Research Trends and Hotspots in the Core Competencies of Chinese Students Following the Issuance of the Compulsory Education Curriculum Scheme (2022 Edition)

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Abstract: Using the CiteSpace tool, this study undertook a profound knowledge mapping analysis of 748 articles focusing on students' core competencies. These articles were carefully curated from the core corpus of CNKI, spanning the years from 2022 to 2024. Through an extensive exploration that encompassed keyword citation frequency, detailed cluster analysis, and a clear timeline visualization, the study uncovered the primary focal points and prevailing trends in domestic research on students' core competencies. This shift in focus was particularly notable after the release of the "Compulsory Education Curriculum Plan (2022 Edition)." The findings illuminated several key research areas, such as student core competencies, effective cultivation strategies, classroom instruction methods tailored to these competencies, and the seamless integration of moral and civic education within academic courses. Furthermore, the results obtained from the cluster analysis reinforced the diverse nature and evolving trends of research in this domain. This comprehensive study presented a broad perspective on the current state of research regarding students' core competencies, and provided tangible recommendations for future research paths. These included a deeper implementation of new curriculum standards, an emphasis on practical and application-driven methodologies, the promotion of technology-assisted teaching practices, and the establishment of a multifaceted evaluation framework. These insights are designed to serve as valuable references for further exploration and practical implementation of students' core competencies.

Keywords: Core Literacy; Core Quality of Students; Knowledge Graph; Research Hotspot; Research Trend

1. Introduction

Key competency was first described by the Organization for Economic Cooperation and Development (OECD) in 1997. From its original context and definition, the basic meaning of the concept is that a person's "competency" is required to successfully cope with a certain job or action in today's complex situation. It is a comprehensive quality structure or holistic quality outlook composed of various quality elements such as knowledge, skills and attitudes needed to successfully complete this kind of work or action [1]. Since 2000, the term "core literacy" has become an important research direction in the field of educational policy, educational practice and educational research worldwide. International organizations and many countries, including China, are developing and constructing the framework of students' core literacy [2]. In 2014, the Ministry of Education issued the "Opinions of the Ministry of Education on Comprehensively Deepening Curriculum Reform and Implementing the Fundamental Task of Cultivating Morality and People", which proposed the concept of "core literacy" for the first time. It means that students should have the necessary character and key ability to meet the needs of lifelong development and social development [3]. In 2016, Professor Lin's research team released the "General Framework for Chinese Students' Core Literacy Development" [4]. In April 2022, the Ministry of Education issued the Compulsory Education Curriculum Plan (2022 Edition), referred to as the 22nd Edition, and the Curriculum Standards, also known as the New Curriculum Standards. These documents are in response to the requirements of the National Education Congress, fulfilling the fundamental

task of fostering moral character and educating citizens, and adapting to the new teaching challenges brought by technological advancements in the new era. As well as the educational needs after the full popularization of compulsory education, it aims to solve the problems existing in the past 20 years such as the lack of vertical organic connection between school segments, vague curriculum standards and unclear implementation requirements, so as to promote the reform of education and teaching [5]. The biggest highlight of the "22 version plan" is to refine the core literacy.

Since the release of the 22nd Edition Plan, a large number of valuable studies have emerged in the research field of students' core literacy, and some scholars have combed and analyzed the relevant results. For example, Du et al. reviewed the connotation, evaluation and cultivation of core literacy, evaluation of academic and non-academic fields of core literacy and student development, diversified development of evaluation methods, reform of regional education evaluation and school student development, etc. [6]. Qiu et al. adopted the literature research method to analyze periodicals with the theme word "students' core literacy" from 2013 to 2017. It is found that the research on students' core literacy mainly focuses on the connotation exploration of students' core literacy, the exploration of students' core literacy and curriculum design, the relationship between students' core literacy and teacher education and teaching reform, and the evaluation mechanism of students' core literacy [7]. Xu et al. sorted out the relevant literature before December 2017 and summarized the research achievements of scholars in this field on core literacy and Chinese students' core English literacy from three perspectives: the connotation of core literacy, the connotation of Chinese students' core English literacy and relevant practices [8]. Zhu et al. summarized the research status of regional cognitive literacy in the core literacy of geography, and made a review from five aspects: analysis of the connotation of regional cognitive literacy, research on regional cognitive literacy strategies, investigation and evaluation of regional cognitive level, combination of regional cognition with teaching methods and combination of regional cognition with

technical means [9]. These studies have all contributed to the literature research on students' core literacy, but the current research mainly focuses on the core literacy of subjects or students' core literacy before the promulgation of the 22nd Version of the program. After more than two years of practice, this program has produced a wealth of research results. Summarizing and analyzing these research results, we have a comprehensive understanding of the development trend of students' core literacy at the macro level, and point out the direction for the growth path of students' core literacy in the future.

Therefore, this paper will use the method of bibliometrics and CiteSpace visual analysis tool to describe the overall picture of Chinese students' core literacy in the past two years after the "22-year Plan" was issued, analyze the research status, hot spots and frontier trends in this field, and help Chinese students' core literacy research and practice.

2. Research Design

2.1 Research Problems
This study answers the following questions: First, from the perspective of the number of published documents, key literatures and their temporal distribution, what are the research trends and hot spots of domestic students' core literacy after the promulgation of the 22nd Edition Plan? Second, based on the current research trends and hot spots of domestic students' core literacy, what are the future research directions and suggestions?

2.2 Data Sources and Processing
In this study, CNKI was selected as the data source, "advanced search" was selected, and the search term was "Topic: Students' core literacy", and the search time was limited to April 1, 2022 - April 1, 2024. A total of 748 valid articles were obtained after screening and eliminating the irrelevant results.
Result analysis

3. Result Analysis

3.1 Research Hotspots of Students' Core Literacy
Research hotspots refer to the most concerned issues or the most active research areas at

present. CiteSpace can automatically extract key words of cited literature to produce Cluster words, which can be used to summarize research gathering points, and each cluster can be regarded as a closely related independent research field [10]. Time Slicing is set to "2022-2024"; Years Per Slice is set to 1 year. Set Node Types to Key word; Threshold (Selection Criteria) TopN% =50%. Click the Run button (go) to start running CiteSpace and get the keyword co-occurrence map of the literature, as shown in Figure 1. Where N=214, E =228, Density =0.01, N indicates the number of network nodes, E indicates the number of network connections, and Density indicates the network density. For the evaluation index of network Modularity,

the Q of modularity is 0.837, and the value range of Q is generally [0, 1]. A larger value indicates a better clustering effect. If Q > 0.3, it indicates that the clustering structure of the division is significant. The value of the network homogeneity evaluation indicator Silhouette is closer to 1, indicating a higher homogeneity of the network. In Figure 1, Mean Silhouette =0.9042. Therefore, the clustering results are highly reliable and the presentation structure is of reference value. The following is to explore the hot spots and trends of students' core literacy by means of keyword frequency statistics and keyword emergence analysis through the visualization of knowledge graph.
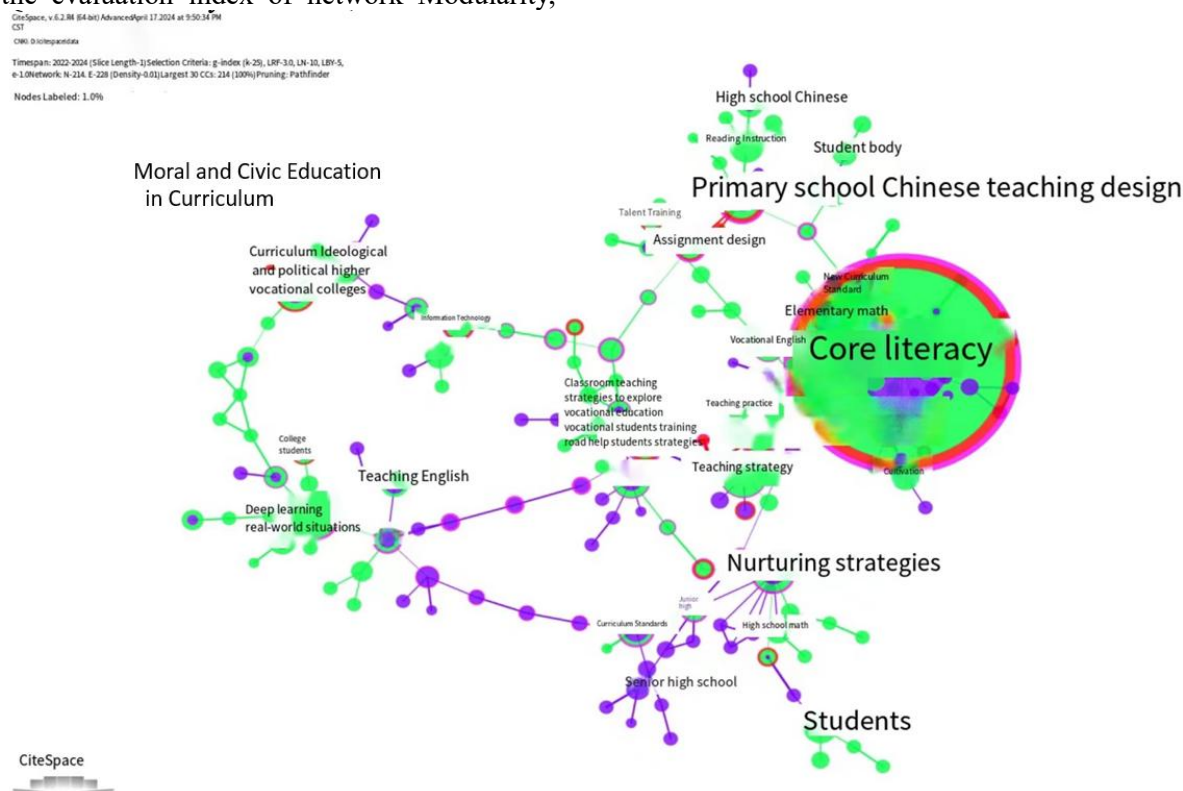

Figure 1. Analysis of Co-occurrence Map of Key Words in Students' Core Literacy

3.1.1 Keyword citation frequency analysis

From 2022 to 2024, the most frequent occurrence in the field of student core literacy research is "core literacy" 438 times, followed by "deep learning" 19 times, "primary school mathematics" 19 times, "teaching strategy" 18 times, "primary school Chinese" 17 times, "Higher vocational colleges" 15 times, "training strategy" 15 times, "classroom teaching" 14 times. "Moral and Civic Education in Curriculum" 13 times, "strategy" 12 times, as shown in Table 1.

3.1.2 Cluster analysis

Cluster Analysis is a statistical method to group the collected data, which aims to summarize the research objects with similar characteristics into a set, reveal the topic structure in a specific research field to infer the research hotspots in the field, and provide a new perspective for in-depth insight and understanding of the core literacy topics of students. Modularization value Q and average profile value S are two key indicators of scientometrics analysis, which are to measure

the clarity of network community structure and the quality of clustering. If Q>0.3, the network structure of the map is significant. If S>0.5, the clustering is more reasonable [11]. The background data showed that the keyword cluster graph cluster module value Q=0.837, indicating that the cluster structure was significant; the average contour value S=0.9042, indicating that the clustering results are convincing. After screening the top 9 cluster entries, it is found that the research hotspots of students' core literacy mainly include "core literacy", "high school", "classroom teaching", "deep learning" and other aspects, as shown in Figure 2.

Table 1. High-frequency Keywords in the Core Literacy Areas of Students in 2022-2024

| Ranker	Frequency	Centrality	Year	Keywords
1	438	0.94	2022	Core literacy
2	19	0.25	2022	Deep learning
3	19	0.02	2022	Elementary math
4	18	0.13	2022	Teaching strategy
5	17	0.36	2022	Primary school Chinese teaching design
6	15	0.08	2022	Higher vocational colleges
7	15	0.38	2022	Nurturing strategies
8	14	0.51	2022	Classroom teaching
9	13	0.12	2022	Moral and civic education in curriculum
10	12	0.19	2022	Strategy
11	11	0.08	2022	Secondary vocational school students
12	11	0.07	2022	Reading instruction
13	11	0.28	2022	Higher vocational college students
14	10	0.4	2023	New curriculum standard
15	10	0.05	2022	Students
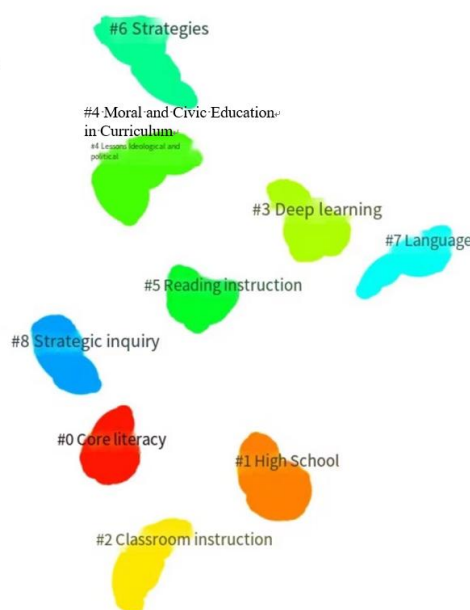
Figure 2. Keyword Clustering Diagram

As can be seen from the clustering map, there are a total of 9 large clusters. According to Table 2, The largest cluster (#0) contains 33 members (profile S=1), the second largest cluster (#1) contains 17 members (profile S=1), the third largest cluster (#2) contains 16 members (profile S=0.939), the fourth largest cluster (#3) contains 16 members (profile S=0.939), and the fifth largest cluster (#4) contains 1 Six members (profile S=0.867), the sixth largest cluster (#5) contains 16 members (profile S=1), the seventh largest cluster (#6) contains 15 members (profile S=0.915), the eighth largest cluster (#7) contains 11 members (profile S=0.925), and the ninth largest cluster (#8) contains 11 members

(profile value) S=0.87).

3.1.3 Research hot spots

By comprehensively considering the word frequency and cluster analysis of high-frequency keywords, and conducting secondary coding and sorting, the research hotspots of students' core literacy can be condensed into the following five aspects: (1) Students' core literacy; (2) Cultivation strategies of students' core literacy; (3) Classroom teaching under core literacy; (4) Moral and Civic Education in Curriculum; (5) Language education.

Table 2. Keyword Clustering Table

Clusters	Members	Silhouette Values	Years	Key Cluster Members
0	33	1	2022	Core literacy (23.67, 1.0E-4); Deep learning (6.86, 0.01); Occupational core literacy (5.7, 0.05); New Era (4.96, 0.05); National feelings (4.96, 0.05)
1	17	1	2022	High school (25.81, 1.0E-4); Cultivation strategy (18.33, 1.0E-4); Athletics teaching (12.8, 0.001); Junior high school (12.8, 0.001); History Teaching (9.07, 0.005)
2	16	0.939	2022	Classroom teaching (23.02, 1.0E-4); Lifting path (11.87, 0.001); Secondary vocational language (11.87, 0.001); Subject knowledge (8.15, 0.005); Talent Training (8.15, 0.005)
3	16	1	2022	Deep learning (23.66, 1.0E-4); High school physics (11.47, 0.001); Evaluation reform (11.47, 0.001); Deep teaching (11.47, 0.001); Teaching Methods (11.47, 0.001)
4	16	0.867	2022	Moral and civic education in curriculum (21.59, 1.0E-4); Information technology (18.83, 1.0E-4); Secondary vocational (13.34, 0.001); College students (11.78, 0.001); Higher vocational colleges (11.22, 0.001)
5	16	1	2022	Reading teaching (29.55, 1.0E-4); Primary Chinese (25.24, 1.0E-4); Job design (8.86, 0.005); High school Chinese (8.86, 0.005); Literacy and writing (6.27, 0.05)
6	15	0.915	2022	Policy (25.63, 1.0E-4); Teaching (13.37, 0.001); Independent learning (13.37, 0.001); Junior high school biology (13.37, 0.001); Discipline literacy (13.37, 0.001)
7	11	0.925	2022	Chinese (22.62, 1.0E-4); Primary school (15.98, 1.0E-4); Application strategy (7.45, 0.01); Computational thinking (7.45, 0.01); Interdisciplinary Learning (7.45, 0.01)
8	11	0.87	2022	Strategy exploration (28.05, 1.0E-4); Teaching strategies (18.66, 1.0E-4); Cooperative learning (13.88, 0.001); Critical thinking ability (13.88, 0.001); High School Moral and Civic Education (10.13, 0.005)

Firstly, the cultivation of students' core competencies is essential. The core quality of students in senior high school subject teaching is a high-frequency key word, which emphasizes how to cultivate the core quality of students in subject teaching. For example, Liao Bin analyzed the role of cultivating students' core literacy in high school geography teaching, and then proposed four strategies for cultivating students' core literacy in high school geography teaching: Design teaching objectives of core literacy based on the meaning of geography; Create a realistic environment, so that the core quality of students can be more deeply integrated; On the basis of teaching materials, the question chain of core literacy is constructed. This paper explores the learning resources in practice, cultivates students' practical ability of subject geography, and finally discusses the practice of cultivating students' core literacy in senior high school geography teaching [12]. Based on the guidance of curriculum standards and her personal teaching and research experience, Shi Ling has carried out in-depth teaching and learning evaluation practices from three dimensions: formulating hierarchical teaching evaluation indicators that meet academic

quality standards, developing examination propositions and evaluation systems that meet academic quality standards, and carefully implementing evaluation and feedback mechanisms for academic achievements. It is necessary to accurately measure the level of teaching activities and learning outcomes in achieving the core literacy of history discipline, so as to promote the comprehensive development of students' core literacy of history discipline [13]. In the teaching of ancient poetry and prose in high school, Wu adopted the teaching mode of project-based learning to guide students to develop their abilities and improve their core Chinese qualities in the process of actively discovering, exploring and solving problems [14].

Secondly, regarding the cultivation strategies for fostering students' core competencies. This paper mainly discusses how to cultivate students' core literacy through deep learning. The core quality is a series of abilities and qualities that students need to adapt to the development of society, and the quality orientation is a prominent feature of the revision of the compulsory education program. The cultivation of students' core literacy can not only rely on the traditional teaching-based teaching method, but must explore its cultivation way according to its specific characteristics, so as to provide teachers with accurate teaching guidance and ensure the effective implementation of the cultivation of core literacy. Compared with shallow learning, deep learning pays more attention to the deep processing, deep understanding and long-term memory of knowledge. It is a process in which learners independently construct knowledge, and can cultivate students' ability to transfer and apply knowledge in real scenarios, which is conducive to promoting the development of students' core literacy [15]. In order to solve the problem of poor teaching practice and difficulty in cultivating students' core qualities in the wisdom classroom, Li et al. believed that the cause of this problem was the lack of "depth". He referred to the characteristics of classroom teaching under the concept of deep learning, and started from the aspects of teaching links, teaching activities (student activities and teacher activities), resources and tools, and teaching evaluation. A smart classroom teaching model from the perspective of deep learning is constructed to

promote the improvement of teaching effect and the cultivation of students' core literacy [16]. Zhang believes that higher vocational colleges should constantly adjust the goal and direction of personnel training, take the cultivation of vocational core qualities as the center, actively explore new models and constantly adjust and optimize, so as to better complete the training and output of high-quality technical and technical talents [17]. Zhao et al. believe that in the process of cultivating students' core qualities, vocational colleges should attach importance to the strengthening of moral and civic education and the strengthening of ability training, and at the same time cultivate students' sense of service, so as to ensure that student cadres develop into leadership talents with excellent comprehensive abilities and truly fulfill the role of outstanding student cadres [18].

Thirdly, the classroom instruction underpinned by the cultivation of core competencies. Classroom teaching is the main position for schools to carry out the task of cultivating morality and cultivating students' core qualities. In order to give full play to its educational function, it is necessary to promote the change of classroom ecology and improve classroom efficiency. In order to highlight the core quality in English teaching, vocational colleges solve the problems such as single teaching method and lack of awareness of core quality cultivation through creating situations, highlighting students' dominant position and innovating teaching methods, so as to effectively improve the teaching effect and quality and promote students' development and progress [19]. In the teaching of mathematics courses, students' thinking ability, innovative consciousness, practical ability and other relevant abilities are cultivated to improve their mathematics learning ability and level, so as to help students understand and master the knowledge points in the primary school mathematics textbooks [20].

Fourthly, the integration of moral and civic education into curriculum. It is a kind of teaching idea and practice, the core is to integrate moral and civic education in Curriculum throughout all aspects of daily teaching activities. The cultivation of core quality is not only the need of talent training and development in the new era, but also one of the contents of curriculum moral and civic

education reform and practice. Zhang of Fujian Agriculture and Forestry University built a curriculum moral and civic education teaching model based on the core qualities of students' development, which is composed of five parts: "Six core qualities" curriculum Moral and Civic Education teaching objectives, point-to-line and surface teaching contents, student-centered whole-process curriculum moral and civic education teaching methods, democratic classroom teaching management, and the interwoven incentive and drive mechanism of "Kexaixing" [21]. Wang elaborated the significance of cultivating students' core qualities such as professional ethics and professional spirit through curriculum moral and civic education and the specific strategies for implementation: Teachers establish curriculum moral and civic education to cultivate students' core professional qualities; Establish the evaluation system for students' goal achievement; Carry out the second classroom of professional teaching and expand the practice platform for cultivating professional core literacy.

The fifth aspect is the education of Chinese language and literature. The research on Chinese education in students' core accomplishment mainly focuses on reading teaching. Xiao believes that primary school Chinese reading teaching under the core quality should not only enable students to read articles correctly, but also improve their comprehension ability, language appreciation level and independent thinking ability [22]. Lou believes that fairy tale teaching in primary schools currently lacks style awareness and is out of touch with students' cognitive level. Based on these problems, she proposes four interesting and efficient reading strategies for fairy tale text teaching: language construction and application, thinking development and improvement, aesthetic appreciation and creation, and cultural inheritance and understanding, with a view to cultivating students' core Chinese quality [23]. Song applied the "reading and thinking" teaching method, which refers to students' concern and exploration of the learning process, that is, the complete process of students' reading, thinking and expression, to improve the quality of primary school reading teaching, improve students' reading level, and implement the goal of cultivating students' core Chinese literacy

[24].

3.2 Research Trend of Students' Core Literacy

Research trends are studies that have changed over time in a field or topic. By observing and analyzing the changes in the field of students' core literacy over time, we can see the evolution of the research on students' core literacy through Figure 3 and Figure 4.
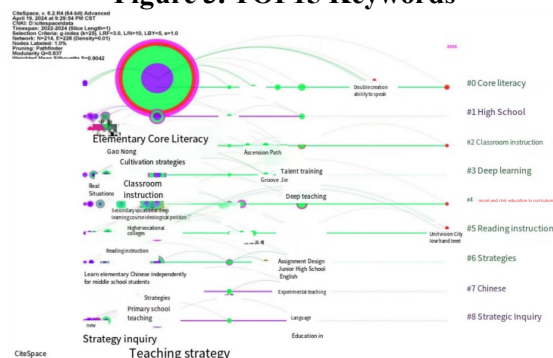

Figure 3. TOP15 Keywords

Figure 4. Keyword Time Diagram

In the first stage (2022), after the promulgation of the 22nd version of the Plan, the research on students' core literacy will focus on all levels of basic education, including high school teaching, art teaching, history teaching, etc., and explore how the new curriculum standards relate to the teaching practices of different disciplines, such as art teaching. In addition, compulsory education and educational strategies targeting specific groups such as junior high school students are also receiving attention. This shows that this year's research focuses on how to achieve the teaching objectives of core literacy in all stages and disciplines of education.

In the second stage (2023), it can be seen from the two pictures that the focus of research has

shifted to new curriculum standards, information technology and teaching innovation, etc. How to integrate new technology and innovative teaching methods to improve students' core literacy has become the trend of this year. Secondly, the growth of Chinese and secondary vocational Chinese indicates the exploration of improving the core quality of Chinese teaching. In addition, the focus on subject experiment teaching and assignment design also shows that it is of great significance to the development of students' core literacy.

In the third stage (until April 2024), with the passage of time, the research on students' core literacy will develop along the track formed in 2023, and will continue to deepen the research on new curriculum standards, information technology and other aspects, and the guidance of core literacy concepts will always be a major direction. In addition, there are new trends such as large units and teaching reform.

3.3 Conclusions and Future Outlooks

3.3.1 Realize the vision of the new curriculum standards

The guidance of the New Curriculum Standard is the core quality, the course content is structured and interdisciplinary

Subject learning and academic quality are also mentioned in the curriculum standards. The structure of curriculum content is a specific measure to implement the core literacy. Guo Hua's interpretation of the New Curriculum Standard talks about the cultivation of students' core literacy, which not only requires teachers to have a high degree of self-awareness, but also requires teachers to actively guide students to participate in teaching activities. Students should also be regarded as the subject of teaching and form and develop their core literacy through active participation and self-exploration, which means that the core task of education is to ensure that students can play a leading role in teaching activities, so as to effectively cultivate their core literacy [25]. Interdisciplinary topic learning is directed to specific research questions as the core, with the curriculum content of a specific discipline as the core, while integrating and applying the relevant knowledge and methods of other disciplines. As a key path to cultivate students' core literacy, interdisciplinary learning not

only breaks the boundaries between disciplines and strengthens the collaborative educational effect between courses, but also plays an important role in helping students form deep knowledge understanding [26]. For example, Yu and Chen pay attention to the integration and blending of "horizontal knowledge", the contextualized field of children's "whole life" and the collaborative participation of "teaching community" in the "interdisciplinary theme learning" of physical education and health course, and constructs the teaching content of "sports +X", scientifically creates the teaching environment of "real situation" and reasonably chooses the teaching method of "inquiry learning". In order to achieve the ultimate effective physical education and health curriculum "interdisciplinary thematic learning" [27]. The curriculum standard also mentions "academic quality". Whether it is the overall direction of setting course objectives, the "academic requirements" of each content section, or the final "academic quality standard", the specific indicators are described according to the dimensions of core literacy, ensuring that core literacy is no longer just an abstract concept. It is translated into the embodiment of students' actual abilities, character and values.

3.3.2 Practice and application orientation

According to the data retrieval results of the last two years, the implementation of core literacy is closely related to teaching practice, and there are 210 literatures related to the topic of "practice". Therefore, core literacy education in the future will be more practical and applied, emphasizing students' ability to apply what they have learned to the real world.

3.3.3 Technology enabling teaching

The report in December 2021 clearly states that it is necessary to "promote the reform of education and teaching by integrating information technology, intelligent technology and education and teaching", and comprehensively promote the innovation of teaching models and the reform of evaluation methods by using technology empowerment. It is also mentioned in the 22nd edition Plan that under the background of new technology, teachers should actively explore the transformation of digitally empowered learning environment and education methods. In the past 23 years, there have been 28 articles on the application of information

technology in subject teaching. With the rapid development of new technology, the cultivation of core literacy of students in the future will increasingly depend on the effective integration of educational technology. Therefore, technology-enabled teaching is a major trend in education.

3.3.4 Diversified evaluation mechanism

In 2020, the Overall Plan for Deepening the Reform of Educational Evaluation in the New Era was issued, mentioning in the reform of student evaluation that through innovative evaluation methods and the improvement of the comprehensive quality evaluation system, the evaluation of moral, physical, aesthetic, and labor education should be strengthened. The high school entrance examination system should be reformed, emphasizing the process and multiple evaluation criteria to reduce reliance on scores. This kind of evaluation mechanism will be more comprehensive and can fully reflect the various abilities and qualities of students. Lianyuanjie Primary School in Wuxi City, Jiangsu Province, through exploring the combination between the national education requirements and the century-old cultural gene of the school, focusing on the cultivation of students' character, quality improvement, ability forging and other aspects, highlighting the real situation creation, process examination, comprehensive evaluation, and multiple feedback in the evaluation process, and constantly improving the scientific and effective evaluation. Effectively let evaluation contribute to students' real development [28].

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