

# Assessing the impact of digital education transformation on high school education

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**Abstract:** The purpose of this study is to comprehensively evaluate the impact of digital education transformation on high school education, including three dimensions of teacher competence, classroom teaching and school management. Through qualitative and quantitative research methods, this paper analyzes how digital technology changes the teaching experience of high school classrooms, explores the key factors affecting the success of digital education transformation, and the impact of digital education transformation on student participation, achievement and school management efficiency. The results show that digital education transformation has significant advantages in improving teaching efficiency and student engagement, but it also faces challenges in resource allocation, teacher training and technical support. In response to the challenges, this paper puts forward corresponding countermeasures and suggestions to provide theoretical and practical guidance for the transformation of digital education in senior high schools.

**Key words:** digital education transformation; high school education; teacher competence; classroom teaching; school management

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## 1 Introduction

In the information society, the transformation of digital education has become an irreversible trend of senior high school education, and its integration into the teaching process is of great significance to improve the quality of education and cultivate students' innovative ability. With the continuous development of science and technology, how to combine digital technology with senior high school education and promote the modernization of education has become the focus of attention in the educational and academic circles.

This paper probes into the specific impact of digital education transformation on senior high school education, and provides theoretical support and practical guidance for the reform and development of senior high school education in our country. The core questions of the study include: How does digital education transformation change the teaching style of high school teachers and the learning experience of students? What impact has it had on student achievement, engagement and repeat rates? What challenges do high schools face in the process of digital education transformation and how to deal with them?

In order to answer the above questions, this study adopts a mixed research method, combined with quantitative analysis and qualitative interview, aiming to fully reveal the actual effects of digital education transformation from multiple angles and levels. In terms of paper structure, the current research situation in related fields is sorted out through literature review, the research methods and data sources are introduced in detail, the analysis is carried out according to the

three levels of teachers, students and schools, and the research findings are summarized and countermeasures are proposed. Through this research path, it provides scientific and systematic theoretical support and practical guidance for the digital transformation of high school education.

## **2 Literature review**

Before exploring the impact of digital education transformation on senior high school education, this paper first systematically combs the current research status of digital education transformation at home and abroad. Through extensive reading and analysis of relevant literature, it is found that domestic and foreign scholars have achieved rich research results in the definition, development process, influencing factors and implementation strategies of digital education transformation. However, the research on digital education transformation in high school is relatively weak, and there is a lack of empirical research on its actual effect and long-term impact.

In terms of theoretical basis, this paper draws on the theories and methods of pedagogy, psychology, information technology and other disciplines to build a theoretical framework for the transformation of digital education. The framework includes the basic concepts and characteristics of digital education transformation, and expounds its impact mechanism on the high school education ecosystem, which provides a solid theoretical support for this research.

The innovation and value of this research are mainly reflected in the following aspects: first, focusing on senior high school stage fills the research gap in this field; secondly, through mixed research methods, the actual effect of digital education transformation is fully revealed.

## **3 Research methods and data sources**

In order to ensure the scientificity and rigor of this study, in terms of research design and methodology, this paper adopts a mixed research method, that is, a combination of quantitative analysis and qualitative interview to collect and analyze data. A large number of relevant data of high school teachers and students were collected through questionnaire survey, and statistical analysis method was used to process and analyze the data, revealing the impact of digital education transformation on students' learning experience and achievement. In order to deeply understand the implementation and challenges of digital education transformation in high school classrooms, we conducted several rounds of qualitative interviews with high school teachers, students, school administrators, etc., to obtain rich and in-depth first-hand information.

In terms of data collection and analysis methods, we strictly follow the norms and standards of academic research to ensure the accuracy and reliability of data. All questionnaires were conducted anonymously to protect the privacy of respondents. In the data analysis, a variety of statistical methods and technical means are adopted to ensure the robustness and credibility of the results.

This study fully considers research limitations and ethical issues. Digital education transformation is a complex and multi-dimensional process, and this study only discusses and analyzes it from some specific perspectives, so there are certain limitations. In the process of data collection and processing, the interviewees' right to know and privacy are always respected, and the ethical norms of academic research are strictly observed. Through these measures, the scientific and rigorous nature of the research has been ensured, providing useful reference for the theoretical development and practical application of digital education transformation in the field of digital education [1].

## **4 The impact of digital education transformation on high school teaching**

With the rapid development of information technology, digital technology has penetrated into every field of high school education, and has had a profound impact on teaching methods and learning experience. This chapter explores in detail how digital technology changes the high school teaching experience, analyzes the key factors affecting the success of

digital education transformation, and further studies the specific impact of digital education transformation on student engagement, achievement, and repeat rate.

Digital technology has brought unprecedented changes to high school teaching. Traditional blackboards and chalks have been replaced by multimedia teaching equipment and interactive electronic whiteboards, making the teaching content more vivid. Digital technology promotes the sharing and optimization of teaching resources, and teachers use the network platform to obtain rich teaching materials and courseware, improving the efficiency of lesson preparation and teaching quality. Students can learn independently and cooperatively through the network to broaden the channels of knowledge acquisition and improve the learning effect.

Driven by digital technology, the high school teaching experience has changed significantly. On the one hand, digital technology makes teaching more personalized and differentiated. According to the different characteristics and needs of students, teachers customize personalized teaching programs and learning paths to meet the diverse needs of students. On the other hand, digital technology enhances the interactivity and fun of teaching. Through advanced technologies such as virtual reality and augmented reality, teachers can create realistic teaching situations to stimulate students' learning interest and enthusiasm.

The success of digital education transformation will not be easy. In practice, the factors that influence the success of digital education transformation are found. The first is the digital literacy and competence of teachers. Teachers need to have basic computer skills, information retrieval ability and digital teaching resources integration ability, in order to effectively use digital technology for teaching. The second is the school's infrastructure and technical support. Schools need to provide perfect digital teaching equipment and network environment, equipped with professional technical support personnel to ensure the smooth progress of digital teaching. The third is the guarantee of policies and institutions. The government and the education sector need to introduce relevant policies to encourage and support the transformation of digital education, and provide necessary funding and resource support.

The impact of digital education transformation on student engagement, achievement and repeat rate is the focus of this study. Through empirical research, digital education reform has significantly improved students' classroom participation and learning performance. Digital technology makes teaching more lively and interesting, stimulating students' learning interest and enthusiasm, and more active participation in classroom activities. Digital technology provides students with a more convenient and efficient way of learning, improving their learning efficiency and performance level. The impact on repeat rates varies by school, region, and student population. Research shows that digital education changes reduce the repeat rate, and students acquire more knowledge and skills in a shorter time. Other studies have found that the repeat reading rate has not decreased significantly, or even increased, which is related to students' learning habits, basic level and psychological factors.

Digital education transformation has a profound impact on high school teaching, bringing both opportunities and challenges. In the future development, it is necessary to further pay attention to the practical effects and challenges of the transformation of digital education, strengthen theoretical research and practical exploration, and promote the in-depth development of digital education in senior high schools [2].

## **5 The impact of digital education transformation on the competence of high school teachers**

With digital education's growth, high school teachers' roles are evolving beyond mere knowledge transmitters to facilitators and collaborators. This shift demands enhanced professional quality and comprehensive skills from teachers. This chapter delves into the evolving teacher identities in digital education, constructs and assesses competency models, and suggests training and professional growth strategies. The traditional teacher-led mode gives way to a student-centered

approach, emphasizing student needs, personality differences, and fostering an environment conducive to learning. Teachers must embrace digital technologies, effectively integrating them into teaching to enhance effectiveness and learning experiences.

To adapt to change, teachers need competencies in professional knowledge, teaching skills, digital technology use, innovative thinking, and problem-solving. Professional knowledge is the foundation, requiring constant updating to meet student needs. Teaching skills are core, involving effective methods to stimulate student interest. Digital technology proficiency is essential, encompassing the flexible application of tools. Innovative thinking and problem-solving expand teachers' capabilities to handle challenges. A scientific evaluation model, encompassing these dimensions with specific indicators, is needed. Assessment tools like surveys, classroom observations, and case analyses aid in comprehensive, objective, and accurate evaluations.

Targeted training in digital technology, teaching skills, and innovative thinking is essential to address teachers' competency gaps. Establishing a robust professional development mechanism ensures continuous learning and growth, stimulating teachers' self-improvement awareness. The digital education transformation demands enhanced teacher competency in high schools, emphasizing the need for comprehensive training and professional growth [3].

## **6 The impact of digital education transformation on senior high school management**

With IT's continuous development and popularization, digital education transformation has become an inevitable trend in high school education, altering teaching methods, learning experiences, and school management. This chapter delves into school management reform under digital education, evaluating efficiency and quality, discussing challenges and countermeasures.

### **6.1 School management reform under the background of digital education**

The impact of digital education transformation on senior high school management is first reflected in the change of management mode. The traditional school management is mainly manual, low efficiency and easy to make mistakes. Under the background of digital education, the way of school management is gradually changing to the direction of information and intelligence. Through the introduction of management information system and intelligent equipment, it can achieve comprehensive management of students, teachers, courses and other aspects, and improve management efficiency and quality.

The reform of school management under the background of digital education includes the following aspects: First, student management informatization. The school establishes a student information management system to comprehensively manage students' basic information, learning situation, reward and punishment records, etc., so as to facilitate teachers and parents to understand the situation of students. Second, intelligent teaching management. The school uses intelligent teaching equipment and management system to comprehensively monitor and manage teachers' teaching plans, teaching processes and teaching effects, so as to improve teaching quality and efficiency. The third is the digitization of curriculum management. The school establishes a digital curriculum resource library to realize the sharing and optimal allocation of curriculum resources and improve the utilization efficiency of curriculum resources [4].

### **6.2 Evaluation of school management efficiency and quality**

Under the background of digital education, the evaluation of school management efficiency and quality has also put forward new requirements. The traditional evaluation method is mainly qualitative evaluation, which is subjective and difficult to quantify. Under the background of digital education, the evaluation method is mainly changed to quantitative evaluation, which objectively evaluates the efficiency and quality of school management by collecting and analyzing various data.

The evaluation of school management efficiency and quality starts from the following aspects: First, the rationality of the evaluation management process. Through the comprehensive combing and analysis of the management process, the bottleneck and problems existing in the process are found out, and the optimization suggestions and improvement measures are put forward. The second is to evaluate the effectiveness of the management information system. The reliability and stability of the system as well as the accuracy and completeness of the data are assessed through the analysis of the usage and data quality of the management information system. The third is to evaluate the satisfaction of management effect. Through the investigation and analysis of the satisfaction of students, teachers, parents and other stakeholders, the effectiveness and quality of school management and the direction of improvement are evaluated [5].

### 6.3 The challenges faced by school management and the countermeasures

The transformation of digital education brings new challenges and opportunities to school management. Among them, the challenges mainly include the following aspects: First, insufficient investment in information equipment and technology. Due to limited funds or insufficient attention, some schools have insufficient investment in information equipment and technology, and are difficult to meet the needs of digital education transformation. Second, the information literacy of managers is not high. Some school administrators have difficulties in adapting to the requirements of digital education transformation due to a lack of information technology knowledge and skills. Third, the problem of information security and privacy protection is prominent. With the improvement of information technology, schools are faced with more and more problems of information security and privacy protection, and need to strengthen relevant management and technical measures [6].

To address the challenges, the school has implemented countermeasures: 1) increase investment in information equipment and technology, and leverage government and societal support to enhance the hardware foundation for digital education transformation; 2) strengthen information literacy training for management personnel to improve their IT knowledge and skills to boost adaptability; 3) reinforce the management of information security and privacy protection, and establish robust safety measures to safeguard student and teacher information and privacy rights [7].

## 7 Research conclusions and prospects

Through in-depth discussion on the impact of digital education transformation in high schools, this study draws important research conclusions and puts forward corresponding countermeasures and suggestions on this basis. At the same time, this study also recognizes its own shortcomings, and the future research direction is prospected.

### 7.1 Summary of the main findings of the study

It is found that digital education transformation has a profound impact on high school teaching, teacher competency and school management. In terms of teaching, digital technology has changed the teaching experience, making teaching more vivid, graphic and personalized, and improving students' learning interest and enthusiasm. In terms of teacher competence, digital education transformation requires teachers to have higher professional quality and comprehensive ability, including professional knowledge, teaching skills, digital technology application ability, innovative thinking and problem solving ability. In terms of school management, the transformation of digital education has promoted the change and innovation of school management, and improved the efficiency and quality of management [8].

Specifically, the following important conclusions are drawn: First, digital education transformation has a positive impact on the learning experience and achievement of high school students, but the impact on student repeat rates varies by school, region, and student group. Second, under the background of digital education, the role of high school teachers has changed significantly. Teachers are required to have higher competency, including professional knowledge, teaching skills, and the ability to use digital technology. Third, the transformation of digital education has promoted the reform of senior

high school management and improved management efficiency and quality, but it also faces challenges such as information security and privacy protection.

### 7.2 The countermeasures and suggestions

Based on the research conclusions, this study puts forward the following countermeasures and suggestions: First, strengthen the construction and sharing of digital educational resources, and improve the utilization efficiency and quality of teaching resources. The second is to strengthen teacher training and professional development, improve the professional quality and comprehensive ability of teachers to make them better adapt to the requirements of digital education transformation. The third is to strengthen the information and intelligent construction of school management, improve management efficiency and quality, and ensure the scientific and normative management of schools. Fourth, strengthen the management of information security and privacy protection to ensure that the information security and privacy rights of students and teachers are not infringed.

In addition, this study also recommends that the government and education departments introduce relevant policies to encourage and support the transformation of digital education, and provide necessary funding and resource support. Strengthen the practical exploration and theoretical research of the transformation of digital education, and promote the in-depth development of digital education in the high school stage [9].

### 7.3 Insufficient research and future research direction

This study has made some achievements, but there are some shortcomings. First of all, the data sources and sample size of this study are limited, and there are certain limitations and biases. Secondly, this study mainly focuses on the impact of digital education transformation on high school teaching, teacher competency and school management, while the impact on other aspects has not been deeply discussed. Finally, the specific practice model and strategy of digital education transformation have not been fully studied and discussed in this study.

Future research should: 1) broaden data sources and sample size to enhance the reliability and representativeness; 2) expand research scope to focus on digital education's impact on mental health and social skills of high school students; 3) deepen practical exploration and theoretical research on digital education transformation, summarizing effective practices and strategies; 4) strengthen international cooperation and exchanges, incorporating global best practices to fast-track digital education development in China [10].

## 8 Conclusion

Digital education transformation is an inevitable trend in the development of high school education, which has a profound impact on teaching, teachers and school management. Through systematic analysis and empirical research, this study provides a comprehensive and in-depth perspective for understanding this transition. However, due to the limitations of research conditions and space, there are still many shortcomings in this paper. It is expected that future research can further expand and deepen the exploration of related fields.

### Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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