19	Zollneritsch et al. [47]	2012	3	44	An et al. [69]	2022	2
20	Chong et al. [31]	2008	3	45	Ding et al. [76]	2023	2
21	Jiang et al. [41]	2018	3	46	Derakhshan [72]	2021	2
22	Negovan et al. [48]	2012	3	47	Liu [70]	2023	2
23	Zhen et al. [39]	2018	3	48	Van Uden et al. [38]	2013	2
24	Nelson et al. [77]	2012	3	49	Van Bergen et al. [37]	2022	2
25	Wong et al. [51]	2012	3	50	Verschueren [55]	2015	2

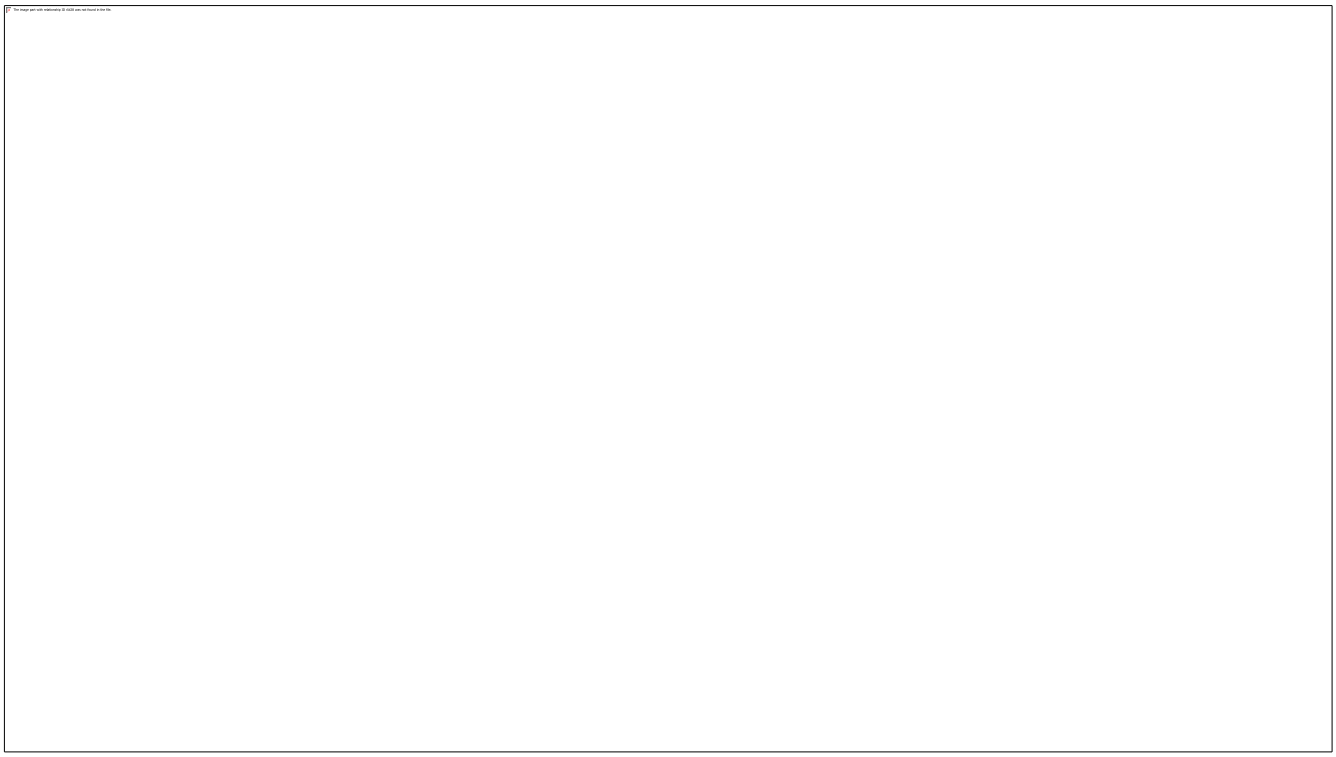

Figure 7.
Cited Author Co-citation Analysis.

Unlike author collaboration networks, cited author co-citation analysis focuses on which scholars' ideas and theories are widely cited by researchers in a given field, thereby revealing the intellectual origins and major academic schools of thought in that field.

According to the cited author clustering map, the largest and most central cluster is 0 achievement goal orientation. This indicates that achievement goal theory is one of the most core and mainstream theoretical frameworks for explaining phenomena in this field. Core scholars in this cluster may include Elliot and Dweck [78] and other founders of this theory.

Second, school engagement and the developmental-ecological model constitute two additional important theoretical foundations. Cluster #1 may include scholars such as Fredricks et al. [3] and Schaufeli et al. [79], who made pioneering contributions to the construct of "study engagement." Cluster #2 points to Bronfenbrenner, U.'s ecosystem theory, which emphasizes the importance of understanding students within a multi-level environment (family, school, society).

Some emerging, more specific theoretical schools of thought have also begun to take shape, such as academic buoyancy (academic resilience) and motivational support. The emergence of clusters signifies that research is deepening from grand theories to more specific, more operational psychological constructs and intervention strategies. Particularly noteworthy is the "transformational lecturer" cluster, which directly links leadership theory to educational contexts and is highly correlated with the independent variable "teacher positive leadership" in this study.

4. Findings and conclusions

This study used CiteSpace software to conduct a scientific knowledge map analysis of 243 WoS core collection articles on teacher influence and student engagement. Through the visualization analysis of co-occurrence and co-citation networks

of keywords, authors, and articles, this study systematically revealed the research hotspots, knowledge base, and cutting-edge trends in this field.

4.1. Findings

This study conducted a visual analysis of nearly two decades of literature in the field of teacher support and student engagement, systematically mapping out the knowledge landscape of the field. The main findings can be summarized as a core structure, a theoretical foundation, and a dynamic trend. First, the research hotspots in the field are clearly centered around the core structure of "teacher support → student psychological mechanisms → student engagement/achievement." Among these, "teacher support and relationship building" serves as the primary research starting point, "study engagement and its opposite (alienation)" represents the core process-oriented outcomes, while "academic achievement" serves as the ultimate outcome measure. Second, the theoretical foundation of this field exhibits diverse characteristics, but an analysis of cited authors reveals that it is primarily rooted in achievement goal theory, study engagement theory, and ecosystem theory. These theories collectively provide a core motivational and contextual framework for understanding student behavior. Finally, the research frontier reveals a dynamic evolutionary path from focusing on macro-level educational stages to micro-level classrooms, and from emphasizing academic outcomes to caring about psychological processes and subjective well-being, indicating that this field is deepening in a more refined, integrated, and humanistic direction.

4.2. Research Conclusions

Based on the above findings, this study draws three core conclusions. First, the introduction of the concept of "teacher positive leadership" is a necessary expansion and forward-looking upgrade of the existing research paradigm. It transcends the traditional passive perspective of "teacher support" and provides a more proactive and comprehensive theoretical framework to systematically summarize the role of teachers in empowering students. Second, exploring an integrated model of diverse psychological mechanisms is a significant gap in current research. Although single mechanisms such as "self-efficacy" have been studied, few studies have examined psychological capital, which represents "psychological resources," and achievement goals, which represent "motivation orientation," within a unified model. This leaves important room for innovation in future theoretical development. Third, the generalizability of existing research findings urgently requires validation and refinement in more diverse cultural and educational contexts, particularly in regions like China with unique sociocultural backgrounds. Teachers' positive influences may exhibit distinct compensatory effects and mechanisms, pointing the way forward for future localized research.

4.3. Insights

The findings of this study have important implications for future theoretical exploration and current educational practice. At the theoretical level, this study is the first to use visualization to map the macro-level knowledge structure of the emerging interdisciplinary field of "the impact of teachers' positive leadership on students' study engagement." It clearly identifies the knowledge structure, hotspots, and gaps in this field, providing subsequent researchers with clear theoretical coordinates and innovative pathways, which will help promote the integration and deepening of related theories. At the practical level, the research results send a clear signal to educational administrators and frontline teachers: the key to enhancing student study engagement lies in promoting a shift in the teacher's role from a passive "supporter" to an active "positive leader." This implies that future teacher training and professional development programs should place greater emphasis on cultivating teachers' abilities to create positive classroom atmospheres, engage in effective motivational communication, and help students construct a sense of meaning in learning. Additionally, for education policymakers, it is essential to encourage and support universities in implementing teacher empowerment programs, particularly in regions with relatively scarce educational resources, as a crucial strategic lever for promoting educational equity and enhancing educational quality.

5. Conclusion

This study aims to uncover the mechanism by which teachers' positive leadership influences students' learning engagement. Through visualized analysis using knowledge mapping, the research reveals that the core structure of the field clearly centers around the pathway of "teacher support/leadership → students' psychological mechanisms → learning engagement/academic achievement." The theoretical foundation is deeply rooted in achievement goal theory and engagement theory, and the research frontier is evolving toward more human-centered and refined directions. The study concludes that the shift from "teacher support" to "positive teacher leadership" represents an inevitable advancement in this research domain. The most innovative future direction lies in constructing an integrative model of psychological mechanisms and conducting localized validation within specific cultural contexts. This study not only provides a macro-level "map" for the theoretical advancement of the field but also offers valuable guidance for practical efforts to enhance future education quality through teacher empowerment.

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