Research on the Creation of Digital Teaching Resources for Information Technology Courses Based on ChatGPT Technology

Junjie Chen
Zibo Vocational Institute, Zibo, Shangdong, China

Abstract: The purpose of this paper is to study the current teaching situation and teaching needs of information technology courses in vocational colleges. At present, these courses generally face challenges such as insufficient digital teaching resources, lagging updates in teaching content, and lack of personalized learning support. Through in-depth analysis of these needs, identify key issues based on the application of ChatGPT technology, and clarify its potential application scenarios in the curriculum. This research will help design more effective teaching resources, better adapt to the needs of the current educational environment, and improve teaching quality and learning effectiveness.

Keywords: ChatGPT Technology; Information Technology Courses; Digital Teaching Resources

1. Introduction

1.1 Background

Educational application research based on ChatGPT technology in domestic universities and research institutions includes the development of intelligent teaching auxiliary systems, virtual teaching assistants, and online learning platforms. Some scholars have applied ChatGPT technology in information technology courses, providing personalized learning support and answering questions through dialogue interaction with students. Internationally, many universities and research institutions are also exploring the application of ChatGPT technology in education. Although research on creating digital teaching resources for courses based on ChatGPT technology is still in the exploratory stage both domestically and internationally, some promising results have been achieved and are expected to further promote innovation and development in the field of education in the future. Our research will focus more on providing personalized learning experiences according to students' different needs and learning styles, helping them better understand and master knowledge, and paying attention to how to strengthen interaction and cooperation between teachers and students.

1.2 Purpose

The main focus of this research is to provide personalized learning experiences according to students' different needs and learning styles, helping them better understand and master knowledge, and paying attention to ways to enhance interaction and cooperation between teachers and students.

2. Research Content

2.1 Research Object

Current Teaching Situation and Needs of Information Technology Courses in Vocational Colleges: The current teaching situation and needs of information technology courses in vocational colleges are the research objects of this project. At present, these courses generally face challenges such as insufficient digital teaching resources, lagging updates in teaching content, and lack of personalized learning support. Through in-depth analysis of these needs, the project aims to identify key issues based on the application of ChatGPT technology and clarify its potential application scenarios in the curriculum. This research will help design more effective teaching resources to better meet the needs of the current educational environment and improve teaching quality and learning outcomes.

2.2 Theoretical Objectives

Explore the intelligent teaching resource generation mechanism and its theoretical framework based on ChatGPT, revealing the impact mechanism of AI technology on information technology courses.
Study the optimization theory of digital teaching

resources, propose a personalized learning support and evaluation model based on ChatGPT, and improve the theory of instructional design.

2.3 Application Objectives

Provide a ChatGPT-based digital teaching resource construction scheme for information technology courses in colleges and universities to improve classroom interaction and personalized teaching effects.

Provide practical models of AI-assisted teaching management for educational management departments and schools, promote digital transformation, and improve teaching management efficiency.

2.4 Basic Research Approach

Firstly, by investigating the current situation of information technology courses in vocational colleges, clarify the shortage of teaching resources and personalized needs of teachers and students, and determine the research objectives. Secondly, based on the needs analysis, design and develop a ChatGPT-driven teaching resource generation system, covering automatic course content generation, interactive feedback, and personalized tutoring functions. Subsequently, the project will conduct experiments in real classrooms to evaluate the system's role in improving teaching effectiveness, student achievement, and classroom interaction, and collect feedback data. Finally, optimize the system based on experimental results, propose an implementation plan, and promote the widespread application of this technology in information technology courses in vocational colleges.

3. Exploration of Creating Digital Teaching Resources Based on ChatGPT

3.1 Research Object

Current Teaching Situation and Needs of Information Technology Courses in Vocational Colleges: The main research object of this project is the current teaching situation and needs of information technology courses in vocational colleges. At present, these courses generally face challenges such as insufficient digital teaching resources, lagging updates in teaching content, and lack of personalized learning support. Through in-depth analysis of these needs, the project aims to identify key issues based on the application of ChatGPT technology and clarify its potential application scenarios in the curriculum. This research will help design more effective teaching resources to better meet the needs of the current educational environment and improve teaching quality and learning outcomes.

3.2 Intelligent Launch: Construction of Theoretical Basis

Basic Principles and Application Framework of ChatGPT Technology: Clarify the basic principles of ChatGPT technology and its application framework in education. Explore how to use its text generation capabilities to automate and personalize the generation of teaching content, such as courseware, exercises, and interactive feedback.

Concept and Current Situation of Digital Teaching Resources: Define digital teaching resources and examine the current use of digital teaching resources in information technology courses in vocational colleges, identify existing problems and opportunities for improvement, and provide a theoretical basis for subsequent research.

Combination of Instructional Design Theory and Generative AI: Explore how traditional instructional design theory can be combined with generative AI technology, especially in content generation, learning assessment, and student interactive feedback.

3.3 Intelligent Empowerment: Design of Teaching Resource System

Needs Analysis and Technology Evaluation: Analyze the specific needs of information technology courses in vocational colleges through literature review and field research, and evaluate the adaptability and potential challenges of ChatGPT technology in this field.

Design of ChatGPT-Based Teaching Resource Generation System: Design and develop a ChatGPT-based teaching resource generation system, including automatic content generation modules, personalized learning tutoring modules, and interactive feedback modules.

Teaching Experiments and Data Evaluation: Implement ChatGPT-based teaching resources in actual teaching, collect and analyze experimental data, evaluate the effectiveness of system implementation, and adjust and optimize the system design accordingly.

3.4 Continuous Evolution: Optimization Path and Strategy

Enhance the Intelligence and Precision of Teaching Resource Generation: Research how to ensure the accuracy and adaptability of generated teaching content by optimizing the ChatGPT model and introducing a teacher review mechanism, as well as how to integrate multimodal content to enrich teaching resources.

Strengthen Personalized Learning Support and Optimization of Interaction Modes: Propose strategies to enhance personalized learning path recommendations and real-time interactive feedback, leveraging ChatGPT to optimize the learning experience and increase student engagement and learning outcomes.

Establish a Sustainable Update Mechanism for Digital Teaching Resources: Explore the establishment of an automatically updated teaching resource update platform with the participation of both teachers and students, maintaining the modernity and relevance of teaching content and addressing rapidly changing educational needs.

4. Effectiveness Evaluation

Researching the impact of digital teaching resources created based on ChatGPT technology on students' learning outcomes can explore whether this novel method of generating teaching resources is more effective in knowledge imparting, concept understanding, and problem-solving. By assessing indicators such as students' knowledge mastery, learning interest, and participation, a scientific basis for the effectiveness of this teaching method can be provided. ChatGPT technology possesses natural language processing and generation capabilities, enabling it to provide personalized educational content according to the needs and levels of different students. Researching how to utilize ChatGPT technology to achieve personalized education, including adapting to different learning styles and providing customized feedback, can provide new ideas and methods for personalized education.

Through digital teaching resources, high-quality information technology course resources can be popularized to more regions and groups, improving the accessibility and sustainability of educational resources. In some regions or institutions, there may be a shortage of information technology teachers. Utilizing ChatGPT technology to create digital teaching resources can address this issue by providing high-quality teaching content. ChatGPT technology can generate customized teaching content according to students' personalized needs and learning characteristics, providing better learning support and guidance for students.

5. Conclusion

Synthesizing the above research, ChatGPT technology demonstrates significant practical effects in creating digital teaching resources for information technology courses. By creating personalized learning resources and real-time feedback, students' academic performance has improved, while their engagement and satisfaction have been stimulated. The practical teaching resources and project-based learning have expanded students' practical abilities. Teachers have improved teaching efficiency and obtained more teaching support through ChatGPT technology. These specific effects highlight the positive impact of ChatGPT technology in the teaching of information technology courses, providing substantial guidance and reference for promoting educational innovation, enhancing students' comprehensive literacy, and improving teaching quality.

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