Journal of Landscape Research 2025, 17(4): 79-82

Pathways and Practical Exploration in Smart Course Development for Higher Vocational Colleges: A Case Study on Study Tour Course Design

YANG Qiong[1], ZHAO Yuxia[2], SUN Yuejiang[1], LI Hua[1]

(1. Qingdao Preschool Education College, Qingdao, Shandong 266318, China; 2. Superstar Group Limited, Beijing 100080, China)

Abstract A "smart course" denotes a learner-centered curriculum model that deeply integrates advanced technologies, including generative artificial intelligence (AI) and big data analytics, with ongoing optimization and iterative refinement. This paper examines the pathways of smart course development in higher vocational education by using the Study Tour Course Design course as a practical case study. The analysis is conducted from four perspectives: innovation in educational concepts, innovation in teaching models, transformation in learning paradigms, and enhancement in evaluation systems. By developing a three-dimensional framework encompassing "knowledge, skills, and problems", the focus of education shifts from "knowledge imparting" to "competency development". This approach fosters a transformation in teaching interactions, moving beyond the traditional "teacher and student interaction" to a more integrated trinity collaboration of "teachers, students, and machines", and promotes the transformation of students' learning from "passive receptive learning" to "autonomous inquiry-based learning". Simultaneously, it facilitates the transition of evaluation methods from "outcome-based evaluation" to "multi-dimensional evaluation".

Keywords Smart course, Study tour course design, Knowledge map, Skill map, Problem map

DOI 10.16785/j.issn 1943-989x.2025.4.017

The *2022 Work Priorities of the Ministry of Education* propose implementing a digitalization strategy for education and accelerating the digital transformation and intelligent advancement of education[1]. In April 2025, the Ministry of Education, in conjunction with eight other departments, issued a directive aimed at accelerating the digitalization of education. This directive emphasized the promotion of digital transformation across courses, textbooks, and teaching methodologies. Key initiatives include enhancing the knowledge map, developing competency maps for job skills, advancing the application of large-scale educational models, and facilitating the intelligent upgrading of course, textbook, and teaching systems. Furthermore, it advocates for the integration of artificial intelligence (AI) technologies throughout all components and stages of education and instruction, thereby fostering the convergence of science and technology education with humanistic education[2]. The comprehensive application of AI technology can effectively resolve challenges inherent in traditional courses, such as inadequate personalized learning support and limited methods of ability assessment, thereby offering innovative approaches for cultivating highly skilled talents aligned with the demands of digital economic development.

Against this backdrop, this study explores the pathway of smart course development in higher vocational colleges during the era of AI, using the Study Tour Course Design course as a practical carrier. By constructing a three-dimensional model encompassing "knowledge, skills, and problems", and integrating intelligent technologies such as generative AI and big data analytics, the course system is intelligently restructured. Over a two-year period, the course development team completed the entire process, from constructing the theoretical framework to conducting practical validation, thereby establishing a replicable and scalable model for the development of smart courses in higher vocational colleges.

1 Smart courses

Smart courses are learner-centered educational programs aimed at cultivating innovative, multidisciplinary talents. These courses deeply integrate intelligent technologies, including generative AI and big data analytics, and utilize smart teaching platforms, AI tools, and digital resources to implement comprehensive blended learning designs. This is achieved through systematic reconstruction of teaching content, dynamic tracking of skill development, and scenario-based alignment with real-world challenges. As a result, smart course is a novel curriculum model that undergoes continuous optimization and iteration. The core features are characterized by the intelligent reorganization of teaching content, personalized adaptation of learning pathways, evidence-based optimization of teaching pro-cesses, and digital and intelligent integration of teaching evaluation. These elements collectively facilitate the digital transformation of all educa-tional components and the continuous iterative enhancement of teaching effectiveness.

2 Pathway of Study Tour Course Design course development

2.1 Clarifying the positioning and ob–jectives of the course

Study Tour Course Design is a fundamental professional course within the Study Tour Management and Service specialty. Foundational courses include Pedagogy and Educational Psychology, while subsequent courses include Study Tour Base Operation and Study Tour Guide Practice. These courses are cohesively integrated and closely aligned with the talent cultivation objectives of the Study Tour specialty. This course is designed in accordance with the job content and requirements such as study tour guides and course development designers. It establishes teaching objectives that emphasize the enhancement of both occupational skills and professional ethics, the integration of practical

Received: May 25, 2025 Accepted: July 21, 2025

Sponsored by Vocational Education Teaching Reform Research Project of Shandong Province "Research on Digital New-Form Curriculum Development Based on AI Knowledge Maps in the Context of Industry-Education Integration" (2023352); Vocational Education Teaching Reform Research Project of Shandong Province "Innovation and Practice in the Development Model of Vocational College Master Craftsman Studios under the Perspective of Industry-Education Integration" (2024375).

abilities with labor education, and the alignment of professional learning with ideological and political education. This course aims to develop professionals skilled in designing and delivering study-tour curricula, implementing study tour activities, and marketing study tour products. Graduates will also demonstrate strong planning and organizational skills, educational and instructional competencies, lifelong learning abilities, and a commitment to sustainable development.

2.2 Reconstructing the teaching content of the course

Based on the inherent logic of study tour course development, the content of the Design, Implementation, Evaluation, and Enhancement (DIEE) vocational skills certification has been incorporated into the Study Tour Course Design framework[3]. Guided by authentic work tasks and focused on the central question of how to design and implement study tour courses, seven major project tasks have been reorganized around six fundamental elements of course design. Additionally, seven ideological and political themes are examined, resulting in the formulation of 22 tasks and the identification of 42 knowledge and skill points. The course aims to enhance students' capacity to design study tour courses, thereby broadening the connotation and avenues of ideological and political education. Additionally, it emphasizes current focal points within the Study Tour discipline and emerging trends in professional competitions by incorporating content related to marine and industrial study tours, seeking to develop students' skills in planning and executing study tour courses.

2.3 Establishing maps to facilitate students' personalized learning

2.3.1 Knowledge map. Based on the knowledge map, the visualization of knowledge and skill points is accomplished, offering students a systematic theoretical framework that establishes a solid foundation for the development of professional competencies and supports their ongoing growth and advancement. The knowledge map for the Study Tour Course Design course centers on the comprehensive process of study tour course development, integrating knowledge from three dimensions: fundamental theory, methodological processes, and practical applications. This map employs a modular design, ensuring logical connections among each module to facilitate students in constructing a comprehensive knowledge system. The knowledge map is displayed via a visualization platform as a "dynamic radar chart" (Fig.1), illustrating the hierarchical relationships and logical connections among knowledge points, thereby assisting students in developing a systematic cognitive framework[4].

2.3.2 Competency maps for job skills. Core job competency objectives are delineated according to the competency map, establishing connections with relevant knowledge and skill points to facilitate objective-oriented effective teaching and evidence-based assessment. Focusing on the job responsibilities of study tour guides, a four-tier indicator job competency map is developed, which systematically maps these competencies to the corresponding knowledge and skill components of the course. The job competency map is depicted as a "hierarchical diagram" (Fig.2), illustrating the real-time development status of students' abilities. It aligns with the standards of vocational skills certificates, thereby offering students a clear pathway for skill enhancement.

2.3.3 Problem map. Based on the problem map, a structured decomposition of problems, cases, and projects is accomplished, which is then integrated with the knowledge map to facilitate the internalization and application of knowledge through problem-solving or project-based practice. The course problem map for the Study Tour Course Design identifies typical issues encountered in study tour practice as its starting point and establishes an integrated three-component learning support system encompassing "problems, knowledge, and cases". The problem map is structured as a "mind map" (Fig.3), which decomposes complex problems into multiple sub-problems and links them to relevant knowledge modules and case resources. The question bank is categorized according to difficulty levels, enabling students to select a suitable starting point for learning based on their individual circumstances.

2.4 Empowering with digital intelligence to achieve quality improvement, burden reduction and efficiency enhancement

Leveraging AI for digital empowerment, this approach involves the intelligent generation of learning paths, the strategic dissemination of resources, the comprehensive analysis of students' learning conditions, and the systematic evaluation and feedback provision. Consequently, it establishes a deep blended teaching model characterized by the interactive integration of "teachers, students, and machines", aiming to enhance educational quality, reduce workload, and increase efficiency[5]. The Study Tour Course Design course thoroughly integrates AI technology to develop an intelligent teaching system comprising "three maps and one platform". This course modularizes and reorganizes knowledge across the entire process of study tour curriculum development based on a knowledge map. It dynamically tracks students' growth trajectories in core skills, including "planning, implementation, and evaluation", through a job competency map and establishes an intelligent matching library of authentic industry cases utilizing a problem map. During the instructional process, the intelligent teaching platform employs learning analytics technology to capture students' behavioral data in real time, automatically identify blind spots in the learning situation analysis of the project design, and intelligently recommend appropriate materials from the regional cultural resource library. Meanwhile, the platform aligns with vocational skills certification standards, systematically analyzing discrepancies between students' work and industry benchmarks. It offers quantitative feedback across multiple dimensions, including the attainment of labor education objectives and the incorporation of ideological and political education within the curriculum. Since its implementation, the course has been acknowledged as a provincial-level exemplary online course in vocational education and has established a distinctive model characterized by "intelligent guidance, precise evaluation, and the integration of industry and education".

3 Achievements of smart course development

3.1 Innovation in educational concept: shifting the focus from "knowledge imparting" to "competency development"

In the context of advancing vocational education reform, the educational concept is fundamentally shifting from "knowledge imparting" to "competency development". This shift necessitates that course design should be grounded in intelligent educational platforms and focused on professional competencies. By employing two approaches, task-driven learning and authentic scenario experiences, a novel training system that is competency-driven and integrates both virtual and real-world components can be developed. Specifically, the course development utilizes an intelligent job competency analysis system to systematically deconstruct the essential professional skills required of study tour instructors, including "course design", "activity organization", and "safety management", thereby creating a dynamically updated competency matrix. Through the intelligent teaching platform, students have

continuous access to the authentic work order database of enterprises and can complete digital practice tasks, including "AR scene surveys", "intelligent cost estimation", and "AI risk prediction", within a virtual simulation training environment. The system automatically records operational trajectories and generates radar charts to assess competency development. Meanwhile, the "competency archive", developed using blockchain technology, comprehensively documents students' skill development across various stages, including course design, intelligent implementation, and digital evaluation. Enterprise mentors perform real-time process assessments via remote collaboration platforms. The intelligent course employs machine learning algorithms to recommend personalized improvement pathways for students, thereby facilitating the transformation from "rote knowledge retention" to "intelligent application". This approach aims to cultivate research and study talents equipped with digital literacy for the contemporary era.

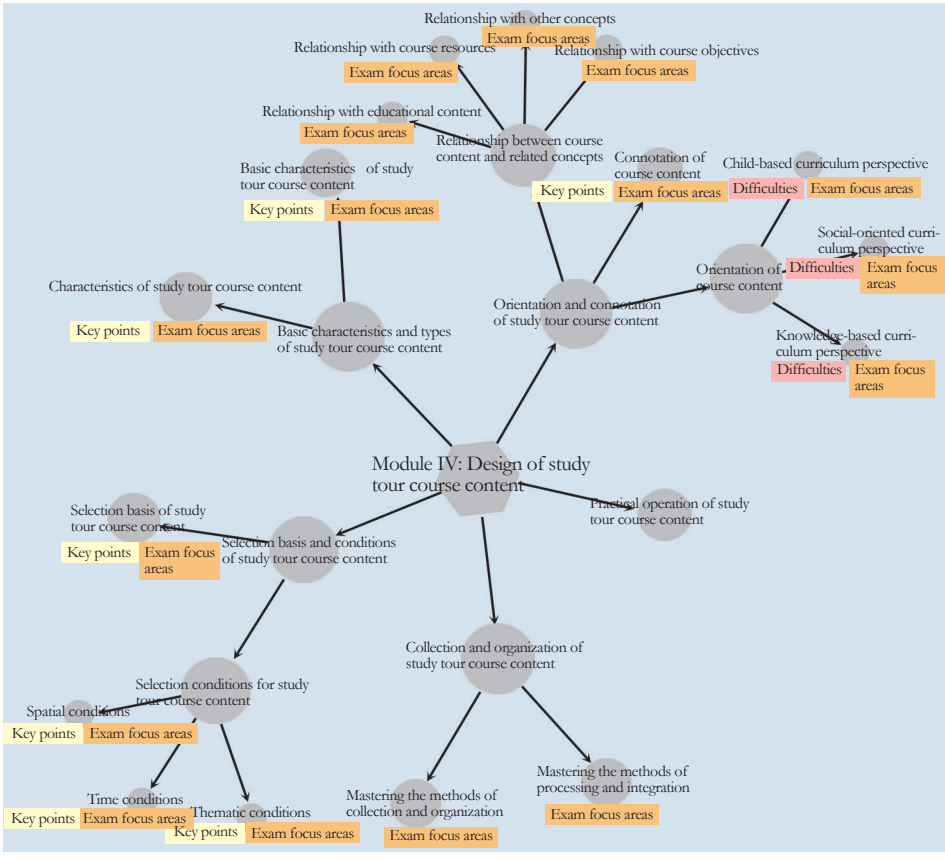

Fig.1 Knowledge map for the design of study tour course content

3.2 Innovation in teaching models: shifting from "teacher and student interaction" to deep tripartite collaboration among "teachers, students, and machines" [6]

In an intelligent teaching environment, educators automatically generate personalized research and study plan frameworks using an intelligent lesson preparation system. Concurrently, students receive real-time resource recommendations and risk assessments facilitated by AI design assistants. Additionally, the virtual simulation platform has established a digital twin research and study base, enabling students to engage in immersive scenario-based drills and emergency plan simulations. The intelligent learning analysis system continuously records students' design trajectories throughout the entire process, automatically generates ability diagnostic reports through big data analysis, and offers teachers precise recommendations for instructional interventions. This innovative teaching model of "human and machine collaboration" preserves the emotional education and value-guidance functions of teachers while enabling personalized learning support, intelligent process management, and precise quality evaluation in study tour course design through the comprehensive integration of intelligent technologies. Consequently, it substantially enhances students' course design capabilities and

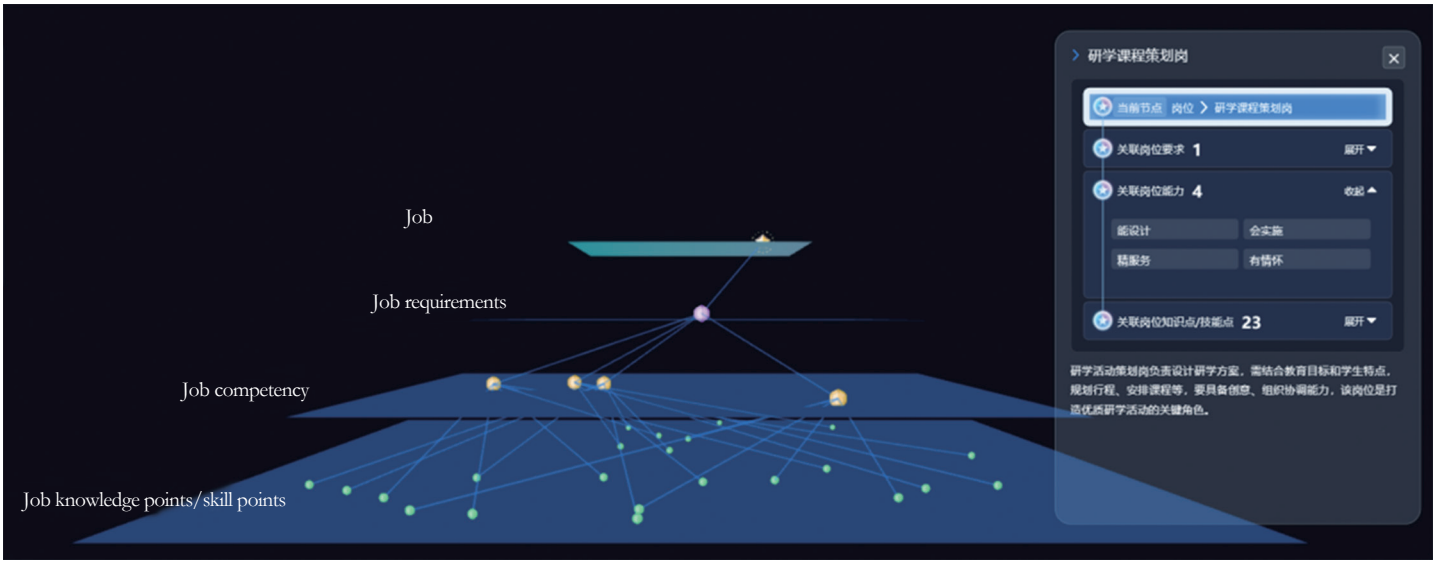

Fig.2 Job competency map for study tour activity planning

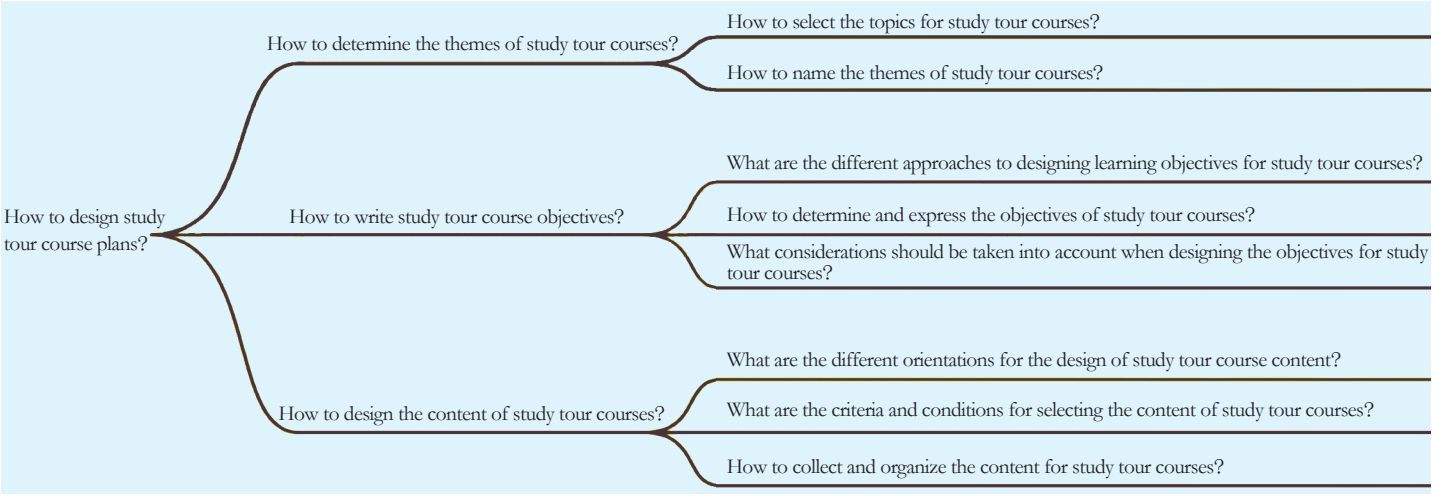

Fig.3 How to design a problem map for study tour course plan

professional adaptability.

3.3 Transformation in learning paradigms: shifting from "passive receptive learning" to "autonomous inquiry–based learning"

The development of intelligent courses has significantly transformed the learning paradigm in the Study Tour Course Design, establishing an autonomous inquiry model that is "learner-centered". Utilizing the intelligent learning platform, students are empowered to independently select thematic course packages, such as the "Red Study Tour", "Industrial Study Tour", and "Ecological Study Tour", aligned with their individual career development goals. They receive personalized task recommendations through AI learning assistants, enabling them to autonomously plan investigation routes and design interactive components in virtual study tour base. Furthermore, the intelligent teaching system provides 24 h online digital mentorship, facilitating students' engagement in collaborative explorations across different temporal and spatial contexts. The Learning Management System (LMS) automatically tracks learning trajectories and produces a "Capability Shortcoming Diagnosis Report" through big data analysis, thereby enabling students to independently adjust their learning paths. This innovative learning paradigm has substantially improved students' digital learning competencies and their capacity for lifelong development.

3.4 Enhancement in evaluation systems: shifting from "outcome–based evaluation" to "multi–dimensional evaluation"

The study tour course evaluation system within the digital context has undergone multi-dimensional innovation. Firstly, a dual-track evaluation mechanism integrating "AI and human assessment" has been established. This system not only automatically collects quantitative data, such as the duration of scheme design and resource utilization, via an intelligent platform but also incorporates qualitative evaluations from educators and industry mentors. Secondly, dynamic evaluation tools have been developed, including VR simulation scoring systems and blockchain-based preservation platforms of study tour achievements. Thirdly, a comprehensive evaluation process has been established, incorporating assessment points at each stage, from the initial scheme design and mid-term virtual drills to the subsequent on-site implementation. Fourthly, multiple evaluators are involved, including intelligent system scoring, teacher evaluations, enterprise mentor assessments, peer evaluations among students, and feedback from trainees[7]. This multi-dimensional evaluation system offers a more scientific and comprehensive assurance of the quality of talent development.

4 Conclusions

The rapid advancement of AI technology has created novel opportunities and avenues for reforming vocational education courses. The Study Tour Course Design smart course has achieved intelligent reorganization of course content, personalized adaptation of learning pathways, evidence-based optimization of instructional processes, and the integration of digital and intelligent evaluation methods. This approach offers a valuable model for cultivating highly skilled professionals aligned with the demands of digital economic development[8]. In the future, as technologies such as large educational models and virtual simulation continue to mature, smart courses are expected to advance in areas including personalized learning support, intelligent instructional decision-making, and enhanced integration of industry and education. These developments will effectively facilitate the digital transformation and intelligent advancement of higher vocational education.

References

[1] Ministry of Education of the People's Republic of China. (February 8, 2022). *2022 Work priorities of the Ministry of Education*. Retrieved from http://www.moe.gov.cn/jyb_sjzl/moe_164/202202/t20220208_597666.html.

[2] Retrieved from https://www.gov.cn/zhengce/zhengceku/202504/content_7019045.htm.

[3] Mo, M. X. (2022). Construction of a comprehensive practical education system for the study tour management and service major. *Educational Observation*, *11*(14), 5-9.

[4] Wang, W. J., He, X. W. (2025). Research on the construction of new form courses based on knowledge graph/AI technology. *Education and Teaching Forum*, (16), 48-51.

[5] Shen, L. Y., Li, M. & Zhang, Z. W. et al. (2022). The construction and application in practice of intelligent teaching ecosystem in colleges and universities based on AI technology: Taking Zhejiang University as an example. *Modern Educational Technology*, *32*(12), 85-92.

[6] Su, Y. K. (2024). *Smart course: Definition/characteristics and construction*. Retrieved from https://mp.weixin.qq.com/s/ASQA3ayNwYpDkOVWp4vH3A.

[7] Zheng, L. Y., Zhao, C. M. & Guo, M. Q. (2021). On the innovative construction of online course implementation mode and its application practice. *Modern Distance Education*, (1), 32-39.

[8] Wang, Z, J., Yu, X. Y. (2022). Online course design and development: Elements, conceptual model, and process model. *Open Education Research*, *28*(3), 81-92.