Original Paper

Exploration of Teaching Reform Strategies in Higher Vocational Colleges Based on Artificial Intelligence

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Abstract

The emergence of artificial intelligence and its extensive application in the field of education have exerted a great influence on promoting the reform of school education, making the educational and teaching work in higher vocational colleges show a new development trend. Starting from the general background of the era of artificial intelligence, this paper analyzes the important significance of the era of artificial intelligence on the educational reform in higher vocational colleges and the challenges faced by the educational and teaching reform in higher vocational colleges. On this basis, the educational reform strategies are proposed, hoping to highlight the educational characteristics of higher vocational colleges in the era of artificial intelligence and comprehensively promote the efficient progress of educational and teaching work in higher vocational colleges.

Keywords

Artificial Intelligence, Higher Vocational Colleges, Teaching Reform

1. Introduction

Artificial Intelligence, abbreviated as AI, centers around the crucial concept of extracting knowledge from vast amounts of data through complex algorithmic models and rules, thereby creating novel and original content. This technology encompasses the creation of various types of content such as text, image, audio, video, and games, demonstrating capabilities distinct from traditional data processing and analysis.

Precisely, AI utilizes pre-trained large-scale models, like GPT and Stable Diffusion, to learn and master knowledge and rules in different fields. These models can conduct self-learning with a huge amount of data and then, according to the user's input or instructions, output content with correct logic and grammar. This technology is highly creative and versatile, enabling AI to adapt to different fields and scenarios and generate a diverse range of content.

In the current era of the booming development of artificial intelligence, the educational model in higher vocational colleges has undergone earth shattering changes. These changes are reflected not only in teaching content but also in teaching methods, teaching concepts, and the cultivation goals of students' abilities. Higher vocational colleges must conform to the trend of the times and actively respond to various challenges brought about by the new era. Only in this way can they seek good career development prospects for students and cultivate high quality professional talents who meet the needs of the times in this increasingly competitive social environment. For instance, in the curriculum setting of artificial intelligence related majors, it should not be limited to the imparting of theoretical knowledge. Instead, a large number of practical courses should be added, providing students with opportunities to get involved in real world artificial intelligence projects and enhancing their practical operation abilities and problem-solving abilities.

2. The Important Value of Artificial Intelligence Applied to Teaching Reform in Higher Vocational Colleges

In the contemporary era, technology is developing at an unprecedentedly rapid pace. Among them, the vigorous rise of artificial intelligence technology is like a powerful force, which is deeply reshaping every field of society. The influence of this reshaping cannot be underestimated. To a certain extent, it has made the teaching in higher vocational colleges face an enormous and unprecedented transformation. Higher vocational colleges, as important bases for cultivating professional and technical talents for society, are starting to change in many aspects such as their traditional teaching models, teaching contents, and teaching methods under the impact of artificial intelligence technology.

At the same time, the wide application of artificial intelligence technology in the field of educational practice has brought earth - shattering impacts on educational reform. From the distribution and integration of teaching resources, to the optimization and innovation of the teaching process, and then to the evaluation and feedback of teaching results, artificial intelligence technology plays an irreplaceable role. For instance, in terms of the distribution of teaching resources, artificial intelligence can accurately allocate learning resources suitable for different students according to various factors such as students' learning progress and the degree of knowledge mastery, which is difficult to achieve in the traditional teaching mode. This change is not only limited to the superficial teaching forms but also penetrates into the deep - seated structures such as educational concepts and educational systems, greatly promoting the whole process of educational reform.

2.1 Promote the Innovation of Teaching Methods and Improve Teaching Effectiveness

Artificial intelligence has directly influenced the teaching methods in higher vocational colleges, promoting the evolution of teaching methods towards intelligence and digitalization, and significantly enhancing the achievements of teaching informatization. Traditional teaching methods are often teacher - centered, imparting knowledge by means of blackboard writing, PPT, etc. However, with the assistance of artificial intelligence technology, teaching methods are changing towards more

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personalized and more interactive directions.

Firstly, AI technology can provide personalized learning paths. In teaching, teachers can analyze students' learning data with the help of AI technology, accurately grasp each student's learning characteristics and progress, and customize learning plans for them. For example, in teaching, for students with strong comprehension abilities, teachers can recommend more in - depth learning materials and more difficult exercise questions by using AI technology; for students with a weak foundation, teachers can provide more basic knowledge training and progressive exercise questions by using AI.

Secondly, AI technology makes teaching interaction more convenient and efficient. On online learning platforms, teachers can use AI technology for intelligent Q&A, answer students' questions in a timely manner during the learning process, and give real - time feedback according to students' learning conditions, helping students know their own learning situation in time and make adjustments, comprehensively improving students' ability to learn course knowledge.

Finally, teachers can carry out course design and teaching management work more efficiently and with high quality by using AI technology. Teachers can use AI to analyze students' learning data in teaching management and teaching practice, know which knowledge points are difficult for students to master, and then optimize teaching content and methods in a targeted manner. They can also use AI technology for classroom management, such as automatically recording students' attendance, study duration, etc., to improve teaching efficiency.

2.2 Enrich the Learning Content and Promote the Renewal of Resources

Artificial intelligence has not only transformed teaching methods but also greatly enriched learning resources. With the help of AI, higher vocational colleges can easily obtain and integrate high - quality teaching resources from around the world, thus providing students with more diverse learning content. First, AI can intelligently search and screen high - quality teaching resources on the network, such as online courses, academic papers, and experimental instructions, and integrate these resources into the teaching platform for students to study at any time, which helps to expand students' knowledge scope and enables them to carry out self - study according to their own interests and needs. Second, the use of AI can promote the optimization and update of learning resources. By analyzing students' learning data and usage habits, AI can quickly detect obsolete or no longer applicable teaching resources and recommend more appropriate and cutting - edge learning content, building a dynamic learning resource update system and ensuring that the teaching in higher vocational colleges always keeps up with the times.

2.3 Improve the Evaluation and Feedback Mechanism to Cultivate Students' Comprehensive Qualities

Artificial intelligence is of great significance in perfecting the teaching evaluation and feedback mechanisms in higher vocational colleges. Traditional evaluation methods mostly rely on regular examinations and assignments. Although this method can quantify students' learning achievements, it is difficult to fully reflect students' learning processes and the status of their ability improvement. In the

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process of higher vocational education and teaching reform, the introduction of artificial intelligence makes evaluation and feedback more comprehensive and timely. With the help of artificial intelligence, teachers can monitor and analyze students' learning data in real - time and issue personalized learning reports and feedback for each student, which helps students to be aware of their own learning progress and existing problems in time, and then formulate more effective learning plans. Meanwhile, teachers can use artificial intelligence to analyze students' learning data, master their situations in terms of knowledge acquisition, learning attitude and skill development, so as to give more accurate evaluations and suggestions, rationally exercise students' comprehensive qualities and promote students' growth.

3. Challenges Faced by Teaching Reforms in Higher Vocational Colleges in the Era of Generative Artificial Intelligence

With the vigorous development of generative artificial intelligence technology, this technological wave, like a surging tide, is rapidly sweeping across all fields. For higher vocational colleges, in the process of their teaching reform, they are at a crucial crossroads and are presented with an unprecedented opportunity. This opportunity is like a door leading to brand - new teaching models and concepts, providing infinite possibilities for the innovative development of higher vocational education. However, in this process, higher vocational colleges are also inevitably faced with severe challenges from multiple aspects. These challenges, like numerous obstacles, lie across the path of teaching reform and urgently need to be overcome and resolved.

3.1 The Challenges of the Transformation of the Role of Teachers

In the context of the era of artificial intelligence, the teaching methods and work contents of teachers in higher vocational colleges have obviously changed. The traditional teacher - centered teaching model is gradually being replaced by the student - centered personalized and interactive learning model. This transformation places higher demands on teachers. Teachers should not only have solid professional knowledge, but also possess the ability to guide students to carry out self - study, collaborative study and innovative study. However, some teachers have adapted to the traditional teaching methods during long - term teaching practice and are confused about how to effectively use artificial intelligence technology to assist teaching. They need to re - position their roles in teaching, transforming from simple knowledge transmitters to guides, collaborators and facilitators in the students' learning process. And during the role - transformation period, they should have stronger cross - disciplinary integration ability, technology application ability and innovative thinking ability, which is indeed a great challenge.

3.2 The Challenges of the Integration and Application of Technology

When artificial intelligence technology is applied to teaching, it needs to be integrated with other educational technologies to construct a complete and efficient teaching system. However, in actual practice, higher vocational colleges often face great difficulties in technology integration. Specifically, there may be problems in compatibility, stability, and user experience among different technologies, which will have an impact on teaching effectiveness and students' learning experience. Moreover, as

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technologies are constantly updated, higher vocational colleges must continuously invest funds and resources to upgrade and improve the teaching system to ensure that it keeps pace with the times. To a certain extent, this will increase the economic burden and management difficulty of the school, and is also not conducive to the scientific, systematic development and implementation of educational and teaching reforms in higher vocational colleges.

3.3 The Challenges of Data Privacy and Security

In the era of artificial intelligence, students' learning data has already become a crucial resource for teaching reform. However, during the process of collection, storage, and utilization of these data, they also encounter severe privacy and security problems. If the data is leaked or misused, students' personal privacy and the reputation of schools will be severely damaged (Wu, 2023a).

In view of this situation, in order to protect students' data privacy and security, higher vocational colleges need to establish complete data management systems and security protection mechanisms, such as clarifying the scope and purpose of data collection, strengthening data encryption and backup measures, and restricting data access rights. Moreover, it is also necessary to strengthen data security awareness education for teachers and students to enhance their risk - prevention capabilities.

Nevertheless, in the actual operation process, implementing these measures is rather difficult. Limited by technology and management levels, schools may not be able to completely eliminate data leakage and abuse phenomena. Meanwhile, students have different degrees of emphasis on data privacy, which increases the complexity of data management. This is a considerable challenge for the educational and teaching reform in higher vocational colleges.

4. Teaching Reform Strategies in Higher Vocational Colleges Based on Generative Artificial Intelligence

The application of artificial intelligence technology in educational practice has greatly promoted the transformation of educational and teaching activities in higher vocational colleges. It has impelled higher vocational colleges to reconsider the innovative measures of teaching models, with the expectation of constructing a characteristic teaching guidance system to lead students to carry out in - depth learning and systematic exploration. Next, the reform and innovation ideas of educational and teaching activities in higher vocational colleges in the context of the generative artificial intelligence era will be analyzed in detail.

4.1 Adjust the Value Orientation: Focus on Humanistic Care and Cultivate High-Quality Talents

In the context of the era of artificial intelligence, artificial intelligence technologies represented by ChatGPT have indeed created a new situation for higher education and have, to a large extent, enhanced the quality and efficiency of teaching. However, when carrying out educational and teaching reform practices, higher vocational colleges must be clearly aware that such technologies are ultimately just intelligent tools for auxiliary teaching, and they can by no means replace the position and role of teachers in the growth process of students.

Therefore, higher vocational colleges should uphold the educational concept of fostering virtue through education and let humanistic care permeate every aspect of teaching activities. This implies that in the process of talent cultivation, schools should not only focus on students' knowledge accumulation and skill improvement but also place emphasis on cultivating students' emotions, training their thinking, and shaping their moral qualities. At the same time, various forms of teaching activities should be appropriately carried out to create diversified practical opportunities for students, promote their all - round development and free growth, so that while they master professional knowledge, they also possess good humanistic qualities and a sense of social responsibility.

In addition, higher vocational colleges should also actively guide students to establish a correct view of science and technology and its use. When teaching professional skills, students should be made clear that although artificial intelligence technology is powerful, it is not omnipotent. When using artificial intelligence technology, a rational and responsible attitude should be adhered to, regarding it as a means to improve learning and working efficiency rather than a substitute for one's own thinking and judgment. For this purpose, higher vocational colleges can try to improve students' scientific and technological literacy and discrimination ability by offering relevant courses, holding lectures and seminars, etc., so that they can use artificial intelligence technology scientifically and reasonably (Wang, 2023). Only in this way can higher vocational colleges truly adhere to the value orientation of student-centered development in teaching reform, give full play to the advantages of artificial intelligence technology while preventing excessive dependence on it, and gradually organically integrate humanistic care and science and technology education to cultivate high-quality talents with both professional qualities and sound personalities, truly demonstrating the educational value of advanced technologies and driving the innovative and systematic implementation of various educational works.

4.2 Remodel Teaching Objectives: Foster Thinking and Creativity, Break through the Limitations of Knowledge Acquisition

In the context of the era of artificial intelligence, during the teaching reform in higher vocational colleges, it is necessary to focus on adjusting the teaching objectives so as to adapt to the new educational environment. Moreover, when setting teaching objectives, college teachers should not only focus on the convenience of knowledge acquisition, but also place more emphasis on teaching students to think independently and solve problems creatively. The German philosopher Jaspers once made a profound assertion that the goal of university education is not only to impart knowledge, but more importantly, to lead students to perceive the connotations of life, regulate their will and behavior, and inspire their free nature through cultural inheritance, so as to promote them to become "whole persons" with all - round development. Based on such an idea, higher vocational colleges should accurately identify the impacts generated in the era of generative artificial intelligence, explore appropriate development paths, and re - position the main directions of talent cultivation.

Specifically, the practical application of technologies such as ChatGPT has indeed brought

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unprecedented convenience to students in higher vocational education to acquire knowledge. However, excessive reliance on such technologies may cause students to be trapped in the quagmire of being satisfied with existing answers, thereby reducing their problem - awareness and critical spirit. Even this "convenience" may breed students' inertia in the process of seeking knowledge, which hinders the development of their thinking and the improvement of their innovation ability. Therefore, in the teaching process, higher vocational colleges should actively explore and implement various teaching models, especially focus on developing teaching activities that can stimulate students' high - order thinking, ensure that the designed activities are both interesting and challenging, and enable students to actively participate in them, discover problems, analyze problems and find solutions. At the same time, teachers should also assign some tasks that cannot be completed with the help of ChatGPT or related artificial intelligence tools, so as to encourage students to carry out practical operations and temper their practical abilities (Yang, 2023). In addition, higher vocational colleges need to attach importance to the cultivation of students' autonomous learning ability, cooperative learning ability and inquiry - based learning ability. In this cultivation practice, artificial intelligence technology can be used to construct rich learning situations, provide diverse learning resources, and guide students to carry out cooperative learning and inquiry - based learning in the process of actual problem - solving. In this way, in the practice of educational and teaching reform, higher vocational colleges can set teaching objectives more scientifically and reasonably, attach importance to the cultivation of students' thinking ability and creative spirit, make higher vocational teaching break through the limitations of knowledge imparting and skill training, cultivate students' autonomous learning, cooperative learning and inquiry - based learning abilities, and then enable students to become talents with independent thinking ability and innovative spirit.

4.3 Reform the Teaching Strategies: Implement Individualized Guidance and Carry out Teaching in Accordance with Students' Aptitude

In the context of the era of artificial intelligence, the teaching reform in higher vocational colleges must attach importance to the transformation of teachers' teaching methods so as to ensure the quality and effectiveness of teaching. In the new era, although intelligent technologies like ChatGPT can answer according to students' questions and achieve intelligent and personalized knowledge push, this teaching method cannot completely replace the functions of teachers. Therefore, if higher vocational colleges want to fully exert teachers' professional strengths and promote the all - round development of students, they should guide teachers to teach students in accordance with their actual situations, fulfill the duties of imparting knowledge and educating people, and require teachers to observe and understand the unique characteristics and personalities of each student, purposefully plan teaching activities and extracurricular practical activities, and use personalized teaching methods, so as to better meet students' learning needs and arouse their learning interests and potentials. It should be noted that relying too much on ChatGPT technology in the teaching activities of higher vocational colleges may lead to the simplification and mechanization of teaching activities. Moreover, although this technology can

improve teaching efficiency, if teaching activities are carried out only by using the same algorithm and the "norm" of the same object, a new "one - size - fits - all" teaching model will be created, ignoring the individual differences and diversities of students and making it difficult to effectively stimulate students' innovative thinking and exploratory spirit. Therefore, when teachers in higher vocational colleges use artificial intelligence technology to assist teaching, they should pay more attention to students' thinking training and the improvement of creativity. For example, teachers can design challenging and exploratory learning tasks in teaching practice, lead students to think and explore in - depth, cultivate their critical thinking and innovation ability, and also attach importance to students' emotional needs and psychological development, becoming their "guides" for academic progress and personality development. Through personalized guidance and teaching according to students' aptitudes, the overall effectiveness of education and teaching in higher vocational colleges and the quality of talent cultivation can be improved, making the comprehensive education management work of the school show an innovative development trend and providing relatively scientific guidance for the modernization reform of higher vocational education teaching (Wu, 2023b).

4.4 Students' Learning Methods: Strengthen the Training of Critical Thinking and Encourage Students to Think Deeply

Examination and evaluation mechanism: Innovate the evaluation concept and examination design and actively embrace new technologies

In the context of the era of artificial intelligence, during the teaching reform process in higher vocational colleges, emphasis should be placed on cultivating students' critical thinking abilities. Although intelligent technologies like ChatGPT can provide students with abundant information and knowledge, it does not mean that students can directly obtain accurate answers. With the support of advanced technologies, schools need to strengthen the training of students' critical thinking, prompting students to actively think about and study in - depth the knowledge of professional courses.

On the positive side, ChatGPT has created a platform for students to access a variety of information and viewpoints, enabling students to comprehensively use this information to challenge and reflect on their existing knowledge, thereby perfecting their personal knowledge systems and forming unique insights. However, in the actual implementation of educational teaching reform, the potential risks cannot be ignored either. Since the quality of the information pushed by ChatGPT varies, the answers it generates are sometimes misleading. Especially in the case of algorithm - based precise pushing, wrong answers may be more deceptive and easily mislead students.

Therefore, in the teaching process of higher vocational colleges, special attention should be paid to the cultivation of critical thinking, helping students to distinguish truth from falsehood in a vast amount of information, guiding them to grasp the key of problems and make rational decisions (Li, 2023). Meanwhile, in order to effectively cultivate students' critical thinking abilities, teachers can design a series of challenging learning tasks to encourage students to independently analyze, evaluate and reflect on the received information, rather than simply accepting the ready - made answers pushed by

algorithms. In addition, higher vocational colleges can also offer specialized critical thinking courses or integrate critical thinking training into other courses, so as to improve students' information discrimination ability and problem - solving ability, cultivate students' critical thinking, enable students to better cope with the influence of the era of artificial intelligence, develop excellent thinking and learning habits, and then better adapt to the future social development needs and realize personal values when participating in social construction.

4.5 Examination and Evaluation Mechanism: Innovate the Evaluation Concept and Examination Design and Actively Embrace New Technologies

With the emergence of advanced technologies like ChatGPT, human beings' abilities in knowledge memory and reproduction are clearly inferior to these intelligent technologies. Therefore, in the context of the era of generative artificial intelligence, when conducting teaching reforms, higher vocational colleges must re - consider and innovate the concepts, contents, and methods of examination evaluation, and try to abandon the traditional examination evaluation models that overly focus on knowledge memory and reproduction, and construct a brand - new intelligent evaluation system.

By means of artificial intelligence technology, when reforming the assessment and evaluation mechanism, teachers can attempt to introduce multi - dimensional evaluation criteria. For example, evaluation can be carried out from multiple aspects such as critical thinking, innovative thinking, problem - solving ability, and teamwork ability to construct a comprehensive evaluation system, so as to ensure that students' overall qualities can be more comprehensively considered in teaching evaluation and feedback.

In terms of examination methods, in view of the wide application of technologies such as ChatGPT, it is neither practical nor in line with the trend of technological development for higher vocational colleges to simply prohibit students from using these technologies in academic activities. Therefore, schools should reform teaching evaluation in line with the times, pay more attention to guiding students to use these technologies reasonably during the examination process, and try to formulate clear usage regulations to strengthen students' moral self - discipline awareness when using new technologies, or use the case - teaching method to clarify the boundaries of scientific and technological ethics.

At the same time, in order to give full play to the positive role of artificial intelligence in teaching, higher vocational colleges should formulate a series of teaching norms and standards, such as designing and implementing standards and norms in all aspects such as teacher teaching, student learning, and examination evaluation. The purpose is to ensure the rational use of artificial intelligence technology, thereby maximizing the technical benefits it brings to teaching. In this way, when reforming the evaluation model, higher vocational colleges actively innovate evaluation concepts, introduce multi - dimensional evaluation criteria, and formulate reasonable teaching norms and standards, which can not only better conform to the development trend of artificial intelligence technology, but also more effectively improve students' comprehensive qualities and lay a solid foundation for students' future development (Zhou, 2023).

5. Conclusion

From the perspective of higher vocational education, generative artificial intelligence can generate content in various forms such as text, image, sound, video and code, and its capabilities as a whole have already surpassed the data processing and analysis capabilities of traditional software. For higher vocational education, generative artificial intelligence can be regarded as an innovative tool and technology, which is helpful for students to improve their practical and innovative abilities. Moreover, when teachers guide students to learn and use generative artificial intelligence technology, students can understand the development trend of modern science and technology more deeply, and then enhance their competitiveness in the future workplace. Therefore, in the context of the era of generative artificial intelligence, it is necessary for higher vocational colleges to re - consider the needs of education and teaching reform, actively explore and improve the teaching system, so as to promote the innovative development of higher vocational education and promote the all - round improvement of school education efficiency.

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