

Integration Mode of Ideological and Political Education and “Mass Entrepreneurship and Innovation” Education in Colleges and Universities Based on Cloud Platform Digital Education

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ABSTRACT To improve the effectiveness of integrating ideological and political education (IPE) and innovation and entrepreneurship education (IEE) in universities, this study investigates an integration model supported by cloud-platform digital education. Based on the analysis of educational collaboration requirements, a cloud-based integrated education framework is developed to support resource sharing, information interaction, and intelligent service management. Questionnaire data from university students are used to evaluate the current status of IPE–IEE integration and identify key challenges in participation, instructional effectiveness, and practical implementation. On this basis, a digital education platform incorporating user management, service scheduling, and educational resource allocation is constructed. The platform adopts a layered cloud-service architecture to improve the efficiency of educational information transmission and resource coordination. Results indicate that students generally support the integration of IPE and IEE, particularly through the combination of classroom instruction and practical activities. The proposed framework provides a data-driven and scalable approach for integrated education management and offers an engineering-oriented reference for the development of intelligent educational service platforms.

INDEX TERMS cloud platform digital education, educational information management, resource allocation, intelligent service architecture

I. INTRODUCTION

IN the growth of university talents, IPE and IEE are very important, and they are closely related. Only through combination and mutual support can innovative high-quality talents be cultivated to a greater extent, so as to meet the demand for high-caliber, innovative professionals in the modern era.. At present, students’ innovative and entrepreneurial thinking is not yet organically linked to IPE in the university talent development process. This relationship is not sufficient, and the management system is not perfect, which can not provide a real platform for IPE, nor can it provide specific ideas for people to start businesses. Therefore, only by strengthening the relationship between them can they achieve integration and become the key to human resources development.

At present, many scholars have conducted research on

IPE and “mass entrepreneurship and innovation” (MEI) education. Yang Hao analyzed and explored intelligent teaching methods for ideological and political education in universities under the background of “innovation and entrepreneurship”, constructing an intelligent teaching system for ideological and political education in universities under this context [1]. Huang Xiaoli believes that universities should adapt to the changing times in cultivating sports professionals, promoting the development of innovative sports talents through an educational model of “ideological and political guidance, innovation, and coordination”, addressing the employment challenges faced by college students, and contributing to the sports industry [2]. Li Baozhen, based on analyzing the role of integrating civic education into innovation education and the cultivation of social responsibility through IEE, selected ten provincial universities as research

subjects. Using path coefficients, he explored the impact of entrepreneurship education on social responsibility and examined the mediating role of political education between IEE and social responsibility [3]. Mei Weihui, through semi-structured interviews and policy document reviews, specifically focused on Zhejiang Province as a research subject to discuss the issues and challenges in implementing university entrepreneurship education programs in China [4]. Wang Xu's research aims to summarize advanced experiences and models of new engineering IEE in Chinese and foreign universities, analyze influencing factors, and propose qualitative enhancement paths and improvement suggestions based on AIGC technology in conjunction with sustainable development goals [5]. Although IPE and IEE are both studied, few scholars combine IPE and IEE.

Cloud platform digital education is more widely used in the education sector. Gao Hui-Wen conducted a thematic study on innovative strategies for ideological and political education methods in the network era, aiming to help students correct their learning attitudes, cultivate good moral character, and guide them to establish correct values, outlook on life, and moral values [6]. Yang Huabing's research aimed to explore the impact of using the VIP Dog electronic learning platform in ideological and political education on the motivation and academic performance of China students, and found that the use of electronic learning platforms in ideological and political education can help improve students' enthusiasm and academic performance [7]. Hakak Saqib investigated the applicability of gamification of learning through cloud computing, and conducted a comprehensive survey of the most advanced gamification in education and learning [8]. Wu Liangzhou developed an intelligent education system based on detection technology using deep learning techniques. The system primarily aims to determine whether standards are met, closely aligning with the cognitive hotspots of contemporary college students [9]. Mathew Saju conducted a fundamental study to demonstrate how cloud computing platforms could be introduced in education to enhance the agility of teaching and learning and to have a cost-effective infrastructure [10]. Li Chen was based on the blockchain structure and designed according to the security requirements of the digital education resource cloud platform to solve the data asynchronous problem [11]. Although there are many researches on cloud platform digital education, a digital cloud platform integrating college IPE and IEE has not been established.

At present, the degree of integration of IPE and IEE in universities is relatively low. The teaching of the two disciplines is relatively decentralized, and there is no clear teaching method and teaching responsibility distribution. To improve the integration of college IPE and IEE, this article studied the integration method of college IPE and IEE based on cloud platform digital education. This article first introduced the basic knowledge, then conducted experimental study on the issues in the process of education integration. Finally, a digital cloud platform for teaching integration was

established.

The integration of IPE and IEE is not a simple additive process, but a synergistic mechanism where IPE provides the value orientation and psychological resilience necessary for technical skill application. While IEE focuses on the 'how-to' of business modeling and technical execution, IPE addresses the 'why' fostering a sense of social responsibility and ethical judgment that prevents 'blind entrepreneurship'.

II. THEORETICAL BASIS FOR THE INTEGRATION OF IDEOLOGICAL AND POLITICAL EDUCATION AND "MASS ENTREPRENEURSHIP AND INNOVATION" EDUCATION IN UNIVERSITIES

(1) IPE in universities

The university has an outstanding education system and abundant wisdom in ideological and political teaching. Driven by contemporary educational paradigms, IPE has gradually become standardized and systematic. It can be said that the overall achievements of ideological and political teaching are significant and stable. The world economic integration, digital modernization and the rapid expansion of the knowledge-based economy necessitate that universities must further consolidate and improve IPE to enhance the quality of life of all people and speed up the reform and opening up [12].

IPE emphasizes the completion of unrestricted and diversified development of individuals [13].

In general, IPE includes the following contents.

Cultivating students' sound personality: For thinkers and political educators, the most crucial thing is to cultivate a sunny personality and foster good personal conduct in students, etc.

Collective consciousness: The cooperation ability between students is cultivated and an optimistic world outlook is created.

Cultivating entrepreneurship and innovation spirit: Students are encouraged to create the spirit of daring, striving, and breaking through, encouraging students to be brave in entrepreneurship, and laying the foundation for all students' thinking needs of innovation and entrepreneurship [14].

Promoting students' social responsibility: Through the growth of IPE, all positive internal energy is mobilized to spur students to engage in various types of professional practice, and to actively participate in voluntary service for the public good. Students are encouraged to teach in poor mountainous areas, thus nurturing their sense of social mission [15].

In the digital era, the core contents of IPE are being redefined through their intersection with cloud-based technologies:

Digital Personality Cultivation: Beyond traditional moral conduct, IPE now utilizes cloud platforms to create 'Digital Portfolios' that track and guide students' ethical growth and psychological well-being in real-time, fostering a sound personality through data-driven feedback.

Virtual Collective Consciousness: The cultivation of cooperation and optimistic worldviews is no longer confined to

physical classrooms. Cloud-mediated collaborative projects allow students to develop collective consciousness in virtual environments, mirroring the remote teamwork essential in modern entrepreneurship. Digitally-Enabled Entrepreneurial Spirit: The encouragement of daring and breakthrough thinking is facilitated by cloud-based ‘Sandboxes’, where students can iterate on innovative ideas in a low-risk, high-feedback digital environment effectively laying the foundation for innovation and entrepreneurship.

Cloud-Assisted Social Responsibility: The promotion of social mission is expanded via digital platforms that connect students with remote areas for ‘Virtual Teaching’ or public welfare services, allowing for a broader and more efficient mobilization of internal energy to serve society.

(2) “Mass entrepreneurship and innovation” education “Mass entrepreneurship and innovation” education refers to IEE. The introduction and development of IEE is an essential response to the imperatives of high-quality economic development.. It can help adjust the economic and industrial layout, accelerate economic growth and cultural progress, and strengthen the level of technological innovation. The growth of innovation and entrepreneurship is conducive to the construction of innovation and entrepreneurship specialty. Entrepreneurship is also a powerful force that can balance the market and promote social development and cultural prosperity. Innovative entrepreneurship allows students to use what they have learned to transform scientific knowledge into energy and to develop a multitude of entrepreneurial elites [16].

The final goal of the IEE is to foster creativity in students, which defines the essence and direction of the IEE, the human resource development model, and the theoretical structure.

Instead of viewing IEE in isolation, the ‘integration mode’ treats it as a practice-oriented carrier for IPE.

1) Value-Driven Innovation Awareness: Innovation awareness is no longer just about market sensitivity, but about identifying social pain points through the lens of IPE. This ensures that entrepreneurial thinking is rooted in social responsibility and national development needs.

2) Spirit-Led Entrepreneurship: The cultivation of entrepreneurship is integrated with the ‘sound personality’ goals of IPE. It emphasizes that the resilience to overcome difficulties is derived from a strong sense of mission and professional ethics fostered by ideological guidance.

3) Competency-Based Collaborative Practice: Skills are not merely technical tools but are developed through ‘Red Entrepreneurship’ projects where students apply innovative functions to solve real-world social problems, thereby achieving the sum of individual capabilities and social value.

(3) Necessity of the integration of “mass entrepreneurship and innovation” education and IPE in universities. In terms of teaching focus and learning achievements, many universities only use entrepreneurship training in the process of career guidance or career planning, and still take the traditional large-scale education form. The programme is

limited to “public entrepreneurship and innovation” training for low-level cooperation, such as policy formulation and entrepreneurial skills development. Generally speaking, neither schools, teachers nor students attach importance to IEE. IPE has formed a more complete theoretical system from the center to the local [17]. Therefore, the combination of IEE and college IPE can improve the understanding of IEE and promote the development of IEE.

In terms of the relationship between theory and practice, IPE in universities has long used a combination of theoretical guidance and practical educational methods, resulting in a lack of teaching of ideological and political subjects for university students. This is mainly because the theoretical connection between teachers is not real, which reduces the reliability of the theory. The education of entrepreneurship and mass innovation is mainly carried out in practical courses attended by students. The combination of ideological and political theory innovation and practical learning can deepen theoretical knowledge, and promote the development of “mass innovation”. In this sense, the integration of “innovation” into IPE should be promoted [18]. Specifically, the logical bridge lies in Non-cognitive Skill Development: IPE cultivates qualities such as perseverance, integrity, and risk-bearing capacity, which are the foundational ‘soft skills’ that enable students to persist through the iterative failures inherent in technical innovation. By aligning personal entrepreneurial goals with national development strategies through IPE, students gain a stronger internal drive, transforming passive skill acquisition into proactive, value-driven innovation. Thus, IPE acts as the ‘steering wheel’ and ‘booster’ that ensures technical entrepreneurship skills are applied effectively and sustainably.

III. PROBLEMS AND MEASURES IN THE INTEGRATION OF IPE AND IEE IN UNIVERSITIES

(1) Problems in the integration of IPE and IEE in universities This article conducts an offline questionnaire survey on 200 students from three colleges (Ideological and Political Education, Management, and Economics). To ensure the representativeness of the sample and minimize selection bias, a stratified random sampling method was employed. The demographic breakdown of the 182 valid respondents is as follows: 48.4% male and 51.6% female; 35.2% freshmen, 30.8% sophomores, 24.2% juniors, and 9.8% seniors. The questionnaire’s reliability and validity were rigorously tested before formal distribution. The Cronbach’s alpha coefficient for the overall scale was 0.856, indicating high internal consistency. Furthermore, Expert Judgment and Exploratory Factor Analysis (EFA) were conducted to verify content and construct validity (KMO value = 0.812, Bartlett’s $p < 0.001$), ensuring that the survey instruments effectively measured students’ awareness and participation in IEE programs.

The survey on students’ awareness and participation in school IEE programs revealed that while most students are aware of these initiatives, there remains room for improvement in both their actual participation willingness

and program effectiveness. Additionally, students' preferences for different IEE formats show significant variations, reflecting diverse needs in learning approaches and skill development pathways. This provides crucial insights for designing inclusive education models, as detailed in Tables 1 and 2.

TABLE 1. Students' Awareness and Participation in School IEE

Project	Proportion (%)	Description
Know and participate in IEE activities	62	Students understand and actually participate in the innovation and entrepreneurship education activities organized by the school.
I don't know there is an IEE event	18	Students do not know whether the school carries out related activities.
Know but do not participate in IEE activities	20	Students understand the activities but lack the willingness to participate.

As shown in Table 1, 62% of the students know that the school has carried out IEE activities and participated in them. 18% of the students do not know that the school has conducted IEE activities. 20% of the students know that the school has carried out IEE activities but do not participate. It can be seen from the comparative data that the publicity of the school's IEE activities is good, but it is not possible to fully motivate students to engage in the activities. There are many students who are unwilling to actively participate in IEE activities.

TABLE 2. Students' Preferences for IEE Formats (Multiple Choice)

IEE activity form	Support percentage (%)	Description
Offer IEE courses	83	Students most hope to learn innovation and entrepreneurship knowledge through systematic courses.
Organize IEE related competitions	69	Competition is regarded as an important way to improve your abilities.
Provide IEE practical activities	54	Practical activities help to combine theory and practice.
Hold IEE related lectures	26	The acceptance of the lecture format is relatively low.

As shown in Table 2, 83% of the students believe that colleges should provide IEE courses. 54% of the students think that colleges should provide IEE practical activities. 26% of the students think that colleges should provide IEE related lectures. 69% of the students think that the school should organize IEE related competitions. It can be observed that a greater proportion of choices are made to offer IEE courses and organize IEE-related competitions, with most students wishing to improve their innovation and entrepreneurship skills through competitions besides the relevant courses.

The evaluation results of students on the school IEE are shown in Figure 1.

33% of the students are dissatisfied with the school IEE. 42% think the school IEE is average. 17% are relatively satisfied with the school IEE. 8% are very satisfied with the school IEE. The data shows that more than half of the students have an unsatisfactory and average attitude towards the school's IEE, indicating that the school's IEE is currently not satisfying the needs of students.

The 33% dissatisfaction rate primarily stems from three root causes: uneven resource distribution, delayed feedback loops, and the lack of personalized learning pathways in traditional face-to-face IEE. Traditional improvements often fail to scale due to limited faculty hours and physical space constraints.

The Smart Education Cloud Platform addresses these issues through three specific mechanisms:

1) Resource Democratization: Unlike localized physical resources, the cloud platform provides a unified digital library and virtual 'Red Sandbox' for simulation. This ensures students from different departments have equal access to high-quality IPE-IEE integrated materials, eliminating geographic and departmental barriers. 2) Real-time Feedback via AI-Assisted Modules: Traditional face-to-face feedback is often delayed by several days. The cloud platform's service center integrates automated assessment tools that provide immediate diagnostic reports on students' entrepreneurial logic and ideological alignment, significantly improving the 'timeliness' of instruction. 3) Adaptive Learning Pathways: While face-to-face instruction typically follows a 'one-size-fits-all' curriculum, the platform uses data-driven profiling to recommend customized content. This directly addresses the 'average' rating (42%) by allowing students to bypass redundant material and focus on their specific skill gaps in innovation.

The findings for the role of IPE in IEE are illustrated in Figure 2.

As for the role of IPE in IEE, 13% of the students do not understand this aspect. 22% of the students think that the integration of the two does not work. 36% of the students think that the integration of the two plays a small role. 29% of the students think that the combination of the two plays a great role. It can be learned from the data that more than half of the students think that the integration of IPE and IEE can work, which shows that the integration of IPE and IEE is in line with the students' ideas and can work well.

The survey results of effective approaches to the effectiveness of IPE in IEE (multiple choices are allowed) are shown in Figure 3.

As for the effective way of the effectiveness of IPE in IEE, 62% of the students think that the content of the two disciplines should be integrated in the classroom teaching. 79% think that the practical activities of the two disciplines should be linked together. 47% of the students think that teachers of the two disciplines should be allowed to conduct joint teaching. 33% of the students think that relevant lectures on the integration of the two disciplines should be added. It can be seen from the data that classroom teaching

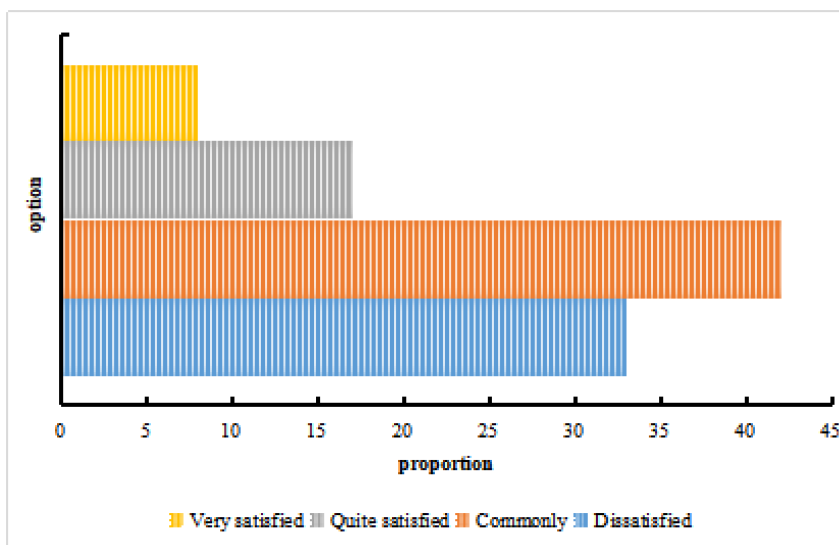


FIGURE 1. Students' evaluation of school IEE

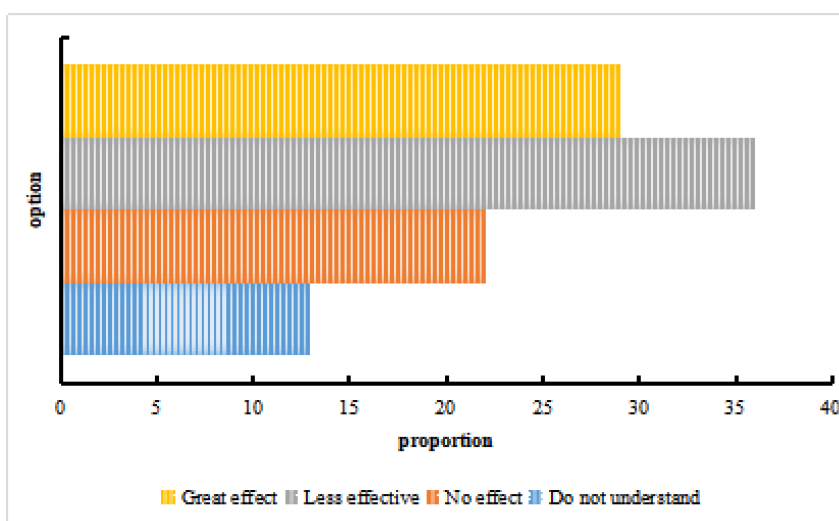


FIGURE 2. The role of IPE in IEE

and practical activities are the focus of students' attention, and more than 50% of the students support the integration of teaching and practical activities. The integration of IPE in IEE should be promoted from these two aspects.

(2) Measures for the integration of IPE and IEE in universities. To strengthen the integration of IPE and IEE, the following aspects can be carried out:

1) Strengthening high-level learning projects
The cooperation mechanism of "allround cooperation and interdepartmental cooperation" has been established. The four principles of "full participation, targeting each student, focusing on the comprehensive and coordinated development of students, and connecting all links of talent training and development" have been implemented. In the field of innovation and entrepreneurship, schools need to develop new training programs, focusing on teaching content, teaching methods and evaluation methods. Education content, such as the development of entrepreneurship curriculum, emphasis

on teachers' IPE, entrepreneurship training, education and life of after-school counselors. Professional teachers form values through teaching method especially in group projects.

2) Creating a more favorable environment for integration
First, textbooks are included in the classroom. IPE can improve the influence and attraction of IPE by participating in practical activities of entrepreneurial development. Secondly, it is combined with extracurricular practice. The innovative IEE is included in the school's IPE, and the school organizes students to actively participate in voluntary services and public welfare activities. Through the understanding of the activity, students are encouraged to start their own businesses by participating in extracurricular practice, thus creating entrepreneurial values and serving the society.

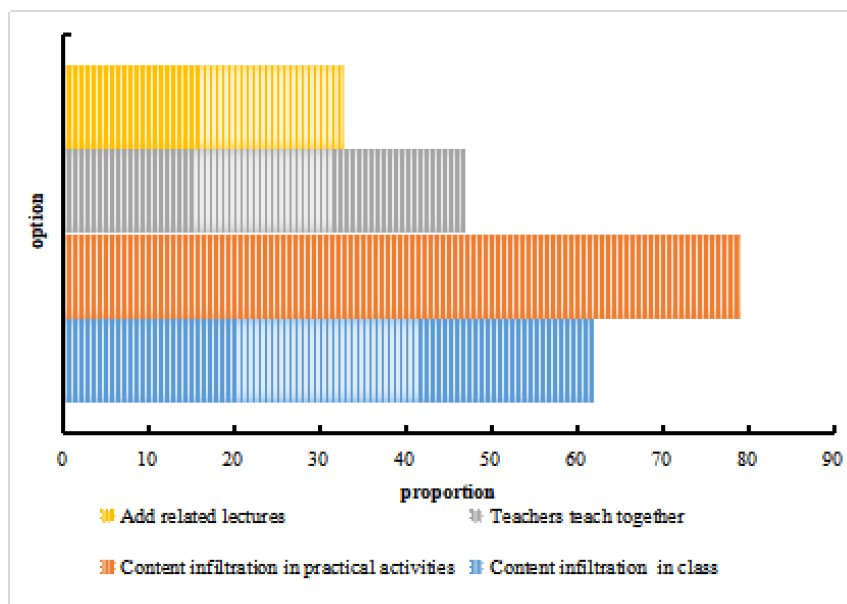


FIGURE 3. An effective approach to the effectiveness of IPE in IEE

IV. INTEGRATED EDUCATION PLATFORM BASED ON CLOUD PLATFORM DIGITAL EDUCATION

The traditional education information system lacks unity and diversity. Due to the difference of system structure, different systems cannot effectively allocate education resources.

The smart education cloud platform solves these problems. The smart education cloud platform adopts a layered Microservices Architecture to ensure high availability and scalability. In terms of deployment, the platform utilizes a Hybrid Cloud model (PaaS/SaaS): the infrastructure layer provides Virtualized Computing Resources via PaaS for customized teaching tools, while the application layer delivers standardized education modules (such as IPE-IEE collaborative resource pools) via SaaS.

To address the lack of technical specifics, the platform implements RESTful API protocols for seamless data exchange between the 'Education Cloud Service Center' and third-party educational applications. For data processing, an Asynchronous Message Queue mechanism (such as RabbitMQ) is employed to handle high-concurrency requests during peak online learning hours. The 'Smart Education Cloud Service' layer integrates a Collaborative Filtering Recommendation Algorithm to push personalized IPE and IEE resources based on students' historical learning behaviors and entrepreneurial interests, ensuring precise resource allocation in a digital environment. The smart education cloud platform is shown in Figure 4.

The intelligent cloud education platform provides transparent services at any time. Users send requests to the intelligent cloud education platform through terminals. The platform has gone through a series of complex logical processes, such as query analysis, finding appropriate service interfaces, computing and packaging related data formats, and finally returning services and education resources to

users.

The smart education cloud platform consists of three modules: education cloud users, education cloud service centers, and education cloud services, as shown in Figure 5.

(1) Education cloud users

Education cloud users are usually students, teachers and educators. Students and teachers focus on the use of educational resources and teaching services, while educational administrators focus on the use of educational management and evaluation services. Users can fully access the cloud education center and assign necessary education services according to their needs and rights.

The Cloud Centre is the focus of the entire Smart Cloud Education platform and is responsible for the registration, retrieval and access of the Cloud Education system and the authentication of Cloud Education users. Before delivering services to cloud users, it is necessary to publish all cloud services here. Cloud access also needs to be unified. After obtaining permission, the service can be sent to the corresponding education interface. Cloud education center can intelligently identify the role of users and create different education service models.

(2) Education cloud service center

The education cloud service center consists of two parts: users and services. Users are composed of three modules: user registration, user login and user management. After completing the basic information and accepting the platform maintenance agreement, the user can become a legitimate user of the intelligent education platform. Once the user successfully logs in, the login module creates a built-in identifier. All services can authenticate based on identity at login to verify the user's status. When the training request is sent to the center, the user can find the corresponding service interface

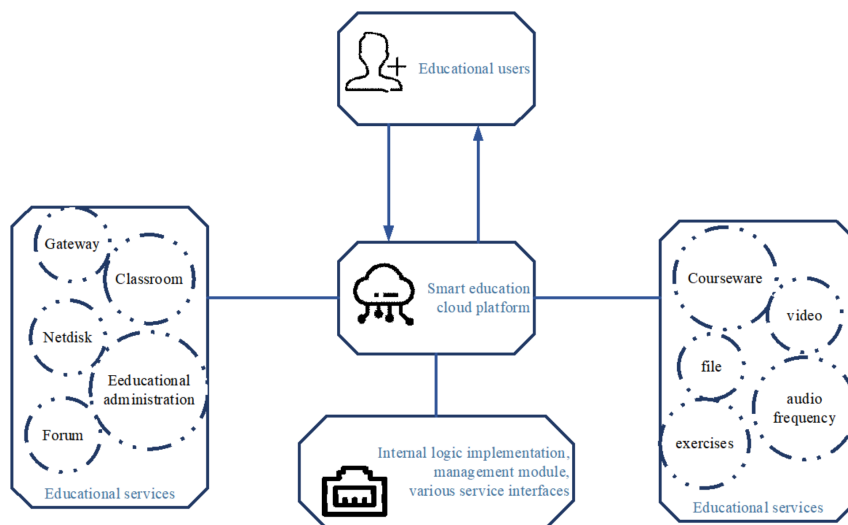


FIGURE 4. Smart education cloud platform

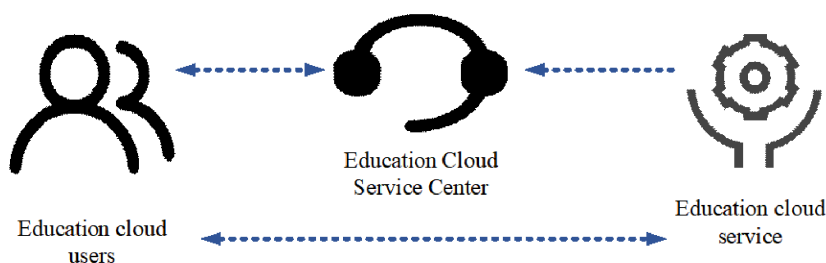


FIGURE 5. Composition of smart education cloud platform module

through the service. Once the service is allowed, users are able to benefit from the required service. The service authentication process includes user authentication, access rights and service borrowing. For legal users, when leasing for the first time, the service authority module is bound to the service according to the platform protocol. After leasing, it directly requests services for cloud education services. In addition, the service authorization module automatically recovers outdated user services through regular script tests. Service management controls the attributes of all platform services. Platform administrators can flexibly enable and disable services.

(3) Education cloud service

Cloud education service is a service provider that provides cloud education users with specific education services such as distance education, education management, and portals. The infrastructure layer, which provides hardware resources and support for the software environment, deploys a large distributed cloud computing and storage environment, or leases high-quality servers to create virtual hardware and software pools. The platform is built on one level, which standardizes the business logic and data format of various education services, and establishes a service monitoring and resource planning mechanism. On this basis, public services are provided, such as education portal and other basic education services providing education, data storage and other services.

As a technological platform supporting the deep integration of ideological and political education with IEE in higher education, the Smart Education Cloud Platform's architecture design directly impacts the efficiency of educational resource integration and service experience. The platform consists of three interconnected modules: Education Cloud Users, Education Cloud Service Center, and Education Cloud Services. These modules work together to achieve intelligent resource allocation, precise service delivery, and digital management of teaching processes, providing systematic support for the "Ideological and Political Education + Innovation and Entrepreneurship" integrated education model. As shown in Table 3.

TABLE 3. Functional Description of the Three Major Modules in the Smart Education Cloud Platform

Module	Main user	Function description
Educate cloud users	Students, teachers, managers	Obtain educational resources and services according to authority, and support personalized learning and management.
Education Cloud Service Center	Users and service providers	Responsible for user authentication, service registration, etc.
Education Cloud Service	Service provider	Provide distance learning, education management, portal services, etc., and support resource virtualization, service standardization, and flexible expansion.

V. CONCLUSION

The combination of IPE with IEE could effectively promote the comprehensive quality of students and train high quality and innovative talents. To improve the integration effect of IPE and IEE, this paper used cloud platform digital technology to study the integration method of IPE and IEE. This article first analyzed the status quo of the research, then conducted experiments on three universities to study the status quo and shortcomings of educational integration. Finally, a cloud platform digital education platform integrating IPE and IEE was constructed.

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All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this article.

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STATEMENT OF CONSENT

Informed consent to participate was obtained from all of the participants in the study

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