The impact of artificial intelligence technology in education on the learning habits of Chinese vocational college students

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ABSTRACT: With the gradual popularization of the application of AI technology in vocational colleges and universities, AI technology is changing students' learning methods and habits, which not only improves the personalized and interactive teaching, but also makes students' learning methods more flexible and diversified. However, in the process of widespread application of AI technology, how to balance the relationship between technology and teaching, how to ensure the fairness and sustainability of technology, is still a problem that educators need to think about and solve. These backgrounds provide theoretical basis and practical significance for this paper to study the influence of AI technology on the learning habits of Chinese vocational college students.This study will selects a vocational college located in Tangshan, Hebei Province, China through the method of case study to determine (1) What type of AI technology do the vocational college students in China prefer to use? (2) Why do vocational college students in education use AI? (3) How does AI technology impact the vocational college students' learning habits in China? The data will be collected through classroom observation and interview. Thematic analysis was used to process the data collected by the study.This study hopes to systematically analyze the specific impact of artificial intelligence tools on the learning habits of Chinese vocational college students, including the changes in students' learning behaviors and ways of thinking.The results of this study will help to better integrate vocational skills into the teaching environment of Chinese vocational schoolsThis is especially reflected in guiding the future of artificial intelligence technology to better integrate into China's vocational college education.

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CHAPTER 1
INTRODUCTION

1.1 Background of study

China's vocational education is an important part of the education system, aiming at cultivating application-oriented technical talents for the society. However, the traditional vocational education is relatively limited in teaching resources, teaching methods and teaching means, which is difficult to meet the diversified needs of modern society. At the same time, some teachers have a stereotype about the study habits of Chinese vocational students, believing that these students do not have good study habits, and regard them as lazy, stupid or "bad seeds" of academic failure. (Wang, 2021) Faced with these challenges, more and more vocational colleges and universities began to introduce AI technology to improve teaching quality and students' learning effect.

In the current era of rapid development of science and technology, artificial intelligence (AI) technology, as one of the most revolutionary and potential technologies in the 21st century, has gradually penetrated into the field of education, and its application in education is mainly reflected in the following aspects: intelligent tutoring system, adaptive learning platform, intelligent assessment system and learning analysis tools. These tools can provide personalized tutoring to students based on their study habits. At the same time, AI technology can also help teachers better evaluate students' learning outcomes, so as to help teachers better control the teaching progress and provide students with better classroom teaching content.

To sum up, with the gradual popularization of the application of AI technology in vocational colleges and universities, AI technology is changing students' learning methods and habits, which not only improves the personalized and interactive teaching, but also makes students' learning methods more flexible and diversified. However, in the process of widespread application of AI technology, how to balance the relationship between technology and teaching, how to ensure the fairness and sustainability of technology, is still a problem that educators need to think about and solve. These backgrounds provide theoretical basis and practical significance for this paper to study the influence of AI technology on the learning habits of Chinese vocational college students.

1.2 Statement of Problem

With the rapid development of artificial intelligence (AI) technology, the teaching methods and learning environment in the field of education have undergone profound changes. AI technology is changing the teaching model and student learning habits of vocational education, especially through personalized learning systems to help students improve learning outcomes (UNESCO-UNEVOC, 2021; Zhang & Li, 2021). AI technology can not only provide personalized learning support for students in the learning process, but also optimize the teaching process of teachers through data analysis and intelligent assessment. (Liu, M. 2018)However, although there have been

studies showing that AI technology can help students improve learning efficiency in adaptive learning, personalized assisted learning and other aspects, most of these studies focus on general higher education or vocational skills training in specific fields, and less concern about the change of learning habits of Chinese vocational college students. In the context of Chinese vocational colleges, the specific impact of AI technology on students' learning habits has not been fully studied. Due to the diversity of their majors, students in vocational colleges have different learning goals and needs.At the same time, there is a significant difference between the ability of students in vocational colleges and the ability of students in traditional academic colleges. (Team, 2023)The requirements of vocational colleges for students often pay more attention to the acquisition of practical skills. (Bailey & Clive Belfield, 2019)Therefore, whether AI technology can help students master the knowledge and skills required for them in the teaching objectives of vocational colleges more effectively, and then help students change their original learning habits, is still an urgent field of research. Therefore, this study will involve the practical application of AI technology in the classroom, collect the behavioral data of students in AI-assisted learning environment, analyze how students conduct self-time management through AI technology so as to conduct independent learning, and further explore the specific application of AI technology in Chinese vocational colleges and its far-reaching impact on students' learning habits. This study will provide valuable insights to educators in vocational colleges to help them better understand and support students' learning needs, thereby promoting the deep integration of AI technology with vocational education.

1.3 Objectives

This study will explore the ability of artificial intelligence in the application of vocational colleges in China to help students improve learning efficiency, provide personalized support, reduce cognitive load, and provide immediate feedback. By understanding these reasons, the study will provide insights into how AI can be further adapted to meet the educational needs of vocational college students.

This study aims to identify the impact of AI technology in education on the learning habits of Chinese vocational college students.At the same time,this study will provide comprehensive data and theoretical support for the future integration and optimization of AI technology in vocational college education by investigating the specific motivations of students who like to use AI tools to help them complete their homework.

1.4 Research Questions

1.4.1 What type of AI technology do the vocational college students in China prefer to use?

1.4.2 Why do vocational college students in education use AI?

1.4.3 How does AI technology impact the vocational college students' learning habits in China ?

1.5 Significance of the Study

The results of this study helps to better integrate vocational skills into the teaching environment of Chinese vocational schools, which will be reflected in the following aspects.

Practical implications for vocational education. Chinese vocational colleges tend to develop students' practical skills and employment-oriented teaching objectives, which are often different from the traditional universities that cultivate students' academic ability. This study explored how AI technologies, such as intelligent tutoring systems and personalized learning platforms, can be used specifically for vocational education. By understanding the preferences and habits of Chinese vocational school students in the use of artificial intelligence, Chinese vocational schools and private education institutions can provide vocational school students with better AI tools, thus effectively improving the learning efficiency of students.

Improve the employment situation of students in vocational colleges and universities. Based on the content of this study, Chinese vocational colleges can apply artificial intelligence tools that are more suitable for students' learning habits in teaching, so as to improve the practicability of students' learning skills in professional fields, and then better help students improve their professional quality. The results of this study may create a more effective learning environment for vocational college students, help students better master the key skills they must have in the future employment, so as to improve the employment situation of vocational college students.

Supporting student-centered learning strategies. This study aims to determine how AI can support student-centered learning by providing personalized feedback, reducing cognitive load, and assisting in time management. Based on the content of this research, AI technology developers can optimize the existing AI tool system, so that it can better adapt to the learning habits of vocational college students. Meanwhile, AI technology developers can also better develop AI systems that meet the diversified learning habits of students. So as to better promote the integration of artificial intelligence technology and vocational college education in China.

Improve the equity of education. The application of artificial intelligence in education can make quality educational resources more accessible to the educated. Based on this research, AI technology can better provide personalized assistance to students who have difficulty learning in traditional classroom Settings. At the same time, for areas with poor education development, artificial intelligence tools optimized based on students' learning habits can provide students with more abundant learning resources, which means that artificial intelligence tools will be able to help students in different regions to narrow the learning gap and create a fairer employment and competition environment for students.

Guiding the future integration of AI technology into vocational college education in China. Finally, this study will provide theoretical and practical suggestions for the future integration of AI in vocational education. By identifying the key factors that motivate students to use AI, this study helps developers and educators of AI tools optimize the application of AI technology in vocational college education in China, thereby ensuring

that AI technology can better meet current and future educational needs.
In conclusion, this research will provide data and theoretical references for the progress of artificial intelligence technology and the reform of vocational college education in China, and ultimately provide a better application of artificial intelligence in vocational education, so as to improve students' academic achievement.

1.6 Limitation of the Study

Based on the research objectives and data collection methods of this study, there may be limitations in the following aspects.

1.6.1 Representativeness of sample

This study will mainly aimed at the data collection of students from vocational colleges in China. The selected samples may be unique in terms of geographical location, economic development level and cultural background, which may limit the universality of the research results. While this study can provide valuable insights into vocational education in China, its conclusions may not be directly applicable to vocational education systems in other countries or other parts of China. At the same time, the data collected in the research may be affected by factors such as the level of resources from the selected vocational colleges, the types of majors studied by students, and their learning habits, which may affect the wide applicability of the research results.

1.6.2 Objectivity and subjectivity of data

The data in this study will mainly from students' self-reports (such as questionnaires and interviews). While these methods can capture students' personal experiences and subjective feelings, they are also susceptible to social expectation biases (such as students' tendency to give answers that conform to social expectations) and memory biases. Research may therefore not fully reflect students' actual AI-assisted learning behavior.

1.6.3 The diversity of AI technologies

The application of AI technology in education covers many forms such as intelligent tutoring systems, personalized learning platforms, learning analysis tools, and different forms of tools may adopt different naming methods. On this basis, if the impact of specific AI software on students' learning habits is not fully or deeply discussed at the generality level in this study, the research results may be too broad in understanding the impact of AI technology on students' learning habits. Further elaboration of the application of AI technology types in Chinese vocational colleges may help to improve the accuracy of the results of this study.

1.6.4 Time limitation

Due to the rapid development of AI technology and education technology in the current era, the data collected in this study may not fully reflect the long-term impact of AI

technology on the learning habits of Chinese vocational college students in the future. Current findings may lose some of their applicability as technology advances, so follow-up studies need to be regularly updated and supplemented.

1.6.5 Differences in AI technology acceptance

Different students have significant differences in their acceptance and ability to use AI technology, especially in vocational colleges and universities, where students of different majors and grades may have different acceptance degrees of AI technology. At the same time, students' acceptance of AI technology may be influenced by the educational environment, such as teachers' teaching methods and school policies. These factors are difficult to completely control in this study, so they may lead to the assessment of the application effect of AI technology in this study being too general, which may lead to the failure to accurately assess the impact of AI technology on students' learning habits.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

In recent years, the application of artificial intelligence (AI) technology in the field of education has received a lot of attention, and AI technology has shown significant potential in higher education and vocational education, but also accompanied by some challenges. This chapter will review the literature on the application of AI in higher education, vocational education and personalized learning.This chapter begins with the introduction (2.1) and includes subsequent chapters; Application of AI technology in higher education (2.2). Application of AI technology in vocational education (2.3) The application of AI technology in personalized learning (2.4). The application of AI technology in interdisciplinary and art education (2.5). This is followed by The theoretical basis for application of artificial intelligence in education（2.6）.
The conceptual framework of the study (2.7) and finally the summary (2.8).

2.2 Application of AI technology in higher education

AI technology is widely used in higher education to predict students' learning outcomes and analyze students' learning behaviors. Bates et al. (2020) demonstrated the application of AI in multiple educational contexts in his research. It was pointed out that AI technology played a significant role in predicting student achievement and analyzing student learning based on behaviorist learning model in the application of higher education in Turkey and Taiwan. At the same time, the authors note in the study that because current AI tools are mostly limited to behaviorist learning models, they may not be able to provide students with more concrete content with critical and creative thinking. Gonzalez-Calatayud et al. (2021) systematically reviewed the application of AI in educational assessment between 2010 and 2020 by means of literature review in this study, and found that AI technology was mainly used for formative assessment of students during the study period. Especially in areas such as language learning, mathematics and medicine, at the same time, schools and teachers adopting AI technology often improve their teaching efficiency and assessment accuracy by using AI technology's automatic grading and real-time feedback features.

2.3 Application of AI technology in vocational education

AI technology is gradually applied in the field of vocational education in teaching quality assessment and optimization of students' learning process. Jiao (2020) evaluated the integration of dance teaching and AI technology in vocational colleges by using BP neural network model in his research, and the research results showed that the integration of AI intelligent technology and dance teaching in vocational schools could significantly improve students' learning interest and teachers' teaching effect. In addition, Wu (2021) showed in his research that the application of AI cloud teaching technology in English teaching in vocational colleges can effectively improve students' enthusiasm to participate in classroom activities, thus improving students' expected learning results. In addition, AI technology can also provide students with richer learning content by

providing personalized learning guidance for students. In this study, Tsai et al. (2022) discussed the influence of AI and Internet of Things (AIoT) courses on the learning effect of vocational college students and found that the integration of AI technology and vocational school courses could significantly improve the learning effect of students in computational thinking, programming language and other related professional courses. In addition, the research also shows that integrating AI technology into professional courses can effectively increase students' acceptance of digital tools.

2.4 The application of AI technology in personalized learning

One of the most critical application directions of AI in education, especially in vocational education, is to assist students in personalized learning. AI can provide students with personalized learning content based on their learning needs and their specific learning progress. Liu (2018) analyzed the influence of artificial intelligence technology on computer teaching through literature review and pointed out that artificial intelligence can improve students' learning efficiency by providing personalized assisted learning for students. At the same time, teachers can effectively improve their work efficiency and teaching quality by using AI technologies such as intelligent teaching management. In the study, the author recognized the impact of AI technology on education, and suggested that basic knowledge education of AI technology should be promoted in primary and secondary schools, so as to cultivate more high-end talents for the future society. In this study, Suparyati et al. (2024) further affirmed the potential of AI technology in providing students with personalized learning and assessment through systematic literature review, and held that AI technology could provide students with better learning experience by adjusting teaching content in real time.

2.5 The application of AI technology in interdisciplinary and art education

AI technology has shown great potential in promoting the integration of different disciplines, especially in arts education. Yang (2020) discussed the application of AI technology in art courses of higher vocational colleges in his research. The research finds that the application of AI technology in the art curriculum of higher vocational colleges can effectively enrich the course content and improve the teaching efficiency, so as to better promote the diversified and intelligent development of art education in higher vocational colleges. Hou (2021) studies the application of AI technology in English courses in higher vocational colleges. In the study, the author pointed out that AI technology can effectively improve students' pronunciation skills and translation ability. At the same time, AI technology can provide effective teaching assistance to teachers while providing personalized feedback to students through its own intelligent platform.

2.6 Theoretical basis for application of artificial intelligence in education

At present, AI technology is mainly applied in education based on behaviorist learning theory and constructivism learning theory. Blake (2024) pointed out in his research that AI technology can provide students with reinforcement and incentive mechanism based on behaviorism learning theory in skills training and other aspects according to students' operational performance, so as to help students better master the operational process of

learned skills. At the same time, the application of AI technology in constructivism in vocational education provides students with the theoretical basis to support students' autonomous learning and situational learning. Grubaugh et al. (2023) in his research, through the use of AI tools, educators can better improve the teaching methods based on constructivism learning theory, so as to improve students' class participation and metacognition level of self-reflection. At the same time, the use of AI tools based on constructivist learning theory can bring students a richer learning experience. Wu (2023) pointed out in his research that AI technology can provide students with a real or simulated environment based on the constructivist learning theory to help students apply what they have learned, thereby improving their learning initiative and deepening their understanding of what they have learned. At the same time, the author points out in the study that AI can provide interactive resources for students in the learning platform and encourage students to build their own knowledge system in the exploration.

Based on the analysis of existing research, it can be concluded that AI technology has great application potential in personalized learning, intelligent assessment, teaching management and other aspects of higher education and vocational education. Taken together, these studies show that AI can effectively improve teacher effectiveness and optimize student learning experiences through personalized learning support and automated assessment, especially in interdisciplinary teaching and vocational skills education. However, the above study also points out that the application of AI technology in education also faces data privacy and ethical challenges, and future research needs to focus on the integration of AI technology and education in the long term. Therefore, this study will analyze the impact of the application of AI technology in higher vocational colleges on students' learning habits. In general, the purpose of this study is to provide effective theoretical and data references for promoting the integration of AI technology and vocational college education.

2.7 Theoretical Framework of the Study

In order to more comprehensively demonstrate the application effect of AI technology in vocational education, so as to better analyze the impact of AI technology application on students' learning habits in vocational schools, this study will divide the learning process into multiple modules based on the theories of behaviorism and constructivism, and build a comprehensive theoretical framework model by integrating these modules. To explore how AI technology can help students improve learning habits through behavioral reinforcement and knowledge construction.The following is a detailed description of the framework.

The theoretical framework of this study will be constructed around behaviorism and constructivism learning theories, with the purpose of analyzing the influence of artificial intelligence technology on the learning habits of middle school students in vocational education. This research framework will guide this research by dividing specific modules in the research process, and in each specific module will involve the application of different AI tools that will enhance the process of changing student

behavior and knowledge building. The theoretical framework of this study will inform and guide basic research in each field in terms of behaviorist modules, constructivism modules, and integration and application.

Firstly, in the behaviorist module, behaviorist learning theory emphasizes that artificial intelligence technology supports learners' learning by providing learners with external reinforcement tools. (Jiao, 2020) The framework of this study will guide this research by focusing on how features such as instant feedback, reward systems, and repetitive exercises provided by AI tools enhance students' learning habits. At the same time, behaviorist learning theory provides a clear basis for studying the role of AI in motivating students to adopt positive learning behaviors through timely and sustained reinforcement.

Secondly, in the constructivism module. This framework will guide this research to explore the potential of AI tools to assist students in self-directed learning and knowledge building. Ai tools help students engage deeply in the learning process by providing a platform for personalized exercises and contextualized tasks. (Gonzalez-Calatayud et al., 2021) In the vocational education environment, AI technology can effectively support students' knowledge application and skill improvement in real or simulated work scenarios by providing students with personalized practice platforms and contextualized task design.

Finally, in terms of integration and application: The framework integrates behaviorist and constructivist approaches to provide a holistic view of the role of AI in vocational education. The integration section will guides the research toward understanding the dual effect of AI's dynamic feedback and contextual learning tasks. This will help guide the author to investigate how these combination strategies foster the change of students' learning habits and cognitive development in the study, so as to promote the improvement of students' long-term learning habits in various teaching fields in vocational schools.

By building the research around these modules, the framework will provide a theoretical basis for this research on the application of specific artificial intelligence in vocational college education under the behaviorist and constructivist paradigms, and guide the data collection and analysis of this research, which will help researchers better understand the deeper impact of AI technology on the learning habits of vocational college students.

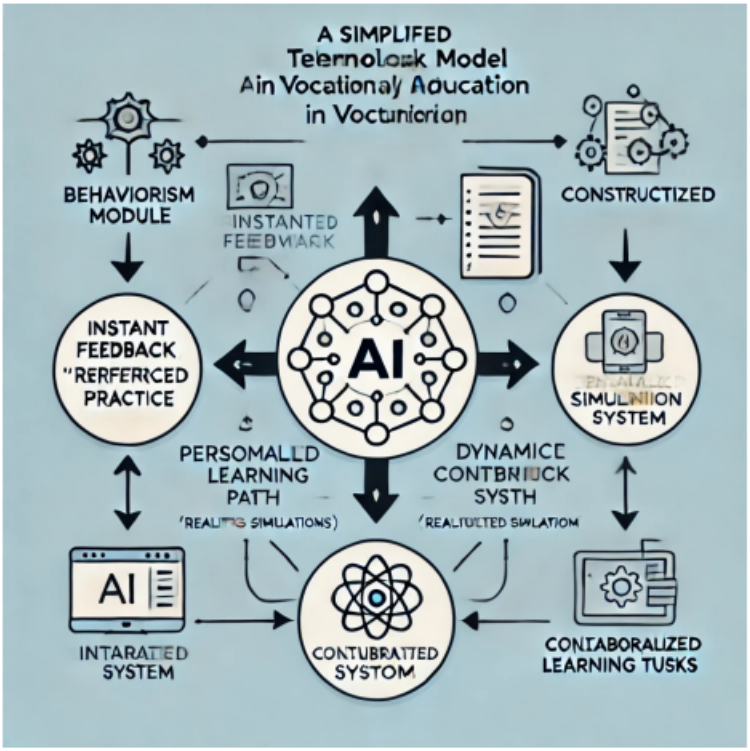


Figure2.1

2.8 Summary

This chapter reviews the application of artificial intelligence in higher education, vocational education and personalized learning. At the same time, the paper discusses the theoretical basis of the application of AI technology in education and provides a theoretical framework.This chapter also points out the challenges and research gaps in the application and future development of artificial intelligence technology in higher vocational colleges. The next chapter is about research methods. It describes the study design, study methodology, data collection tools, and research background and background.

CHAPTER 3
METHODOLOGY

3.1 Introduction

This chapter starts with an introduction (3.1). Then explains research design (3.2), sampling (3.3), instruments (3.4)and data collection (3.5), It is followed by data analysis (3.6), ethical considerations (3.7) and the chapter ends with the summary (3.8), Ensure that the research process is consistent with the research objectives.

3.2 Research Design

This study will adopt the qualitative research method to solve the problems in this study. Through qualitative methods such as interviews and case studies, this study will collect opinions from students and educators in selected Chinese vocational colleges on their experiences with AI in learning environments. By focusing on the personal experiences and perceptions of students and educators, the study aims to explore how AI tool technologies affect students' learning habits. At the same time, the use of qualitative research methods such as case studies and interviews helps to establish a deeper connection between researchers and participants. This will help researchers better solve the problems in the study.

3.3 Sampling

Purposive sampling will be used in this study, aiming to select participants with specific experiences and backgrounds in order to better explore the application of artificial intelligence (AI) technology in vocational education in China and its impact on students' learning habits. Purposive Sampling can help researchers purposefully select samples that meet specific criteria or conditions according to the research objective. (Diaz Alzate et al., 2021) Meanwhile, the purposive sampling method is applicable to qualitative research. In the research on the impact of using AI technology on the learning habits of vocational college students, the selection of participants with direct relevant experience can help researchers collect more targeted data. Therefore, in this study, the samples collected by the research institute will be taken from Tangshan Polytechnic of Industry and Technology in Hebei Province, China, which has widely introduced AI technology into teaching, and both students and teachers have experience in using AI tools. Participants will cover students of different majors in the first to third years of the college.

At the same time, the samples collected by the research institute will mainly come from vocational college students who use AI-assisted tools (such as intelligent tutoring systems, personalized learning platforms) in their daily learning. The purpose of selecting these students for sample data collection is to deeply understand the influence of AI technology on their learning behavior, learning interest, autonomous learning ability and cognitive load.

Finally, in order to ensure the validity of the collected data and its relevance to the purpose of this study, participants in this study need to meet the conditions of using AI technology tools to aid learning for at least one semester during the study period.

Considering the characteristics of qualitative research, this study will adopt the method of collecting small-scale samples, so that researchers can conduct in-depth interviews and observations of participants. It is expected that the sample size will select 10-15 vocational college students from different majors, ensuring that the sample is diverse and covers different grades, genders and learning backgrounds.

3.4 Instruments

This research aims to explore the application of artificial intelligence (AI) technology in Chinese higher vocational colleges and its impact on students' learning habits. Therefore, the research tools for this study will use interview and observation to ensure that sufficient depth of data can be collected and accurate analysis of how AI technology changes students' learning habits. The following are specific research tools:

3.4.1 Observation

When using observation as research tool in this study, the following steps will be taken specifically to collect data.

The object of observation: In this study, students in a vocational school in Tangshan, Hebei Province, China will be selected as the observation objects, and the data for this study will be collected by observing the way students in this school interact with the AI system and the changes in learning habits and behaviors during the learning process using AI technology.

Observation type: This study will use a combination of participatory observation and non-participatory observation to collect data.

Participatory observation: The researcher will enter the classroom teaching of the school selected by this study as a participant, and observe the changes of students' learning behaviors and habits caused by AI-assisted learning in classroom teaching through direct interaction with the observed, so as to collect the data of this study.

Non-participatory observation: In order to ensure the objectivity of data collection, the researcher will combine the method of watching classroom teaching videos of the selected schools in the study to collect data. At the same time, the researcher will record the key behaviors of the students in the classroom according to the observation sheet to ensure that the data comes from the natural performance of the students in the classroom learning process. In addition, when the observed behavior is consistent with the study objectives, the researcher will mark and record these key events in detail.

Observation plan and observation sheet: In this study, the researcher will collect the research data by designing the observation plan and writing the observation record

sheet.The observation plan will include the time, place, object and frequency of observation. At the same time, the researchers will detail the duration and location of each observation. In addition, the researcher will identify the behaviors or events that need to be recorded in the observation record sheet and set a recording framework for each item. In AI-assisted teaching scenarios, observation sheets will include metrics such as student engagement, frequency of interaction with AI, and task completion.

Organize and analyze data: The author will organize the observational data into clear and structured observation notes by categorizing it. Meanwhile, when handling the data collected through non-participant observation, the researcher will compare the notes and videos to verify the data. After the data has been categorized, the researcher will encode and classify the observed data, grouping similar behaviors to identify behavior patterns. Through the process of classification analysis, the researcher will help discover the differences and consistencies in students' behaviors in different contexts.

Observation reports: The researcher will summarize the observations based on the data collected during the observations, including the background, methods, findings, and conclusions of the observations. At the same time, the authors will describe key behaviors and events in detail in the report, and provide analytical results to support the answers to the questions in this study.

3.4.2 Interviews

The interview method is another major tool used in this study to gain insight into participants' experience with the use of AI technology in teaching. The interview method can collect students' and teachers' subjective feelings about AI technology, as well as its impact on learning habits and teaching effectiveness.

Semi-structured interview: This study adopts semi-structured interview, which not only has a preset question framework, but also allows the interviewees to freely express their opinions. This approach allows for in-depth feedback from participants while ensuring thematic consistency.

Interview subjects:

Students Interview: Students who have used AI technology in their learning process are mainly selected, especially those who have used AI tools (such as intelligent tutoring systems, adaptive learning platforms, etc.) for at least one semester. Through interviews, researchers will learn about students' experiences with AI technology, the impact of the technology on learning behavior, and how it compares to traditional learning models.

Interview questions will focus on the following topics:

1. Experience using AI technology: Participants' adaptability to AI technology, ease of use, and impact on learning/teaching.
2. Change of learning habits: Whether students have changed their learning habits due to the use of AI technology, such as the enhancement of independent learning ability, the enhancement of learning interest or the reduction of cognitive load.
3. The impact of AI technology on classroom interaction: Does AI tool change the way of teacher-student interaction, student participation and classroom atmosphere?
4. Comparison with traditional teaching models: How participants perceive the

differences between AI-assisted teaching and traditional teaching, and whether they believe AI can improve learning outcomes.

Data collection tools include: semi-structured interviews with students to explore their views on the role of AI in their educational experience. The use of watch lists in classrooms that integrate AI tools allows researchers to record interactions between students and AI systems.

3.5 Data Collection

In this study, the data collection process will be divided into two stages to ensure that in-depth data on the application of AI technology in vocational education is obtained from multiple perspectives. The two phases, interviews and classroom observations, aim to fully understand the impact of AI technology on students' learning habits.

Stage one: Interview

During the interview phase, the researchers will conduct semi-structured interviews with selected students. The interviewees included students who had already used AI tools in their learning or teaching process, and the interviews focused on the following topics:

Experience with AI tools: Respondents will share how and how often they use AI tools in their daily learning during the interview. Students will describe how AI tools help them complete tasks in the course, aid decision-making, provide personalized tutoring, and more.

Challenges: The researchers will explore the difficulties interviewees have encountered in using AI technology. For example, students may face challenges from technical operations. At the same time, this study will discuss technical limitations and students' adaptability in interviews.

Perceived benefits of AI technology: In particular, the researchers will focus on positive feedback from the student population, including the advantages of AI in personalized learning, automated assessment, and improved learning efficiency. In the interview, respondents will share how AI tools have helped them in terms of knowledge acquisition, skill development and time management.

Through these interviews, researchers will have an in-depth understanding of the application effect of AI technology in vocational schools and its potential impact on the learning habits of vocational school students from the perspective of individual experience. The interview data in this stage provide important reference and background information for the data analysis in the subsequent observation stage.

Stage two: Classroom observation

In the second stage, researchers will conduct classroom observations, focusing on the way AI technology interacts with students during the teaching process. The purpose of

classroom observation is to obtain real-time data on student interaction with AI technology in a natural teaching environment. Specific observations include:

Interaction patterns between students and AI: Researchers will observe and record the frequency and way students use AI tools in the classroom. In the recording process, researchers will focus on whether students actively use AI for self-assessment, complete exercises or receive instant feedback. These data can reveal how motivated and engaged students are in learning with the help of AI.

The impact of AI on students' learning behavior: During the observation process, researchers will focus on how AI technology affects students' learning behavior in terms of learning concentration, task completion and interaction between classmates.

Through classroom observations, researchers will be able to record and analyze the direct impact of AI technology on students' learning habits in real situations, providing further support for interview data. The two-stage data collection method ensures the comprehensiveness and depth of the research data, which enables the research to analyze the actual impact of AI technology on students' learning habits in vocational education from both subjective experience and objective observation.

3.6 Data Analysis

The qualitative data collected in this study will be analyzed using thematic analysis methods to systematically analyze the impact of artificial intelligence (AI) technologies on the learning habits of vocational school students. Thematic analysis method is an analysis technique applicable to qualitative data (Georgiou Konstantinos, 2024). Through data coding and topic extraction, the application effect of AI technology in vocational education environment and its impact on students' learning habits can be deeply analyzed.

Data coding: Researcher will preliminarily summarize the potential themes in the data by preliminarily coding the interview and observation data. For example, a student's reference to "getting instant feedback through an AI system" might be coded as "instant feedback."

Identify key topics: On the basis of the preliminary coding, the researcher will identify the core themes by grouping the collected data. In this study, regarding the impact of AI technology on students' learning habits, the key themes that may be extracted include: autonomous learning ability, students' learning interest, and the reduction of students' cognitive load.

Classification and comparison: In this study, the author will classify the data from interviews and observations by topic and compare the data under the same topic. By comparing across individuals, researchers will be able to identify differences in the impact of AI technology on different learners. For example, some students may respond positively to AI feedback, while others show some adaptive challenges. Analysis of

these differences helps to reveal the diversity that AI exhibits in influencing students' learning habits.

Data integration and pattern recognition: The researcher will further integrate data on the same topic to analyze the structural impact of AI technology on students' learning habits in vocational education

Conclusion: Based on the analysis results of themes and patterns, the researchers will summarize the impact of AI technology on the learning habits of vocational college students. At the same time, this study can also identify the limitations of AI technology in application through thematic analysis, which will provide improvement suggestions for subsequent research.

Table3.1

Analysis Steps	Description
Data Coding	Conduct initial coding of interview and observation data, marking specific sentences, segments, or behaviors as individual coding units to help identify potential themes in the data.
Identifying Key Themes	Group the data based on coding to identify core themes related to the impact of AI technology on learning habits, such as autonomous learning, learning interest, and cognitive load reduction.
Categorization and Comparison	Classify the data by themes and compare data within the same theme to identify differences in the impact of AI technology on different learners, such as feedback effects and adaptability challenges.
Data Integration and Pattern Recognition	After thematic classification, further integrate data within the same themes to extract deeper patterns, revealing structural impacts of AI on learning interest, autonomous learning, etc.
Drawing Conclusions	Summarize the results of the thematic analysis, combining subjective feedback and objective observations to conclude the specific impacts of AI technology on learning habits and provide application recommendations.

3.7 Ethical Consideration

Informed consent: All participants will be informed of the purpose of the study and their rights, including the right to withdraw at any time.

Confidentiality: Data will be anonymized to protect the identity of participants and ensure that personal information is not leaked.

Voluntary participation: Participation is entirely voluntary, without any compulsion or incentive to ensure a just response.

Researchers will work with faculty members to initially screen eligible students and faculty through classroom observations and communication with administration. The researchers then sent invitations to eligible participants by email or in person, along with detailed study information and informed consent.

3.8 Summary

This chapter Outlines the methodological approaches used to explore how artificial intelligence technologies affect the learning habits of Chinese vocational students. Through qualitative research methods such as interviews, observations, and case studies,

this study aims to collect rich, context-specific data to address research questions and contribute to understanding the role of AI in vocational education.

CHAPTER 4
FINDINGS

4.1Introduction

This chapter presents the findings and discussion of data obtained from semi-structured interview and observation.Fifteen students and a class from Zhangjiakou Vocational and Technical College participated in this study.This chapter begins with a brief introduction(4.1).Then flowed by vocational college students prefer AI technology type(4.2).Reasons for vocational college student use AI(4.3).The impact of AI technology on the learning habits of Chinese vocational college students(4.4).The chapter ends with the summary(4.5)

4.2Vocational College Students Prefer AI Technology type

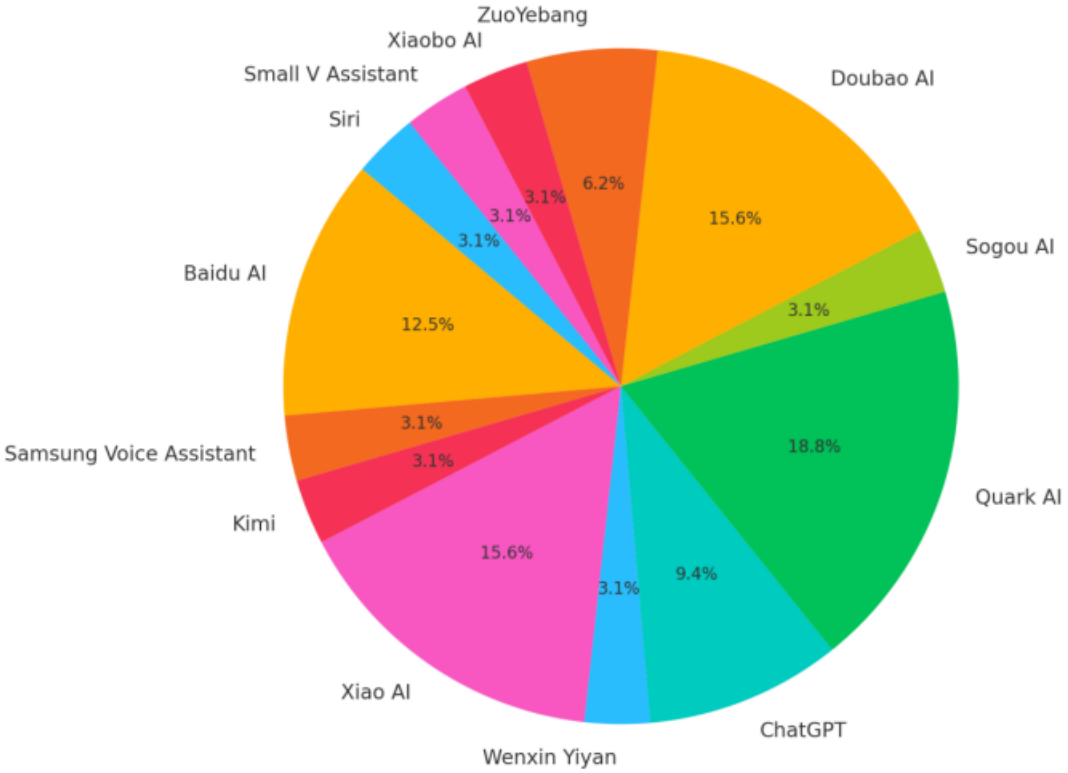


Figure4.1Vocational College Students Prefer AI Technology type

Figure4.1 shows the names of AI tools that students prefer to use. According to Figure4.1, Chinese vocational college students mainly use Baidu AI, Kimi, Xiao AI (Millet Assistant), ChatGPT, Quark AI, Wenxin Yiyan and other artificial intelligence tools. These tools were frequently mentioned by participants in the interview and were used in scenarios such as organizing learning materials, retrieving knowledge information, assisting students in generating creative thinking, and assisting students in completing autonomous learning tasks.For example, Student 4 mentioned in the interview:*"I usually use Wenxin Yiyan and ChatGPT to help me complete advertising planning tasks. These tools also help me translate languages and create art."*

These AI tools used by students in their daily learning highlight the important role of AI tools in providing personalized learning support to students and improving student learning efficiency. Almost all participants said in the interview that these AI tools provide them with targeted learning knowledge through their own functions, helping them to better manage their learning process, so as to learn more effectively. This

finding is consistent with Liu's (2018) research finding that AI technology helps students improve their learning efficiency by providing customized learning support for students.

Other than that. AI tools further enhance their appeal to students with their engaging features for knowledge transfer, such as the presentation of retrieved information through animations or structured Outlines. Student 8 stated in the interview:*"The AI tool I use most often is Quark AI. I use it to generate images I need and provide creative ideas for documents."*This finding is consistent with Hou's (2021) research highlighting the ability of AI intelligence technology to provide personalized content to students through its own platform capabilities. At the same time, the findings of this study also noted that AI intelligence tools can provide students with personalized learning content while also creatively providing students with different ways to present learning content, this finding has been less mentioned in current research.

In conclusion, Chinese vocational college students prefer AI tools that are aligned with their academic and personal learning goals, which can provide students with more efficient, targeted and engaging knowledge content support. The preference of students when choosing AI intelligence tools reflects the importance of integrating AI technology into current vocational education. Reasonable integration of artificial intelligence technology into current vocational education can better help students strengthen time management, provide students with knowledge content that can support their personalized learning, and thus help students achieve better learning outcomes and support students' personalized educational experience. By meeting these needs of students, AI tools can help change traditional learning habits and equip students with the skills needed in modern career fields.

4.3Reasons For Vocational College Student Use AI

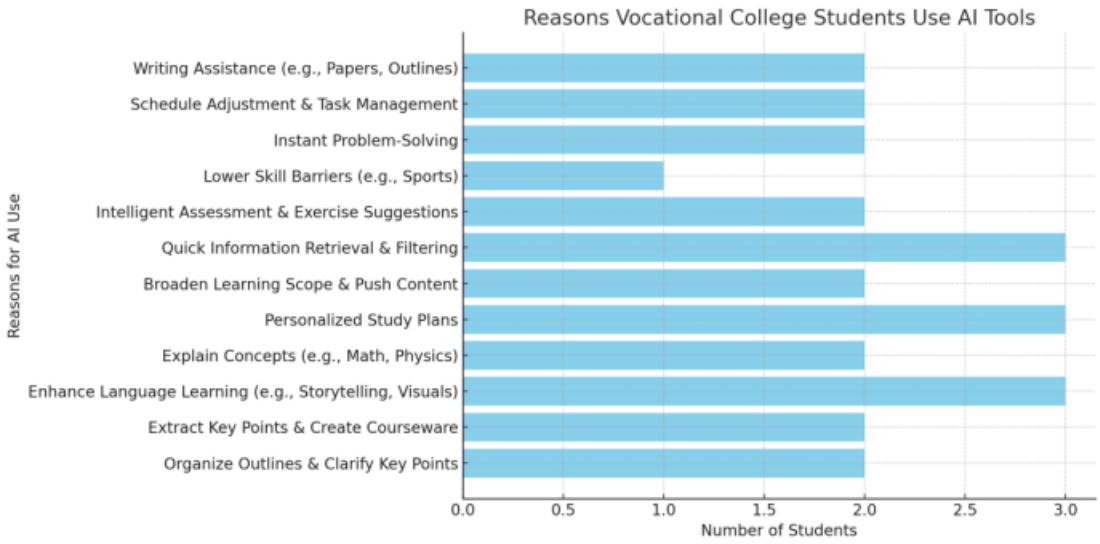


Figure4.2Reasons for vocational college student use AI

According to the Figure4.2, students use AI tools for five key reasons: to improve learning efficiency, provide personalized support, optimize time management, enhance learning interest, and foster self-directed learning.The data from this study found that vocational college students prefer to use AI tools to assist learning in the learning process because these tools address key challenges in traditional learning methods, such

as time constraints, lack of personalized resources, and lack of student engagement in the learning process.AI tools, through their own capabilities, are able to provide students with targeted learning content, which enables students to better focus on their unique academic needs and interests. Student 5 shared in the interview:"*Ai tools personalize my study schedule and help me allocate my time efficiently.*"Meanwhile, student 6 explained:"*Ai tools can present knowledge in a way I like, making learning easier and more engaging.*"At the same time, AI tools, with their automated information retrieval and processing capabilities, can help students complete tasks faster.Student 15 pointed out that: "*Ai tools not only provide quick answers, but also provide targeted suggestions, such as recommending exercises based on my mistakes, to help solidify what I've learned.*"By improving the learning efficiency of students in the process of independent learning, AI tools can allow students to allocate more time to the learning content of personal interest or other subjects, which will also make the learning process of students more effective. This finding is consistent with Liu's (2018) research finding that AI can improve students' learning efficiency by providing personalized assisted learning to students.

At the same time, another reason for students to use AI tools is that AI tools can help students optimize time management. In this study, many students used AI tools to effectively manage their schedules and self-directed study time.Student 13 emphasis that: "*Ai tools tailor my daily tasks to my schedule and help me achieve my learning goals more efficiently.*"The personalized time management function provided by the artificial intelligence tool based on its platform system can help students rationally plan their study and life, and cultivate students' ability to plan and supervise their study time independently, which will help students better balance their study and personal life. This finding further supports the view of Suparyati et al. (2024) in their study that AI technology has great potential in providing personalized learning guidance to students.

In addition, an important reason for students to use AI tools is that AI tools can help students enhance their learning interest in the subject. This is mainly reflected in the interactive presentation of knowledge, the presentation of tailor-made learning content for students, the lowering of barriers to learning new skills and the provision of creative and dynamic content for students.AI tools have significantly increased students' interest in learning by making the learning process more engaging, interactive, and tailored to their preferences.Several students highlighted in this study how AI tools can transform traditionally challenging or mundane learning tasks into enjoyable experiences.

In terms of interactive presentation of knowledge, AI tools are able to present to students those complex concepts that exist in the discipline in a creative and engaging form, which helps motivate students to study their discipline more deeply. For example, student 4 shared that: "*Ai tools use animations to explain complex mathematical or physical concepts, making them easier to understand.*" The study found that the approach adopted by AI not only simplified the abstract concepts that existed in the original subject, but also helped students maintain their interest in subjects that they had previously found difficult to learn.

When it comes to presenting learning content tailored to students, students value how AI tools can adapt the content presented to their learning preferences. Student 3 representation that: "*Artificial intelligence tools can choose the English words I need to learn according to my learning situation, and improve my learning interest through*

storytelling or visual AIDS." This personalized approach can establish a close connection between students' own unique learning style and the content of the knowledge, and help students to learn the subject content in their preferred learning style, thus further enhancing students' learning interest.

In terms of reducing barriers to learning new skills, AI tools facilitate the learning of new skills by providing students with easy-to-grasp technical guidance and content support. Student 11 mentioned: "*I use artificial intelligence tools to learn badminton. These AI tools lower the barriers to acquiring new skills and provide advanced training methods that make learning more enjoyable for me.*" This finding demonstrates the versatility of AI tools in supporting students' academic learning as well as learning outside the classroom.

In providing creative and dynamic content to students. AI tools help make the learning process more engaging by providing students with innovative and dynamic learning content. Student 8 points out: "*My forest health course requires gathering a lot of information. Artificial intelligence tools can quickly search and filter relevant information, greatly reducing task completion time.*" Ai tools encourage students to tackle demanding learning projects with greater enthusiasm through their high efficiency in providing information content. At the same time, student 9 stressed: "*Ai tools not only quickly answered my questions, but also recommended relevant knowledge based on my interests, which broadened my horizons and made learning more enjoyable.*" Ai tools can also inspire students to explore new areas of knowledge that interest them. This feature of AI tools can motivate students to go beyond their courses and explore more areas of knowledge.These students' responses show how AI tools specifically enhanced students' interest in learning. Ai tools turn potentially boring or frustrating learning experiences into opportunities for curiosity and creativity by making learning content more accessible and providing students with more personalized ways to present knowledge.This finding further supports Wu (2021) 's research finding that the application of AI cloud teaching technology in higher vocational English teaching can effectively enhance students' learning interest and thus improve students' expected learning results. This increased interest in learning is essential to developing students' motivation for continuous learning.

The final reason for students to use AI tools is that AI tools can cultivate students' autonomous learning ability. Students value the ability of AI tools to assist them according to their own needs, which can effectively assist them in independent learning. Student 12 pointed out that: "*Before, I had to rely on teachers or books to help solve problems, which was time-consuming. Now, AI tools provide instant solutions that allow me to learn more independently.*"This access to immediate support reduces reliance on traditional resources and helps students better engage in self-directed learning. This finding complements Wu's (2023) argument that AI technology can improve students' learning autonomy.

To sum up, the reason why vocational students use AI tools is that these AI tools effectively solve the inherent challenges in traditional learning, such as inefficiency and lack of personalization. The results of the study show that AI technology can effectively circumvent the problems existing in traditional vocational education methods that do not meet the development needs of students by creating a more efficient, engaging, and student-centered learning environment. Promoting the integration of artificial

intelligence technology and vocational education can provide students with knowledge content and teaching methods that are more in line with their individual development needs, which will help students further optimize their academic performance and provide students with a good knowledge and ability reserve for adapting to the needs of modern workplaces.

4.4The Impact Of AI Technology On The Learning Habits Of Chinese Vocational College Students

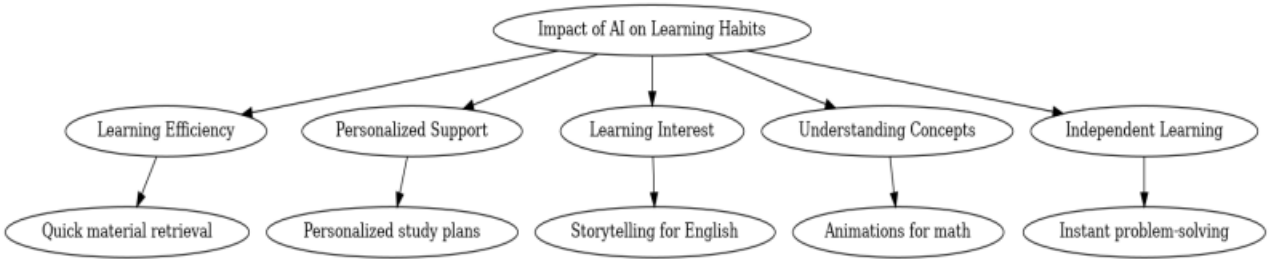


Figure 4.3 The Impact Of AI Technology On The Learning Habits Of Chinese Vocational College Students（Interview）

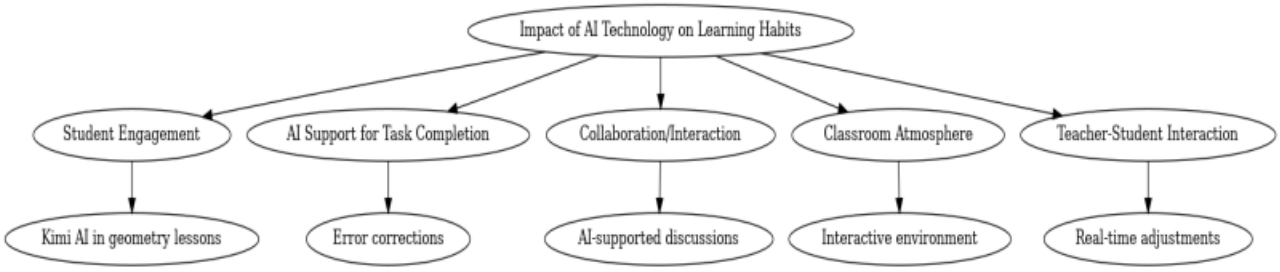


Figure 4.4 The Impact Of AI Technology On The Learning Habits Of Chinese Vocational College Students（Classroom Observation）

Figures 4.3 and 4.4 show that AI technology has a significant effect on the learning habits of Chinese vocational college students. In the interview, the students emphasized that the main advantages of AI technology are the efficiency it can provide by having the materials fast, organizing them efficiently, and bringing about personalized learning, including tailor-made study plans and auto-suggestions that significantly increase the study efficiency of vocational students. Storytelling and animations tend to make it all more interesting and simple, therefore enabling a more engaged learning experience for students. Observations in the classroom have indicated how AI tools, such as Kimi AI, provide for active participation, support problem-solving collaboratively, and also offer an interactive atmosphere. Besides, AI-powered real-time analytics allow teachers to effectively address common errors, further revealing another dual role of AI in fostering independent and classroom-based learning.

The wide application of artificial intelligence (AI) technology has significantly changed the learning behavior of vocational college students, which is manifested in the improvement of information retrieval efficiency, the optimization of learning plans, the improvement of feedback and evaluation methods, and the enhancement of concept understanding ability. These changes are not only reflected in student interviews, but

also further verified through classroom observation, which strongly echoes the research results of existing literature.

4.4.1 Information Retrieval

AI tools enable students to quickly acquire and process a large amount of information through efficient and intelligent operation, which significantly improves the efficiency of task completion. Student 14 said： *"The AI tool allows me to quickly find the information I need to write my paper and generate an outline so that I can focus on the content instead of spending a lot of time searching for sources."* The researchers observed that Kimi AI was capable of rapidly identifying errors in code, such as missing loop conditions, and providing targeted optimization recommendations during the programming course. This immediate feedback allows students to focus more on the training of logical thinking rather than getting bogged down in tedious debugging. In addition, Student 15 added, "*It used to take hours to organize the data, now it takes just minutes."* This effective method of information acquisition is in accordance with Jiao's (2020) research, which demonstrates that AI technology enables students to focus on higher-level learning activities and save time by leveraging its robust data processing capabilities.

4.4.2 Optimization of Learning Plans

AI technology helps students manage their time scientifically through personalized learning support and cultivates more systematic learning habits.Student 5 mentioned, "*The AI tool makes a study plan based on my learning progress, so that I don't miss anything that needs to be reviewed.*"Classroom observations also revealed that Kimi AI divides complex mathematical theorems into multiple easy-to-understand steps based on the student's ability level, ensuring that students have clear direction throughout the learning process.Student 6 further pointed out that "*After planning my time with AI tools, I was able to find a better balance between study and life.*" This intelligent planning ability not only improves learning efficiency but also effectively alleviates students' anxiety caused by difficult tasks. Wu's (2021) research backs up this claim, demonstrating that AI tools can provide students with personalized and efficient time management plans by dynamically adjusting learning activities.

4.4.3 Feedback and Evaluation

The AI system's immediate and targeted feedback has significantly improved students' autonomous learning ability.Student 7 said, "*An AI system like Homework Help grades my essays and provides suggestions for improvement, which allows me to see my progress every time I write.*"During the observations, Kimi AI not only identified errors in the students' code, but also suggested alternative solutions, such as more efficient algorithms. This detailed feedback enables students to recognize their own flaws while increasing their confidence in dealing with complex problems.Student 10 also said, "*The AI tool can automatically mark my mistakes and recommend relevant exercises, so that I can make rapid progress in practice.*"Tsai et al. (2022) demonstrated that the use of AI technology in real-time feedback and learning assessment effectively increased students'

personalized learning ability and room for improvement, which is completely consistent with the above student and classroom data.

4.4.4 Conceptual Understanding

AI tools leverage dynamic presentations and interactive learning to give students a more intuitive grasp of complex abstract concepts.For example, Student 4 mentioned, "*The AI tool uses dynamic demonstrations to explain the principle of force synthesis, which allows me to not only memorize the formula, but also understand the logic.*"In the class, Kimi AI shows the direction and magnitude changes of forces by generating vector graphs in real time, and students can intuitively see the synthesis and decomposition process of forces through interactive operations, thus gaining a deeper understanding of abstract physical concepts.Student 9 also mentioned, "*I used to think the concepts of management were very boring, but through the interactive display of AI tools, these theoretical knowledge became vivid and easy to accept.*"Blake's (2024) study also shows that AI technology can effectively enhance students' understanding of complex concepts through interactive and visual tools, thus significantly improving learning results.

AI technology has demonstrated a powerful transformative power in vocational education by improving the efficiency of information retrieval, optimizing learning plans, providing immediate feedback, and enhancing conceptual understanding. These findings are in very good agreement with the literature and further confirm that AI technology is indispensable in modern education systems; while providing personalized and intelligent support, AI not only changes the way students learn, but it also lays a very solid foundation for their future development in the modern workplace.

4.5 Summary

Based on the semi-structured interviews and observations in the classrooms, this research will carry out in-depth explorations on how artificial intelligence (AI) technology has influenced the learning behaviors of students in Chinese vocational colleges. Results showed that the influence of AI technology on the students' learning behaviors improved a lot. The learning efficiency of students increased significantly. Students learned things more efficiently and quickly, particularly through AI tools, which has helped to enhance the learning efficiency of students to a large extent. The effective information retrieval function enables students to retrieve and process a huge amount of learning resources within a very short time and thus focus on higher levels of learning activities. Meanwhile, the immediate feedback function of the AI tool helped students to identify and correct errors quickly for optimization. For example, AI systems allow students to automatically get a grade with particular suggestions for improvement in academic writing, enabling students to upgrade their skills as soon as possible. The second aspect is that AI technology optimizes management in the best possible way while considering students' learning plans due to personalized learning support. Using AI tools enables the dynamic adjustment of task arrangements based on the learning progress and needs of students, thus helping students to scientifically allocate time and form systematic learning habits. This kind of intelligent planning not only relieves

students from the stress caused by heavy study tasks but also enhances their ability to balance academic and personal life. Besides, AI tools can break down complex learning goals into small, actionable tasks so that students can keep a clear sense of direction throughout the learning process. Highly, finally, AI technology enhances students' understanding of abstract concepts with dynamic presentations and interactive learning and fosters interest in learning. For this purpose, AI tools are used through animations or visualizations for illusive presentation of abstract mathematical or physical concepts. Only this novelty in the presentation of knowledge helps students grasp deep theoretical knowledge but enhances their interest in the subject and motivation toward exploration. This study also revealed that the personalized learning content and interactive features of the AI tool further enhance the autonomous learning ability of students in completing learning tasks independently without teacher guidance. In short, AI technology has transformed traditional learning modes by significantly improving learning efficiency, optimizing learning plans, and enhancing interest and understanding, injecting new vitality into the development of vocational education, while laying a solid foundation for students to succeed in the modern workplace.

CHAPTER 5
DISCUSTION

5.1 Introduction

This chapter begins with a brief introduction(5.1).Then flowed by the conclusion(5.2).Including AI technology has significantly improved the learning efficiency of students(5.2.1). AI technology optimizes the management of students' learning plans(5.2.2).AI technology enhances students' learning interest and understanding ability(5.2.3).The chapter ends with the recommendation (5.3) .Including Deep integration of AI technology into vocational education curricula(5.3.1). Provide comprehensive AI tool training and support(5.3.2).Build an ecosystem that supports personalized learning(5.3.3)

5.2 Conclusion

5.2.1 AI technology has significantly improved the learning efficiency of students

This study showed that AI tools show great potential for improving student learning efficiency through their efficient information retrieval and instant feedback capabilities. In the traditional learning mode, students often spend a lot of time manually searching and filtering learning resources, which not only reduces efficiency, but also may lead to fatigue in the learning process. AI tools, through intelligent algorithms and powerful data processing capabilities, are able to complete these tasks in a short time, enabling students to focus more on high-level thinking and application. For example, when students complete academic writing, AI tools can not only automatically grade, but also help students quickly identify mistakes through specific suggestions for improvement, thereby improving their writing ability in a relatively short time. In addition, the instant feedback capabilities of AI tools are especially important for students. When students encounter difficult problems in the learning process, AI tools can quickly provide solutions or reference suggestions, preventing students from feeling frustrated by being unable to break through the problem for a long time. This immediacy not only increases learning efficiency, but also enhances students' ability to stay active during the learning process. This aligns with Jiao's (2020) study, which states that AI technology further optimizes the learning process by reducing repetitive tasks and allowing students to devote more time to creative thinking and deep learning.

5.2.2 AI technology optimizes the management of students' learning plans

This study discovered that AI technology has great advantages in optimizing the management of students' learning programs, with personalized learning support at its heart. Contrasting with the traditional "cookie-cutter" teaching plans, AI tools dynamically analyze the learning behavior and progress of students to offer learning tasks and schedules that better suit each student's needs. For instance, guided by the AI tool, students set the daily study objective and modify their study plan based on what they actually achieved, greatly enhancing scientific time management. On the whole, students said AI tools help to plan time better so that time in balancing study and life is reasonably apportioned without overburdening with stress and academics. In addition, AI technology is able to break down complex learning goals into specific, small

learning tasks, so that students can clearly see their progress at each stage. This approach not only helps students maintain motivation, but also makes them more comfortable with long study assignments. For example, a student mentioned that through the learning plan function of the AI tool, he was able to accurately identify the weak points of review and make targeted review plans, which significantly improved the efficiency of review. The existing literature also validates this finding, such as Wu (2021) pointing out that AI tools significantly improve students' learning efficiency and task completion quality by dynamically adjusting learning tasks and providing personalized time management schemes.

5.2.3 AI technology enhances students' learning interest and understanding ability

The dynamic presentation, interactive learning and visual presentation of AI technology greatly enhance students' learning interest and understanding of complex concepts. In traditional teaching, the learning of abstract concepts often relies on the teacher's verbal descriptions or static illustrations, which is not interesting for many students and may even make learning boring. AI tools present complex theoretical knowledge in a more intuitive and vivid way through animation, interactive scenes, and dynamic knowledge presentation. For example, when studying "the synthesis and decomposition of forces" in physics, AI tools help students visually see the process of force changes through real-time generated vector animations, so that they can not only remember the formula, but also deeply understand the logic behind it. In addition, AI tools also push personalized content according to students' learning interests and needs, so that students always stay motivated during the learning process. For example, one student mentioned that the personalized knowledge recommendations he was exposed to through AI tools not only broadened his disciplinary horizons, but also stimulated his interest in exploring new areas of knowledge. What's more, AI tools have also demonstrated excellent functionality in reducing students' learning disabilities. For example, when students learn new technologies or skills through AI tools, they find that the easy-to-understand guidance and content support provided by these tools greatly lowers the learning barrier, making it easier for them to master new knowledge. This finding is consistent with the findings of Blake (2024), which pointed out that AI tools, through interactive and visual teaching methods, not only effectively improve students' mastery of complex concepts, but also greatly enhance students' interest in learning and motivation to continue learning.

5.3Recommendation

5.3.1Deep integration of AI technology into vocational education curricula

In vocational education, the deep integration of artificial intelligence (AI) technology has significant potential to not only improve the quality of teaching, but also provide customized support for the characteristics of different disciplines, and promote the cultivation of students' practical ability and the optimization of learning results. In technical courses, AI tools, such as code debugging systems or virtual simulation software, can provide feedback and optimization suggestions in real time to help students master programming and engineering skills more efficiently. In language

courses, speech recognition and translation AI tools can provide students with context-based immersive language learning environments, especially in professional English, to help students improve industry-specific communication skills; In management and business, the AI data analysis platform allows students to practice skills such as marketing, financial forecasting and decision making by simulating real business scenarios; In design and creativity courses, AI generation tools can release students' creative potential and improve creative efficiency by quickly generating design drafts, copywriting content or optimizing visual elements; Engineering and mechanical courses can use AI simulation technology to provide students with virtual equipment operation and architectural design testing environment, so as to reduce experiment costs and improve learning effects; In nursing and health courses, AI-driven virtual cases and simulation training systems provide students with safe and efficient practice opportunities to effectively reduce the risk of actual operations. These integration practices need to be achieved through a number of measures, including: promoting the active participation of teachers in AI-driven curriculum design, establishing interdisciplinary teams to develop AI teaching solutions that meet the characteristics of the discipline, equipped with high-performance hardware and professional AI application software, and piloting in some courses, and continuously optimizing integration solutions through feedback from students and teachers. In addition, in order to ensure the sustainable application of AI technology in vocational education, it is recommended that schools develop a systematic evaluation mechanism, regularly evaluate the teaching effectiveness of AI technology and student learning outcomes, and continuously improve its application strategies. Through these systematic and strategic measures, AI technology can inject new vitality into vocational education, not only improving students' learning efficiency and professional competence, but also better meeting the demand for highly skilled talents in the modern workplace.

5.3.2Provide comprehensive AI tool training and support

In vocational education, promoting the widespread use of AI technology requires attention to both teacher and student support and development, as well as its potential ethical issues. First, for teachers, schools can help them master the practical application of AI tools in teaching, such as how to design AI-based personalized learning paths, real-time feedback systems, or dynamic presentation content, by providing specialized training and skills upgrading opportunities. In addition, AI teaching pilot courses and resource sharing platforms will be set up to support teachers to accumulate experience in the pilot, and promote interdisciplinary exchanges and cooperation through the sharing of successful cases. In order to motivate teachers to actively participate, teaching design incentives can also be established, such as rewarding the best AI integration solutions, and introducing continuous feedback mechanisms to optimize training and technical support strategies in a timely manner through symposia or questionnaires. Secondly, for students, AI skills training courses should be organized so that students can understand and master the basic operation and application scenarios of AI tools, such as the use of code debugging tools in programming, and the application of speech assessment and translation tools in language learning. At the same time, schools can provide students with AI-based learning management platforms to help them develop learning plans, track learning progress, and recommend personalized content and resources based on data analysis. In addition, schools should encourage

students to actively use AI tools in academic tasks or projects, explore more potential of the technology through competitions or hands-on activities, and develop students' critical thinking so that they can rationally look at the limitations and potential risks of AI technology. In particular, the application of AI technology also involves ethical issues such as privacy protection, fairness, and algorithmic transparency. Schools must raise awareness of data ethics through curriculum and training, such as educating students about how AI handles personal data and its potential risks, and ensuring that AI tools are used in accordance with data security and privacy protection principles. At the same time, schools should establish clear ethical codes, such as requiring AI tool developers to provide transparent data use statements and review and guard against potential risks of bias and discrimination. In addition, in order to ensure the legitimate rights and interests of teachers and students, the school can establish an AI technology ethics committee to supervise the introduction and application of AI tools. Through the above systematic measures, we can not only promote the application of AI in vocational education at the technical level, but also guarantee its fairness and sustainability at the ethical level, and ultimately improve the teaching effect and students' vocational skills, laying a solid foundation for its future development.

5.3.3Build an ecosystem that supports personalized learning

The core advantage of AI technology is its ability to provide personalized support, so vocational colleges should focus on building a personalized learning ecosystem that is compatible with constructivist learning theory. Constructivism believes that learning is a process of actively constructing knowledge through interaction with the environment, rather than simply receiving information. As a result, AI technology can effectively support students in building knowledge in real situations through dynamic feedback, interactive learning, and personalized content recommendations. Schools can develop AI-based personalized learning platforms that combine students' interests, learning habits, and career goals to dynamically generate learning paths and knowledge maps. Through these tools, students are not only able to adjust their goals to their own learning progress, but also to actively explore and solve problems in rich real-world task situations. For example, AI tools can simulate career scenarios for students, allowing them to learn how to apply their skills in a real work environment, facilitating knowledge transfer and deep learning. In addition, schools should combine constructivism's emphasis on social interaction and use AI technology to promote collaborative learning. The AI platform can support students to form learning teams and bring students with different strengths and abilities together to complete challenging tasks through intelligent grouping functions. For example, AI can automatically assign roles and tasks to each student based on their learning data, and encourage team members to collaborate to exchange knowledge and reflect on ideas, thereby jointly building a higher level of understanding. At the same time, schools should also set up a learning tutor mechanism to provide personalized guidance for students combined with AI-generated data reports. Tutors can not only help students interpret learning data, but also guide students to actively construct knowledge through reflection and experimentation in complex situations. In addition, AI tools can also serve as an aid to tutors in this process, providing real-time data analysis and teaching recommendations to help tutors better support students' learning. To ensure the sustainability of this

ecosystem, schools need to pay special attention to data privacy and AI ethics. Through curriculum education, students are taught how to protect personal privacy when using AI technology, while developing their sense of technical responsibility. For example, students are guided to reflect on the fairness and transparency of the content recommended by AI, so that they learn to critically look at the limitations of technology while accepting technical support. The personalized learning ecosystem combined with constructivism learning theory can not only enhance students' learning interest and autonomy, but also help students realize the internalization and transfer of knowledge through the learning process of contextualization and collaboration, and lay a solid foundation for future career development.

Appendix

Appendix A Consent Form

Student Consent Form

The impact of AI technology in education on the learning habits of Chinese vocational college students

Researcher: ZhangRui

Student Informed Consent Form

I am currently a postgraduate student at Taylor's University. I would like to do classroom observation as part of my research. As part of the observation, I would also like to do video/audio recordings of your English class. Thus, I would like to request your permission to observe, interview and record you during your lessons in the class for a semester from December 2024 to February 2025. I would appreciate if you could sign and return the form as soon as possible.

Thank You.

Consent Statement

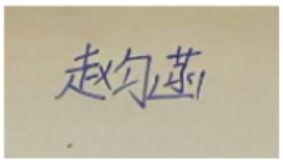
I, the undersigned, have understood the above explanation and have given my consent to
voluntarily participate in this study.

[√] I consent to being recorded while in class, during the group discussions, oral
presentations and interview.

[√] I consent to the recordings being analysed for the research purposes. Anonymity will be preserved if extracts are included in research publications or reports

Name: _____ZhaoYunhan_____

Signature:



_____ _____

Date: 02.12.2024

Teacher Consent Form

The impact of AI technology in education on the learning habits of Chinese vocational college students

Researcher: ZhangRui

Informed Consent Form

Permission from Mr.Lee, class lecturer

I am currently a postgraduate student at Taylor's University . I would like to do classroom observations as part of my research. As part of the observation, I would also like to do video/audio recordings of your English class. So, I would like to request your permission to observe, interview and record you and the class for a semester from December 2024 to February 2025. I would appreciate if you could sign and return the form as soon as possible.

Thank You.

Consent Statement

I, the undersigned, have understood the above explanation and have given my consent to

voluntarily participate in this study and allow the researcher access to my class during lessons.

[√] I consent to being recorded while in class, during the group discussions, oral

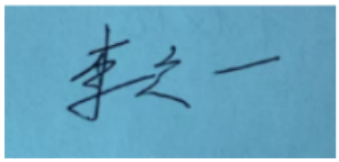
presentations and interview.

[√] I consent to the recordings being analysed for the research purposes. Anonymity will

be preserved if extracts are included in research publications or reports.

Name: LI Liuyi

Signature:



Date: 1.2.2025

Appendix B Interview video

Semi-Structured Questions:

1. What AI tools do you use most frequently, and what are their main functions?
2. How do you think AI tools have influenced your learning behavior and habits?
3. What advantages or challenges do you perceive when comparing AI-assisted learning with traditional methods?
4. Have you faced any technical or adaptability issues when using AI tools? How did you address them?
5. How have AI tools specifically impacted your learning efficiency, interest, or time management?

https://drive.google.com/file/d/1T4PeIP-fyOpR_jnuds11kxpC3oX6bGsI/view?usp=drive_link

Appendix C Transfer From Interview

1.What AI tools do you use most frequently, and what are their main functions?
Student: 我平常用的最多的如百度 AI 或者三星语音助手，也就 B4B 就用在各种作业方面查找各种资料帮我。疏通各种思维导图就很方便。（I usually use the most such as Baidu AI or Samsung voice assistant, B4B is used in a variety of jobs to find a variety of information to help me. It's easy to unclog all kinds of mind maps.） **Researcher:** 有没有一些功能是你比较喜欢的呢？（Are there any features you like?） **Student:** 大数据统查功能，例如我的专业课中的茶艺课程，AI 工具能够为我介绍一些茶叶的产地以及他们的制作方法，同时，AI 工具可以将这些信息进行集合，归类。可以帮助我很方便的具体的知道各种茶叶的制作方法。（Big data check function, such as the tea art course in my professional course, AI tools can introduce some tea origin and their production methods to me, and AI tools can collect and classify these information. It can help me to know the specific method of making various tea easily.）
2.How have AI tools specifically impacted your learning efficiency, interest, or time management?
Student: AI 对我行为的影响是我会在写作业之前先习惯性的去用 AI 搜索一下，检索一下关键信息。为我的作业提供一个大纲。我会习惯性的利用 AI 工具先把大纲确定下来，再结合我的理解添加框架。（The influence of AI on my behavior is that I will habitually use AI to search and retrieve key information before I do my homework. Provide an outline for my homework. I will habitually use AI tools to determine the outline first, and then add the framework based on my understanding.） **Researcher:** 好的，也就是检索这些关键的信息，关于你作业或者课程的。这些东西对你的学习或者习惯有所帮助吗？（Ok, so that means retrieving key information about your assignment or course. Do these things help you with your studies or habits?） **Student:** 对我的学习习惯有很大的改善。他让我的学习变得更加简便，不需要我通过网站一条一条的去搜索关键信息。AI 工具会将这些信息向我进行集中性的展示，这会很节约时间从而帮助我更便捷的学习！（It has greatly improved my study habits. It made learning easier for me, without requiring me to search for key information one by one through the website. The AI tool will show me this information in a centralized way, which will save time and help me learn more easily!）
3.What advantages or challenges do you perceive when comparing AI-assisted learning with traditional methods?

Student：在我看来 AI 工具的优势在于，他可以使学生们在接触一个新的，陌生的事物的情况下可以更好的对这一事物或者学习内容进行理解。比如说在课堂中的各种机械零件，在传统的课堂中它可能仅仅是书本上的知识。但是通过 AI 技术的 3D 和制图等功能可以让我们作为学生很直接的了解到这些机械零件的构造。（In my opinion, the advantage of AI tools is that they can make students better understand this thing or the learning content when they are exposed to a new and unfamiliar thing. For example, in the classroom of various mechanical parts, in the traditional classroom it may only be book knowledge. However, through the 3D and cartographic functions of AI technology, we can directly understand the construction of these mechanical parts as students.）

4.Have you faced any technical or adaptability issues when using AI tools? How did you address them?

Student：有的一些智能 AI 工具可能没有中文版本，对于某些英语基础不好的同学会造成很大的困扰。但是。我会尝试利用翻译软件对其中的内容进行检索。（Some intelligent AI tools may not have a Chinese version, which will cause great trouble for some students with poor English foundation. But. I will try to use translation software to retrieve the contents.）

Researcher：好的，你可以通过使用其他的翻译软件，然后帮助你去理解这个人工智 I 的人工智能 AI 的一些具体的功能，然后来帮助你使用这个 AI。（Well, you can help you use this AI by using other translation software that then helps you understand some of the specific functions of this AI and then helps you use this AI.）

Student：对。（Yes）

5.How have AI tools specifically impacted your learning efficiency, interest, or time management?

Student：AI 对我的影响很大，比如手表配备了各种智能检测功能，也会给我提供非常健康的休息和休息。例如，他会告诉我什么时候睡觉或提醒我喝水，提醒我锻炼，这将是一个很好的改善我的健康。此外，它也会提高我的睡眠质量，使我更方便地完成我的各种任务。

（AI has a great impact on me, such as the watch equipped with various intelligent detection functions, which will also provide me with a very healthy rest and rest. For example, he will tell me what time to go to bed or remind me to drink water, remind me to exercise, which will be a good improvement to my health. In addition, it will also improve my sleep quality and make it more convenient for me to complete my various assignments.）

https://docs.google.com/document/d/1XXW7mt_wg_S8w4C9pIiZaqHbE7OhnXN3/edit?usp=drive_link&ouid=116929540252679302108&rtpof=true&sd=true

Appendix D Thematic Analysis

Research Question	Theme	Evidence from Participants (P) responses
1. What type of AI technology do the vocational college students in China prefer to use?	AI technology to improve students' learning efficiency	P2: "I use Kimi and Xiao AI to help me extract important content from learning materials and integrate them efficiently." P7: "ZuoYebang AI helps me grade my writing automatically, which improves my writing ability and efficiency." P4: "Wenxin Yiyan and ChatGPT help me complete advertising planning tasks in my courses by generating creative ideas." P10: "I use Xiao AI to plan my study time and retrieve relevant knowledge based on my interests." P11: "AI tools like Xiao AI and Baidu AI help me solve learning puzzles independently when teachers are unavailable."
1. What type of AI technology do the vocational college students in China prefer to use?	AI intelligent tools support personalized learning for students	P1: "I usually use Baidu AI or Samsung voice assistant most often. These tools help me create mind maps and sort out learning materials." P6: "ChatGPT helps me find professional academic knowledge and assists in language translation." P10: "I use Xiao AI to plan my study time and retrieve relevant knowledge." P13: "I use Vivo's AI assistant for quick retrieval of information, especially for solving difficulties in study and life." P15: "Quark AI helps me quickly search for learning knowledge and translate languages effectively."
2. Why do vocational college students in education use AI?	The role of AI technology in time management	P5: "AI tools provide personalized study plans, allowing me to manage my time more reasonably and improve my learning outcomes." P4: "I use AI to create detailed learning plans and efficiently allocate time for studying various subjects." P6: "AI tools like Quark AI reduce the time spent collecting learning materials, increasing overall time utilization." P8: "AI tools can quickly adjust my daily schedules to match my sleeping habits and study goals."

		P13: "AI tools help me plan future tasks flexibly and ensure my study life stays well-organized."
2. Why do vocational college students in education use AI?	AI technology enhances learning interest	P3: "AI tools can pick out some English words I need to learn based on my progress and even make stories for learning, improving my efficiency and interest." P8: "AI tools make boring management concepts interesting by providing engaging presentations and interactive content." P11: "AI-assisted learning lowered the threshold for learning new skills like badminton, making it more enjoyable for me." P12: "AI tools provide personalized knowledge and reminders, making my learning more efficient and engaging." P14: "AI tools provide explanations in ways I find enjoyable and useful, improving my engagement in English learning."
3. How does AI technology impact the vocational college students' learning habits in China?	AI technology changes learning behavior	P9: "AI tools provide me with personalized learning plans, expanding my knowledge horizon and improving my autonomy in learning." P5: "AI tools provide me with on-demand learning resources beyond the classroom, improving my professional knowledge." P8: "AI tools allow me to quickly complete tasks that previously required hours of effort using traditional methods." P14: "AI tools have replaced the need for library visits with instant access to highly personalized learning materials." P3: "AI tools retrieve information faster than traditional methods, helping me focus on targeted, personalized learning."

Reference

Bailey, T., & Clive Belfield, C. (2019, October). *The False Dichotomy between Academic Learning & Occupational Skills*. American Academy of Arts & Sciences. https://www.amacad.org/publication/daedalus/false-dichotomy-between-academic-learning-occupational-skills

Bates, T., Cobo, C., Mariño, O., & Wheeler, S. (2020). Can artificial intelligence transform higher education? International Journal of Educational Technology in Higher Education, 17(1). https://doi.org/10.1186/s41239-020-00218-x

Blake, J. (2024). Unleashing the Potential: Positive Impacts of Generative AI on Learning and Teaching. Www.igi-Global.com; IGI Global. https://www.igi-global.com/chapter/unleashing-the-potential/334771

Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: a Review. IEEE Access, 8(8), 75264–75278. https://doi.org/10.1109/ACCESS.2020.2988510

De-La-Peña, C., Roda-Segarra, J., & Chaves-Yuste, B. (2024). Improving English Foreign Language (EFL) Performance using Artificial Intelligence in Vocational Education and Training (VET). 16(1), 71–83. https://doi.org/10.30880/jtet.2024.16.01.006

Díaz Alzate, M. V., Menjura Acosta, J. P., & Fonseca Echeverri, M. C. (2021). Political-Pedagogical Character of the Collective Actions of the Popular Bars. The Qualitative Report. https://doi.org/10.46743/2160-3715/2021

Georgiou Konstantinos. (2024). Thematic analysis: A practical guide. European Journal of Psychotherapy & Counselling, 1–4. https://doi.org/10.1080/13642537.2024.2391666

González-Calatayud, V., Prendes-Espinosa, P., & Roig-Vila, R. (2021). Artificial Intelligence for Student Assessment: A Systematic Review. Applied Sciences, 11(12), 5467. https://doi.org/10.3390/app11125467

Grubaugh, S., Levitt, G., & Deever, D. (2023). Harnessing AI to Power Constructivist Learning: An Evolution in Educational Methodologies. EIKI Journal of Effective Teaching Methods, 1(3). https://doi.org/10.59652/jetm.v1i3.43

Hou, Z. (2021). Research on Adopting Artificial Intelligence Technology to Improve Effectiveness of Vocational College English Learning. Journal of Physics: Conference Series, 1744(4), 042122. https://doi.org/10.1088/1742-6596/1744/4/042122

Huang, J., Wei, S., & He, Z. (2023). Exploring Students' Learning Habitus from Chinese Higher Vocational Colleges. Sustainability, 15(9), 7145–7145. https://doi.org/10.3390/su15097145

Hui, F. (2020). The Impact of Artificial Intelligence on Vocational Education and Countermeasures. Journal of Physics: Conference Series, 1693, 012124. https://doi.org/10.1088/1742-6596/1693/1/012124

Jiao, Y. (2020). The Application of Artificial Intelligence Technology in the Quality Evaluation of Dance Multimedia Teaching in Higher Vocational Colleges. Journal of Physics: Conference Series, 1533, 032059. https://doi.org/10.1088/1742-6596/1533/3/032059

Khatib, J., Dalam, S., Yupelmi, M., Ganefri, Giatman, M., Krismadinata, & Syah, N. (2024). (online) Transformation Of Students' Career Orientation in The Era of Artificial Intelligence: A Systematic Literature Review. In Indonesian Journal of Computer Science.

Liu, M. (2018). The Application and Development Research of Artificial Intelligence Education in Wisdom Education Era.

Ma, J. (2019). The Challenge and Development of Vocational Education Under the Background of Artificial Intelligence.

Majid, I., & Lakshmi, Y. V. (2022, September 28). Artificial Intelligence In Education. Social Science Research Network. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4463555

Meng, W., & Sumettikoon, P. (2022). The Use of Artificial Intelligence to Enhance Teaching Effectiveness in Vocational Education. Eurasian Journal of Educational Research, 98, 266–283. https://doi.org/10.14689/ejer.2022.98.017

Suparyati, A., Widiastuti, I., Saputro, I. N., & Pambudi, N. A. (2024). The Role of Artificial Intelligence (AI) in Vocational Education. JIPTEK : Jurnal Ilmiah Pendidikan Teknik Dan Kejuruan, 17(1). https://doi.org/10.20961/jiptek.v17i1.75995

Team, I. E. (2023, October 3). Vocational Vs. Academic Education: a Comparative Analysis - Institute of Vocational Training: Mastering Practical Skills Online. https://instituteofvocationaltraining.com/vocational-vs-academic-education-a-comparative-analysis/

Tsai, C.-C., Chung, C.-C., Cheng, Y.-M., & Lou, S.-J. (2022). Deep learning course development and evaluation of artificial intelligence in vocational senior high schools. Frontiers in Psychology, 13. https://doi.org/10.3389/fpsyg.2022.965926

Wang, G. (2021). "They Are Bad seeds": Stereotyping Habitus in Chinese VET Colleges. British Journal of Sociology of Education, 42(7), 1–14. https://doi.org/10.1080/01425692.2021.1959299

Wei, Y. (2022). On the Training and Path of Artificial Intelligence Talents in Vocational Colleges. https://doi.org/10.23977/avte.2022.040212

Wu, X. (2021a). Application of Artificial Intelligence in Higher Vocational English Teaching Mode. Journal of Physics: Conference Series, 1852(2), 022089. https://doi.org/10.1088/1742-6596/1852/2/022089

Wu, X. (2021b). Application of Artificial Intelligence in Modern Vocational Education Technology. Journal of Physics: Conference Series, 1881(3), 032074. https://doi.org/10.1088/1742-6596/1881/3/032074

Wu, Y. (2023). Integrating Generative AI in Education: How ChatGPT Brings Challenges for Future Learning and Teaching. Journal of Advanced Research in Education, 2(4), 6–10. https://doi.org/10.56397/jare.2023.07.02

Yang, R. (2020). Artificial Intelligence-Based Strategies for Improving the Teaching Effect of Art Major Courses in Colleges. International Journal of Emerging Technologies in Learning (IJET), 15(22), 146. https://doi.org/10.3991/ijet.v15i22.18199

Yufei, L., Saleh, S., Jiahui, H., & Abdullah, S. M. S. (2020). Review of the Application of Artificial Intelligence in Education. International Journal of Innovation, Creativity and Change, 12(8), 548–562. https://doi.org/10.53333/ijicc2013/12850