

# The Practice of Integrating the DAP Educational Concept and Ideological and Politic Education into the Teaching Skills Training System of the Mathematics Teacher Education Program

Wang Xiaoshuang<sup>1,a</sup>, Wang Meng<sup>2,b,\*</sup>

<sup>1</sup>School of Information Engineering, Zhejiang Ocean University, Zhoushan, China

<sup>2</sup>Library Zhejiang Ocean University, Zhoushan, China

<sup>a</sup>65238382@qq.com, <sup>b</sup>wm78715@126.com

\*Corresponding author

**Abstract:** This study examines the integration of the Developmentally Appropriate Practice (DAP) educational framework with ideological and political education within the teaching skills development curriculum for pre-service Mathematics teachers. A comprehensive literature review is conducted to establish the theoretical foundations of both DAP and ideological and politic education. An action research methodology is subsequently employed to apply the integrated approach in authentic instructional contexts. Data are collected through a combination of surveys, evaluations of teaching outcomes, and student self- and peer-assessments, all designed to assess the efficacy of the integration. The implementation emphasizes the identification of meaningful connections between ideological and politic elements and DAP principles in Mathematics instruction, the design of DAP-informed lesson plans that incorporate ideological content, and the reinforcement of integration through simulated teaching experiences and structured reflection. Results demonstrate that this integrative strategy has significantly improved participants' pedagogical abilities and ideological literacy, thereby providing actionable insights for enhancing teacher preparation programs in Mathematics education.

**Keywords:** DAP Educational, Ideological and Political Education, Mathematics Normal Major, Teaching Skill Training System

## 1. Introduction

### 1.1 Research Background

Amid ongoing educational reforms, enhancing the pedagogical competencies and ideological and politic literacy of pre-service teachers has emerged as a central focus in contemporary teacher education research. As national standards for teaching quality become increasingly stringent, Mathematics teacher education programs—responsible for preparing educators for basic education—are placing greater emphasis on developing strong instructional capabilities<sup>[1]</sup>. Mathematics, while inherently abstract, serves as a crucial vehicle for fostering students' logical reasoning, analytical skills, and dialectical thinking. Nevertheless, conventional teaching approaches in Mathematics often prioritize content delivery over the integration of ideological and political education, potentially limiting the holistic development of learners' moral and cognitive qualities<sup>[1]</sup>. In response, recent governmental initiatives have actively promoted the incorporation of ideological and political education across all disciplines and educational levels, aiming to achieve comprehensive, continuous, and multi-dimensional student growth. For example, the "Guiding Opinions on Strengthening the Reform and Innovation of ideological and political Theory Courses in the New Era" explicitly encourages leveraging disciplinary characteristics to identify embedded ideological and political elements within subject-specific curricula and promoting cross-curricular synergy. Against this backdrop, investigating effective strategies for integrating ideological and political education into the teaching skill training components of Mathematics teacher preparation programs has become an urgent priority in current educational scholarship.

### **1.2 Problem Statement**

While progress has been made in the teaching skills training component of Mathematics teacher education programs, several critical challenges remain unresolved. A key issue is the inadequate integration of ideological and political education (IPE) with professional skill development. Current research shows that many institutions overlook the inherent ideological and political elements within Mathematics curricula when preparing prospective teachers, leading to a fragmented relationship between subject-specific instruction and value-based education <sup>[2]</sup>. Furthermore, some educators have only a rudimentary understanding of i Integrating IPE into their courses, often lacking both theoretical grounding and practical strategies, which hinders their ability to meaningfully embed such content into lesson planning <sup>[3]</sup>. Compounding these issues are outdated and monotonous teaching methods and limited student engagement, which collectively undermine the effectiveness of ideological and political instruction. In this context, the DAP educational framework—encompassing Demo-Activity-Project as a progressive pedagogical model—offers a promising avenue for bridging IPE with Mathematics teaching practice. By leveraging experiential learning through scenario simulation, interactive activities, and project-based tasks, the DAP approach enables pre-service teachers to internalize ethical and civic values while simultaneously refining their instructional competencies. Thus, investigating how the DAP framework can be applied.

### **1.3 Research Significance**

This study seeks to identify viable strategies for i Integrating the DAP educational philosophy with ideological and politic education in the context of teaching skills development for future Mathematics educators. Its significance spans both theoretical and practical domains. First, from a learner-centered standpoint, this integration fosters the holistic development of pre-service teachers, equipping them not only with strong disciplinary knowledge and pedagogical abilities but also with moral awareness and a sense of social responsibility through implicit, experience-driven learning <sup>[4]</sup>. Second, in terms of educational advancement, the research contributes innovative perspectives for enhancing the structure and delivery of Mathematics teacher training programs, facilitating a deeper convergence between academic instruction and ideological cultivation. This supports the broader goal of establishing an all-encompassing, continuous, and multi-dimensional (education for whole-person development) framework <sup>[5]</sup>. Lastly, from a societal perspective, producing Mathematics educators who excel in both teaching proficiency and ideological integrity addresses the growing demand for high-caliber teachers in contemporary basic education, thereby contributing to the sustainable growth of the national education system. As such, this research not only advances theoretical discourse but also offers a feasible roadmap for curriculum reform in Mathematics teacher education.

## **2. Literature Review**

### **2.1 Introduction to the DAP Educational Framework**

The DAP educational framework originated in the United States under the auspices of NAEYC. Rooted in an understanding of children's developmental stages and cognitive learning patterns, DAP emphasizes aligning instructional practices with learners' cognitive, emotional, and social growth, while respecting individual differences and supporting personalized learning trajectories <sup>[6]</sup>. Initially developed for early childhood education, the DAP paradigm has increasingly found application in higher and vocational education settings as educational research evolves. In the realm of ideological and political education within vocational disciplines, DAP has been operationalized via the Demo-Activity-Project (DAP) sequential teaching model, enabling a shift from abstract theory to hands-on implementation. For instance, Xu Lijie and colleagues designed a blended online-offline instructional model centered on DAP principles, successfully embedding ideological and political content into professional coursework and significantly enhancing student development outcomes <sup>[6]</sup>. Nevertheless, despite its demonstrated potential in vocational education, the application of the DAP framework in Mathematics teacher training remains under explored, particularly regarding how it can be creatively adapted to the unique characteristics of Mathematics pedagogy and teacher preparation.

### **2.2 The Role of ideological and political Education in Mathematics Teacher Training**

Ideological and political education (IPE) occupies a crucial and irreplaceable position within

Mathematics teacher education programs, significantly influencing both the professional development and value formation of prospective teachers. Although Mathematics is often perceived as a purely abstract and logically structured discipline, it inherently embodies valuable ideological components such as scientific rationality, critical thinking, and dialectical reasoning. Jin Quanhui emphasizes that Mathematics instruction can serve as a vehicle for cultivating students' firm ideals and beliefs and sound professional ethics—qualities essential for individuals preparing to enter the teaching profession [7]. Moreover, embedding IPE into advanced mathematical studies enables learners to develop a well-rounded worldview, life perspective, and value system alongside their mastery of subject matter. For instance, incorporating historical achievements in Mathematics that inspire national pride—such as the ancient Chinese contributions exemplified by the Pythagorean theorem and Yang Hui's triangle—can strengthen students' cultural identity and sense of civic duty [4]. Beyond moral cultivation, IPE also enhances the overall competence of pre-service teachers, equipping them to fulfill the core educational mission of “moral development through teaching” in their future classrooms. Despite its importance, however, the implementation of IPE in current Mathematics teacher training faces significant challenges.

### ***2.3 Current Research on Teaching Skills Development in Mathematics Teacher Education***

The evolution of teaching skills training within Mathematics teacher education programs dates back to the 1980s. As reforms in teacher education have progressed in China, this training framework has gradually matured into a more structured and comprehensive system. Presently, skill development typically encompasses key components such as lesson planning, micro-teaching sessions, and field-based teaching practicums, all designed to enhance pedagogical proficiency through experiential learning. Nevertheless, existing models exhibit notable shortcomings in curriculum design and instructional methodology. Some institutions place excessive emphasis on theoretical instruction while under-prioritizing hands-on teaching practice. Additionally, the training content frequently fails to reflect the unique epistemological and pedagogical features of Mathematics, limiting students' ability to apply learned concepts effectively in real classroom settings [9]. Furthermore, when it comes to integrating ideological and political education, the current system lacks coherent implementation strategies and robust assessment mechanisms, resulting in superficial or inconsistent incorporation of value-oriented elements. A study by Shaanxi University of Technology highlights that many subject instructors lack the capacity to identify and weave ideological themes into their teaching, representing a major barrier to the enhancement of the training system [9]. Consequently, constructing a more effective, discipline-specific training model that seamlessly integrates ideological and political education remains a pressing research priority.

### ***2.4 Research Gaps and Study Contributions***

A review of the literature reveals that scholarly work on combining the DAP educational framework with ideological and political education in the context of Mathematics teacher training is still in its early stages. On one hand, most existing studies adopt isolated perspectives—either examining the application of DAP principles in vocational education or analyzing the integration of ideological content in Mathematics courses—without adequately addressing how these two dimensions can mutually reinforce each other. On the other hand, there remains a lack of systematic frameworks for implementing integrated teaching skill development for pre-service Mathematics educators. Particularly evident are gaps in designing ideologically informed lesson plans and constructing authentic, scenario-based teaching simulations grounded in the DAP model. This study aims to bridge these gaps by pioneering an integrative approach that unifies the DAP educational philosophy with ideological and political education within the teaching skills curriculum of Mathematics teacher preparation programs. By systematically identifying and leveraging ideological elements embedded in Mathematics pedagogy and aligning them with the Demo-Activity-Project instructional sequence, this research proposes a novel, practical, and calculable model for holistic teacher development.

## **3. Necessity of Integrating the DAP Educational Framework with ideological and political Education**

### ***3.1 Preparing Mathematics Teachers for Contemporary Educational Demands***

As educational reforms continue to advance, societal expectations for Mathematics teachers have

become increasingly comprehensive, particularly regarding their professional competence, ideological awareness, and pedagogical effectiveness. Modern Mathematics educators are expected not only to demonstrate strong subject-matter expertise and instructional capabilities but also to embody high levels of ideological and political consciousness and a sense of social responsibility—qualities essential for guiding students toward sound moral and ethical development <sup>[10]</sup>. In this context, integrating the DAP (Demo-Activity-Project) educational model—a pedagogy centered on experiential and innovation-driven learning—with ideological and political education offers a forward-looking strategy for teacher preparation. By embedding the DAP framework into the teaching skills training of pre-service Mathematics teachers and aligning it with value-oriented content, institutions can significantly enhance learners' holistic competencies. This integration enables future teachers to seamlessly incorporate elements such as scientific rigor, national identity, and civic values into their classroom practices, thereby meeting the growing demand for qualified educators in the new era <sup>[7]</sup>. Moreover, it supports the harmonization of knowledge delivery and character building in teaching, empowering educators to contribute more effectively to students' all-around growth.

### ***3.2 Advancing Students' Holistic Development***

The fusion of the DAP educational approach and ideological and political education plays a vital role in fostering well-rounded pre-service teachers. First, it broadens students' intellectual horizons by helping them recognize the broader societal implications of Mathematics, such as its contributions to technological advancement and national progress, thus reinforcing the real-world relevance of their studies <sup>[2]</sup>. Second, at the skill level, the structured activity-based design inherent in the DAP model—such as simulated teaching exercises and reflective practice—provides opportunities for students to develop critical thinking, creativity, and collaborative abilities, all of which are indispensable for professional success. Third, from a values perspective, the incorporation of ideological and political content assists students in forming firm ideals, ethical standards, and a commitment to educational responsibility, enabling them to serve as positive role models who inspire students through integrity and dedication. Consequently, the synergistic combination of DAP principles and ideological education not only promotes comprehensive student development but also lays the groundwork for cultivating Mathematics teachers who excel in both moral character and professional excellence.

### ***3.3 Strengthening the Teaching Skills Training Framework***

Integrating the DAP educational philosophy with ideological and political education contributes meaningfully to the refinement of the Mathematics teacher training system. On one hand, this integration diversifies and deepens the curriculum by infusing traditional teaching skill modules with multidimensional content. For instance, identifying ideological themes within mathematical concepts and aligning them with the progressive stages of the DAP model allows for the creation of more purposeful and impactful learning experiences, enhancing both course engagement and educational outcomes. On the other hand, it drives pedagogical innovation by shifting the focus from passive knowledge transfer to active, competency-based learning. Methods such as case-based instruction and project-centered tasks enable students to grasp mathematical concepts through practical application while simultaneously recognizing their connections to ethics, society, and politics—thereby strengthening their sense of mission and civic awareness. Furthermore, this integration facilitates the development of a more balanced assessment system. By evaluating both pedagogical proficiency and ideological (ideological and political literacy), teacher education programs can achieve more accurate feedback and continuous improvement, ultimately elevating the overall quality of instruction.

## **4. Practical Strategies for Integrating the DAP Model with ideological and political Education**

### ***4.1 Embedding Integration in Mathematics Teaching Design***

#### ***4.1.1 Investigating the Convergence of ideological and political Components and the DAP Framework***

Integrating ideological and political education into Mathematics instruction through the lens of the DAP (Demonstration - Activity - Project) educational philosophy is a crucial strategy for achieving holistic educational cultivation. Mathematics, as a discipline, inherently embodies valuable ideological and political resources - such as rational thinking, scientific rigor, and national identity - that can be

effectively aligned with the student - centered principles of DAP through thoughtful pedagogical design. For instance, when introducing mathematical theories, educators can highlight the achievements of Chinese scholars in relevant domains to foster students' sense of national pride and inspire their passion for scientific discovery. In teaching the topic of "infinite series," instructors might use the iterative construction of the Koch snowflake curve from an equilateral triangle to illustrate the boundless nature and creative potential of Mathematics, thereby reinforcing values such as scientific dedication and reverence for natural laws. Furthermore, in lessons on analytic geometry or algebraic equations, real - world engineering examples - like the application of mathematical modeling in China's bridge construction projects - can be incorporated. The design of the Husutong Yellow River Rail-Road Bridge, which features a 1092 - meter steel - truss cable - stayed structure, serves as a compelling case to demonstrate how mathematical principles contribute to major national infrastructure.

#### ***4.1.2 Constructing ideological and political Teaching Strategies Grounded in DAP***

Developing instructional plans that embed ideological and political elements within the DAP framework demands comprehensive planning in both objective setting and activity organization. Instructional goals should explicitly address three key dimensions: knowledge acquisition, skill development, and value formation. For example, when delivering the unit on "Functions and Limits," beyond ensuring students' mastery of functional properties and limit calculations, learning objectives should also emphasize cultivating logical reasoning and a spirit of scientific inquiry. By incorporating historical milestones in Mathematics or real-life applications, students can gain insight into the role of Mathematics in addressing practical challenges. Moreover, classroom activities can follow the DAP model of "Demonstration - Activity - Project" to scaffold learning progressively. When presenting derivatives, teachers may start by illustrating their use in kinematics, then facilitate group discussions on derivative applications in disciplines such as economics or biology, and conclude with a project task that requires students to apply derivative concepts to devise solutions for real-world issues. This structured yet flexible methodology supports deep conceptual understanding while seamlessly integrating ideological and political education, enabling students to recognize the intrinsic relationship between mathematical knowledge and societal progress.

### ***4.2 Implementation in Simulated Teaching Contexts***

#### ***4.2.1 Designing DAP-Oriented Simulated Learning Environments with ideological and political Integration***

Creating immersive simulated learning scenarios that align with the DAP philosophy and incorporate ideological and political education is essential in experiential teaching. Through contextually relevant situations drawn from students' everyday lives, instructors can enhance engagement and motivation. For example, in a simulation exercise centered on "urban traffic optimization," students could be tasked with constructing mathematical models to analyze traffic patterns and propose data-driven improvements. During this process, teachers can guide reflection on the broader implications of Mathematics in urban development and public welfare, integrating discussions around civic duty and ethical responsibility. This helps students appreciate that mathematical competence extends beyond academic pursuits to become a vital instrument for social advancement. Additionally, digital tools such as online collaborative platforms or simulation software can be leveraged to enrich resource accessibility and promote interactive learning experiences, further supporting the integration of values within technical instruction.

#### ***4.2.2 Facilitating Student-Led Instruction through the Integration of DAP and ideological and political Education***

Within the simulated teaching context, instructors play a pivotal role not only in delivering content but more importantly in guiding students to apply both the DAP educational framework and ideological and political elements in their instructional delivery, thereby enhancing their pedagogical competence. A primary focus should be placed on fostering students' capacity for self-directed learning and creative thinking. For instance, during simulation exercises, educators can encourage trainee teachers to independently develop lesson plans that incorporate ideological and political themes. When teaching "probability theory," students might design a scenario centered on "assessing risks in public health crises," integrating statistical methods with discussions on societal duties during epidemic control. This approach not only highlights the real-world applicability of mathematical concepts but also reinforces the value-oriented goals of ideological education. Furthermore, instructors should provide timely feedback and constructive evaluation to help students recognize gaps in their teaching practice

and guide iterative improvements. After a simulation session, mentors can assess how effectively ideological and political components were embedded in the lesson design and offer specific recommendations—such as strategies for more seamlessly linking mathematical topics with moral or civic themes, or ways to increase learner engagement through interactive activities. This form of guided reflection enables pre-service teachers to progressively internalize the integration of the DAP model with ideological and political objectives in authentic teaching contexts.

### ***4.3 Enhancing Integration via Reflective Practice***

#### ***4.3.1 Building a Reflective Practice System Rooted in DAP and ideological and political Education***

Establishing a structured reflective practice mechanism grounded in the DAP philosophy and ideological and political education is essential for supporting continuous professional development and refining teaching outcomes. Under this system, students are encouraged to engage in systematic self-evaluation after teaching simulations, identifying challenges and exploring solutions for improvement. For example, after completing a mock lesson, students can complete a reflective journal documenting their performance in key areas such as lesson planning, classroom execution, and the integration of ideological values. They can critically analyze which aspects were effective and which require refinement. Instructors, in turn, can facilitate regular reflection workshops where students share insights and collaboratively propose improvements. Moreover, digital tools can be integrated into the reflection process to support documentation and assessment. Online platforms can be used to collect and organize student reflections, while data analytics can generate individualized feedback reports, enabling learners to gain deeper insights into their strengths and developmental needs. Such a DAP-informed reflective framework not only strengthens self-awareness and cognitive skills but also creates a sustainable pathway for the deeper fusion of ideological education within subject-specific instruction.

#### ***4.3.2 Improving Integration Outcomes through Critical Reflection***

Using reflection to identify limitations and refine the integration of the DAP model with ideological and political education is a vital component in strengthening students' practical teaching abilities. Through reflective analysis, students can evaluate their instructional practices from multiple angles. For example, they may consider whether ideological elements were meaningfully connected to mathematical content and whether these integrates achieved the intended educational impact. If certain political or ethical messages appear forced or fail to resonate with learners, adjustments can be made in future designs. When teaching "linear programming," for instance, students could revise their approach by incorporating case studies on corporate decision-making related to environmental sustainability, thus aligning mathematical modeling with broader societal values like ecological responsibility. Additionally, reflection allows students to assess their application of the DAP model—such as whether student autonomy was adequately promoted or whether project-based tasks provided sufficient cognitive challenge. By alliterative revising their instructional strategies based on these insights, students enhance both their teaching proficiency and the effectiveness of ideological integration, ultimately achieving a cohesive synthesis of disciplinary knowledge, pedagogical skill, and value cultivation.

## **5. Assessment of Integration Practice Outcomes**

### ***5.1 Development of Evaluation Criteria***

To ensure a comprehensive and rigorous assessment of the integration of the DAP (Demonstration-Activity-Project) educational framework with ideological and political education within the teaching skills training component of the Mathematics teacher education program, this study has developed a multi-faceted and hierarchical evaluation system. This system is structured around two primary domains: enhancement of students' pedagogical competencies and advancement of their ideological and political awareness—each further broken down into specific, measurable indicators.

In the domain of teaching skill development, key evaluation criteria include lesson planning proficiency, classroom delivery effectiveness, assessment literacy, and instructional innovation. These indicators are designed to capture the degree to which students can effectively apply mathematical knowledge and pedagogical strategies within integrated teaching practices. For instance, by evaluating whether students can thoughtfully incorporate the DAP model into lesson designs that embed ideological and political content during simulated instruction, their growth in curriculum design

capabilities can be assessed.

Regarding ideological and political development, the evaluation focuses on dimensions such as moral integrity, civic consciousness, national identity, and scientific dedication. These criteria align with the overarching goals of ideological education—fostering sound values and professional ethics through subject-based teaching. For example, insights from students' reflective writings can be analyzed to gauge their comprehension and internalization of ideological themes, thereby measuring progress in value formation<sup>[8]</sup>. To enhance the reliability and validity of findings, the evaluation framework combines both quantitative metrics and qualitative insights, ensuring a balanced and objective appraisal of outcomes.

### **5.2 Data Collection Approaches**

Gather robust and credible evidence for evaluation, this study employs a mixed-methods data collection strategy, incorporating surveys, teaching performance presentations, and self- and peer-assessment practices.

First, structured questionnaires serve as a principal source of data. Tailored to capture students' experiences in the integration initiative, these instruments assess their familiarity with the dap model, perception of ideological and political elements, and perceived growth in teaching abilities. The survey design draws upon established measurement scales from prior research and has undergone multiple rounds of refinement to ensure content validity and internal consistency.

Second, teaching performance demonstrations provide direct observational data on students' practical application of the integrated approach. By organizing simulation sessions where participants deliver lessons incorporating both dap principles and ideological content, evaluators can observe and document real-time teaching behaviors and decision-making processes.

Additionally, self- and peer-evaluations play a crucial role in capturing diverse perspectives on teaching effectiveness. Encouraging students to critically assess their own and others' performances not only strengthens their reflective capacity but also enriches the database with subjective yet insightful viewpoints. Once compiled, these qualitative assessments are coded and integrated as supplementary inputs for quantitative analysis, thereby broadening the scope and depth of the overall evaluation.

### **5.3 Outcome Evaluation**

Through systematic analysis of the collected data, this study evaluates the overall impact of i Integrating the DAP educational philosophy with ideological and political education in the context of Mathematics teacher training. Findings indicate substantial improvements in both pedagogical competence and ideological development among participants. In terms of teaching skill enhancement, the results reveal notable advancements in lesson planning, classroom execution, and instructional assessment. For example, over 80% of the respondents reported in the survey that their participation in the integrated practice significantly improved their ability to incorporate ideological and political themes into Mathematics lesson designs. They also indicated greater confidence in applying the DAP model to structure engaging and purposeful classroom activities during simulations. Furthermore, performance demonstrations confirmed these self-reported gains, showing that students were increasingly capable of designing coherent, student-centered lessons that seamlessly integrate disciplinary knowledge with value-based education.

## **6. Practical Challenges and Corresponding Solutions**

### **6.1 Faculty Conceptual Shift: A Key Obstacle**

I Integrating Developmentally Appropriate Practice (DAP) principles and ideological and political education into the pedagogical training of Mathematics teacher programs presents a significant hurdle: transforming educators' mindsets. Traditionally, instructors have prioritized content delivery over moral or value-based guidance, adhering to an instructional paradigm that struggles to align with contemporary demands for holistic education. Moreover, some faculty members lack sufficient familiarity with DAP, perceiving it as incompatible with conventional teaching approaches, which leads to reluctance in adopting these innovations. To facilitate mindset evolution, structured professional development initiatives should be implemented. These may include targeted workshops, expert-led

discussions on the foundational aspects of DAP, and demonstrations of how it can coexist with ideological and political instruction. Additionally, encouraging participation in teaching competitions centered on curriculum-based ideological integration can foster motivation through experiential learning and peer recognition. Establishing a coordinated framework linking "Party Branches – Teacher Party Members – Course Teams" also proves beneficial. By integrating party study activities with pedagogical training, this model enhances teachers' political consciousness and equips them to seamlessly embed ideological components into their instruction.

## **6.2 Challenges in Integrating Educational Resources**

Effective integration of DAP and ideological education hinges on the cohesive use of diverse educational resources. However, practical implementation encounters multiple barriers. One primary issue lies in curricular materials: current textbooks for Mathematics teacher training predominantly emphasize disciplinary knowledge and offer limited ways to incorporate ideological content, thus complicating lesson planning. Furthermore, insufficient access to practical training environments undermines the effectiveness of applied learning. For example, during teaching simulations or internships, students often lack exposure to authentic classroom settings, which weakens the connection between theory and real-world practice. To overcome these limitations, several strategies are recommended. First, develop new teaching materials specifically designed to integrate ideological elements into Mathematics education, supplemented by curated case repositories for instructional support. Second, enhance both on-campus and external practice platforms through collaborative efforts such as university-enterprise partnerships and regional educational alliances, expanding opportunities for hands-on experience. Additionally, leveraging digital technologies—such as virtual teaching labs and online learning portals—can help bridge resource gaps and increase the flexibility and reach of instruction.

## **6.3 Student Adjustment Difficulties**

Students encountering integrated DAP and ideological and political teaching may experience adjustment challenges, with heightened academic stress being the most notable. This approach expects learners not only to grasp subject-specific knowledge but also to cultivate political awareness and broader competencies, placing greater demands on their time management and cognitive capacity. Moreover, unfamiliarity with innovative teaching formats—particularly in simulated teaching scenarios—can lead to anxiety, as students must rapidly transition from theoretical understanding to practical application. To support student adaptation, several measures can be adopted. First, instructors should modulate the instructional tempo and thoughtfully sequence course content to prevent overload. Second, provide robust psychological support via mental health seminars and personalized counseling to reduce stress and improve well-being. Third, emphasize the development of self-directed learning skills and creative thinking. For example, when introducing complex theoretical concepts, guided inquiry methods or problem-based tasks can be employed to promote deeper engagement and confidence in applying knowledge.

## **7. Conclusions and Future Directions**

### **7.1 Summary of Findings**

This study investigated the integration of Developmentally Appropriate Practice (DAP) principles with ideological and political education within the teaching skills development framework of Mathematics teacher training programs. The findings indicate that such integration plays a significant role in enhancing students' overall competence and refining pedagogical instruction. It not only supports the cultivation of Mathematics educators who align with contemporary societal expectations but also substantially improves learners' holistic development across cognitive, skill-based, and value-oriented dimensions. In curriculum design, identifying synergies between ideological and political content and DAP—such as embedding scientific inquiry attitudes and national identity into mathematical instruction—has effectively enhanced both the educational depth and ideological relevance of courses. Furthermore, teaching plans grounded in DAP principles have offered clear learning objectives and diverse instructional strategies, thereby facilitating the advancement of students' pedagogical capabilities. During simulated teaching exercises, incorporating ideologically meaningful contexts and guiding trainees to apply DAP frameworks has strengthened both their practical teaching



abilities and internalization of ideological education goals. The implementation of a reflective practice mechanism enables students to continuously refine their instructional behaviors, fostering a deeper connection between theoretical knowledge and real-world application. Overall, this research confirms the viability and positive impact of i Integrating DAP and ideological education into Mathematics teacher training, offering valuable insights for similar initiatives in other disciplines.

## 7.2 Implications for Future Research and Practice

While this study demonstrates promising outcomes, there remains potential for further refinement and expansion. First, theoretical foundations require deeper exploration. A systematic analysis of how DAP and ideological education intersect, along with the development of adaptable models across various educational contexts, would strengthen the conceptual underpinnings of such integrative efforts. Second, the scope of application should be broadened beyond Mathematics teacher education to include other academic domains, such as science, engineering, humanities, and social sciences, to assess the generalizability and contextual adaptability of the integration model. Moreover, persistent challenges—including resistance to change among faculty, difficulties in resource coordination, and student adjustment issues—call for more tailored interventions. Potential solutions include targeted professional development programs, the establishment of shared digital resource platforms, and enhanced psychological support systems to facilitate smoother implementation. Lastly, it is recommended to implement longitudinal assessment mechanisms to evaluate the sustained impact of integrated teaching on graduates' professional growth and civic responsibility. Such data would provide evidence-based guidance for the continuous improvement of teacher training curricula in Mathematics education.

## Acknowledgements

Zhejiang Ocean University's 2024 Project for Teacher Education and Teaching Innovation (Project No: 1413426052309)

## References

- [1] Jin Quanhui. *Exploration and Practice of I Integrating ideological and political Education into Mathematics Teaching in Normal Universities* [J]. *Journal of Yanbian Education College*, 2024, 38(1): 94-97.
- [2] Li Chunhui. *Construction and Practice of Mathematics Integrated Classroom* [J]. *Mathematics Friends*, 2023, 37(14): 27-28.
- [3] Xu Lijie; Ge Hua; Zhou Hongbin. *Reform and Practice of ideological and political Education in Higher Vocational Courses Based on DAP Teaching Model* [J]. *Journal of Shaozhou Vocational and Technical College*, 2023, 26(3): 16-21.
- [4] Yu Shanshan. *Exploration of the Organic Integration of "ideological and political Education" and "Mathematics Teaching" in Secondary Vocational Schools* [J]. *Education Progress*, 2024, 14(5): 1364-1369.
- [5] Zhang Shu; Dai Shiqi. *Construction and Exploration of the ideological and political Education System in College Mathematics Courses under the Digital Model* [J]. *Internet Weekly*, 2024, (2): 74-76.
- [6] Wang Suhua; Zhang Ning; Wu Yi; Qin Li. *Research on the Integration of ideological and political Education into the Teaching Practice of College Mathematics* [J]. *Growth*, 2023, (11): 136-138.
- [7] Zhao Hui. *Discussion on the Implementation of ideological and political Education in Mathematics and Applied Mathematics (Teacher Education) Professional Courses - Taking Shaanxi University of Technology as an Example* [J]. *Western Quality Education*, 2022, 8(21): 13-16.
- [8] Zhou Meijuan; Li Juncheng. *investigating and Analysis of the ideological and political Education Awareness and Ability of Mathematics Teachers-in-Training - Taking Local Universities in Hunan Province as an Example* [J]. *Innovation Education Research*, 2023, 11(6): 1300-1309.
- [9] Zhou Yonghua. *Exploration of the Integration and Practice of ideological and political Elements in Higher Vocational Mathematics Teaching under the Standardization Background* [J]. *China Standardization*, 2024, (2): 215-217.
- [10] Liu Xiaoyan; Zhao Zhiqin; Liu Huali. *Exploration and Practice of "Advanced Mathematics" Teaching Integrated with the ideological and political Education Concept* [J]. *Education Progress*, 2022, 12(7): 2426-2432.