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The Predicament and Approach of Basic Curriculum Reform in Russia under the Background of Digital Transformation

Jialan Wei

Guangxi Normal University, Guilin, Guangxi, China

Abstract: ***The application of digital technology in the field of education has rapidly promoted the development of basic education courses in Russia, and digital transformation has become a trend in the field of education. In the process of digital transformation, the basic education curriculum in Russia is confronted with difficulties such as insufficient efforts in the development of digital courses, lack of innovation in teaching strategies, weak practical application ability, insufficient digital literacy of teachers, lack of internal motivation, and a single teaching evaluation model that neglects multi-dimensional assessment. To address these predicaments, Russia has adopted strategies such as strengthening top-level design, establishing a standardized and digital curriculum system, promoting blended teaching models, enhancing students' digital application capabilities, building a hierarchical training system, setting up a digital capability incentive mechanism, establishing a dynamic evaluation mechanism, and promoting the reform of multi-party collaborative evaluation. By analyzing the experience of Russia, this article provides useful references for the digital transformation of basic education courses in other countries.***

Keywords: Digital Transformation Russia Basic education courses Curriculum reform**.**

1. Introduction

In July 2021, the "Guiding Opinions of the Ministry of Education and Five Other Departments on Promoting the Construction of New Education Infrastructure and Building a High-Quality Education Support System" proposed that it is necessary to "promote the digital transformation, intelligent upgrading, and integrated innovation of education to support high-quality education development" [1]. Digital technology has compelled countries to carry out digital transformation one after another, especially in the field of education. As a fighting nation state, Russia has also formulated a development strategy related to the digital transformation of education. The digital transformation of education is an important part of the entire digital transformation of Russia and also a measure for the country to achieve the goal of becoming an educational power. On December 2, 2021, the Russian government issued the decree "Directions for the Strategic Transformation of Education Digitalization in the Field of Activities of the Russian Ministry of Education", outlining the core contents of the six directions for the strategic transformation of education digitalization. At the parallel session of the 2024 World Digital Education Conference on "Challenges and Opportunities of Digital Transformation for Basic Education", scholars from various countries all put forward their own insights on digital education, believing that generative artificial intelligence brings new educational concepts, educational evaluation mechanisms, and educational contents to today's curriculum reform.

2. Background of Digital Transformation of Basic Education Curriculum in Russia

2.1 The Global Digital Wave and Educational Transformation

With the rapid development of digital technologies represented by 5G, artificial intelligence, big data and cloud computing, the production and lifestyle of human society have been profoundly changed, and profound changes have also been promoted in the field of education. The rise of online education, such as MOOCs and online degree programs, has led to the vigorous development of new educational models, breaking the time and space limitations of traditional education and providing more people with the opportunity to receive higher education. Digital technology has made personalized learning possible. Students can choose the learning content and progress according to their own interests and needs, and improve the learning efficiency. It has also promoted the sharing and dissemination of educational resources, broken the limitations of regions and institutions, and enabled high-quality educational resources to be disseminated more widely.

2.2 Russian National Strategy and Policy Support

In 2016, Russian launch "modern digital education environment of the Russian federation" project (СовременнаяцифроваяобразовательнаясредавРоссийскойФедерации), the project is the key content of digital economy strategy, Aiming to solve the problem of uneven allocation of educational resources, information technology is used to reconstruct the lifelong learning system for all [2]. In 2017, President Putin signed Presidential Decree No. 203 of the "Information Society Development Strategy of the Russian Federation from 2017 to 2030", explicitly stating the need to promote digital transformation in the education sector, develop digital education platforms and resources, and cultivate digital talents [3]. In 2018, the "State Plan for the Coordinated Development of Science and Higher Education of the Russian Federation" further detailed the goals and paths for the digital transformation of higher education, proposing to build a modern digital education environment, develop digital educational resources and tools, and enhance the digital literacy of teachers and students. In 2019, Russia launched the national project "Digital Education

Environment", which aims to provide high-speed Internet access for all educational institutions in Russia and develop and promote digital educational resources and platforms [4]. In 2021, the Russian Ministry of Education issued the National Strategic Framework for the Digital Transformation of Education, which sets out the strategic development target of embedding intelligent teaching systems in more than 30% of the basic education curriculum by 2030 and achieving automated assessment of 50% of students' homework through artificial intelligence technology [5].

2.3 Review of the Development of Basic Education Curriculum in Russia

The educational curriculum during the Soviet era emphasized the dissemination of national will and socialist ideology. The course content focuses on cultivating students' collectivist spirit and patriotic feelings to meet the political needs of the country. With the development of the Soviet economy, the basic education curriculum was also adjusted accordingly to meet the needs of industrialization and social construction. The education of science and engineering has been strengthened, and a large number of engineers and technical talents have been cultivated. After the disintegration of the Soviet Union, Russia carried out a comprehensive reform of the basic education curriculum. The key points of the reform include strengthening basic education, improving the quality of education and promoting educational equity, etc. In addition, Russia has begun to actively integrate into the international education system, strengthen educational exchanges and cooperation with other countries, and promote the international development of Russia's basic education curriculum, making it more in line with international standards and market demands. Since the Putin era, the development of basic education courses in Russia has placed greater emphasis on the all-round development and individual cultivation of students. Especially with the development of artificial intelligence, comprehensive innovations are taking place in course objectives, course contents, teaching models, etc.

3. Challenges Faced by the Curriculum Reform of Basic Education in Russia

3.1 The Development of Digital Courses in Russia is Insufficient

Educational resources, capital investment and infrastructure influence the development of digital courses in Russia. In Russia, high-quality educational resources are mainly concentrated in major cities such as Moscow and St. Petersburg. However, in remote areas, due to the lack of professional programming education, the regional distribution of talents is uneven. Uneven distribution of educational resources not only affects the promotion of programming education for all, but also restricts the construction and development of digital curriculum. The lagging construction of digital infrastructure in Russian primary and secondary schools is one of the main bottlenecks restricting the development of digital courses. As of 2020, nearly 40% of urban schools had a network speed of 100 mb/s or above, while in rural areas, nearly half of the schools had a network speed of less than 30 mb/s, and even more than 20% of the schools had a network speed of less than 2 mb/s. Firstly, the imperfection of the network infrastructure often leads to phenomena such as lag and delay in the online teaching process, which seriously affects the teaching effect and students' learning experience. Secondly, the insufficiency of hardware equipment restricts the development and utilization of digital teaching resources. The weak foundation of the ICT industry has led to the lagging construction of infrastructure such as high computing power servers and intelligent teaching platforms, which has restricted the comprehensive promotion of personalized learning systems. Finally, the lag of digital infrastructure also affects the resource sharing and collaboration among primary and secondary schools, making it difficult for high-quality educational resources to be disseminated and utilized on a wider scale [6].

3.2 The Teaching Strategies Lack Innovation and the Practical Application Ability is Weak

On the one hand, Russian teachers are deeply influenced by traditional ideas, focus on the indoctrination and memorization of knowledge, still adopt the one-way output mode such as "cramming" and "full class lecturing", the classroom interaction is insufficient, it is difficult to stimulate students' initiative and creativity, resulting in the disconnection between theory and practice neglect the development of students' innovation ability and practical ability. This outdated teaching mode is often teacher-centered, with students passively accepting knowledge and lacking opportunities for active thinking and interactive communication. On the other hand, there are significant differences among different educational stages, subjects and students. Teachers' ability to use digital tools is weak. They fail to use digital technology to analyze individual differences among students and let students learn in a personalized way, resulting in a mismatch between learning content and students' actual needs, and practical ability development becomes a mere formality.

3.3 Teachers Lack Digital Literacy and Intrinsic Motivation

Russian primary and secondary school teachers lack the necessary digital teaching skills and experience, making it difficult for them to effectively utilize digital technologies to carry out teaching activities and curriculum design. Firstly, some teachers are not familiar with the use of digital teaching tools and platforms, which leads to poor online teaching effects and the inability to fully leverage the advantages of digital teaching. Secondly, teachers have limited capabilities in the design and development of digital courses, making it difficult for them to effectively transform traditional course content into digital forms, which affects the quality and appeal of the courses. Furthermore, teachers' insufficient understanding and application ability of emerging digital technologies, such as artificial intelligence and big data analysis, limits their ability to introduce cutting-edge technologies and innovative methods in teaching.

3.4 The Teaching Evaluation Mode is Single and Neglects Multi-dimensional Assessment

At present, the teaching evaluation system in the field of

education generally has a one-sided tendency of "judging students by their scores". This model not only fails to fully reflect students' true abilities, but also forms a deep contradiction with the talent cultivation goals of the new era. From the current situation, most schools still take examination results as the core evaluation indicator, which leads to both teachers' teaching and students' development being confined within the framework of "score supremacy". For instance, in Chinese language classes, knowledge memory is only tested through standardized test questions, while the examination of students' core qualities such as language expression and critical thinking is neglected. As a result, the students cultivated are often "high-scoring but low-ability", lacking the ability to solve practical problems. This evaluation orientation has also exacerbated educational anxiety. Teachers have to adopt the sea of exercises strategy to improve their grades, while students lose their interest in learning and the motivation for innovation in mechanical training [7].

4. Coping Strategies for Curriculum Reform in Russian Basic Education

4.1 Strengthen Top-level Design and Build a Standardized and Digitalized Curriculum System

Top-level institutional design is about controlling the overall situation and serves as the "top tower" guiding the direction. The top-level institutional design is a "top-down" approach, formulated by the state in response to the new educational trends emerging both domestically and internationally. It also points out the direction for the cultivation of digital literacy among teachers in schools at all levels and of all types. 2011 "modern school" project (С о kind guide р е м е н н а second ш seem о л а), Russia began to large campus network infrastructure. In 2016, the launch of the "Digital Education Environment" project directly promoted the extensive introduction of digital tools in educational activities, the establishment of a unified educational space, the collaborative development and governance of digital resources, as well as the digital management and service upgrade in the field of education [8]. In December 2021, the Russian government officially introduced the "Strategic Direction for Digital Transformation of Education" as a national top-level planning document, which systematically constructs the framework for digital transformation of education from dimensions such as legal guarantee, implementation path and development vision. Its core tasks include the following four aspects: First, supply of digital educational resources. Ensure the accessibility and quality of digital education content and services by developing standardized online course platform and distance education system to cover students of all grades. Second, Service integration system construction: Create a unified digital access port, integrate the functions of the Ministry of Education 's information system and regional platforms, and form a full-chain education service ecosystem. Third, improving educational management efficiency. Optimize the home-school collaboration mechanism by using digital tools and strengthen the ability to track and analyze data in the teaching process. Fourth, interoperability of technical standards. Promote the unification of EDUCATIONAL data storage, transmission and analysis norms, achieve cross-system data compatibility and sharing. This strategy, through multi-level system deployment, aims to promote the deep integration of information technology into the entire educational and teaching scenario, providing key support for Russia to achieve educational modernization goals Russia needs to establish national digital educational resource libraries, integrate multiple standardized courses to form a curriculum map covering the entire basic education, which can effectively break down regional educational resource barriers [9].

4.2 Promote the Blended Teaching Model and Enhance Students' Digital Application Capabilities

The blended teaching mode refers to a blended teaching environment composed of mobile devices, online teaching environments and offline classroom discussions. Educational technology plays an important role in blended teaching. Among them, online teaching represented by MOOCs and SPOC flipped classrooms has a more remarkable effect. Teachers provide personalized learning services for students through digital tools and platforms to stimulate students' interest in learning. The promotion of the blended teaching model is becoming an important breakthrough to break through the rigidity of traditional education and enhance students' digital literacy. This teaching mode follows the cognitive development law of "input - inquiry - transfer" and constructs a three-stage integrated learning closed loop. During the pre-class driving stage, students rely on the classic text analysis videos and task guidance sheets customized by the teacher to complete the decoding of language elements and the sorting out of writing techniques through self-study, initially achieving the perception and internalization of knowledge. Entering the classroom stage, teachers, based on the learning situation diagnosis data from the SPOC platform, implement precise teaching by adopting the flipped classroom model. Through activities such as group collaborative exploration, multi-dimensional text debate, and student-centered mutual evaluation and feedback, students are guided to deeply deconstruct the creative logic, thematic value, and social and cultural connections of the discourse. At the same time, the transfer training of "promoting thinking through writing" is carried out to drive the cognitive leap from understanding to analysis. The after-class extension stage focuses on ability expansion. On the one hand, a cross-text knowledge network is constructed through thematic radiation reading. On the other hand, relying on the imitation writing practices of the four types of genres: narrative, argumentation, explanation and application, combined with the three-dimensional feedback mechanism of self-assessment scales, peer mutual learning and teacher comments, the high-level goals of critical thinking and innovative expression are ultimately achieved. Form a complete quality cultivation chain from knowledge comprehension to creative output [10].

4.3 Build a Hierarchical Training System to Enhance Teachers' Digital Literacy

As an important component of the National Education Program, the "Future Teachers" project promotes the iteration of teachers' professional capabilities through systematic policy design, with its core objective focusing on the digital transformation capabilities of educators. Although this project was incorporated into the national education modernization

strategic framework in 2021, its key reform measures have continued to deepen through the following paths. First, to promote the deep integration of information technology into classroom teaching scenarios, it is required that teachers master tools such as intelligent lesson preparation system, virtual simulation experiment platform, realize the paradigm shift from traditional lecture to blended teaching, develop digital teaching resource library covering all subjects, and ensure the timeliness and scientific nature of teaching content through dynamic update mechanism. Secondly, we have developed an integrated online and offline continuing education model and a competence assessment system including new assessment tools such as micro-certificates and digital badges. As of 2020, 75,000 teachers have completed the competence upgrade project [11]. Finally, through digital workshops, cloud teaching and research community and other carriers, promote student-centered personalized teaching concept, strengthen teachers' understanding and practice of digital ethics and humanistic education.

4.4 Establish a Dynamic Evaluation Mechanism and Conduct Analysis Using Digital Tools

In the process of constructing a dynamic evaluation mechanism for basic education courses in Russia, the traditional evaluation paradigm is being reshaped through artificial intelligence technology, forming a multi-party collaborative intelligent evaluation system. The Smart Education Evaluation 2030 initiative, which will be launched in 2024, will build a multi-dimensional evaluation index library covering cognitive development, digital literacy and collaboration skills () by integrating classroom teaching behavior data, students' digital works and regional unified test results based on the national education data middle platform built by the Federal Education Supervision Agency. This system adopts federated learning technology, enabling schools in Russia's educational experimental zones to share evaluation models under the premise of data privacy protection and dynamically optimize evaluation weights through machine learning algorithms. The establishment of this evaluation system helps to form a positive interaction between the platform and developers, encourages developers to improve the quality of course development, enhances the trust of educational institutions and student users in digital educational resources, and also facilitates users' course selection and developers' course diagnosis [12].

Personalized education plays a significant role in reducing students' academic burden. The long-standing problem of excessive homework burden not only restricts learning efficiency but also has a negative impact on students' physical and mental health. The traditional homework mode lacks specificity and is difficult to adapt to the individual differences of students, which is prone to lead to inefficient learning. Russia should develop an intelligent evaluation system, allowing students to obtain personalized learning analysis reports, accurately identify knowledge shortcomings and optimize learning paths, thereby avoiding repetitive and inefficient training. Teachers can keep track of the learning situation of their classes in real time through the intelligent platform. Combined with the multi-dimensional data analysis reports generated by the system, they can dynamically adjust their teaching strategies. This move not only enhances the pertinence of the classroom but also frees up more energy for teachers to devote to teaching research innovation and personalized tutoring, thus forming a virtuous cycle of "precise teaching, individualized learning, and scientific assessment" [13].

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