# Development of a New Technology Compound Talent Intelligent Learning Platform Based on Personalized Learning

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*Abstract:* With the continuous deepening of educational digital reform, the demands for digital empowerment of modern education and technology-driven educational transformation have become particularly urgent. Smart learning platforms and intelligent learning cloud services have emerged in this context. The "JinYu" project focuses on the cultivation of talents in the new era of the Internet and the construction of smart education. It is dedicated to providing an online learning platform and practical opportunities for programming learners, cultivating university students' innovation and entrepreneurship capabilities. The project centers around the construction of high-quality courses in programming languages, emphasizing video recording and textbook writing. This initiative aims to expose a wider audience to courses related to programming and big data development, thereby creating a new technology compound talent intelligent learning platform based on personalized learning. The platform effectively promotes the transformation of smart learning forms and teaching modes in universities.

*Keywords:* Smart learning, innovation in teaching modes, educational digital transformation

## 1. Introduction

The Internet serves as a network of information and knowledge. With the continuous improvement of the internet ecosystem, the rapid development of mobile internet, and the upgrading of consumer attitudes, an increasing number of people are eagerly entering the forefront. The former "free knowledge internet," under the influence of content entrepreneurship and internet sharing platforms, has gradually evolved into a "knowledge e-commerce" era where individuals are willing to pay for knowledge and value. Simultaneously, to accelerate the modernization of education, advance the construction of an educationally strong nation, promote the development of educational informatization in the new era, foster innovation-driven development, the Ministry of Education has successively issued documents such as the "13th Five-Year Plan for Educational Informatization" and the "Educational Informatization 2.0 Action Plan." These initiatives vigorously promote smart education, aiming to achieve lifelong learning for the entire population.

The concept of "Internet + Education" leverages the combination of the internet, information technology, cloud computing, big data, and education. It optimizes and integrates educational

resources, applying the innovative achievements of the internet to various aspects of education. This approach provides learners with a new service model of high-quality, flexible, and personalized education to meet the talent demands of the internet era and facilitate educational transformation.

In recent years, driven by the strong advocacy of the Chinese government and technological progress, Chinese education is continuously moving towards modernization, and the scale of online education is expanding. Meanwhile, as the reform of digital teaching deepens, the demand for iterative upgrades in teaching applications through technological innovation has become more urgent. Thus, the emergence of so-called smart education learning platforms or cloud services has become inevitable.

## 2. Research Status

In the 1990s, both domestically and internationally, the concept of smart learning had already caught the attention of some academic experts and researchers. However, the research on smart learning was still in its infancy, with limited exploration within the academic community.

As we entered the 21st century, the rapid development of technologies such as the internet, virtual reality, artificial intelligence, cloud computing, and the Internet of Things provided technical support for the construction of smart learning environments. An increasing number of scholars began to focus on related research in this field [1]. The educational paradigm gradually shifted towards collaborative, shared, participatory, customized, and autonomous education [2]. The development of relevant technologies and academic research has spurred changes and iterations in teaching models for educators and learning methods for students. The concept of smart education has gradually become a focal point in the global education sector.

Since 2014, research on smart learning in China has evolved from theoretical aspects such as concepts and ideas to practical applications such as instructional design, teaching models, and the application of intelligent teaching and products [3]. Crossing into 2018, research in China on smart learning has shifted from the theoretical level to the practical aspects of precise teaching for educators and autonomous learning for students. The exploration extends to innovations in the application of digital teaching in higher education management platforms and processes. Additionally, the use of data mining and artificial intelligence technologies has facilitated in-depth learning and intelligent analysis of the resources utilized by teachers and students in teaching [4].

According to the "China Smart Education Regional Development Research Report 2021," smart education in China has further progressed comprehensively. Intelligent technologies increasingly support the construction of smart learning environments, providing innovative momentum for high-quality educational development, and the concept of personalized education is becoming deeply ingrained in the hearts and minds of educators and learners [5].

## 3. Research Significance

### 3.1. Student Perspective — Personalized Education, Autonomous Learning, Virtuous Cycle

Online education has the capability to transcend the limitations of traditional curriculum time and space. Leveraging the internet for resource sharing, all students can engage in learning and examinations through this platform. Students have the flexibility to study courses anytime and anywhere, alleviating concerns about the unavailability of specific courses at their respective schools. Simultaneously, the format of online learning reduces academic pressure, allowing students to easily grasp each lesson. In areas where clarification is needed, students can replay the content until they achieve full understanding.

The primary target audience for the JinYu platform includes university students and early-career

professionals. For the former, it facilitates the development of specific skills during the university phase, expanding and enhancing various programming abilities, laying a solid foundation for future academic and employment pursuits. It also aids in creating projects independently, easing financial burdens related to tuition. For the latter, it is beneficial for expanding new strengths in the workplace, utilizing programming and other skills to seize opportunities for promotions, or using leisure time to enhance personal qualities.

Compared to other learning platforms where learners operate independently, and the course system architecture may be chaotic, the JinYu platform's unique construction model, coupled with its distinctive social interaction features and subsequent team-building, provides learners with more opportunities to connect with a broader social circle. This facilitates mutual growth, knowledge sharing, and practical application, contributing to comprehensive improvement.

### 3.2. University Perspective — Convenient and Efficient, Digital Collaboration, Scientific Management

Universities aim to cultivate students who will have promising futures and careers. The JinYu platform can provide high-quality courses, contributing to the overall quality improvement of students and boosting the university's employment rate. Simultaneously, the integration of online courses with offline ones enhances the campus's level of intelligent management and teaching.

### 3.3. Social Perspective — Talent Supply, Precision Delivery, Co-creation of Value

Existing enterprises face challenges related to difficulties in recruitment and the uneven quality of recruits. Companies expend substantial resources in their search for outstanding employees. The JinYu platform offers a channel for outsourcing companies to find professionally aligned employees with a solid foundation, immediately creating value for the enterprise. This approach not only eliminates the cost of talent development for businesses but also enables the JinYu platform to select outstanding and willing students based on the enterprise's needs, significantly contributing to the delivery of technically skilled talents with exceptional practical abilities to society.

## 4. Function Design and Innovation of JinYu Platform

### 4.1. Product Function Design

"JinYu" primarily focuses on the introduction of high-quality courses, differentiating itself from traditional teaching methods. We prioritize a user-centric approach, advocate for personalized learning, and provide more practical opportunities, ensuring that learning is not restricted by various factors, making everyone a learner.

The platform emphasizes the construction of smart education, aiming to cultivate talents in internet programming and applications of big data. It intends to establish a new talent cultivation model, providing learners with an online learning platform and practical opportunities. This course adheres to the policy guidance of educational reform, concentrating on the construction of premium courses in universities. It is dedicated to fostering entrepreneurial capabilities in university students and has initiated project construction focused on video recording and textbook writing of programming languages, with an emphasis on practical application, enabling more people to access courses related to programming and big data development [6].

The JinYu platform builds a modularized overall project, combining online network courses, offline practical operations, and later-stage team integration and project coordination modules. We highlight the product positioning of "teaching in the early stages + practical application in the later stages," which can be further divided into services such as premium course teaching, derivative

product assistant teaching, derivative product outsourcing services, and project development services. This facilitates learners to efficiently and conveniently study high-quality courses and meet the specific requirements of project production during practical application.

## 4.2. Educational Mode Innovation

### 4.2.1. Problem-Oriented Case-Based Teaching Content Organization Philosophy

Traditional development-oriented course teaching strategies primarily involve teacher-led lectures with students as the main audience. Teachers explain knowledge points one by one according to the content of the course, continuously inputting knowledge to students, often neglecting the output from students. In contrast to traditional teaching philosophies, we adopt a problem-oriented teaching strategy, shifting teaching from imparting knowledge to interaction. This approach encourages students to actively consider how to apply knowledge to solve problems, helping them develop good learning habits and improving teaching effectiveness [7].

For example, in the development of the course on online WeChat Mini Program development, considering that the course primarily cultivates students' abilities in Mini Program development, we use DouDou Cloud Assistant as a teaching case. Following a problem-oriented approach, we divide the DouDou Cloud Assistant Mini Program into 10 problem modules, unfolding module learning in a storytelling manner. Student learning of WeChat Mini Program-related knowledge is no longer solely teacher-driven. Instead, Mini Program knowledge is distributed in a networked fashion within the learning modules, guiding students to acquire and fully understand knowledge points through solving practical problems, significantly enhancing learning effectiveness.

### 4.2.2. Student-Centered Implementation Philosophy of the Teaching Process

We adhere to a student-centered teaching philosophy with the support of teacher teams, assistant teams, and development teams to fully stimulate students' subjective initiative. Differing from traditional teaching team organizational structures, we strive to create an efficient, intelligent, and mutually beneficial new community model—centered around students. This model integrates teacher teams, assistant teams, and development teams organically. The teacher team is responsible for delivering core course content, guiding the assistant team in formulating overall teaching plans, and overseeing the design, video recording, and management of teaching processes. The assistant team iterates on teaching content and provides personalized Q&A services. Additionally, the teacher team guides the development team in project development. The informationization projects undertaken by the development team also provide more teaching cases for the course, prompting continuous improvement of teaching content. Students, as the main learners, receive instruction from the teacher team, clarification of doubts from the assistant team, and project development insights from the development team. Students interested in project development can join the development team, enhancing the overall strength of the team and ultimately forming an efficient, intelligent, and mutually beneficial teaching closed-loop system.

### 4.2.3. Hybrid Online and Offline Interactive Learning Model

To adapt to the changes and developments in teaching subjects, teaching resources, and teaching media in the "Internet+" era, and to innovate the talent cultivation model under informationized conditions, improving the quality of talent cultivation, the school, in the process of educational reform, should give high priority to using informationization as a means to explore the establishment of a combination of "online" network platform teaching and "offline" traditional face-to-face teaching. This is achieved by constructing a deep learning field that integrates situations, interactions,

experiences, and reflections to enhance students' awareness of independent learning, cultivate innovative spirit, improve practical abilities, and achieve remarkable results [8]. The traditional teaching model forms an antagonistic relationship between teachers and students, neglecting students' differences during lectures, failing to cultivate students' independent learning abilities, and unable to meet the personalized needs of students at different levels. The MOOC teaching model, as a completely new mode of teaching reform, lacks the teacher's guidance and supervision in the fully online learning mode, deviating significantly from expected teaching outcomes [9]. Therefore, a blended learning model, combining the advantages of traditional classroom teaching and MOOC teaching, has emerged. To accelerate the cultivation of Internet talents, we propose the case of "DouDou Cloud Assistant" and develop online video courses for WeChat Mini Program development. This initiative has obtained support from the Ministry of Education's collaborative education project.

### 4.3. Platform Course Architecture

### 4.3.1. Course Mode Innovation

The JinYu platform, based on free core courses to attract traffic, follows up with advanced paid courses. It adopts a development model of offering free introductory courses and expanding into paid courses. The platform also provides professional teaching teams to adjust content as needed. The assistant team enhances the learning quality, and leveraging market insights improves the market applicability of talent cultivation. The following are several innovative advantages:

Firstly, in-depth student engagement and rapid iteration: Through assistants' deep interaction with students, real-time communication and clarification occur during the teaching process, enabling immediate acquisition of user feedback. This serves as the basis for timely updates and iterations of teaching materials and courses.

Secondly, flipped classroom and tiered assistants: Establishing a tiered assistant system divides the assistant team into three levels: basic, intermediate, and advanced. Excellent students with outstanding performance join the basic assistant team to assist with simple queries. More complex student issues are escalated through the levels of assistants, ensuring tracking and Q&A tailored to the difficulty level, enhancing the targeted nature of teaching guidance.

Thirdly, modular learning for swift results: Creating content barriers by combining case-based teaching with functional module teaching. The team uses internally developed outstanding projects as teaching cases, unfolding module-based learning in a storytelling manner. The learned content focuses on specific code for implementing functional modules, departing from traditional linear learning (mechanical teaching according to developer documentation). This approach forms a mesh of knowledge points in the small program, enhancing learning and development efficiency.

### 4.3.2. Online Course Development

In terms of online course development, we have offered multiple courses on MOOC platforms, Bilibili, NetEase Cloud Classroom, etc., for university students to study, including courses like "WeChat Mini Program Development from Entry to Practice," "Advanced Language Programming Design," and "C Language." Using the DouDou Cloud Assistant developed by students as a case study, we developed an online video course for WeChat Mini Program development, receiving support from the Ministry of Education's collaborative education project. After the course was launched on NetEase Cloud Classroom, we gradually recorded our own teaching videos, ensuring three hours of updates every Sunday. There are a total of 61 teaching videos, with a duration of 8.4 hours, covering 10 teaching chapters. Currently, the cumulative enrollment on NetEase Cloud Classroom has exceeded 6,000. In April 2019, the course was launched on China University MOOC and became the first WeChat Mini Program course on China University MOOC. It has been offered

three times, with over 60,000 cumulative enrollments, receiving accolades such as the first-class online course in Zhejiang Province and the first prize for provincial outstanding MOOC, achieving fruitful results. Additionally, we actively collaborated with Tsinghua University Press. The books "Learning WeChat Mini Program Development on the Fly - Micro Course Video Edition" and "Statistical Decision Methods and Applications" have been published.

### 4.3.3. Offline Course Development

In terms of offline course development, we are committed to providing comprehensive online and offline courses and building distinctive offline communication communities, truly creating an efficient, intelligent, and mutually beneficial educational closed-loop system. Currently, we have offered WeChat Mini Program development courses on campus, serving as elective courses for the 2017 and 2018 batches. The course is also established as a general elective course, open to all students and faculty interested in development technology. The cumulative enrollment has exceeded 600 people, receiving widespread acclaim.

### 4.4. Platform Business Model

The "Golden Course" series of classroom teaching products have tremendous market potential. Currently, we adopt a development model with basic services offered for free and value-added services for a fee. In the initial stage, we emphasize providing free services for public welfare to teachers and students. Multiple high-quality teaching courses have already been released on platforms such as NetEase Cloud Classroom and Bilibili, available for free learning by university students. When a sufficiently large customer base is accumulated, we will introduce charges for specific functions and courses. Simultaneously, we will activate advertising to attract advertisers and utilize the flow of traffic. In the later stage, we will gradually move towards commercialization, continuously increasing the proportion of premium teaching content. We will also adopt a platform cooperation approach for promotion, seeking influencers on platforms like Xiaohongshu and TikTok to expand market share further. This project adopts a multi-channel knowledge monetization approach for profitability, specifically categorized into five major segments: Course Fees, Textbook Sales, Institutional Cooperation, Forum Development, and Internal Development.

### 4.4.1. Course Fees — Customized Knowledge Payment Services

After attracting more talent through free courses, we will enter the advanced paid course phase. We will charge for selected premium content on platforms like NetEase Cloud Classroom, transforming knowledge into products or services. Simultaneously, through one-on-one assistance from the assistant team, we will charge extra for tutoring. This model not only encourages the production of high-quality content but also realizes the commercial value of "Golden Courses."

### 4.4.2. Textbook Sales — Selling Collaboratively Produced Matching Textbooks

In the textbook sales section, through collaboration with Tsinghua University Press, team members will contact teachers and graduate students to co-publish textbooks on WeChat Mini Program development. This collaboration aims to obtain publishing fees and sales profits. We will continuously update textbooks to achieve rapid iteration and updates of teaching content.

### 4.4.3. Institutional Cooperation — Jointly Cultivating New Technology Development Talents

Through collaboration with educational institutions, we will promote and publicize their courses

among the user base, earning income from advertising fees and referral fees (fixed income for advertising and additional revenue for successful student enrollment). Meanwhile, we collaborate with enterprises like Danei to enhance talent cultivation models and offer customized projects for talent development. By feeding back the latest technological demands of the market into our courses, we ultimately explore a talent development model where the operation is primarily led by startup companies, facilitating rapid iteration and updates of teaching content [10].

### 4.4.4. Learning Forum — Online Community Comprehensive Service Sales

Drawing inspiration from SDNLAB and CSDN, we will create a website or a Mini Program to integrate the entire system. This will establish a community that combines course learning, Mini Program development, and forums. Through this platform, we will charge relevant advertising fees and service fees, nurturing a high-quality social community and enhancing the convenience of learning resource sharing.

### 4.4.5. Internal Development — Development Team Undertaking Outsourced Projects

We will establish an internal development department, allowing student development teams to undertake outsourced Mini Program development projects. This approach aims to secure funds for continuous improvement of teaching content and provide case support. We will offer low-priced Mini Program templates or customize Mini Program development for clients, ensuring profitability.

## 5. Conclusion and Outlook

### 5.1. Conclusion

This platform focuses on cultivating talents for the new era of the internet and the construction of intelligent education. It is committed to providing online learning platforms and practical opportunities for programming learners, fostering entrepreneurial abilities in university students. Centered around the recording of programming language videos and the writing of textbooks, we have initiated the construction of high-quality courses in universities. This allows a broader audience to access courses related to programming and big data development. Consequently, we aim to create a new technology compound talent intelligent learning platform based on personalized learning. The core advantages of this platform include:

Firstly, team teaching for mutual cooperation. We have assembled a teaching team comprising teachers and assistants. This team independently creates new teaching materials, records videos, develops project source codes for teaching, and regularly organizes learning records. Continuous improvements are made to teaching based on feedback.

Secondly, industry-academia cooperation for collaborative education. We have established a complete business closed-loop model that ensures sustainable development. In addition to training internet application-oriented talents with a professional teaching team, we have strengthened students' practical experiences through collaboration with companies, providing outsourcing services and generating profits.

Lastly, student-oriented technology with a focus on practicality. We emphasize dual reconstruction of theory and practice, encouraging students to engage in technological innovation. The goal is to ensure students not only master theoretical knowledge but also complete the development of practical projects. Adhering to the principle of prioritizing practice, over 130 undergraduate students have formed 75 teams for small program development, participating in the university's WeChat Mini Program development competition. Fourteen teams received awards, showcasing commendable achievements. In addition, the introduction of courses such as C language and principles of

communication has significantly elevated students' professional knowledge. Students independently undertake tasks such as designing small programs, conducting big data analyses, and engaging in autonomous programming to cultivate their innovative and analytical thinking. This hands-on experience contributes to genuine understanding, fostering the growth of students through practical application.

## 5.2. Outlook

In the future, we will further explore how to transition the system from "initial exploration" to "deep integration." We will coordinate big data in the learning, teaching, and management processes, establish an education data warehouse, promote the interconnected sharing of educational data, and form an educational brain. We will comprehensively advance data integration and interoperability, establish data application and analysis models for students, teachers, and schools, and use digital learning tools and resources to shape the future of educational practices. We hope to contribute, to some extent, to the progress of "smart universities" and "smart campuses."

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