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Research on the Leadership of Educators' Spirit in the Ideological and Political Teaching of Advanced Mathematics Courses under the Strategy of Building an Educational Powerhouse

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Abstract: Under the strategy of building an educational power country, the reform of higher mathematics teaching should take into account both value guidance and digital innovation. This study, guided by the "educationalist spirit", explores the integration of course ideological education into teaching and leverages digital innovation for empowerment. Analyzing the literature reveals that there is a gap in the connection between the "educationalist spirit" theory and the "digital and intelligent technology" practice. Therefore, a "spiritual guidance–technological empowerment" dual-wheel driving model is proposed, along with the corresponding framework and path. Research shows that this model can enhance teaching effectiveness and educational quality, providing an integrated path for cultivating top-notch innovative talents.

Keywords: Educational power; Higher mathematics; Ideological education in courses; Educationalist spirit; Digital and intelligent enabling; Teaching innovation

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1. Introduction

Under the strategy of building an educational power nation, the reform of higher mathematics teaching is of great significance. It is a core basic course in higher education, which not only needs to impart knowledge but also needs to implement the concept of "cultivating people with virtue", and also needs to adapt to the digital and intelligent era. Currently, the teaching reform has two main lines, one is "digital and intelligent empowerment", using digital and intelligent tools to improve efficiency and experience and the another is "course ideological education", exploring ideological elements to integrate into teaching [1]. However, these two lines operate independently without sufficient integration, and the application of technology is prone to falling into instrumental rationality, while the integration of ideological education is prone to becoming formalism.

The proposal of the "educationalist spirit" provides guidance for solving problems. It has rich connotations, requiring teachers to be both "scholars" and "mentors" [2]. Incorporating it into the construction of digital and intelligent ideological education courses can enable technology to serve the educational goals and make ideological education more vivid. Based on this, this research is based on the background of building an educational power nation, combines "ideological education in courses" and "digital and intelligent empowerment" and under the guidance of the "educationalist spirit", constructs an innovative model for higher mathematics teaching, meeting the training needs of innovative talents in the new era.

2. Current research status at home and abroad

2.1. Digital and intelligent empowerment of higher mathematics teaching

In foreign countries, the integration of STEM education technologies began early, and online learning platforms, mathematical software, and intelligent tutoring systems were utilized for personalized teaching [3]. In recent years, the focus has shifted to using learning analytics and artificial intelligence to predict student performance for precise intervention, and VR and AR technologies have achieved remarkable results in mathematical visualization [4].

In China, digital empowerment of higher mathematics teaching is an important direction of reform. The advantages of digital teaching platforms are recognized, and intelligent tools can enhance interaction and improve feedback efficiency. Online and offline hybrid teaching can improve academic performance [5]. Domestic scholars have explored the use of advanced AI models for learning prediction and analyzed influencing factors using structural equation models [6,7]. However, there are issues such as uneven popularization, insufficient technical literacy of teachers, and disconnection between technology and teaching goals [8].

2.2. Ideological and political education in higher mathematics courses

Ideological and political education is a characteristic educational concept in China. Main research is conducted domestically. Since relevant conferences and guidelines were released, the importance of ideological and political education in higher mathematics courses has been recognized. Research focuses including the necessity, considering that higher mathematics contains ideological and political elements and that their exploration is necessary to implement the requirements of cultivating virtue and fostering talents. Secondly, path strategies, proposing to explore cases from multiple aspects, develop cases using specific methods, and reverse design ideological and political goals, and more. Another challenge, such as insufficient ideological and political ability of teachers, rigid case exploration, rigid integration mechanisms, and incomplete evaluation systems [9–11]. Although there is no concept of "ideological and political education" in foreign countries, research on "value education" has reference significance.

2.3. Integration of educator spirit and ideological and political education

The research on educator spirit has emerged, elaborating on its importance for teacher development and basic education, and exploring the integration points with ideological and political courses in universities and professional ideological and political courses. It can promote teachers' transformation, enhance teaching effectiveness, and is a driving force for the construction of ideological and political education. However, the systematic integration of "educator spirit", "ideological and political education" and "digital and intelligent empowerment", especially in the application and empirical research in the field of higher mathematics, is relatively weak.

3. Gaps and innovation

3.1. Gaps

The concept lacks overall guidance, and the technical and ideological aspects are disconnected; the mechanism lacks empirical evidence, and the model lacks a systematic structure.

3.2. Innovation

First proposed the "educator spirit" as the overarching principle, constructing a tripartite framework of "spirit–value–technology"; revealing the dual-drive mechanism of "spiritual reshaping + digital innovation"; outputting replicable "identify elements–create scenarios–evaluate results" full-process solutions.

4. Methods and paths

The research design involved three rounds of iterations including

(1) Reviewing literature and analyzing case studies to refine the theory;

(2) Constructing the "Spiritual guidance–Content reconstruction–Technology empowerment–Effect evaluation" model

(3) Applying the model in experimental classes, collecting data on both learning and ideological education dimensions, using mixed methods to verify and continuously optimize, and forming a promotion template.

4.1. Data sources

The data mainly come from three type of data, learning behavior data, moral education effective data and teaching process data.

4.1.1. Learning behavior data

Obtained from teaching platforms such as Superstar Learning Platform, including students' video viewing duration, homework completion rate, forum posts, test scores, classroom performance (the classroom performance of a certain class is shown in **Figure 1**).

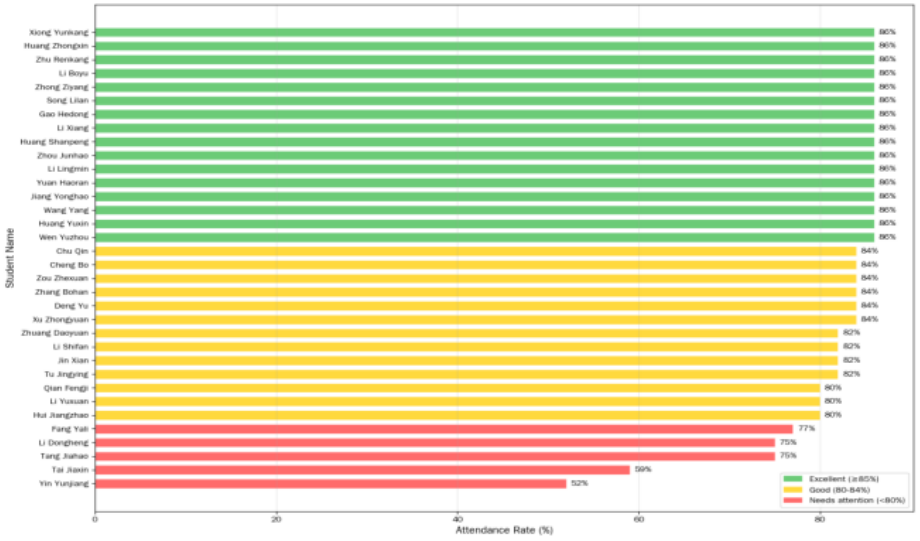

Figure 1. Class performance situation.

4.1.2. Moral education effectiveness data

Pre-test and post-test questionnaire surveys by measuring dimensions such as values and social responsibility, students' course papers/reflection reports, interview transcriptions, course-based moral education score data (the moral education score data of a certain class of students is shown in **Figure 2**).

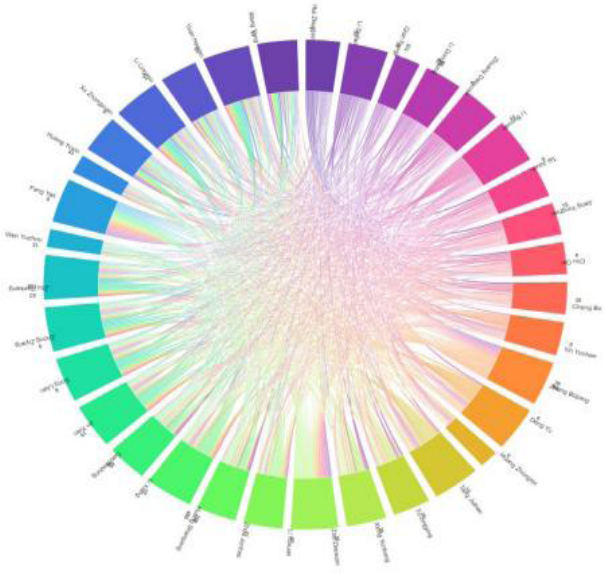

Figure 2. Student ideological and political score data chart.

4.1.3. Teaching process data

The teacher's written content recorded by the intelligent tablet, and the student operation logs in VR/AR teaching.

4.2. Research on mathematical model

To quantitatively analyze the influence mechanism of digital empowerment and ideological and political leadership on learning outcomes, a structural equation model (Structural Equation Modeling, SEM) was constructed [7].

4.2.1. Latent variables

(1) Exogenous latent variables (ξ)

Degree of use of digital technology (measured by platform activity, tool usage frequency), spirit of educator integration (measured by lesson plan scores, student perception evaluations).

(2) Endogenous latent variables (η)

Learning immersion (η_1), ideological identification (η_2), final academic performance (η_3).

4.2.2. Path hypotheses (H)

(1) H_1: Degree of use of digital technology → Learning immersion ($\xi_1 \rightarrow \eta_1$)

(2) H_2: Spirit of educator integration → Ideological identification ($\xi_2 \rightarrow \eta_2$)

(3) H_3: Degree of use of digital technology → Ideological identification ($\xi_1 \rightarrow \eta_2$) (Testing the direct effect of technology on ideology)

(4) H_4: Learning immersion → Final academic performance ($\eta_1 \rightarrow \eta_3$)

(5) H_5: Ideological identification → Final academic performance ($\eta_2 \rightarrow \eta_3$) (Testing the promoting effect of ideology on grades)

(6) H_6: Learning immersion → Ideological identification ($\eta_1 \rightarrow \eta_2$) (Testing the impact of immersion on value identification)

This model aims to verify that the spirit of educators and digital technology not only directly act on the intermediate variables, but also may jointly influence students' final learning outcomes through interaction.

5. Experimental process and result analysis

5.1. Experimental process

Taking the "Advanced Mathematics A2" course of a university in one academic year as the experimental environment, 5 parallel classes (n = 191 people) were randomly selected and divided into two groups (the attendance situation of the 5 classes is shown in **Figure 3**).

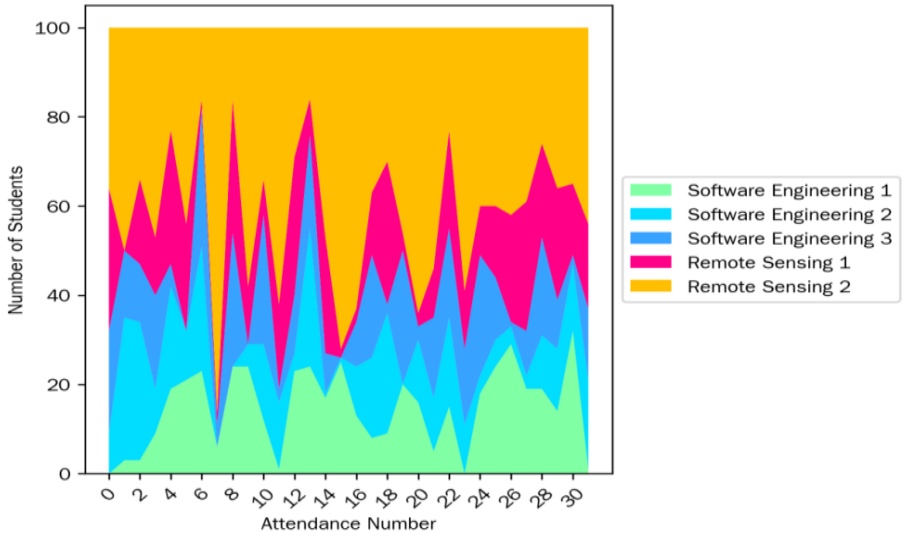

Figure 3. Attendance record.

5.2. Experimental group (2 classes)

Teaching using the DEIP-ES model. For example, when teaching the concept of "limit", the teacher (with the spirit of educator) not only explained the mathematical definition, but also used VR technology to reproduce Liu Hui's "Suan Fa Tong Zhi" exploration process (digital empowerment) and guided students to experience the philosophical thought of "infinite approximation" and the innovative spirit of ancient scientists (course ideological and political education).

5.3. Control group (3 classes)

Using traditional multimedia-assisted teaching, including the same knowledge points and simple ideological and political case introductions, but without in-depth digital immersion design and spiritual leadership reinforcement.

5.4. Result analysis

5.4.1. Academic performance comparison

The final average score of the experimental group was significantly higher than that of the control group (for

example, 85.3 vs 78.6, $p < 0.01$), and the score rate of high-order thinking ability questions was significantly improved.

5.4.2. Learning behavior analysis

The average online duration, interaction times, and resource download volumes of the experimental group on the teaching platform were significantly higher than those of the control group. The initial goodness-of-fit indicators of the SEM model (such as CFI = 0.93, RMSEA = 0.06) were good, and paths H_1, H_2, H_4, and H_5 were all significant, indicating that digital intelligence empowerment indirectly promotes academic performance by enhancing immersion, and the educationalist spirit leadership indirectly promotes academic performance by strengthening ideological and political identification.

5.4.3. Ideological and political effectiveness analysis

Text analysis of the reflection reports of students in the experimental group revealed that the frequency and emotional intensity of keywords such as "responsibility", "innovation", "perseverance", and "cultural confidence" were significantly higher than those of the control group. The questionnaire survey shows that the post-test scores of the experimental group increased more significantly in the dimensions of "learning interest" and "social responsibility".

For case interviews, students in the experimental group generally reported that "the VR experience of the circumferential area calculation was very impressive. Not only did they understand the knowledge, but they also felt the beauty of mathematics and the perseverance of scientists" and "the teacher's passionate explanation made us feel that mathematics was not far from our lives and the development of the country".

6. Limitations and outlook

The samples are limited, the duration is short, the reliance on platforms is high, and the teacher qualification requirements are strict. Its universality needs to be verified. In the future, multiple centers will be expanded to increase the sample size, generative AI will be introduced, intelligent assessment tools will be developed, and a teacher community will be jointly established.

7. Conclusion

The research has confirmed that the DEIP-ES model, which integrates educationalist spirit with curriculum ideological education and digital intelligence empowerment, resolves the "value–technology" disconnection, significantly improves the quality of high-level mathematics teaching and education, and provides a replicable innovative path for the construction of an educational power.

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