

# The Construction of New Forms of Textbooks and Exploration of Smart Teaching Models in the Perspective of Digital Education Transformation

Zhelu Wang<sup>1, a</sup>

<sup>1</sup>Wenzhou Polytechnic, Wenzhou 325035, China

<sup>a</sup>382211678@qq.com

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**Abstract:** Currently, digitalization is leading a new wave of educational reform and innovation, giving birth to new forms of digital education, which will continue to have a profound impact on the development of education. This article is based on the "Chaoxing Learning Pass" online platform, exploring new forms of textbook construction and smart classroom models, promoting the integration of digital teaching resources with twin technology, modular design of dynamic textbook project library and smart teaching implementation, as well as the construction of a diversified online evaluation system. It stimulates students' interest in learning, enhances their knowledge literacy and practical skills in industrial robot technology, and achieves good practical teaching results.

**Keywords:** Digitalization of education; New form textbooks; Smart teaching; Pattern exploration.

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## 1. Introduction

Under the background of digital transformation in education, digital technology empowers the reform of teaching models, accelerates the construction of new forms of textbooks, and the continuous emergence of intelligent manufacturing new scenarios and models brings new opportunities and challenges to textbook construction and smart teaching. The construction of textbooks is a new driving force and focus for the innovation of the "Three Education Reform" in the new era. The construction of new forms of textbooks should be designed based on the real projects of enterprises, based on the work process, and applied to smart classroom teaching, highlighting the industrial, diverse, and open nature of vocational education, which helps to promote the effective connection of the education chain, industrial chain, and talent chain. [1-3]

The new form of textbooks is an important component and support for the construction of the talent training system in vocational colleges, as well as a requirement for the digital transformation of vocational education and the deep integration of industry and education. Driven by the digital transformation strategy of education, textbooks, which carry key elements such as vocational education knowledge, abilities, and qualities, are developing from stable, static, and closed paper textbooks to diverse, dynamic, and open new forms of textbooks. At present, textbook construction and instructional design mainly face the following challenges:

(1) The integration of a three-dimensional multimodal teaching ecosystem with traditional textbooks lacking interaction and services;

(2) The penetration of dynamic enterprise production tasks and relatively stable textbooks and teaching content;

(3) The combination of precise assessment of all elements of the entire learning process and relatively single summative teaching evaluation.

The construction of new forms of textbooks helps to solve the problems of textbook construction and teaching design, promote the transformation of teaching resources, and build a

scenario based smart classroom. With the support of digital twin technology, we will innovate a new ecosystem of vocational education, rely on digital new forms of teaching materials resources, "Chaoxing Learning Pass" platform videos, virtual simulations, and physical entities, and deepen blended online and offline teaching. It is of great significance to continuously improve the adaptability of smart classrooms and accelerate the quality improvement of vocational education talent cultivation by combining new technologies such as digital twins. [4-7]

## 2. The Construction of New Form Textbooks and Exploration of Smart Teaching Models

This article takes the construction of the "Offline Programming and Simulation of Industrial Robots" textbook as an example, guided by the principles of "moral education and comprehensive education", and closely revolves around the goal of cultivating high-quality technical and skilled personnel in industrial robots, exploring intelligent teaching models. Smart teaching explores the integration of professional teaching standards and "1+X" vocational ability evaluation standards, selects typical project cases from new forms of textbooks, and combines the fundamental problems of process technology application and innovation that need to be solved in the actual production of industrial robots. Project teaching is carried out with projects as the link, tasks as the carrier, and work processes as the orientation. Typical projects in textbooks need to undergo content modularization, develop loose leaf tasks, form a multi-dimensional, full-time and full process evaluation system, and based on the "Chaoxing Learning Platform" and digital technology, develop rich digital resources to adapt to smart teaching and promote blended online and offline teaching.

## **2.1. Twin technology integration of digital teaching resources to build a new type of multimodal loose leaf teaching material**

Targeting the fields of intelligent equipment and advanced manufacturing, we adopt digital twin technology to build a digital training platform that is the same as a real industrial robot training platform. Docking with the digital teaching resources such as videos, animations, VR, etc. of the "Chaoxing Learning Pass" course platform for robots, constructing a new type of multimodal loose leaf teaching materials and digital platform. Students can conduct independent exploration, collaborative communication, and online practical training based on textbook task guidance and QR code links.

In terms of content arrangement, the textbook adopts the concept of "action oriented and task driven", and designs projects based on the work process, systematically planning the structural system of the textbook. The new form of textbooks is carefully arranged according to the current teaching needs of vocational colleges. Based on the 1+X practical training platform for industrial robot application programming, construct 8 typical projects that are "scenario based and progressive". This includes industrial robot drawing workstations, cutting workstations, handling workstations, palletizing workstations, welding workstations, assembly workstations, visual sorting workstations, and RFID comprehensive application programming.

In terms of textbook arrangement, based on the integration of industry and education, schools and enterprises jointly research and develop talent training plans. Timely incorporate new technologies, processes, and standards into teaching standards and content, and develop ultra new online information resources. Combining vocational skill level certificates with professional development, curriculum development, textbook development, etc. Deepen the reform of teachers, textbooks, and teaching methods.

At the same time, according to the concept of "integrated design, structured curriculum, and granular resources" digital resource construction of the Ministry of Education, digital twin technology is introduced, and based on the "Chaoxing Learning Platform", an industrial robot digital twin ubiquitous teaching student ecology and smart classroom is constructed, and a fully spatiotemporal digital curriculum is constructed.

## **2.2. Based on real work, modular design of dynamic textbook project library and implementation of smart teaching**

Taking the offline programming and simulation textbook for industrial robots as an example, with projects as the link, tasks as the carrier, and work processes as the orientation. Based on the "Chaoxing Learning Pass" platform, modular design scenarios and a progressive dynamic textbook project library. Including eight major projects: industrial robot drawing, cutting, handling, palletizing, welding, assembly, visual sorting, and RFID comprehensive application. And dynamically update the textbook project library based on industrial development and production reality.

The textbook project is based on the work process and applied to the reform of the intelligent teaching mode of the "Chaoxing Learning Pass" course. It is based on the integration of "teaching, learning, and doing" in higher vocational education, and designs a "three in one" smart

classroom teaching mode based on the "Chaoxing Learning Platform". Starting from the three questions of "what to teach, how to teach", "what to learn, how to learn", and "what to do, how to do", carry out smart classroom teaching and implementation. Using loose leaf project tasks as carriers, student-centered, and based on work processes for instructional design.

Taking the industrial robot visual sorting module as an example, based on the "Chaoxing Learning Platform", the teaching process is implemented according to the principles of "preliminary learning before class, breakthrough improvement in class, and expansion and incubation after class". Based on the concept of "action oriented", modular teaching reform is carried out using loose leaf task work orders as carriers and digitization and informatization as the starting point. Teaching revolves around six steps including "information" - "planning and decision-making" - "task implementation" - "task evaluation and inspection" - "task feedback". By combining the vivid characteristics of online courses and new forms of textbooks, reforms will be carried out in areas such as curriculum revolution, student status, teacher role, and classroom revolution.

## **2.3. Following the principle of promoting learning through evaluation, construct a diverse collaborative formative evaluation system**

Based on the "Chaoxing Learning Platform", construct a multi-dimensional collaborative and all-round formative evaluation system. The application of diverse digital technology in smart classroom teaching supports the formative evaluation of the entire teaching process, which is intuitive, evaluable, and measurable. Record the entire teaching process through the Chaoxingyun platform and new forms of textbooks. At the same time, relying on the Chaoxing Learning Platform to master student teaching resources, self-study and self-test data. Industry mentors, teachers, and students participate in the entire evaluation process, and the evaluation is aligned with the demands of "stakeholders", promoting students to learn independently and innovate in practice through continuous cooperation, exploration, and problem-solving.

## **3. Characteristics and Innovation**

### **3.1. Utilizing digital technology to construct three-dimensional loose leaf teaching materials and smart classrooms**

Twin technology integrates digital resources and explores the reform of "Super Star+" loose leaf teaching materials and smart teaching models. Online courses are provided on platforms such as "Chaoxing Platform" and "Xueyin Online". The "action oriented" methods and course content involved in the textbooks are accompanied by relevant learning resources, including online courses, teaching videos, and 1+X question bank resources. QR codes can be scanned for learning in smart classrooms. Continuously updating and optimizing the "Chaoxing Learning Pass"+loose leaf teaching project in response to technological and technological innovations in the industry, to promote talent cultivation and model innovation in smart classroom applications.

### 3.2. Modular Project Design and Smart Teaching Implementation

The new form of teaching materials is based on the "Chaoxing Learning Platform", where industry mentors, projects, standards, values, and new technologies are effectively integrated into the smart classroom, and project modular design is carried out. The school enterprise dual mentors collaborate to carry out teaching design and implementation, guided by digital reform, and rely on twin technology in the innovation platform to transform enterprise technical transformation projects into teaching cases. Based on smart classrooms, students learn typical business cases before class, focus on problems, repeatedly hone core skills in class, consolidate key points after class, and expand practice to transform the knowledge and technology learned in class into practical production applications, incubating student patents, innovative projects, and other achievements.

### 3.3. Typical case studies, integrating ideological and political elements of courses such as craftsmanship spirit

Based on typical cases of industrial robots, build an ideological and political resource library for industrial robot courses on the "Chaoxing Learning Platform". In case import, knowledge linking and project training. Not only does it highlight the job type, professionalism and practicality, improve students' professional skills, but it also focuses on cultivating good professional ethics and professional literacy in students.

### 3.4. Building a diversified collaborative evaluation system, effectively implementing the promotion of learning through evaluation

Based on the Chaoxing platform, multiple digital technologies such as digital courses, QR codes, digital twins, and loose leaf formats are applied to support the entire teaching process, which is evaluable and measurable. By using loose leaf teaching materials and the "Super Star Platform", students can grasp self-learning and self-test data of teaching resources, with the goal of "formative+summative" evaluation, and record the entire learning process of students in real time. Enterprise mentors, teachers, and students participate throughout the entire process to promote students to shape industry values through continuous cooperation, exploration, and problem-solving.

## 4. Conclusion

Industrial robot technology, as an emerging technology, is the core technology of intelligent manufacturing. At present, China is in a critical period of intelligent manufacturing transformation and upgrading, requiring a large number of industrial robot technology talents. The construction of new forms of teaching materials and smart classrooms for industrial robots is based on the "Chaoxing Learning Platform", which integrates the 1+X standards for industrial robots, integrates ideological and political education into the curriculum, integrates media and loose leaf teaching materials, and introduces digital twin technology to build a digital

workstation for classroom design. The distinctive features and highlights play a very important role in enhancing the enthusiasm of students in the classroom.

This project focuses on digitization and introduces teaching standards and 1+X level standards into textbooks based on the "Chaoxing Learning Platform", as well as industrial robot technology smart classrooms. This project aims to reconstruct the content of the textbook and reform the teaching mode, using the action oriented method to deepen and gradually build a diversified online evaluation system through six stages. It conforms to the cognitive laws of students, stimulates their interest in learning, enhances their knowledge and practical skills in industrial robot technology, and achieves good practical teaching results.

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## References

- [1] Pan Zhengjun, Zhao Lianfen, Yuan Lina. Construction of a new series of teaching materials for the integration of paper and data in the field of data science and big data technology [J]. Computer Education, 2024 (02): 198-202. DOI: 10.16512/j.cnki.jsjy.2024.02.020.
- [2] Li Hezhi, Bu Pu, Ye Zhimiao et al. Analysis of the connotation, characteristics, and adaptability of new forms of vocational education textbooks [J]. Modern Vocational Education, 2024 (04): 65-68.
- [3] Cheng Xiuhua, Tian Chenmiao, Lin Miao, et al. Preliminary exploration of the construction of new forms of teaching materials in universities under the background of smart classrooms [J]. Science and Education Wenhui (Mid Decadal), 2019 (26): 10-12. DOI: 10.16871/j.cnki. kjwhb. 2019. 09.005.
- [4] Sun Wei. New Forms of Integrated Textbooks Help Smart Classrooms - Taking the Development and Design of Supporting Textbooks for Vocational Education Professional Teaching Resource Library as an Example [J]. Chinese Editor, 2018 (04): 61-63+69.
- [5] Zhang Minqing, Zhang Mingshu, Zhang Zhen et al. Construction of New Forms of Textbooks Based on Smart Teaching Cloud Platform [J]. Computer Education, 2023 (12): 400-403. DOI: 10.16512/j.cnki.jsjy.2023.12.012.
- [6] Cheng Xiuli. Exploration of Multidimensional Process Evaluation in the Context of "Chaoxing Learning Pass" [J]. Modern Information Technology, 2024,8 (02): 195-198. DOI: 10.19850/j.cnki.2096-4706.2024.042.
- [7] Qi Yan. Research on Teaching Design and Practice of Vocational Aviation English Course Based on Chaoxing Learning Pass [J]. Forestry Teaching, 2024 (02): 71-74.