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## RESEARCH STATUS AND TREND OF LEARNING MOTIVATION IN ONLINE LEARNING BASED ON CITESPACE

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### Abstract:

In this study, CiteSpace software was used to visually analyze 177 literatures on online learning and learning motivation in the CNKI (China National Knowledge Infrastructure) database from 2016 to 2023. Firstly, the number of publications and subject distribution of these literatures are sorted out. Then, CiteSpace software is used to analyze the co-occurrence of high-frequency keywords and the evolution of research topics. In the process, several important trends and findings were uncovered. First, the amount of literature published on the topic of e-learning and learning motivation in China shows an inverted U-shaped growth trend, which indicates that this field still has great development potential in the future. Second, the development process of online learning and learning motivation research is divided into three stages: germination, slow growth and fluctuating growth. Third, the analysis finds that current research mainly focuses on the perspective of pedagogy, so future research can make breakthroughs in disciplines and methods, especially in exploring the influencing factors and stimulation strategies of learning motivation in online learning. The findings of this study provide an important reference and direction for future research.

### Keywords:

Status And Trend; Online Learning; Learning Motivation; Citespace Software;  
Visual Analysis; Inverted U-Shaped Growth

## Introduction

In the journey towards modernizing education, the evolution of teaching methods stands out as an indispensable aspect (Wei, 2022). In the quest to modernize school teaching methods, online courses, massive open online courses (MOOCs), and various other digital resources have consistently played pivotal roles. These resources not only foster innovative teaching approaches and methodologies but also complement the teaching content in universities and colleges, thereby enhancing educational efficacy (Wei, 2022). The integration of online teaching resources into traditional classroom settings has systematically influenced teaching practices, consequently elevating the overall quality of classroom education. The advent of the COVID-19 pandemic in January 2020 precipitated a rapid shift from traditional offline teaching to online modalities, prompting widespread adoption of digital teaching tools across all educational levels (Wei, 2022). Educational institutions nationwide have actively embraced platforms such as Tencent Classroom, Dingding, Rain Classroom, and Wisdom Tree to facilitate online instruction. Notably, online teaching had already gained significant traction prior to 2020, primarily serving to complement traditional teaching methods by providing additional support for students' autonomous learning through platforms like micro-lesson and MOOC platforms. It is evident that the application of online teaching resources has become deeply ingrained in educational practices, playing a critical role in enhancing both traditional and online teaching methodologies. This shift underscores the importance of adapting to modern educational paradigms to ensure continued advancement in educational quality and efficacy.

The systematic inquiry into motivation traces its roots back to approximately 1930, coinciding with the official appearance of the term "motivation" in scholarly literature. From a psychological standpoint, motivation is construed as either an internal impetus or a product of external stimuli and reinforcement (Dörnyei, 1998). Alternatively, from the lens of social constructivism, motivation is conceptualized as a cognitive and emotional state that propels individuals toward predefined goals through conscious behavior, thereby engendering sustained intellectual and physical exertion (Williams & Burden, 1997). Learning motivation, specifically, denotes an internal drive that incites individuals to engage in learning activities, persist in those activities, and direct them towards specific learning objectives, serving as an intrinsic mechanism within individuals (Jiang, 2005). Various theoretical frameworks offer diverse interpretations of learning motivation. Behaviorist scholars posit that motivation stems from reinforcement, whereby external stimuli and reinforcement bolster the likelihood of repeated learning behaviors. On the other hand, humanistic perspectives, grounded in the hierarchy of needs theory, view motivation as an individual's quest for self-realization, emphasizing the holistic nature of human beings. Cognitive psychologists contribute theories such as achievement motivation theory, success or failure attribution theory, and self-efficacy theory. According to achievement motivation theory, motivation is driven by the pursuit of accomplishment and serves as an internal driving force. Conversely, the attribution theory of success or failure posits that motivation hinges on an individual's analysis of the reasons behind the outcomes of their actions. Lastly, self-efficacy theory contends that motivation arises from individuals' belief in their capacity to achieve specific goals (Peng & Wang, 2013).

Over the past two decades, the exploration of Chinese scholars' learning motivation has undergone rapid development, yielding numerous studies on students' learning motivation. However, research on online learning remains relatively nascent. Presently, there is a dearth of studies focusing on students' learning motivation in the context of online education, with only

177 articles on online learning motivation indexed in the China National Knowledge Infrastructure (CNKI). To comprehensively grasp the current state and trends of research on students' online learning motivation, this study aims to conduct an in-depth analysis of the research literature available in the CNKI database. Utilizing CiteSpace quantitative visualization software, the study will analyze data from online learning motivation research literature collected between 2016 and 2023. Through this analysis, the study seeks to identify high-impact literature in the field, discern the primary concerns and research topics pertaining to online learning motivation in China, and conduct data mining and quantitative analysis on cited and citation literature. Furthermore, the study aims to delineate the research frontiers and key documents in the realm of online learning motivation research in China using visualization technology. By examining literature trends and keyword distributions, the study aims to offer insights into the current state of domestic research, thereby aiding future scholars in conducting related research endeavors.

## Research Methods and Data Sources

### *Research Issues*

This paper employs CiteSpace software to conduct a visual knowledge map analysis of online learning motivation research in China, aiming to address the following inquiries: (1) What is the distribution of published papers in online learning motivation research over the years, and which year has the highest publication count? (2) What are the primary areas of focus (keyword distribution) in studies on online learning motivation in China? (3) What are the evolving research topics (keywords timeline) in online learning motivation research in China?

### *Research Method*

This paper adopts bibliometric methods and knowledge map visualization techniques, leveraging CiteSpace software to generate visual knowledge maps. Through a combination of literature review and map analysis, this paper provides a comprehensive interpretation of the research landscape concerning students' online learning motivation. The methodology employed encompasses the following steps: (1) Utilizing the quantitative visual analysis feature of the China National Knowledge Infrastructure (CNKI), this paper examines the annual publication volume and identifies high-impact authors within CNKI. Additionally, CiteSpace version 5.3.R3 (64-bit) is employed to analyze keywords and variant terms within CNKI.

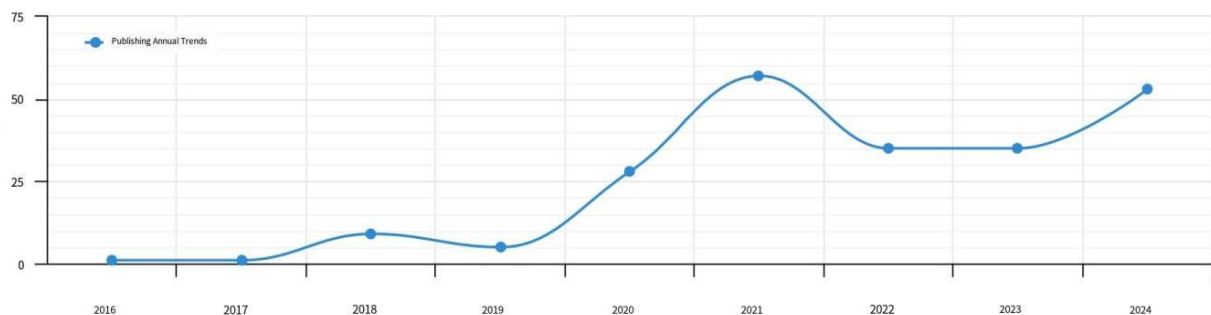
### *Data Source*

The literature for this study was sourced from the China National Knowledge Infrastructure (CNKI). To ensure the literature's quality, an advanced search was conducted within the CNKI journal classification, focusing on the topic of "learning motivation" in conjunction with "online learning," spanning an unrestricted time frame. This search yielded a total of 177 documents. The cut-off date for data collection was January 11, 2024. For the purpose of article analysis, the initial processing of the 177 Chinese documents was carried out using the built-in MySQL database in CiteSpace.

## CNKI Literature Analysis

### *Analysis of Document Volume*

As illustrated in Figure 1, the number of articles published by CNKI exhibits a discernible inverted "U" curve, demonstrating a fluctuating yet overall increasing trend. The apex of this curve was observed in 2021, with 57 articles published. Notably, the earliest literature mentioning the learning motivation of online learning surfaced in 2016, with a trough evident in both 2016 and 2017, each with only one article published. Generally, before 2018, there was relatively limited attention from academic circles on this topic. However, since then, propelled by the continuous advancement of online teaching methods, the onset of the COVID-19 pandemic, and ongoing scholarly exploration within the fields of education and psychology, research interest in this topic has steadily grown. It is anticipated that the volume of related research will continue to increase in 2024.

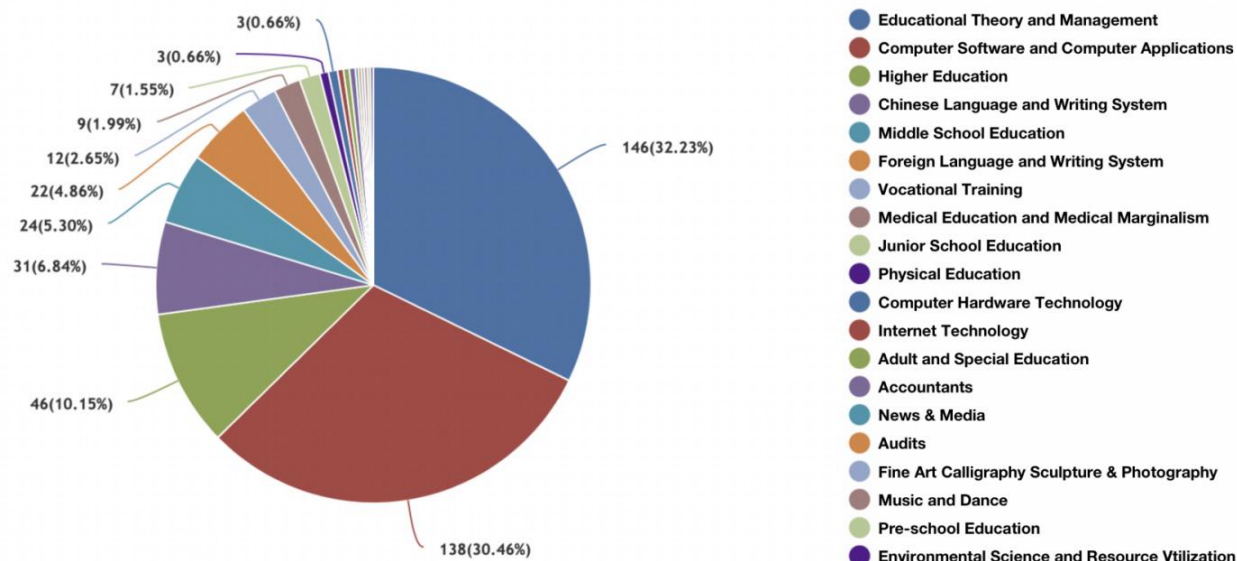


**Figure 1: Annual Analysis of The Number of Papers Published on Online Learning Motivation Research in CNKI**

Source: The figure is drawn according to the accurate retrieval data of subject words in CNKI. The retrieval time is January-November, 2024.

### *Subject Distribution Analysis*

Discipline distribution refers to which disciplines are mainly composed in the papers on online learning motivation in China, as shown in Figure 2:



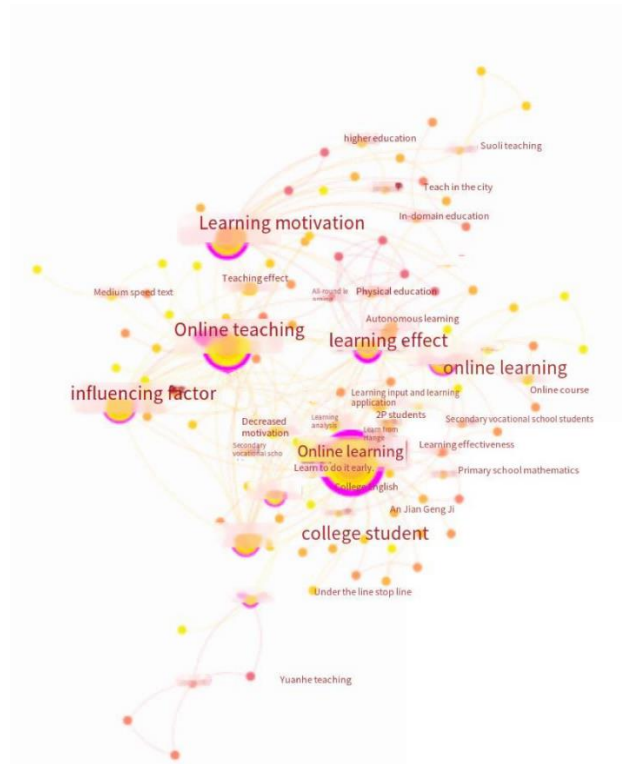
**Figure 2: Subject Distribution Analysis**

Source: The figure is drawn according to the accurate retrieval data of subject words in CNKI. The retrieval time is January 17, 2024.

Upon scrutinizing the distribution of disciplines, it becomes apparent that the bulk of research on the learning motivation of online learning is situated within fields such as educational theory, education management, higher education, and higher vocational education. This observation underscores the burgeoning interest among researchers in understanding the motivational dynamics affecting students, educators, and educational institutions within the digital learning milieu. Given that higher education serves as the primary domain for online learning practices, the notable emphasis on studying online learning motivation in higher education may signify the ongoing digital metamorphosis of higher education and the imperative for continual enhancement of the online learning experience. The prevalence of research on online learning motivation may also mirror the education sector's concerted efforts to confront and adapt to the educational challenges presented by the digital age.

### **High Frequency Keyword Analysis**

Keywords serve as condensed representations of authors' academic perspectives and viewpoints, and are crucial indicators for document collection and indexing (Xie, Liang, & Wen, 2005). Their frequency of occurrence and degree of correlation can unveil the focal points and internal relationships within a specific field (Yu & Dai, 2017). In this research, a total of 177 documents sourced from CNKI were processed using CiteSpace, V. 5.3.R3 (64-bit) to construct a visual knowledge map. Within CiteSpace's updated operational interface, the Time Slicing feature was configured to span from 2016 to 2024 for this study, with the Top N option selected as the Selection Criteria. Given the limited number of literature items, a value of  $n = 100$  was chosen. Additionally, the PruningSliced Networks option was enabled for Pruning, and CiteSpace was executed to generate a keyword co-occurrence knowledge map. The resulting map is presented in Figure 3.



**Figure:3 keyword Network of Online Learning Motivation Research in CNKI**

Source: citespace system analyzes data

To ensure the rigor of our findings, this study examines the prominent themes in the research field by integrating keyword frequency and centrality. We extract the top 10 keywords with the highest frequency from the keyword network diagram of online learning motivation-related research identified in Citespace and present them in tabular format, as illustrated in Table 1.

**Table 1: The Frequency Distribution Table of The Top 10 Keywords in CNKI Online Learning Motivation Related Literature**

Serial Number	Frequency	Centrality	Year	Keyword
1	39	0.5	2019	Online Learning
2	26	0.28	2020	Online Teaching
3	22	0.35	2018	Learning Motivation
4	18	0.13	2019	Influencing Factor
5	10	0.13	2020	College Student
6	9	0.23	2018	Learning Effect
7	9	0.11	2020	Network Learning
8	5	0.03	2021	Decreased Motivation
9	4	0.01	2020	Learning Input



10	4	0.01	2021	Autonomous Learning
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Source: Citespace System Analyzes Data

Table 2 presents the top 10 high-frequency keywords in descending order of word frequency. Typically, higher frequency values correspond to higher centrality scores. Notably, keywords such as "online learning" and "learning motivation" are included in this search, with "online learning" exhibiting the highest frequency (39 occurrences) and a substantial centrality score of 0.5. Following closely is "online teaching" with a frequency of 26 and the highest centrality score of 0.28. "Learning motivation" ranks third in frequency, appearing 22 times. In CiteSpace, a keyword with a centrality score exceeding 0.1 is considered a research hotspot. By identifying keywords with centrality values surpassing 0.1 from Table 1, Table 2 is constructed. Examining Figure 2 and Table 1 in conjunction, it becomes evident that keywords such as "online learning," "learning motivation," "influencing factors," "college students," "learning effect," and "online teaching" emerge as the most prominent. This underscores the prevailing research interests within the domain of online learning motivation in China. In facing the ever-evolving future, lifelong learning is deemed imperative, with cultivating learning motivation serving as an inexhaustible driving force for lifelong learning persistence. Therefore, the study and exploration of learning motivation hold significant theoretical and practical implications.

**Table 2: Keywords of CNKI Online Learning Motivation Related Literature Centrality  $\geq 0.1$**

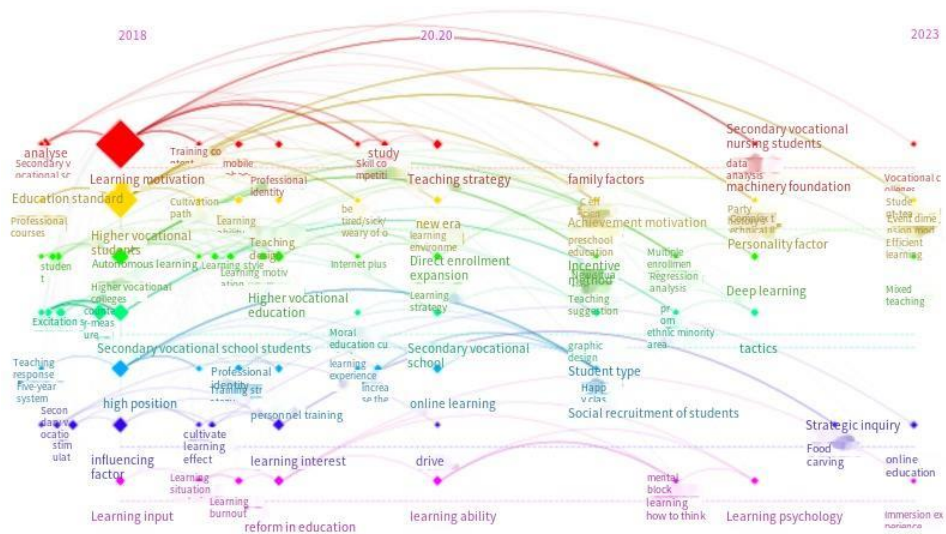
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5	10	0.13	College Student
6	9	0.23	Learning Effect
7	9	0.11	Network Learning

Source: Citespace System Analyzes Data

### ***Research Topic Evolution and Stage Division***

The concept of research hotspots pertains to scientific issues or topics extensively discussed within a corpus of papers that share internal relations and are published over a significant period (Li & Sun, 2014). Utilizing CiteSpace, the Timeline View is employed to uncover the evolutionary map depicting the progression of research subjects within the realm of online learning motivation, as depicted in Figure 4. Over time, research themes undergo continuous transformation. Through the analysis of paper numbers and keyword categories associated with online learning motivation, these developments can be roughly categorized into three stages: nascent development (2016-2018), rapid expansion (2018-2020), and fluctuating growth (2021-2023).

**Figure 4:Timeline View of Keywords For Online Learning Motivation Research in CNKI**



Source: Citespace System Analyzes Data

During the initial stage, spanning from 2016 to 2017, a limited number of articles were published, totaling only 2. This indicates that during this period, only a handful of scholars began to explore the learning motivation associated with online learning. This minimal scholarly attention could be attributed to the relatively sparse prevalence of online learning and teaching practices during that time, resulting in scholars paying less heed to the learning motivation of students within this mode of learning. For instance, Zhao Yingchuan (Zhao, 2016) in his article "What Makes Students Choose Massive Open Online Course—An Empirical Investigation Based on Massive Open Online Course Satisfaction," was among the pioneers to discuss the relationship between online courses and learning motivation. He suggested that online learning might hinder the achievement of curriculum objectives. To enhance satisfaction with massive open online courses, Zhao proposed measures such as enhancing student-teacher interaction, fostering learning motivation, providing environmental support, and refining online course design to alleviate learning pressure. Furthermore, a series of research reports by iResearch (China Adult Online Foreign Language Education Industry White Skin, 2017) analyzed the state of the online education industry in China, indicating that it was in an early stage of maturity in 2017. The market scale was projected to reach 37.56 billion yuan, with the number of users exceeding 26 million. This upward trajectory in the online education market scale and user base laid the groundwork for subsequent research into online learning motivation.

During the second stage, spanning from 2018 to 2019, there was still a relatively modest output of articles, totaling 10 in all. However, there was a noticeable expansion in the categories of keywords and terminologies, primarily encompassing three main themes: online learning, learning motivation, and influencing factors. This period marked a gradual shift in scholarly attention towards blended teaching methods and the investigation of students' learning motivation within this context. Numerous scholars employed empirical research methodologies to examine and analyze the state of students' learning motivation in blended (both online and offline) learning environments. Notable contributions include works by Cai Chen (Cai, 2018),



Zhao (2018), and Yu Huan (Yu, 2018), among others. These scholars underscored the efficacy of blended teaching and delved into its effectiveness through innovative teaching modalities. This phase of research discussed three primary teaching objectives: influencing factors, learning strategies, and autonomous learning. Survey findings revealed that blended teaching methods could effectively facilitate learners' entry into the flow state, stimulate their learning motivation, and enhance their learning effectiveness and self-efficacy. Additionally, Xia Xulin and colleagues (Xia, Li, Yao, & Chen, 2019) advocated for the provision of intuitive learning resources, the creation of a proactive learning and discussion environment, increased interaction among students with diverse learning styles, and the promotion of progress among students with varying learning preferences. Overall, the study of college students' learning motivation during this period began to diversify, reflecting a growing interest in exploring the nuances of blended teaching methods and their impact on students' motivation to learn.

During the third stage, spanning from 2020 to 2023, the proliferation of online teaching due to the pandemic led to a rapid increase in the number of published articles, reaching a peak of 86. This surge was accompanied by a rich array of keyword categories, indicative of a growing trend towards diversification. Scholars during this period exhibited a heightened interest in understanding the learning motivation associated with online learning. Key themes at this stage included online learning, decreased motivation, learning effect, and autonomous learning. Scholars approached the study of online learning motivation from various angles. Some, such as Chi and Xin (Chi & Xin, 2006), focused on the characteristics of learning motivation as a starting point for their investigations. Others delved into the influencing factors and training strategies pertaining to online learning motivation. For instance, Shen Zhonghua and colleagues (Shen & Wu, 2020) highlighted the significant positive impact of knowledge construction, teacher-student interaction, and information processing on college students' online learning effectiveness and motivation. Additionally, rooted in practical realities, some scholars explored the stimulation and maintenance of college students' learning motivation in the online teaching process. For example, Liu (2020) and colleagues (Liu, Liu, Liu, & Xiao, 2020) analyzed factors such as traditional teaching methods, the unbalanced supply and demand of teaching resources, the lack of an effective supervision mechanism, and students' negative emotions, which contributed to the gradual weakening of college students' learning motivation during online teaching. Overall, this stage primarily focused on investigating the relationship between learning motivation and autonomous learning, as well as proposing countermeasures to address the decline in online learning motivation. Scholars also advocated for the cultivation of online learning motivation from a macro perspective, underscoring the importance of this endeavor.

## Conclusion

This paper focuses on the analysis of literature related to learning motivation in online learning sourced from CNKI, encompassing annual publication trends, keyword co-occurrence, and evolution from 2016 to 2023. The research on online learning motivation during this period can be broadly classified into three stages. The first stage, termed as the budding phase (2016-2017), marked the initial introduction of online learning motivation into scholars' research agendas. The second stage, characterized by slow growth (2018-2019), witnessed the inception of research on learning motivation within the context of blended (online and offline) teaching, signifying a diversification of related studies. The third stage, denoted by fluctuating growth (2020-2023), primarily delved into the micro-level examination of influencing factors and pathways for enhancing online learning motivation. During this period, the trend towards

diversified research on online learning motivation became increasingly prominent. The research perspectives predominantly revolve around pedagogy, psychology, and other relevant domains. Given the relatively nascent nature of research on online teaching, there remains ample room for future research enhancements and developments.

In general, the research on learning motivation in online learning from 2016 to 2023 follows certain patterns, which can be summarized as follows:

1. **Exploration of Constructing Mixed Online and Offline Learning Environments:** Emphasis is placed on developing mixed teaching modes that integrate online and offline components. This approach aims to blend practical knowledge, operational skills, and professional emotions to enhance students' practical abilities in real-world workplace settings.
2. **Investigation of Influencing Factors on Students' Motivation:** Special attention is given to examining the factors that influence students' motivation in online learning, with a particular focus on the impact of epidemic situations. Research findings often explore the relationships between subjects and grades, with the objective of assisting educators in better understanding and guiding students' learning motivation.
3. **Predominantly Pedagogical Perspective:** While the research predominantly adopts a pedagogical viewpoint, it also exhibits certain shortcomings:

**Disciplinary Bias:** Despite some inclusion of sports, information technology, and other disciplines, the research primarily concentrates on English learning motivation, with other disciplines, especially science, receiving less attention.

**Methodological Limitations:** The research leans heavily towards qualitative studies, although it incorporates methodologies such as questionnaires and interviews. There is a notable emphasis on theoretical exploration, with comparatively fewer empirical investigations. This highlights an area for future research breakthroughs.

**Limited Focus on Declining Learning Motivation:** There is a scarcity of studies addressing the decline in online learning motivation among students. Consequently, there exists substantial research space for exploring methods to enhance students' motivation in online learning environments in the future.

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