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RESEARCH ON APPLICATION OF ARTIFICIAL INTELLIGENCE IN MEDICAL EDUCATION

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Abstract: With the headway of science and innovation, the use of computerized reasoning is of extraordinary criticalness in different fields, and it has been an immense main thrust in the improvement of an ever increasing number of fields. Through examination on the utilization of computerized reasoning in distance clinical instructing, virtual request, distance schooling the board, training video recording, and so on, this article presumes that man-made brainpower can expand the effectiveness of clinical educating, improve visual utility, and think more like human, subsequently it can more readily serve the individuals. The application impacts of computerized reasoning in the field of clinical schooling, particularly for the improvement of the general nature of clinical understudies, give a lot of motivation to the utilizations of man-made consciousness in clinical training.

Keywords: Artificial Intelligence; Medical Education; Application Research

I. Introduction

As humans place great hopes on artificial intelligence, artificial intelligence can have bright prospects, and it may be applied to all aspects of our lives to improve the overall standard of living of all of us. With the development of artificial intelligence technology, scientists have gradually applied artificial intelligence technology to the teaching field, and quite good results have been achieved. Therefore, the development and progress in artificial intelligence, combined with teaching, will be an excellent new teaching method.

Artificial intelligence is a new science that emerged in the middle of the 20th century. This science mainly belongs to computer science [2], but it covers information science, linguistics, psychology, philosophy, mathematics, and many other disciplines. It is a discipline that has strong comprehensiveness. Artificial intelligence mainly uses computer systems to simulate human thinking activities. This discipline has a wide research scope and it has also been applied in many aspects [3]. Because artificial intelligence has wide research fields, it is also a very challenging science category requiring scientists to have a strong knowledge base in all aspects. At present [4], the research of artificial intelligence is closely related to the current needs of human beings. The research on artificial intelligence technology has also evolved with the changes of the times, so that the artificial intelligence technology can be applied to more meaningful things. The main goal of artificial intelligence is to require computers to have “abilities to acquire and learn knowledge”, “abilities to process knowledge”,

"abilities to understand language", "the ability to infer and search automatically", and abilities in many other aspects[5] . B. Research Content of Artificial Intelligence In terms of research objects, artificial intelligence can be divided into three different areas. The first one is the ability of "natural language processing" and to write computer programs that can be read and spoken. The second one is to develop a machine that has sensitive sensory, and can simulate human hearing and vision and distinguish different environments automatically. The third type is an R&D expert system that uses a computer to simulate an expert's behavior. In terms of the research nature of artificial intelligence, it can be divided into two aspects: theory and engineering. Theoretical research is the continuous development and expansion of artificial intelligence theory. Engineering research is to design and develop corresponding products. These two aspects are closely connected and indivisible. Theoretical research provides a theoretical basis for engineering research; engineering research applies theoretical research to practice. C. Technical Features of Artificial Intelligence Artificial intelligence has the following technical characteristics: search ability, knowledge expression function, reasoning ability, abstraction ability, speech recognition ability, ability to process fuzzy information. These five points have basically made it possible for artificial intelligence to simply simulate human thinking.

Application of Artificial Intelligence in Medical Education: In the past decade, the application of artificial intelligence has solved or partially solved many challenges in the education field, including language processing, reasoning, planning and cognitive modeling. Artificial intelligence provides students with more opportunities to participate in a digital and dynamic way. These opportunities are often not found in outdated textbooks or the fixed environment of the classroom. Through this collaborative learning method, each student has the potential to advance others, and can accelerate the exploration of new learning and the creation of innovative technologies. Four applications are provided below to illustrate how artificial intelligence can be applied to medical education. A. Virtual Inquiry System DxR Clinician is an online virtual patient system that uses artificial intelligence technology specifically for teaching hospitals, medical colleges, and residents. The system is widely used in education and clinical thinking evaluation of medical students. The software collects hundreds of real patient data and is compiled by experts and artificial intelligence as specific cases. These cases cover a wide range of clinical issues. Medical students make diagnoses through inquiry, simulated physical examinations, and supplementary examinations of virtual patients to diagnose and provide treatment plans. For teachers, DxR Clinician can be used as a useful analysis tool to help teachers understand students' behavior and adjust courses through appraisal results. For students, they can quickly develop clinical problem solving skills. By interacting with the cases, students can learn a lot about important disease diagnosis. At the same time, the system can identify mistakes that students make in the process of case analysis, conducts deep learning and analysis, and help students solve these problems. One kind of computer software that has similar function with DxR Clinician is called Intelligent Tutor Systems, which can

track the learner's "psychological steps" in the process of solving problems to diagnose the wrong concepts and estimate the learners' understanding extent of the field. The Intelligent Tutor System can also provide learners with timely guidance, feedback and explanation, and can promote learners' learning behaviors such as self-regulation, self-monitoring and self-explaining. B. Medical Distance Learning Distance education is a kind of teaching method that is not limited by time and space and can realize real-time on-line and off-line teaching. Learning, communication and sharing can be conducted through web-based teaching methods such as microblogging; virtual simulation training, mobile ward round in clinical practice teaching and mobile nursing play an important role in medical teaching, especially virtual simulation teaching technology has gained more in-depth and extensive application; the development of remote transmission technology of imaging and pathological films, instant transfer technology, all online storage technology, active monitoring and self-healing technology, integrated platform technology, three-dimensional post-processing, computer-aided diagnosis, and medical imaging real-time conferencing technology have had a profound impact on the teaching methods; regional Picture Archiving and Communication System (PACS) and regional pathology platform. In the aspects of continuing medical education, China has adopted a dual approval system for institutions and projects. At present, 50 state-level continuing medical education project bases have been approved, and more than 4,000 state-level continuing medical education projects have been newly announced every year. Since the exploration of distance continuing medical education in 1996, the Ministry of Health has successively approved shuangwei net, haoyisheng net, China Stomatology net, Shanghai Zhongshan Hospital, West China Medical Center and Medical Network College of Peking University to carry out distance medical education and assess these institutions in 2006 and 2011. Each year, more than 1500 experts participate in distance continuing medical education covering 20 secondary disciplines and 74 tertiary disciplines. The number of certifications issued by state-level continuing medical education projects in the aforementioned distance learning institutions from 2000 to 2010 is approximately 3 million. This is four times that of the traditional method of education in the same period.

II. Influence of Artificial Intelligence Technology on the Management of Distance Medical Education

Through modern information technology, data centers, teaching resources library, cloud platform, are constructed for students recruiting, training process management and evaluation, which can improve the efficiency and service level of continuing medical education management. In the sharing management of the base, institutional management, trainees, project management, evaluation, credit management and teaching content, modern information technology can be applied, such as the establishment of a continuing education object database, covering the basic information of each student, learning processes and evaluation conditions, and the establishment of a national continuing medical education base and institutional management information system. In 2005, online reporting, online assessment and online publication of national continuing medical education projects were realized. In

residency training, in the process of students' recruitment, announcement, acceptance, teachers' teaching and courses set-up, the common parts can be exchanged and coordinated through the computer system. Among base hospitals, health administrative departments, clinical teachers and departments, the same information can be transmitted through information means (web pages, mobile phones). Synchronizing courses through computer information systems can achieve data exchange, information sharing and business collaboration among different courses. D. Recording teachers' teaching videos According to the requirements for the construction of excellent courses, excellent courses related to medical professions need to be recorded. Leaders and keynote teachers of the excellent course construction team discussed the shooting of classroom teaching videos together with the professional staff of the College Information Technology Center. Before shooting, the shooting plan and shooting process are formulated. All the staffs pay attention to the details during the shooting. After the post-processing and production process, various excellent courses were successfully completed, and the teacher's classroom teaching video was photographed and produced. Combining the construction of all kinds of medical specialty courses, the staffs of the information technology center help the lecturers of the excellent course construction project team to record classroom teaching videos. After skilled editing by the information technology center staffs, courses are recorded as CDs for students to watch repeatedly. It can help students further understand what they did not understand in class and cultivate students' self-learning ability.

III. Conclusion and Prospects

The essence of education is accumulation and inheritance, inheriting the knowledge accumulated by the predecessors to future generations and encouraging them to innovate through educational means. The fundamental of artificial intelligence technology is to accumulate knowledge through machine learning, artificial neural network, data mining and other methods. Through decision supports, the expert system spreads knowledge and applies it. This article analyzes the changes in the way that artificial intelligence technology modifies traditional medical education. A key way that artificial intelligence affects medical education is to support personalized learning, help students at different levels, and provide help and support when teachers and students need it. Artificial intelligence can not only help teachers and students design courses that meet their needs, but also can focus on student performance and alert teachers when problems may arise, helping teachers improve teaching methods. Artificial intelligence will change the role of teachers. Teachers will supplement artificial intelligence courses to provide students with interpersonal interaction and practical experience. Using artificial intelligence systems, students can learn anytime, anywhere, and some classroom teaching can be substituted by these programs.

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