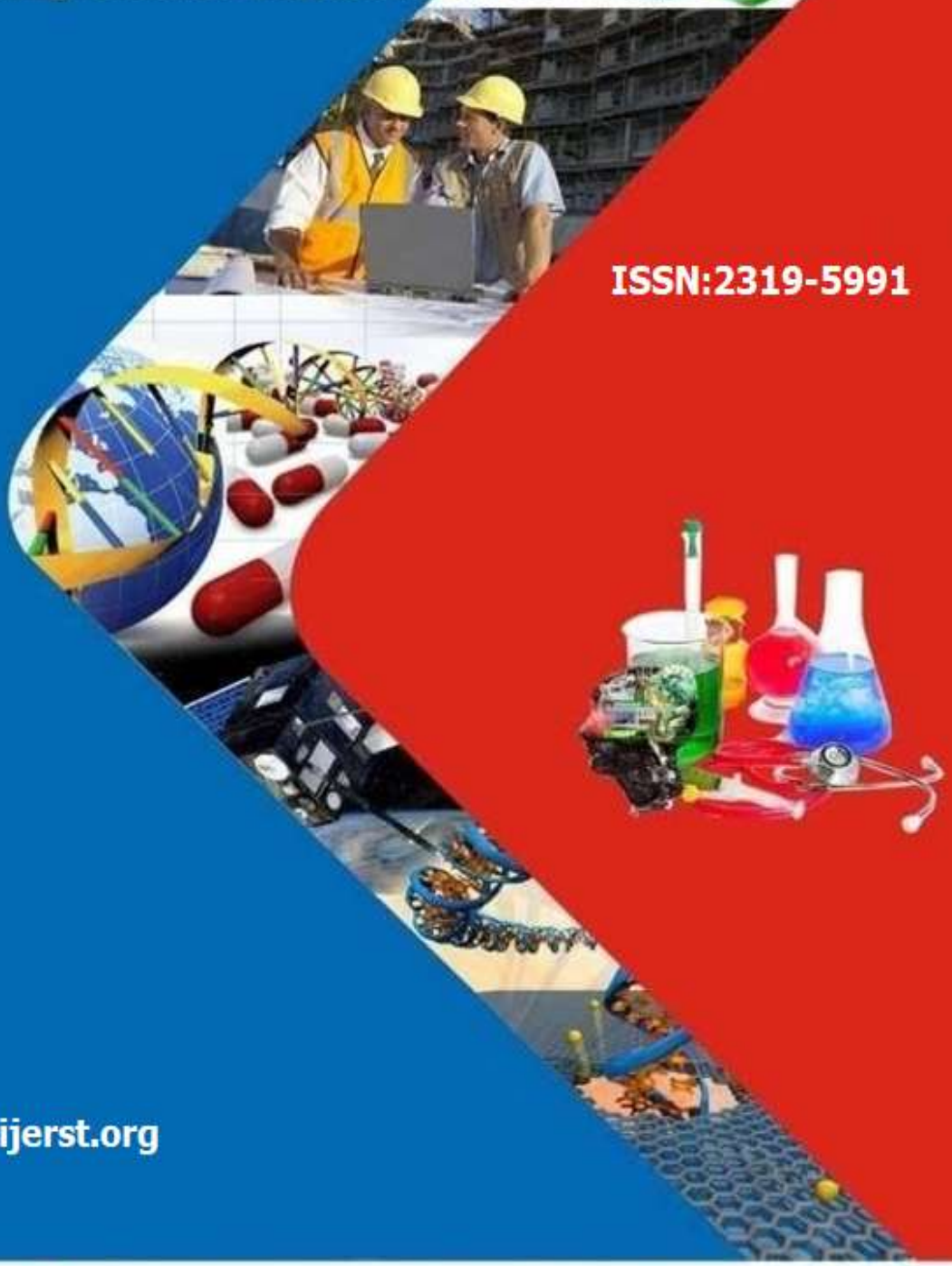
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RESEARCH ON APPLICATION OF ARTIFICIAL INTELLIGENCE IN MEDICAL EDUCATION

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ABSTRACT

With the advancement of science and technology, the application of artificial intelligence is of great significance in various fields, serving as a significant driving force in the development of numerous fields. Through research on the application of artificial intelligence in distance medical education, virtual inquiry, distance education management, and teaching video recording, this article concludes that artificial intelligence can increase the efficiency of medical teaching, improve visual utility, and think more like humans, thus better serving the people. The application effects of artificial intelligence in the field of medical education, especially for the improvement of the overall quality of medical students, provide much inspiration for the applications of artificial intelligence in medical education.

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, 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. 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, 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

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knowledge", "abilities to understand language", "the ability to infer and search automatically", and abilities in many other aspects. 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. 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 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. 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 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

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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, selfmonitoring and self- explaining. 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 n 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 postprocessing, 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. 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'

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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.

II. LITERATURE SURVEY

TITLE: Use of Information Technology in Medical Education [J]. Webmed Central Medical Education

AUTHORS: Department of Respiratory Medicine and Allergy, Guy's Hospital, London

ABSTRACT: The past few years have seen rapid advances in communication and information technology (C&IT), and the pervasion of the worldwide web into everyday life has important implications for education. Most medical schools provide extensive computer networks for their students, and these are increasingly becoming a central component of the learning and teaching environment. Such advances bring new opportunities and challenges to medical education, and are having an impact on the way that we teach and on the way that students learn, and on the very design and delivery of the curriculum. The plethora of information available on the web is overwhelming, and both students and staff need to be taught how to manage it effectively. Medical schools must develop clear strategies to address the issues raised by these technologies. We describe how medical schools are rising to this challenge, look at some of the ways in which communication and information technology can be used to enhance the learning and teaching environment, and discuss the potential impact of future developments on medical education.

TITLE: NMC Horizon Report 2016 Higher Education Edition

AUTHORS: Johnson L, Adams Becker S, Cummins M, et al

ABSTRACT: Nowadays Smart phones have become an irresistible part of everyone's life. With these smart phones the human life is changed for better. "Android Based Campus Solution" is a college management application which basically aimed at managing most of the activities of college. The main objective of this app is to make advancement in education system and institutional activities. This application helps in adding mobility and automation in managing the institutional information. The existing system uses website for publishing notices, or peon helps in circulating notices. This is very time consuming process. The android application simplifies this process by giving instant notifications to the students or concerned staff. This application makes this process easier, faster, secure and less error prone.

TITLE: Learning Environments and Displacement of Learning [J]. British Journal of Educational Technology

AUTHORS: Thomas H. Learning Spaces

ABSTRACT: Traditionally, at least according to popular wisdom, learning took place in venues that were custom-designed for the purpose. The purpose, given the evidence of

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the artefacts with which we are confronted, seems to have been the educational equivalent of the production line that so succinctly characterised the industrialisation of society. One consequence of this design logic, however, is that learning is defined as something that is married to a 'place'. This paper will argue that the conceptual 'slippage' that characterises the disappearing differences between 'learning spaces' and 'learning environments', coupled with the further 'displacement' of the learner (turned avatar) in virtual spaces such as Facebook and Second Life, serves to 'displace' learning itself. In short, our difficulty in understanding and articulating the nature of learning is partly brought about by our inability to articulate where learning takes place—in a world characterised by virtual space and electronic selves. If we are to articulate the nature of learning in our age, then we need to articulate the nature of the real and virtual spaces and bodies that we inhabit.

TITLE: Improving the Quality of University Teaching in Learning Innovation: The Key to Apply Information Technology in Higher Education

AUTHORS: Xinmin Sang, Yangbin Xie

ABSTRACT: Information and communication technologies (ICT) have become commonplace entities in all aspects of life. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavour within business and governance. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners. The use of ICT in education lends itself to more student-centred learning settings and often this creates some tensions for some teachers and students. But with the world moving rapidly into digital media and information, the role of ICT in education is becoming more and more important and this importance will continue to grow and develop in the 21 st century. This paper highlights the various impacts of ICT on contemporary higher education and explores potential future developments. The paper argues the role of ICT in transforming teaching and learning and seeks to explore how this will impact on the way programs will be offered and delivered in the universities and colleges of the future.

III. SYSTEM ANALSIS

EXISTING SYSTEM

Computer technology could be used to reduce the number of mortality and reduce the waiting time to see the specialist. Computer program or software developed by emulating human intelligence could be used to assist the doctors in making decision without consulting the specialists directly. The software was not meant to replace the specialist or doctor, yet it was developed to assist general practitioner and specialist take an immediate action to produce as many doctors as possible. However, while waiting for students to become doctors and the doctors to become specialists, many patients may already die. Current practice for medical treatment required patients to consult specialist for further treatment. Artificial intelligence provides students with more opportunities to participate in a digital and dynamic way.

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PROPOSED SYSTEM

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 such as artificial intelligence in distance medical teaching, virtual inquiry, distance education management, teaching video recording, etc., especially for the improvement of the overall quality of medical students, provide much inspiration for the applications of artificial intelligence in medical education.

IV. IMPLEMENTATION AND RESULTS

MODULE DESCRIPTION

TRAINER: 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 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.

MEDICAL STUDENT: 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. Virtual Inquiry System, Medical Distance Learning, Influence of Artificial Intelligence Technology on the Management of Distance Medical Education, Recording teachers' teaching videos.

Admin: Admin gives the activation permission to users, admin can verify the trainer and student status. the admin can calculate raw SVM support vector machine. the admin can also calculate the raw svm DT (decision tree algorithm). Window-based anomaly detection divides time-series instances into overlapping windows. Anomaly scores are first calculated per window, and then aggregated for comparison with a predefined threshold. In supervised prediction-based anomaly detection, a machine-learning-based predictive model is first learned from historical logs The accumulated difference between these predicted and the actual observations is

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defined as the anomaly score for each test time-series instance.

Artificial Intelligence: Artificial intelligence is a new science that emerged in the middle of the 20th century. This science mainly belongs to computer science, 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. 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, 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.











V. CONCLUSION

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

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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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