



# Research on the Practical Path of Building Smart Courses of Economics in the Context of Educational Digitization

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**Abstract.** Under the wave of “Artificial Intelligence + Education”, the digital transformation of education is accelerating, and the construction of economics smart courses has become a key hand to improve the quality of economics teaching. Currently, economics courses are facing problems such as difficulty in connecting the construction of knowledge system with fragmented content, difficulty in transferring knowledge and transforming abstract theories, and difficulty in adapting personalized learning needs and large-scale teaching. It is particularly important to explore scientific paths to construction. Constructing a closed-loop system oriented to course objectives, precisely guiding the design of teaching activities through the course objectives, diversifying the teaching evaluation throughout the teaching activities, and feeding back the optimization of the objectives through intelligent analysis of the evaluation results to form a dynamic iterative mechanism. At the same time, a synergistic model of the Five Star Teaching Method and ICAP Theory has been adopted for the practical aspects of teaching. By focusing on the core aspects of teaching activities such as context creation and task-driven, thus emphasizing the depth of interaction and cognitive level of student participation, the combination of the two can effectively stimulate in-depth learning and higher-order thinking, empowering blended teaching scenarios. Practice shows that the path realizes precise landing of teaching objectives, data-driven teaching process, and significant optimization of learning experience, significantly improves the effectiveness of blended teaching, and provides a feasible paradigm for the digital transformation of economics education.

**Keywords:** Digitalization of Education, Smart Education, Pathways to Practice, TOPCARES-CDIO, Five Star Pedagogy, ICAP Theory, Economics Curriculum

## 1 Introduction

In recent years, the enormous potential contained in digital technology is being fully unleashed, and advances in artificial intelligence technology, in particular, have brought new opportunities and challenges for reshaping the shape of education and promoting innovation and development. In 2023, General Secretary Xi Jinping emphasized

during the fifth collective study of the Political Bureau of the CPC Central Committee that “the digitization of education is an important breakthrough for China to open up a new track of education development and shape a new advantage in education development.” The Department of Higher Education of the Ministry of Education released “Artificial Intelligence Leads the Development of Digital Innovation in Higher Education” in March 024, which pointed out that accelerating the innovative application of artificial intelligence in higher education requires deep-level changes in the concept of parenting, the path of education, teaching mode, learning paradigm, and evaluation mode, and shaping the “Intelligence +” higher education New Ecology. The center of gravity of training should be changed from “learning knowledge” to “strong ability”, teaching should be changed from “teacher-student interaction” to “teacher/student/machine” deep exchange, and students should be changed from “passive learning” to “independent learning”. Teaching should change from “teacher-student interaction” to “teacher/student/machine” in-depth exchange, and students should change from “passive learning” to “independent learning”.

Combined with the actual situation of education in China, domestic scholars study the in-depth integration of digital tools with economic and management courses, analyze in-depth the connotation, characteristics and constituent elements of the smart classroom at the theoretical level, and explore the teaching design and evaluation methods. In practice, we have extensively researched its application in different disciplines and educational fields, and developed technical support tools such as AI-based personalized learning systems to provide innovative teaching solutions for the education industry. In terms of defining the stages of digital education, Wu Yan, Vice Minister of Education, believes that the digitalization of education is divided into three stages: transformation, transformation and wisdom[1]. Zhu Zhiting and others[2,3] believe that wisdom education is the advanced form of education, leading the digital transformation of education, endowing education with intelligent environment, intelligent pedagogy and intelligent evaluation, and promoting the new ecological needs of education. Chen Zejun and others believe that smart education breaks the constraints of traditional education and combines advanced technologies such as virtual reality and artificial intelligence to provide students with more learning resources, tools and scenarios to enrich their learning experience, as well as providing teachers with a wealth of teaching tools and platforms to promote educational innovation and change[4]. The integration of AI technologies with curriculum development and the application of large-scale teaching and learning are key to achieving intelligent change in higher education[5].

As the core carrier for cultivating applied talents in the field of economy and management, economic and management courses are facing urgent reform needs. The traditional teaching mode based on knowledge inculcation is difficult to adapt to the requirements of cultivating talents' ability in the digital era. There is an urgent need to reconstruct the curriculum system and teaching mode by relying on digital technologies such as artificial intelligence and big data to realize the “result-oriented” ability cultivation goal. We strive to build a teaching scenario of “human-computer collaboration”, strengthen students' higher-order abilities in business data analysis, intelligent decision-making and cross-border collaboration, fully stimulate students' motivation to learn in-

dependently, and enable them to practice their practical ability to solve complex problems in the simulated economic environment, so as to effectively respond to the requirements of the national digitalization development strategy for the cultivation of talents in the field of economics and management. For this reason, this paper takes the economics course as an example to analyze and study the construction path of course wisdom, introducing the wisdom course practice path, teaching practice and promotion effect.

## **2 Practical Paths for Building Smart Courses**

Talent cultivation program is a top-level design, which sets overall cultivation objectives that need to be decomposed into each course to form specific course objectives. The course objectives are the refinement and landing carrier of the talent cultivation program, so that the overall goal has a specific path that can be operated and achieved. Teaching and learning activities are the core means to achieve the objectives of the curriculum, and the design of targeted teaching and learning activities is needed to achieve the objectives of the curriculum, which is a key process for the implementation of the talent training program. Teaching evaluation, on the other hand, is an important part of testing the effectiveness of teaching activities, guaranteeing the achievement of course objectives and providing feedback on the rationality of talent training programs.

In summary, the course teaching process model is the course objectives - course content - learning situation analysis - teaching mode - teaching support platform - digital teaching resources - intelligent design of teaching activities - digital design of teaching evaluation - teaching objectives, forming a closed-loop system in which the course objectives guide the teaching activities, the teaching activities receive teaching evaluation, and the evaluation results feed back the teaching objectives.

## **3 Building Wisdom in Economics Courses**

Economics is a core basic course for economics and management majors, opened in the second semester of the first year, the examination course, the course is based on the framework of modern western economic theory, organically integrating the latest achievements of socialist market economy theory with Chinese characteristics, and systematically constructing a knowledge system covering the two modules of microeconomics and macroeconomics.

### **3.1 Determination of course objectives**

The talent cultivation programs formulated by the majors of Harbin Institute of Information Engineering take the OBE concept as the core, combine with TOPCARES-CDIO education and teaching concepts, and define the primary, secondary and tertiary indicators, forming a complete talent cultivation indicator system.

CDIO (Conceive-Design-Implement-Operate) education concept is an important milestone in the reform of engineering education, the core of which lies in the close integration of practical and theoretical education, focusing on industry-academia cooperation, in order to enhance the competitiveness of the students in the workplace and their innovation ability[6].TOPCARES represents eight Level 1 Competency Indicators, which reflect the comprehensive competencies of students, and the TOPCARES-CDIO Level 1 Competency Indicator System, as shown in Table 1[7].The system breaks down the talent cultivation objectives layer by layer and implements them in each course, project and practical training to ensure that all teaching activities and links can effectively support the development of students' knowledge, ability and quality.

**Table 1.** TOPCARES-CDIO Level 1 Capacity Indicator System

write characters in simplified form	Level 1 capacity indicators
T	Technical knowledge and reasoning
O	Open thinking and innovation)
P	Personal and professional skills
C	(Communication and teamwork
A	Attitude and manner
R	Responsibility
E	Ethical values
S	Social contribution by application practice-CDIO

The course objectives are both a criterion for judging whether the teaching and learning activities of the course have achieved the expected results and a key indicator of the competencies that support the talent cultivation program[8].In this paper, we take the TOPCARES part of the competency indicators supported by the economics curriculum as an example, and get the relationship between the curriculum and the professional competency indicator support, as shown in Table 2.

**Table 2.** Relationship between programming fundamentals courses and professional competency indicators

Objective category	First-level indicators	Second-level indicators	Third-level indicators	Degree of course support
knowledge objective	3. Basic Theory and Methodology	3.1 Specialized basic knowledge	3.1.1 Basic knowledge and theory of economics	H
	4. Open-mindedness and innovation	4.1 Logical thinking skills	4.1.1 Analyzing and evaluating socio-economic phenomena	H
4.2 Critical thinking skills		4.2.1 Making rational judgments about economic phenomena	H	
4.3 Capacity for change and innovation		4.3.1 Innovative capacity for new knowledge and skills and lifelong learning	L	

	5. Individual professional competence	5.1 Integration of theoretical knowledge and practical application	5.1.1 Solutions and recommendations	M
			5.1.2 Problem identification and formulation	M
	7. Communication and Teamwork	7.1 Communication skills	7.1.1 Written writing	M
			7.1.2 Interpersonal communication and division of labor	M
<b>quality objective</b>	1. Values	1.1 Personal values	1.1.2 Virtuous and trustworthy, diligent in thought and action	L

As shown in the above table, the course support level represents the degree of support for the three levels of objectives in the economics program, with H indicating high support, M indicating medium support, and L indicating low support.

The objective categories then categorize the first-level indicators into knowledge, competence and literacy, with the knowledge objective corresponding to basic theories and methods;The competence objectives correspond to open thinking and innovation, personal professionalism, communication and teamwork;The quality objectives correspond to the values, which provide guidance for constructing three-step progressive teaching modules, creating intelligent teaching methods, and diversifying teaching evaluation.

### 3.2 Course Content Objectives and Instructional Activity Pathways

Tertiary Competency Indicators reflect the manifestation of a particular type of knowledge or competency in student learning outcomes, and different educational content corresponds to different Tertiary Competency Indicators, which provide a guide to the optimal path of development. Based on the three-level competency indicators and support information, this paper identifies the course content, expected learning outcomes, and the main teaching activity paths, taking into account the content and characteristics of the economics course, as shown in Table 3.

**Table 3.** Relationship between ability indicators and training paths

serial number	Content Expected Learning Outcomes	Tertiary capacity indicators	Cultivation path
1	Understanding the study of economics, its systems and research methods	3.1.1 Basic knowledge and theory of economics	Reached through pre-class task points, classroom participatory learning, and post-class exercises
2	Understanding microeconomics “one center, two subjects, two markets”	3.1.1 Basic knowledge and theory of economics	Reached through pre-class task points, classroom participatory learning, and post-class exercises

3	Understanding Macroeconomics Economics Policy Regulation Macroeconomic Operations, Economic Growth, Full Employment	3.1.1 Basic knowledge and theory of economics	Reached through pre-class task points, classroom participatory learning, and post-class exercises
4	Demonstrated ability to apply knowledge to solve real-world problems	5.1.1 Solutions and recommendations	Reached through the introduction of cases, classroom seminars, etc.
5	Demonstrated ability to observe, analyze and interpret economic behavior and economic phenomena	5.1.2 Problem identification and formulation	Reached through case introduction, classroom seminar, and post-class research
6	Demonstrated ability to analyze and evaluate	4.1 Logical thinking skills	Achieved through team project-based assignments, case studies, etc.
7	Developing economic thinking, higher order thinking skills	4.2 Critical thinking skills	Achieved through team project-based assignments, research and analysis, and higher-order competency development.
8	Developing the ability to acquire new knowledge, skills and methods	4.3 Capacity for change and innovation	Reached through case studies, access to information, and higher-order competency development
9	Developing report writing, communication and teamwork skills	4.1.3 Written Communication & 4.1.6 Oral and Interpersonal Communication	Reached through writing lab reports, group discussions, and problem solving sharing
10	Cultivate integrity, truthfulness, thoughtfulness and agility	1.1.2 Being virtuous and trustworthy, thinking hard and acting keenly	Reached through pre-class task points, class participation, and homework completion

### 3.3 Situational Analysis

Learning situation analysis is the “starting point” and “basis” of teaching activities. Teachers, before, during and after teaching, systematically collect, organize and analyze the relevant information of students to comprehensively grasp the students' learning foundation, cognitive characteristics, learning needs, individual differences, etc., so as to provide strong empirical support for the setting of teaching objectives, selection of teaching content, design of teaching methods, deployment of teaching resources and subsequent evaluation and feedback. This will provide strong empirical support for the setting of teaching objectives, the selection of teaching content, the design of teaching methods, the deployment of teaching resources and the subsequent evaluation and feedback. The analysis of learning situation is not only the starting point of teaching design, but also the basis for dynamic adjustment throughout the whole teaching process, which is a solid foundation for the implementation of the educational concept of “student-centered” and the realization of accurate teaching and efficient learning. The course team summarized and condensed the urgent problems of the economics course by talking to 152 students who started the course this semester, distributing questionnaires and analyzing learning data:

#### 1. Difficulty in bridging knowledge system construction and fragmented content

Under the traditional teaching mode, the knowledge framework is often presented in the form of chapters, which makes it difficult for students to establish a complete logical

closed loop, and their understanding and mastery of the theoretical knowledge of economics only remain in the derivation of formulas and the memorization of basic concepts and principles. In order to cope with the examination, many students usually adopt fragmented, mechanical instantaneous memorization, and lack of overall grasp of the theoretical system of economics, students fall into the cognitive dilemma of “only seeing the trees but not seeing the forest”.

#### 2. Ability to transfer knowledge and difficulty in transforming abstracted theories

The traditional economics teaching mode focuses on the completeness of the theoretical system and weakens the transformation of theoretical knowledge into practical scenarios due to the limited class time. Unidirectional knowledge inculcation mode inhibits students' active thinking, case discussions, project-based assignments also stay on the surface of the analysis, failing to build up a “theoretical framework - real-world problems - solution strategies” of the complete chain of thinking, which ultimately leads to the learning process into the cycle of mechanical memorization and passive acceptance.

#### 3. Difficulty in matching personalized learning needs with scaled instruction

Under the traditional large-class teaching model, teachers can hardly take into account the students' differentiated knowledge reserves, interests and cognitive levels, and the unified teaching content and progress often lead to indigestion of knowledge for students with a weak foundation, while students with an active mind are stuck in the state of “not getting enough to eat”. This mismatch between supply and demand not only inhibits students' learning effectiveness and creative potential, but also makes it difficult for the teaching and learning process to realize the goal of “teaching students according to their aptitude”.

### 3.4 Intelligent Teaching Model

#### 1. Constructing a three-step progressive teaching module

Based on Bloom's theory of categorization of educational objectives, constructing a three-stage progressive module of “basic theory-application practice-expansion and innovation”. The grounded theory module helps students develop a structured cognitive framework through the teaching of economic concepts and principles, the parsing of models, and the use of tools; The applied practice module accomplishes the leap from knowledge understanding to problem solving with the help of case studies, classroom seminars, economic decision-making simulation experiments and other practice vehicles; Expanding the innovation module to carry out more comprehensive project-based assignments, seminars on hot economic frontiers, and interdisciplinary innovation and entrepreneurship project design, so as to promote students to “create new knowledge” from “challenging the existing paradigm”, and realize the qualitative leap in cognitive ability.

#### 2. Creating intelligent teaching methods

Relying on the Super Star platform to realize the “data-driven-individualized pathway-real-time feedback” intelligent teaching closed-loop, the in-depth integration of the five-star teaching method and ICAP theory, forming a dynamic adaptive teaching model. Through the platform module, we set up tasks such as video watching, pre-class

quiz, pre-class discussion, etc. to complete the “Focusing on Problems” and “Activating Old Knowledge” sessions; Based on the knowledge points, the system dynamically pushes the extended learning resources; in classroom teaching, the theoretical explanation combined with the ICAP theory designs interactive tasks to “demonstrate new knowledge” and “apply new knowledge”. Through classroom interaction data, we can grasp the status of students’ “application of new knowledge”; At the end of the lesson, comprehensive project assignments are designed, and the analysis reports submitted by students are reviewed by AI to recommend scores and the teacher’s review and evaluation to generate comments and suggestions to promote in-depth learning in the stage of “integrating new knowledge”.

### 3.5 Construction of Digital Teaching Resources

#### 1. Digitalization and Intelligentization of Teaching Resources

The course team has built four online resource modules on the SuperStar platform: Knowledge Mapping, AI Case Discussion Library, AI Pre-Course Quiz Library, and Civic Mapping. Create knowledge mapping knowledge points, correlate knowledge points, and set up key points, test points, difficult points, and course contemplation points. Upload videos Teacher team self-recorded boutique class videos, course teaching PPTs, economics animation videos, create online question bank + AI pre-course test questions, post case discussion topics, post-course practice questions and other resources. We help students develop personalized learning through the dismantling of course content, combing of knowledge points, videos and exercises related to knowledge points, and expanded learning resources.

Through the diagnosis of learning conditions on the Super Star platform, we can realize accurate profiling before class, dynamically generate the three-stage learning path of “Foundation Strengthening - Ability Progression - Innovation Breakthrough” based on the knowledge map, and collect students’ interactive data and learning performance in real time during the class, so as to adjust the teaching strategy; Relying on the AI learning companion system to provide 24-hour personalized tutoring after class, it realizes a new paradigm of intelligent classroom in the form of closed-loop design, which is “intelligent diagnosis before class - dynamic tuning during class - expansion and innovation after class”.

#### 2. Digital design of teaching activities

At the heart of the digital design of a course lies the clarification and quantification of pedagogical activities. In online and offline blended teaching, students’ online learning activities need to be planned systematically, such as the setting of pre-course task points, the watching of videos, the learning of documents, the completion of pre-course tests and discussions, and other contents. Offline classroom activities, classroom quizzes, group workshops, case studies, graphical analyses, and robocalls are set up. Each activity should be clearly defined with its name, description, scoring criteria and applicable scenarios. And these activities are configured on the SuperStar platform to support data collection during the teaching and learning implementation, as shown in Table 4.

**Table 4.** Digital definition and quantification of teaching activities

serial number	educational activity	clarification	Classroom Performance Score	Applicable Scenarios
1	lectures	Offline teaching, the explanation of the key points and difficult points, through the introduction of examples and questions, online students task points to complete the situation to grasp the learning situation, focusing on answering the students do not understand the place, and online video to complement each other.	None	Classroom instruction, review sessions, key points and difficult points in knowledge
2	graphical presentation	The teacher teaches and analyzes theory, combining textual representations and graphics, and the students draw and understand graphics. The teacher then proceeds with deduction, analysis and summarization and enhancement.	None	Theoretical analysis and drawing of graphs with some difficulty
3	Learning Feedback	Before the main class, students are randomly selected on the Super Star platform to answer questions or to draw and analyze classroom blackboard graphics, to quickly understand the students' pre-study situation and mastery of learned knowledge points, and to give the correct guidance and answers.	The Super Star platform records the completion of students' pre-study, and the completion of all pre-course task points is calculated according to 100 points, while the incomplete items are discounted according to the proportion of the corresponding points.	Pre-Lesson Task Points or review old knowledge before class
4	ask questions	Create questions based on the content of the course, students answer voluntarily, randomly name students, and name students with a low number of points based on classroom performance points.	Voluntary answers and correct answer ideas +2 points, part of the answer +1 point; random roll call, points less roll call, correct answer ideas +1 point, no answer or incorrect, no extra points;	Classroom teaching questioning and interactive sessions
5	Grab and go, voting, questionnaires	Pre-set before the class some rob, voting, questionnaires and other issues to mobilize the classroom atmosphere. Is the students prefer to participate in the link, interspersed throughout the lesson.	According to the question, snatch a question correctly +1 point, participate in the voting, questionnaire students +1 point	Classroom teaching questioning and interactive sessions
6	Case Study	Teachers integrate cases into the classroom by citing videos, economic and social hotspots, economic policies, daily social and economic phenomena, etc. Teachers conduct the introduction and narration of the cases, students think about them, teachers can inspire and guide them according to the actual situation, students explain their thoughts, summarize and analyze them, and test the mastery and application of knowledge.	3 points for correct thinking + innovativeness; 2 points for clarity of thought and fluency of presentation; 1 point for a partially correct answer	Classroom seminars, group discussions
7	Problem solving and sharing	to summarize and analyze the practice topics, students present and analyze on the blackboard,	Correct thinking and clear presentation +2 points	For book examples, superstar practice

		classmates evaluate each other to point out problems, and classmates explain and interact with each other.		exercises, class exercises
8	panel discussion	The members of the study group discuss fully, and after each group has formed a unified opinion, the teacher then randomly selects any member of certain groups to answer.	No problem with the thought process +2 points for the whole group	Ask some more challenging questions, interactive learning
9	Competency Development	According to the team to complete the research report on consumer behavior, the group to design the questionnaire, the search for information, the analysis of the results of the research, the countermeasures put forward, the production of PPT for reporting; individual production of economics video, the use of a certain theory and knowledge of the economic phenomena around the dissection.	3-6 points depending on team completion Varies	Organize a midterm and a final

### 3.Data-based design for intelligent evaluation

Economics course assessment combines process and outcome assessment, online and offline assessment, and AI evaluation and teacher evaluation.Using assessment to prompt students to complete online tasks and actively participate in offline teaching, multi-dimensional and all-round exercise of students' independent learning ability, problem analysis ability, AI dialogue ability, practical innovation ability and teamwork spirit, with the help of the Super Star platform can be carried out in the process of student assessment data statistics.

$$Course\ grade(100\%) = 30\% \text{ regular grade}(10\% \text{ classroom performance} + 40\% \text{ pre-class assignment points} + 30\% \text{ post-class assignments} + 20\% \text{ team assignments}) + 70\% \text{ final exam} \quad (1)$$

$$Pre - class\ task\ points\ 40\% = document * 5\% + video * 25\% + pre - classquiz * 5\% + discussion * 5\% \quad (2)$$

$$Final\ exam\ 70\% = final\ closed\ book\ exam\ 60\% + economics\ mini\ lecture\ 10\% \quad (3)$$

### 3.6 A Pathway Model for Building Smart Courses in Economics

The logical mapping relationship from the space of curricular goals to the space of teaching and learning activities constitutes the model of a smart curriculum, which is realized through the activity of building curriculum intelligence.The essence of the practical path of smart course construction is the logical mapping process from course objectives to teaching activities. When the data of teaching activities are inputted, the smart education platform can provide real-time statistics on the achievement of each sub-objective of the course, and help teachers optimize the teaching program based on the feedback data.

## 4 Teaching Practices in Economics Courses

The economics course has deeply integrated artificial intelligence tools into classroom teaching, and through the synergistic application of “Five Star Teaching Method” and “ICAP Theory”, the effectiveness of blended teaching has been significantly improved (Figure 1).

The five-star teaching method, a teaching theory advocated by contemporary scholar Prof. Merrill, involves placing specific teaching tasks in step-by-step problem-solving situations to accomplish them, i.e., presenting the problem first, then teaching to each specific task, and then demonstrating how to apply the specific knowledge gained to solving the problem or completing the overall task. Teaching activities are organized in five aspects: focusing on the problem, activating old knowledge, demonstrating new knowledge, applying new knowledge, and integrating new knowledge[9], integrating advanced information technology, hybrid assessment and evaluation system, and carrying out moral education and course politics through the teaching process, enhancing teacher-student interaction, creating a good classroom learning atmosphere, and combining theory and practice. The combination of theory and practice can achieve the teaching effect of comprehensively improving knowledge, ability and quality.

ICAP Learning Styles Taxonomy is an innovative learning styles taxonomy proposed by Michelene T.H. Chi, a professor at Arizona State University, a renowned scholar of educational psychology in the U.S. It provides a clear definition of cognitive engagement activities from an operational point of view and classifies different knowledge change processes and learning outcomes into four types of learning styles based on the learner's outward activities, degree of engagement, and so on. , the degree of participation, etc., to classify different knowledge change processes and learning outcomes, into four learning styles: Interactive, Constructive, Active and Passive. Relevant studies have shown that these modalities are decreasingly effective for learning activities, with higher levels of participation leading to greater learning ability[10]. At the same time, different learning styles bring about differences in changes in knowledge, i.e., differences in the “cognitive processes” that trigger learning effects[11]. Corresponding to the four learning styles of passive, active, constructive and interactive, the process of knowledge change is respectively: storage → integration → inference → collaborative inference; and the result of knowledge change is respectively: memorization → application → transfer → co-creation[12].

In this paper, the teaching tasks are designed according to the five-star teaching method, and the smart classroom is divided into three phases: “before class”, “during class” and “after class”. Pre-course online teaching, teachers focus on the problem of releasing pre-course task points, students use fragmented time, relatively personalized and independent space to learn knowledge independently, knowledge memory and understanding, this stage is a shallow learning stage for students, learning participation is relatively low overall.

In the offline classroom during the lesson, the teacher, based on the learning situation, warms up the old knowledge, teaches and shares the new knowledge, and clears up any unresolved questions, and the teacher provides personalized guidance through-

out the lesson. Students use concentrated class time and collectivized space for collaborative learning, where students share knowledge and ideas, solve their own doubts in a mutually supportive way, deepen, apply and integrate their knowledge and knowledge, and enhance their confidence in the possibility of completing the learning tasks as well as their expectations of the learning outcomes. This stage is a deep learning stage for students, where learning takes place both constructively and actively, and is dominated by constructive learning, which is more often reflected in the depth of both cognitive and behavioral engagement, with an overall high level of learning engagement.

At the stage of integrated practice after school, the SuperStar platform is used to keep statistics on students' learning data, and AI teaching assistants are available 24 hours a day to accompany students in their studies, expanding and answering questions about their knowledge. Offline teachers assign project-based team assignments, group students brainstorm, AI-assisted, division of labor, conduct research activities, access to information, organize and analyze, form a research report, make a PPT and report. The teacher carries out personalized guidance throughout the process, enhances teacher-student, student-student, teacher-student-machine interactions, and establishes diversified interaction paths through exchanges and feedbacks, which makes interactive learning more high-quality and efficient, and provides instrumental support and environmental safeguards for improving students' behavioral, emotional and cognitive participation.

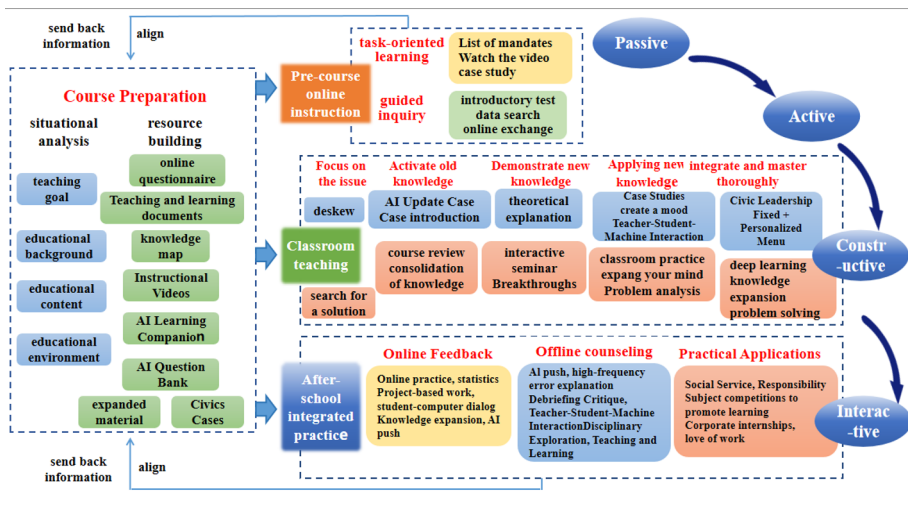


Fig. 1. Teaching Process Design for Smart Classroom in Economics

The Five-Star Approach provides clear steps for teaching and learning, while the ICAP theory provides a scientific basis for optimizing how students learn. By combining the five-star pedagogy with the ICAP learning taxonomy, it is possible to take into account the structured process and the enhancement of student engagement in the instructional design, which not only enhances students' learning interest and engagement,

but also effectively promotes in-depth understanding and transfer of knowledge and application, so as to achieve more efficient teaching goals.

Since the implementation of smart course construction in economics, the teaching quality of economics courses in Harbin Institute of Information Engineering has improved significantly compared to last year (Figure 2). Teaching practice shows that the course has effectively stimulated classroom vitality through the innovative mode of “Artificial Intelligence+Education”, and the data on the Super Star platform shows that students' classroom participation, knowledge mastery and comprehensive application ability have been significantly improved. The blended teaching mode effectively activates students' sense of independent learning and promotes students to realize the cognitive transformation from passive acceptance to active exploration.

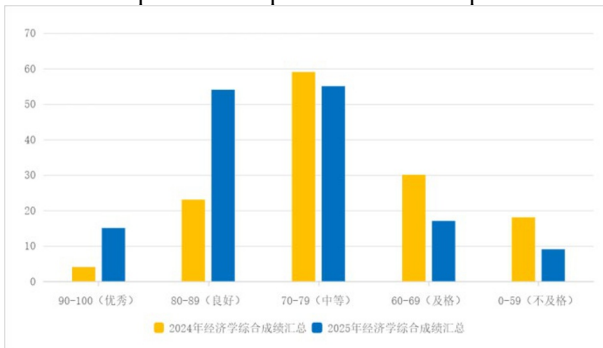


Fig. 2. Comparison of economics scores in 2024 and 2025

## 5 Conclusion

This paper provides an in-depth analysis of the practical path to wisdom in economics courses based on the logical mapping of course objectives to teaching activities. In Harbin Institute of Information Engineering to promote a year found that the path is operable, teaching effect is significant, but also to the recognition of many teachers. However, this approach also has some limitations: the TOPCARES-CDIO educational model may be difficult to apply directly to schools that have not adopted this model. Establishing a cross-school action research community and implementing synchronous classrooms, teacher workshops, joint teaching and research, and other approaches can enable synchronous application across different locations; The Five-Star Teaching Method is integrated with the ICAP Learning Taxonomy to transform students' learning approach from “passive” to “active.” An iterative “two-layer script” teaching plan is developed, which retains the integrity of the Five-Star Teaching Process while embedding ICAP scaffolding and data tracking points into tasks, activities, and evaluations, thereby achieving closed-loop optimization from design to implementation; Based on platform data statistics and integration, due to the lack of personalized data statistics, some teaching activity data requires manual migration, integration, and analysis by teachers, which affects the comprehensiveness and accuracy of teaching data. We will

further strengthen the construction of personalized data collection and analysis capabilities for teaching data, promote deep integration between the platform and teachers' teaching behaviors, and achieve automatic aggregation, intelligent integration, and precise analysis of process-based and outcome-based data. This will enhance the comprehensiveness, accuracy, and interpretability of teaching data, providing reliable support for precise teaching, personalized instruction, and teaching improvements.

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## References

1. WU Y. Digitalization is a strategic issue that affects and even determines the high-quality development of higher education[EB/OL]. <https://mp.weixin.qq.com/s/30rQ6EveXW-PIR9f9XXEWNg>.
2. ZHU Z T, HU J. The practical path of smart education leading the digital transformation of education[J]. *Basic Education in China*, 2023(1):29-32.
3. GUAN Y Q, SUN Y B, ZHU Z T. Research on data-inspired teaching decision-making in a smart classroom environment[J]. *China Educational Technology*, 2019(2):22-28, 42.
4. Guo SJ, Chen Zejun, Han Yongli. Problems and initiatives in the process of promoting wisdom education reform in higher education [J]. *Higher Architectural Education*, 2025, 34(4):13-18.
5. Li Heng, Huang Lu, Wu Xiaozhi. Path exploration of artificial intelligence-enabled higher education: practice and inspiration of Chongqing University [J]. *Higher Architectural Education*, 2025, 34(2):1-9.
6. PAN Yiting, PAN Xiuqiang, QIAN Dongyun et al. Exploration and practice of industry-teaching integration talent cultivation mode of software technology major under CDIO concept[J]. *Software Engineering*, 2019, 22(1): 60-62.
7. Li Xue, Hu Bing. Analysis of the teaching reform of electronic process internship based on TOPCARES-OBE[C]// Lifelong Learning Professional Committee of China College and University School-Owned Industry Association. Proceedings of the Fourth Academic Symposium on Innovation and Development of Educational Information Technology. Liren College of Yanshan University; Qinhuangdao Institute of Industrial Vocational Technology, 2025:286-290.
8. Qin Fudian, Li Jing, Zhou Fuken. Research on the practical path of curriculum digitalization construction in the context of smart education [J]. *Software Guide*, 2025, 34(2):1-9.

9. Zhang, Wen-Diem. Research on the application of five-star teaching method in course teaching [J]. Accountant ,2021(10):113-115.
10. Sheng Qunli, Ding Xu et al. Participation is Competence: A Review and Value Analysis of the ICAP Taxonomy of Learning Styles[J]. Open Education Research, 2017, (02).
11. Sheng Qunli, Ding Xu. " Evidence-based research on ICAP taxonomy of learning styles [J]. Journal of Wuhan University of Science and Technology (Social Science Edition), 2018, (02).
12. Cui Jia, Ding Zhangxin, Wang Haixu. A study on the improvement of learning engagement in flipped classroom based on ICAP theory [J]. China Adult Education, 2021, (23): 51-56.

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