



# Research on the Implementation of the Double Reduction Policy Enabled by Digitalization

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**Abstract.** The digitization-enabled Double Reduction policy represents a significant practice in the digital transformation of China's education, and is essential for the high-quality development of education. The study clarifies the connotation and characterization of the Double Reduction policy and analyzes the key elements and value orientation of the digitally empowered Double Reduction policy based on them; guided by the blended learning theory, the multiple intelligences theory, and the deep learning theory; and clarifies the key links and specific paths for the implementation of the empowerment of digitalization in the implementation of the Double Reduction policy. The key links and specific paths of implementation are clarified, providing some reference for the practical application of digitalization in the implementation of the Double Reduction policy.

**Keywords:** digital empowerment; Double Reduction policy; digital transformation in education.

## 1 Introduction

The application of digital technologies in education is fundamentally about the digital transformation of education. According to the analysis of the evolution of Digital Transformation by Portuguese scholars such as Reis, the concept dates back to 1968, but it was not until 2015 that there was a surge in the number of related papers [1]. Some scholars define Digital Transformation as a strategy, process, and business model[2], emphasizing the use of a combination of new information technologies, connectivity technologies, etc., to achieve significant business improvements. Other scholars define digitalization as "the degree to which an organization adapts to the digital environment"[3]. For the field of education, education digitization in the narrow sense refers to embedding technologies such as big data, cloud computing, artificial intelligence, etc. into educational organizations to achieve innovation and change in products, processes, and modes; in a broader sense, it refers to the in-depth embedding and coupling of a variety of digital technologies with the educational system to achieve the transformation and upgrading of education in the society[4].

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However, digital technology has not yet been able to be embedded and coupled with the Double Reduction policy in a more in-depth manner, and how to build an institutional mechanism for digitally empowering the Double Reduction policy has become an urgent and realistic problem to be solved at present. Based on this, this study intends to clarify the logical connotation of the digitization-enabled Double Reduction policy through in-depth excavation, and introduce digitization technology into the implementation of the Double Reduction policy, so as to empower the Double Reduction policy to further implement in high quality. The policy of Double Reduction can be further implemented with high quality by introducing digitalization technology into the implementation process of Double Reduction policy.

## **2 Content of the Double Reduction Policy on Digital Empowerment**

The implementation of the Double Reduction policy marks the beginning of the shift to high-quality development of China's basic education, the fundamental connotation of which is to reshape the pattern of education, the concept of education, to safeguard the fairness of basic education, and to cultivate high-quality talents for the great rejuvenation of the Chinese nation.

The Double Reduction policy is ostensibly a solution to the problem of overburdened education, but at its root, the Double Reduction policy focuses on the relationship between the State and the market, and between schools and society. Families, schools and society should shift from disorganized and chaotic cooperation to orderly coordination and cooperation to jointly promote the cultivation of talents. As the main position of education, schools should do a good job of teaching and learning, and do their best to ensure that students maximize the efficiency of learning in school, and reduce the demand of parents for off-campus training institutions[5]. Parents should also pay attention to the role of family education, pay attention to their children's mental health, pay attention to their children's moral education, and help young people establish a correct outlook. Home, school and society all play their respective roles in the education process, remodeling a sound and perfect pattern of education. Society should create a favourable social environment for the development of students, provide scientific guidance for the social development of schools, and make use of the rich resources therein to promote the development of students.

The Double Reduction policy is also a revolution in the concept of education. The Double Reduction policy advocates abandoning the "scores-only theory", improving the mechanism for promoting moral education, and no longer using grades as the sole criterion for measuring students' quality, but rather focusing on the overall development of students' comprehensive quality. The disappearance of the "score theory" symbolizes a shift in the concept of education, the concept of education from "test scores" as the basis for the shift to cultivate "comprehensive quality" as the core of the "whole person education". The concept of "whole-person education".

Lastly, basic education, as an integral part of education, plays an important role in the development of individuals, with the aim of stimulating their potential, realizing

their intrinsic value and laying the foundations for their future development. Based on the importance of basic education, it is imperative to ensure equity in basic education. Prior to the implementation of the Double Reduction policy, various types of out-of-school training were prevalent, which led to the children of middle- and high-income groups being able to enjoy more and better educational resources than those of low-income groups. After the implementation of the Double Reduction policy, school education has improved in quality and efficiency, reducing parental demand for out-of-school training and, to a certain extent, ensuring educational equity.

### **3 The Theory of Digitally Enabled Double Reduction Policies**

#### **3.1 Blended Learning Theory**

Singh and other scholars believe that Blended Learning is a learning approach that optimizes learning outcomes by applying the "right" learning technology at the "right" time and the "right" learning style to deliver the "right" competencies to the "right" learners. Blended Learning is a learning approach that optimizes learning outcomes by applying the "right" learning technology at the "right" time, matching the "right" learning style, and delivering the "right" competencies to the "right" learners. This perspective emphasizes the main body of blended learning, the student, and the goal of blended learning, which is to achieve optimal learning results. With the advent of the digital era, Professor He Kexiang put forward a new definition of blended learning that is in line with the development of the times, namely, blended learning refers to the combination of the advantages of traditional learning behaviors and learning styles with the advantages of digital learning, and it is necessary to give full play to the leading role of teachers by guiding, inspiring, and supervising, and to give full play to the students' initiative, creativity, and motivation, in order to achieve the optimal learning effect. The best learning results will be achieved by giving full play to students' subjectivity, creativity, and enthusiasm.

#### **3.2 Multiple Intelligences Theory**

The theory of Multiple Intelligences (Multi-Intelligences, or MI theory) was first proposed by Dr. H. Gardner in his book *The Structure of Intelligence* (1983). The theory holds that human intelligence is pluralistic, with at least eight intelligences existing in each individual, each of which plays a great role in individual development. The theory of multiple intelligences is based on a wealth of educational tools and teaching resources, and advocates the use of diversified educational techniques, respect for the differences in the structure of students' intelligence, and the development of personalized education.

### **3.3 Deep Learning Theory**

The concept of deep learning first appeared in the field of machine learning, and was introduced to the field of education in 1976 by Ference Marton and Roger Säljö, who first introduced the concepts of deep learning and shallow learning in their article "The Essential Difference Between Learning: Outcome and Process". Deep learning theory refers to a critical, active learning style that requires learners to focus on the understanding and use of knowledge in order to reach the higher cognitive levels of "applying, analyzing, synthesizing, and evaluating".

## **4 Digitally Enabled Double Reduction Policy in Practice**

### **4.1 Digital Technology Empowers High-Quality Classroom Teaching and Learning**

High-quality classroom instruction is characterized by the pooling of data across the classroom, the use of data for objective characterization, the agile adaptation of collaborative data, and the development of ubiquitous data creation[6]. On the one hand, it focuses on the personalized and intelligent construction of the learning environment by relying on digital technologies such as artificial intelligence, big data, and learning situation analysis. Through the intelligent teaching platform and the analysis of students' learning data, teachers are able to understand in real time the degree of students' absorption and mastery of classroom knowledge, and use this to dynamically adjust the teaching content and teaching progress, customize the learning path for each student, and push personalized learning resources and challenge tasks according to the students' learning styles, interests and preferences, and ability levels. This precise teaching mode not only respects students' individual differences, but also greatly promotes students' active learning and self-improvement. At the same time, teachers can build "real" learning scenarios for students through the rational use of artificial intelligence and other technologies in the classroom, maximizing students' interest in learning and allowing students to achieve a deeper understanding of knowledge through personal participation. On the other hand, teachers should pay attention to cultivating students' independent learning ability, and guide students to explore independently in the big data environment. Teachers can guide students to master the methods of data collection and analysis, so that students can independently acquire knowledge and evaluate knowledge, thus improving their learning effectiveness.

### **4.2 Digital Technology Empowers Enriched after-School Services**

As an important part of the education system, after-school services aim to provide students with a broader field of knowledge and cultivate diversified interests, thereby enabling them to realize more comprehensive development. Interaction between students and their peers is an important way for young people to cultivate a sense of cooperation and exercise their social skills, so encouraging collaborative learning among students is also an indispensable part of after-school services. Utilizing online

collaborative tools, students can form learning groups across time and space constraints to work together to solve complex problems and share learning experiences. This project-based cooperative learning mode can not only cultivate students' teamwork ability, communication and expression ability, but also stimulate students' innovative and critical thinking in the collision of ideas. At the same time, through the intelligent system to analyze the students' performance, interests and learning difficulties in the classroom and after-school services, we can not only recommend suitable extension courses and reading materials for them, but also realize precise measures in homework assignment and learning progress adjustment.

### **4.3 Digital Technology Enables Diversified Operations Management**

One of the most important aspects of the Double Reduction policy is to improve the quality and efficiency of homework through hierarchical design and placement. Through the empowerment of digital technology, teachers are able to manage homework more diversely and accurately. First of all, although the Double Reduction policy requires reducing the amount of homework and the time to complete homework. However, it is difficult for teachers to track and quantify the amount of time each student spends completing homework, making it impossible to make real-time adjustments to homework assignments in response to the actual situation. Through digital technology, teachers can track the completion time of each student's homework through a digital platform for homework collection, thus adjusting the amount of homework. Secondly, the digital platform can realize the tracking record of each student's learning situation through real-time assessment of the collected homework. Thirdly, the digital platform also provides rich educational resources and learning tools, which can match and filter the assignments according to the collected information of students' learning, and help teachers to match the assignments accurately with the learning situation, learning progress and learning difficulties of different students, so as to realize personalized learning.

### **4.4 Digital Technology-Enabled Training in Standardized Disciplines**

Out-of-school academic training is a major source of burden for students and a major area that the Double Reduction policy is trying to address. Digital technology not only deepens the regulation and optimization of out-of-school subject training, but also further promotes the deep integration of educational equity and personalization. On the one hand, digital technology-enabled discipline training is to utilize the flexibility of the digital platform architecture and the integration capacity of the characteristics of the various types of out-of-school training, unified management, standardized operation, online supervision. Through the use of big data and other digital technologies, the establishment of a database containing information on each off-campus training institution, and regularly update it, screen and clean up unqualified and poor quality institutions on the market, ensure the quality of off-campus training institutions, and realize an all-round mastery of the development and operation trends of training institutions. On the other hand, the in-depth application of AI technology will not only further

promote the realization of personalized education, but also give students more support and encouragement at the emotional level through emotion recognition and interactive technology, enhance learning motivation, and make the learning process more enjoyable and efficient.

## 5 Conclusion

Digitally empowered education is an inevitable trend for the future's high-quality development of education, and the integration of the Double Reduction policy with digital technology is an important innovation in the field of education as a guiding policy for educational development. Based on this, this study proposes the "two, three, four principles" of the digitally-enabled Double Reduction policy after analyzing the connotation and characterization of the Double Reduction policy in depth, i.e., two fields, three elements and four subjects. Two fields, i.e. in-school and out-of-school; three elements, i.e. digital integration to empower classroom teaching, digital integration to empower after-school homework, and digital integration to empower after-school services; and four subjects, i.e. educational organizations, educational models, educational processes, and educational products. This principle aims to create a contractual linked ecosystem through the two fields, break down the education process into three key elements one by one, and finally realize the coupling of digital technology and the four education subjects, so as to promote the transformation and upgrading of social education.

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