Breakthroughs, Challenges, and Implementation Path of Reading Teaching in the New Media Environment

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Abstract: *Under the background of the information age, new media, as an important teaching tool in the field of education, has increasingly highlighted its unique and important teaching role. The development process of new media reveals its historical evolution from nothing to something, and its relatively stable transformation. The analysis and research of reading cognitive theory by many experts and scholars have provided a solid theoretical support for the integration of new media into reading teaching and its important function. Compared with traditional media, new media provides new teaching styles and choices for reading teaching with its advantages of flexible teaching in time and space, intuitive understanding and cognition of presented content, but the problems it may cause in teaching also bring challenges to reading teaching. Therefore, formulating and implementing scientific and effective countermeasures for reading teaching in the new media environment has become an important content of research and teaching.*

Keywords: *dual coding; cognitive load;phenomenon of concreteness advantage; new media literacy; immersive aesthetics*

1. Introduction

In the era of information technology, new media has become an indispensable tool for daily communication in various aspects of learning, work, and life, profoundly influencing and changing our cognitive habits and behavior patterns. As one of the important platforms of new media, networked mobile terminals have become a common carrier and form of new media. According to the 51st Statistical Report on the Development of China's Internet Network issued by the China Internet Network Information Center (CNNIC) in December 2022, the scale of China's Internet users reached 1.067 billion, and the Internet penetration rate reached 75.6%. The proportions of Internet users in China accessing the Internet via mobile phones, desktop computers, laptops, and tablets were respectively 99.8%, 34.2%, 32.8%, and 28.5%;[1] On the other hand, people's demand for and emphasis on reading are increasingly prominent. According to the 20th National Reading Survey Report, both adults and minors (aged 0-17) show an increasing trend in reading rates and reading volume. Based on the above data and discussions, it can be found that on the one hand, new media's intervention and influence on people's daily life and learning are increasingly deepening. On the other hand, people's reading needs are increasing. Therefore, as teachers, how to effectively implement reading teaching in the new media environment has become an important teaching consideration for every teacher.

2. Historical Development and Concept of New Media

Understanding the historical development and concept of new media is a fundamental prerequisite for researching new media and its teaching. Knowing what has happened in the development of new media allows us to grasp existing research results and conclusions, and to clarify the development trajectory of new media, providing a realistic basis and inspirational ideas for research on new media teaching. Analyzing and clarifying the concept of new media helps us to identify the research direction of new media and its teaching, and to avoid ambiguity in understanding the concept.

2.1. Historical Development of New Media

The term "new media" is generally believed to have appeared in 1967, when P. Goldmark, the director of the technology research institute at CBS, proposed it in a project plan on electronic video recording (EVR). The term"new media"also appeared several times in the "Rosenthal Report" in 1969,

after which the concept of "new media" spread rapidly in the United States and around the world. In the 1970s and 1980s, "new media" began to exhibit simple interactive and non-linear characteristics, but its definition and connotation had not yet been rigorously and comprehensively expressed. After the 1990s, with the application and popularization of computers and the Internet, the networked direction of new media became clear. Since the 21st century, the development of new media has mainly exhibited two trends: one is various virtual forms of new media developed through network technology and platforms to meet individuals' needs for work, study, life, etc.; the other is physical entities of new media that can access the Internet or local area network, which are characterized by portability and flexible networking, such as various types of mobile terminals and teaching integrated machines that can access the Internet, providing physical support for individuals or users' work and study.

2.2. Clarifying the Concept of New Media

To organize and implement reading teaching scientifically and effectively in the new media environment, teachers should first be familiar with and understand the concept and connotation of new media, distinguish the differences between new media and traditional media, and clarify the direction and path for implementing reading teaching in the new media environment. Many experts and scholars have made relevant explanations on the concept of new media. For example, Professor Xiong Chengyu of Tsinghua University believes that new media is the sum of media functions based on computer information processing technology and Internet technology.[2] In addition, relevant organizations have also made relevant statements on the concept of new media. For example, UNESCO believes that new media is actually network media. Through the sorting out of various concepts of new media, it can be found that there is no consensus on the concept of new media at present, but many consensuses have been reached, such as relying on digital or network technology and realizing two-way and real-time transmission of information. On the other hand, clarifying the concept of new media needs to pay attention to two aspects: one is in the vertical direction, the connotation of the concept of new media is open and not fixed, and will become richer and change with the development of the times; the other is in the horizontal direction, the connotation of the concept of new media is stable during a certain period, which is conducive to the research and application of new media.

3. Theories Related to Reading Cognition

To organize and implement the process and goals of reading teaching effectively in the new media environment, teachers need to not only be familiar with the development status and concept connotation of new media, but also learn and master relevant theories of reading cognition. This will enrich their theoretical support and reserves for reading teaching in the new media environment, and enable them to design, organize, and implement teaching with targeted measures based on the characteristics and advantages of new media, and to respond to changes in student learning situations, thereby promoting effective implementation of reading teaching.

3.1. Dual Coding Theory

The Dual Coding Theory was proposed by Canadian psychologist Paivio. It suggests that the cognitive system of the subject can be divided into two parts: the semantic system and the imagery system(namely, the verbal and nonverbal systems), which are responsible for encoding abstract information symbols such as words and language, and concrete visual information symbols such as images, respectively. These two systems can work independently or in parallel with each other. Individuals can use one cognitive system (semantic or imagery) to encode and interpret information, or use both systems simultaneously to associate the processed information from both systems. The Dual Coding Theory also reflects and explains the phenomenon of concreteness advantage. According to Paivio's experiments, individuals' memory accuracy and speed for concrete information or visual materials are better than for abstract materials or information. For example, individuals' memory accuracy and comprehension depth for videos and images are better than for texts and tables because the former can enable individuals to engage both the semantic system and the imagery system simultaneously in processing information or cognition symbols, while the latter can only engage the semantic system in processing information.

3.2. Cognitive Load Theory

The Cognitive Load Theory was first proposed by John Sweller, a cognitive psychologist at the University of New South Wales in Australia in 1988, and has since received widespread attention and analysis from many experts and scholars. It is important to note that cognitive load can have both positive and negative effects on individual cognitive learning. There are generally three types of cognitive load: internal cognitive load, external cognitive load, and related cognitive load. In teaching, efforts should be made to reduce external cognitive load and increase related cognitive load, as external cognitive load is mainly caused by poorly designed teaching and belongs to ineffective load, while related cognitive load can promote individuals' graphic construction and graphic automation processes in cognition.[3] As for internal cognitive load, it is more of a "neutral" choice that brings high or low cognitive load to individuals, depending on the gap between the learning material itself and the individual's existing cognitive experience. Additionally, Cognitive Load Theory also explains relevant teaching effects and principles such as "redundancy effect" and "prompting structure principle",etc.

4. Breakthroughs in Reading Teaching in the New Media Environment

Compared with traditional reading teaching, the various advantages of new media can enable teachers to better design, organize, and carry out teaching. It can break free from the inherent limitations of time and space, maximize teaching freedom, enrich students' life experiences to promote learning cognition, and accurately quantify and analyze students' learning performance and learning effects to provide feasible evaluation recommendations. Therefore, teachers should be familiar with and master the important impacts and changes of teaching in the new media environment to promote their own teaching adjustments and improve teaching effectiveness.

4.1. Teaching Freedom in Time and Space

If the postal system and printed materials constituted the first generation of distance education, and printed materials, radio and television, audio and video constituted the second generation of distance education,[4] the continuous development and innovation of digital technology, computer network technology, and mobile intelligent terminals have continuously enriched and fulfilled the connotation of new distance education and provided technological possibilities for achieving broader teaching freedom. As a typical representative of information technology used in the field of education, new media has greatly extended the teaching distance and teaching space, and correspondingly improved the degree of teaching freedom and comfort. On the one hand, in traditional classroom teaching, teachers are often limited to the podium and blackboard (or projection display), and their teaching behavior is mainly limited to the surroundings centered on the podium, with a short teaching radius and limited radiation range of teaching effects, especially for students in the back rows who may not receive enough attention. However, reading teaching in the new media environment can greatly expand teachers' teaching freedom. Teachers' teaching activities are no longer limited to around the podium, but can enter into the students to communicate and interact with them, obtain timely feedback on actual learning situations, and understand students' learning effects as comprehensively as possible. On the other hand, the teaching environment of new media allows students to continue learning, asking questions, and discussing knowledge content outside of class. This free and flexible time and space environment and teaching conditions can greatly stimulate students' desire for knowledge, improve learning efficiency, promote and consolidate mastery of teaching content.

4.2. Supplementing Experience Under Content Visualization

In the previous discussion of cognitive load theory, it was mentioned that its classification mainly includes three types: internal cognitive load, external cognitive load, and related cognitive load. Among them, internal cognitive load belongs to "neutral" load, and its degree of load in individual cognition is high or low depending on the richness of cognitive individuals' existing experience or relevant knowledge (under the premise of a certain complexity of cognitive materials). On the other hand, arousing and supplementing students' life experiences is also one of the three basic paths of reading teaching, with the other two being guidance on reading methods and sharing and exchanging experiences,[5] Students' existing cognitive experience is also a key constituent element when teachers analyze real-life learning situations to determine the starting point for teaching. Therefore, situational presentation graphics provided by new media can make up for individuals' perceptual deficiencies in

information content. Especially when reading text styles with deep artistic conception such as poetry and prose, new media's visualized and continuous text can supplement students' lack of cognitive and metaphorical "experience," reduce internal load degree, and thus minimize comprehension "gap." In addition, the characteristics reflected by new media in the application process also confirm the phenomenon of concrete advantages in dual coding theory. The visualized text presented by new media (including dynamic and static), such as video, animation, images, etc., can better promote individuals' understanding cognition than text or tables (because they can simultaneously activate individuals' semantic system and image system), while also stimulating students' reading enthusiasm and enhancing their participation in teaching.

4.3. Visualized Result Analysis and Objective Evaluation Recommendations

Reading teaching evaluation is a summary of teachers' value on students' reading learning situations. Its essence is a kind of value judgment. According to the role of evaluation implementation, it can be divided into diagnostic evaluation, process evaluation, and summary evaluation. For example, summary evaluation mainly examines students' learning situations through periodic or staged tests. (mid-term or final exams etc.) In the new media environment, teachers can collect and summarize real-time evaluations of each student's reading learning results and quantitatively analyze these visualized results to determine students' academic quality and achievements during the teaching cycle. On the other hand, for those process learning elements that are not easy to quantify but have important impacts on student learning during reading learning, new media can also observe, record, analyze them in a timely manner, such as students' progress rate, emotional input, etc., and provide targeted improvement recommendations to enhance the effectiveness of reading teaching and the objectivity and guidance of student evaluations. Taking "Cape of Good Hope" as an example developed by Haifeng Education's R&D evaluation system for online new media teaching platform (Haifeng Zhixue Center), "Cape of Good Hope" can continuously identify students' emotions and expressions during reading teaching, analyze students' attention concentration and knowledge mastery during teaching after data-orienting processing, present them visually, and provide objective teaching improvement recommendations to help teachers judge student situations and adjust teaching to promote optimization of teaching effects and objectives.

5. Challenges of Reading Teaching in the New Media Environment

While optimizing and improving the reading teaching process and effectiveness in the new media environment, teachers also face some problems and shortcomings that hinder and restrict the achievement of teaching results and goals. These challenges need to be addressed and resolved.

5.1. Challenges to Meaning Construction and Diversified Thinking

Undeniably, the diverse presentation forms of text content in the new media environment have enriched and enhanced the forms and methods of reading teaching, and non-textual presentation forms have had a positive impact on stimulating students' reading willingness and promoting their understanding. However, on the other hand, abstract textual symbols and semantic expressions are imbued with concrete and specific history and tradition, highlighting the poetic language and human beauty behind them,[6] In a quiet and peaceful environment, readers can appreciate the value pursuit hidden in the text and enjoy the process of exploring the multiple meanings behind the words. However, in the reading environment of new media, when individuals are immersed in sensory information stimuli for a long time, their autonomous reading willingness may be weakened, and their immersive associative and deep aesthetic awareness and ability may be weakened. The planar sensory information fills and squeezes out the structured aesthetic space, making reading superficial and surface-level, thereby affecting the construction of meaning for cognitive objects.

Compared with meaning construction of the textual object, cultivating and exercising students' thinking is another important task of reading teaching. In the reading teaching of the new media environment, teachers can use hyperlinks to achieve non-sequential hypertext reading teaching, which helps to cultivate and exercise students' discrete thinking, such as exploring the relationship between different things. However, long-term reading teaching in the new media environment may not pay enough attention to cultivating linear thinking in students, which may frequently neglect students' exercise in logical reasoning abilities, which is not conducive to accurately grasping the essence of things in reading and improving thinking quality.

5.2. Challenges to Forming and Improving New Media Literacy

The degree of organization, implementation, execution, and effectiveness of reading teaching in the new media environment is closely related to teachers' level of new media literacy. New media literacy for reading teaching mainly includes scientific new media teaching concepts and good new media application capabilities. However, in actual teaching practice, teachers' new media literacy still has some issues that cannot be ignored. In terms of teaching concepts, many teachers' views on new media reading teaching show a polarization tendency. On the one hand, they are more resistant to teaching in the new media environment, believing that its sensory reading and virtualization and indirectness in interaction will weaken students' deep cognitive ability and cultivate inert aestheticism. On the other hand, they favor teaching in the new media environment, making it the dominant of teaching, thus falling into the quagmire of "technical rationalism." In terms of new media application capabilities, it mainly lacks familiarity and mastery of the characteristics and functions of different new media and targeted application of new media based on specific text characteristics. For example, difficulties in quickly familiarizing with platform functions lead to difficulties in course design, communication interaction, classroom supervision, learning evaluation, etc.[7] If these issues cannot be effectively resolved in a timely manner, the achievement of teaching results and goals in reading teaching in the new media environment will be delayed or hindered, which is not conducive to smooth implementation of the reading teaching process and achievement of overall course objectives.

6. Implementation Path of Reading Teaching in the New Media Environment

The realization of the concept, goals, content, and effects of reading teaching in the new media environment requires specific teaching paths that combines appropriate teaching design with effective dynamic teaching adjustments. The teaching process should adhere to the principle of combining preset and generative approaches, taking into account the specific realities of the teaching process and the characteristics of the new media environment to effectively carry out teaching and improve teaching effectiveness, promoting the expected achievement of teaching objectives.

6.1. Overall Feedback under Teaching Freedom and Effective Integration of Text Resources

As mentioned earlier, reading teaching in the new media environment has extended the time and space of teaching for teachers, greatly promoting teaching freedom and flexibility. This allows teachers to have more timely and comprehensive mastery and feedback on the overall student situation. In classroom teaching, teachers can use new media to achieve remote teaching of teaching content, thereby expanding the radiation range of teaching effects. The expansion of teaching freedom helps to reduce the psychological distance between teachers and students in the interaction process, thereby enhancing student participation in teaching. At the same time, teachers can more deeply and in real-time understand students' mastery of teaching content, obtain real teaching feedback, and scientifically judge actual student situations to adjust teaching. On the other hand, the teaching process should combine preset and generative approaches. Teaching that strictly follows the teaching design cannot adapt to the actual changes in student situations and teaching situations. Reading teaching in the new media environment provides great convenience for teachers to enrich and integrate text resources in response to dynamic changes in student situations. For some common problems in reading teaching, such as the disconnection between cognitive experience and text material, and the contradiction between limited text material and deep understanding, teachers can use new media (software, platforms, etc.) to real-time enrich, expand, and present relevant text resources to promote students' deepening and comprehensive understanding of textbook content. After class, teachers can provide students with supplementary and targeted reading resources based on the analysis of students' reading and learning data and relevant recommendations provided by new media in class. This can help address cognitive understanding problems arising from individual differences among students.

6.2. Reasonable Interaction of Intuitive Popularization and Immersive Aesthetic Cognition

The diverse text presentation forms of new media help to visualize and popularize the understanding of reading objects by reading subjects, especially image and video (animation) representation methods with their unique cognitive advantages in concreteness, providing an important cognitive channel for externalizing of silencing reading content. However, long-term "new media" information presentation may have a negative impact on individual autonomous aesthetics and active

knowledge construction. On the other hand, traditional paper text reading teaching still exerts its unique advantages and charm, allowing students to immerse themselves in unlimited associations and deep understanding of semantic meanings behind textual symbols, enriching their aesthetic space and thinking quality. Therefore, in teaching, teachers should attach importance to students' immersive text reading, excavate the meaning connections and value brilliance behind textual symbols; on the other hand, teachers should actively leverage the unique advantages of new media, use targeted diversified information presentation forms to promote students' intuitive understanding and reduce cognitive burdens, enriching subjectivity in reading's sensory experience and multiple image understanding. Teachers should comprehensively use diversified teaching methods, teaching means, teaching steps, teaching organization forms, etc., to coordinate the use of new media and paper text in reading teaching. For example, after presenting a graphic representation under new media, teachers should guide students to analyze and interpret it. In perceiving and understanding texts, students can first read patiently before presenting direct visualized text forms to avoid preconceived visual images interference and affect subjectivity's autonomous aesthetics and imaginative play, thereby reducing thinking activity and nurturing cognitive inertia.

6.3. Combining "Quality" Qualitative Evaluation with Measurable Quantitative Evaluation

Teaching evaluation comprehensively analyzes, judges, and draws conclusions on the entire teaching process and results. It is a critical link for teachers to reflect on teaching, summarize gains and losses in teaching, and improve teaching. Quantitative evaluation can refine the overall evaluation object into numerous elements for quantitative analysis. The analysis process is objective and standard, with intuitive and specific results. It has good reliability but mainly applies to quantitative analysis of explicit measurable behaviors. It is not sufficient for deep information analysis. On the other hand, qualitative evaluation can qualitatively describe and analyze those factors that are difficult to quantify but have a significant impact on teaching during the teaching process. It focuses on analyzing and evaluating students' learning performance. Its evaluation process and results contain "people-oriented" thinking and development concepts. However, it also has subjective evaluation tendencies, and the accuracy of evaluation results is difficult to grasp. Therefore, in reading teaching, teachers can use new media to record and analyze students' various quantifiable indicators (elements) in real-time during their reading learning process. They can use evaluation tools such as evaluation scales for objective evaluation of students' reading learning processes and results to obtain more comprehensive and accurate evaluation conclusions. On the other hand, teachers can use evaluation methods such as observation methods, daily inspection methods, portfolio evaluation methods to evaluate those factors that are difficult to measure but have a significant impact on students' academic achievements such as learning attitudes and efforts to evaluate students' development in emotional, intentional, behavioral aspects. Only by combining qualitative and quantitative evaluations can we fully understand and grasp the actual situation of reading teaching and then targeted improve shortcomings to enhance reading teaching effectiveness.

7. Conclusions

The various advantages of the new media environment and its empowerment of teaching provide teachers with new teaching ideas and feasible teaching paths for scientific design and effective implementation of reading teaching. However, the potential problems of reading teaching in the new media environment should also be taken seriously. Therefore, reading teaching for teachers in the new media environment should, on the one hand, targeted playing the advantages of new media according to specific learning situations to make up for the limitations of traditional reading teaching and improve teaching effectiveness. On the other hand, they should consider the negative impact that the new media environment may have on students' reading learning, adhere to the principle of moderation, and comprehensively use diverse teaching forms to promote the effective achievement of teaching objectives.

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