

Challenges and Countermeasures of artificial intelligence in classroom teaching

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Abstract: *With the application of artificial intelligence in the field of education gradually from imagination to reality, classroom teaching will usher in the reform and challenge of the coexistence of human teachers and artificial intelligence. Artificial intelligence is helpful to expand classroom teaching resources, dynamically understand students' learning situation, provide personalized teaching conditions and optimize classroom teaching relationship. But at the same time, artificial intelligence also brings challenges to classroom teaching, such as how to cooperate with "double teacher" teaching, how to effectively regulate and integrate teaching content, how to avoid the tendency of technicalism in teaching evaluation, and how to avoid weakening the relationship between teachers and students. In the face of this situation, we should correctly understand the value and role of artificial intelligence, reasonably standardize the teaching content, realize the diversification of teaching evaluation subjects, and give full play to the "educating" role of teachers.*

Keywords: *artificial intelligence; classroom teaching; value; challenge; response*

1. The value of artificial intelligence in classroom teaching

1.1 Expand classroom teaching resources

Classroom teaching resources refer to all kinds of conditions that support and can be used for classroom teaching. They are generally divided into hardware resources and software resources. In terms of hardware resources, artificial intelligence will promote the complete innovation of teaching equipment. The introduction of AI devices into classroom teaching can not only effectively support the Internet, cloud computing, big data, wearable devices, VR and other new technologies, promote the further updating and optimization of teaching devices, but also serve as a mobile knowledge repository to solve the problem of knowledge reserve by actively setting up the associated knowledge base. Teachers can make full use of artificial intelligence teaching equipment, grasp the learning situation of the whole class more comprehensively and conveniently, and realize the real-time update and extensive sharing of teaching content in the classroom, so that each student can get full development, improve the efficiency of students' mastery of knowledge, and break the current situation that the efficiency of traditional classroom teaching mainly depends on the level of teachers.

In terms of software resources, AI will expand curriculum resources. Artificial intelligence relies on the massive information data of the Internet. Through the intelligent push engine, it can provide online teaching, micro video, micro lecture, cloud classroom and other online resources at any time. Rich curriculum resources become an important way to expand the classroom teaching content and provide more choices for teachers and students. Artificial intelligence big data platform can collect and sort out the latest information such as multiple views, multiple perspectives and real problems brought by the network at any time, ensure that the knowledge content is kept in the latest state, continuously optimize and improve the learning system, timely adjust and update the teaching content, which is more flexible and practical, and also strengthen the connection with students' life and artificial intelligence technology.

1.2 Dynamic understanding of students' learning

By using its own image capture technology, artificial intelligence can capture students' behaviors, facial expressions, micro movements, objects and other elements in a multi angle and all-round real-time dynamic way, and compare the collected data with the concentration analysis model integrated by the front-end computing device or server, so as to accurately analyze students' learning status and class concentration from multiple dimensions, so as to improve students' learning efficiency And the causes of

distraction, comprehensive evaluation of teaching effect.

Through this kind of accurate data statistical analysis, on the one hand, it ensures the teachers' dynamic grasp of the whole learning process of students, and is conducive to the development of personalized counseling strategies for students. From the beginning of classroom teaching, classroom behavior analysis technology will continue to calculate whether there is a gap between students' learning performance and learning goals. Once students' learning performance is lower than learning goals, intelligent monitoring system will make relevant reminders; if learning performance still does not meet the standard, the system will analyze students' learning performance in class by combining their facial expressions and behavior performance. The teacher will pay more attention to the students and adopt targeted personalized counseling strategies. On the other hand, it is also helpful for students to accurately evaluate their own learning effect. Through the integrated analysis of individual students' concentration and the real-time feedback of various learning data, the artificial intelligence system enables learners to intuitively understand their own learning situation, and timely adjust their own learning methods, learning progress and learning content according to the guidance strategies proposed by artificial intelligence, so as to improve the efficiency of classroom learning. Whenever students have behavior problems such as inattention or drowsiness in class, the artificial intelligence system will immediately remind students to make them fully aware of their anomie behavior and stop it in time, so as to regulate the occurrence of classroom problem behavior.

1.3 Provide personalized teaching conditions

Artificial intelligence can not only generate students' personalized data accurately, but also provide technical support for personalized teaching. Due to the unique learning situation of different students, artificial intelligence can analyze the traces left by students through big data, such as their usual interests, examination scores of various subjects, expression records in class, homework completion, etc., and accurately generate personalized data of each student's learning situation. This process is commonly known as "portrait", that is, personality characteristics Induction extraction. Through the "portrait", teachers can grasp the students' strengths and the difficulties they are facing, so as to guide the students' development and improve their deficiencies in time. On this basis, they can formulate personalized teaching plans, and constantly revise them with the feedback and enrichment of big data.

Artificial intelligence can make corresponding learning plans and learning contents according to students' learning habits and learning efficiency, which provides big data basis for students to develop personalized training programs and implement individualized teaching. At the same time, according to the difference of students' understanding, the individual learning plan and content can be flexibly adjusted at any time, so that teachers and students are no longer limited to the fixed teaching content. In classroom teaching, the teaching process can be optimized according to the requirements of "precision learning". Through repeated learning, trial and error, and error correction of artificial intelligence robot, the teaching process has very high accuracy and flexibility. Compared with human teachers, AI obviously knows more about students' different potential factors and ability levels.

1.4 Optimize classroom teaching relationship

The "double teacher" teaching in the era of artificial intelligence deeply integrates the network teaching method with the real classroom teaching activities, and gradually forms a new relationship between "teaching" and "learning". With the help of the suggestions given by artificial intelligence, teachers can optimize and adjust the teaching content in time, choose different teaching methods, so as to make targeted lesson preparation and explanation, promote the transformation of classroom teaching from "teaching" as the center to "learning" as the center, and make it possible to respect each learning individual.

This new relationship between "teaching" and "learning" has greatly changed the roles of teachers and students. On the one hand, AI redefines the role of teachers. As flipped learning will become the mainstream collective learning mode in the era of artificial intelligence^[1], teachers will no longer be pure knowledge "exporters" in the classroom, but absorb more flexible knowledge as a "receiver" in the teaching process by organizing teaching activities. On the other hand, due to the generation of classroom teaching resources in the era of artificial intelligence, all kinds of problems encountered by students in the process of preview and homework will become part of the classroom teaching content. Therefore, students are no longer just passive "receivers" of knowledge, but become "constructors" of knowledge in a certain sense, which is conducive to the cultivation of students' learning ability and mode of thinking,

deepening learning experience, and giving full play to students' subjectivity.

2. The challenge of artificial intelligence to classroom teaching

2.1 How to cooperate with "Double Teachers" in Education

In the future, education will enter the era of coexistence of human teachers and artificial intelligence. Human computer interaction will become the main form of classroom teaching, and the teaching method will be more flexible and open.^[2] teachers and AI robots will cooperate as "Double Teachers" to carry out classroom teaching work, and jointly complete the tasks of one-to-one counseling and personalized teaching. This kind of human-computer interactive teaching has become a trend, promoting the reform of organizational teaching process.^[3] However, in this process, the teaching mode of "Double Teachers" cooperation inevitably has the following problems:

First of all, Although artificial intelligence is enough to undertake most of the "teaching" work, so that teachers focus on the implementation of "education", but the biggest problem of this "double teacher" mode is that it ignores the ontological function of education as classroom teaching, and forcibly divides "education" as a whole into "teaching" and "education", which actually separates the main way to achieve effective education through teaching, while "any" mode The teaching of separating the relationship between the three elements not only goes against the essential meaning of classroom teaching, but also will destroy the internal logic of teaching activities.^[4]

Secondly, education is a very complex and coherent systematic project. Only through a long time of teaching by words and deeds can teachers influence students imperceptibly and help them develop a healthy personality. Compared with human teachers, artificial intelligence lacks the ability of emotional output and social interaction, so its collaborative education mode is too single.

Finally, because "people are the product of the environment", class atmosphere, interpersonal relationship, class atmosphere and collective sense of honor have a potential influence on the healthy growth of students. It is difficult for classroom teaching under the background of artificial intelligence to form the discussion and exploration of the same problem in the traditional classroom, and teachers can not effectively mobilize the whole class to form a class atmosphere of collective communication, The lack of classroom psychological environment is just what artificial intelligence teaching method can't make up for.

2.2 How to standardize and integrate the teaching content effectively

The application of artificial intelligence technology and the change of classroom teaching environment lead to the profound change of teaching content. Almost all the knowledge, repetition, memory, retrieval and question answering can be replaced by artificial intelligence.^[5] No matter in the physical classroom or virtual classroom, teaching will no longer occupy the main time, but will be carried out through network self-study after class. Students are no longer required to memorize and recite fixed teaching content, but focus on cultivating thinking ability. Therefore, how to structure and integrate knowledge under the background of artificial intelligence, and how to effectively transfer knowledge on this basis has become one of the main challenges.

First of all, under certain circumstances, the richness of information may even bring difficulties for students to choose information. For students, artificial intelligence technology can provide massive information at any time, breaking the limitation of traditional classroom teaching content quantity and boundary. However, the amount of information obtained through artificial intelligence system is generally too large, the speed of knowledge change is too fast, and the time given to students to think and express is often too little. Students need to spend a lot of time to analyze and sort out. Secondly, the teaching content lacks systematic integration. Because personalized teaching is separated from the fixed teaching content with complete logical structure and coherent connection in traditional classroom teaching, it mainly pushes relevant knowledge according to students' personalized needs and interests, which is very unfavorable to their all-round development. Students lack a systematic and complete knowledge system and theoretical framework, and have difficulties in constructing knowledge structure and reviewing memory. For teachers, if there is no unified syllabus, it will not be conducive to the normal and orderly development of teaching work.

2.3 How to avoid technicalism in teaching evaluation

Under the packaging of technicalism, the teaching evaluation of artificial intelligence has been put on the coat of "science" because of its "intelligence", but its nature of ignoring people's thoughts, emotions and subjective initiative cannot be changed. In other words, can machines really replace human beings to evaluate students? This is a question worth thinking about.

On the one hand, teaching evaluation based on artificial intelligence technology relies too much on data. It is easy to cause classroom teaching activities to become a superposition of mechanical and technical behaviors, which makes teaching evaluation unable to reflect the real results. Artificial intelligence decomposes the activities of teachers and students in the classroom into many details, and takes these details as the "quantitative" index of anatomy evaluation teaching. However, classroom teaching is obviously a complex process of interaction between teachers and students, and different teachers and students often have different teaching styles and learning habits. It is difficult to comprehensively evaluate and measure the teaching process only based on a few standardized expressions and movements and the number of times, let alone examine the inner world of students through their expressions. Therefore, relying too much on artificial intelligence technology will make the evaluation result inevitably one-sided and untrue. On the other hand, AI teaching evaluation is likely to "hijack" classroom teaching in turn. If the results of artificial intelligence system are alienated as the only way to evaluate teachers' teaching, then classroom teaching under camera monitoring is likely to evolve into a kind of "show" performance. In order to get higher evaluation, teachers and students often deliberately "show", which is not conducive to the free play of teachers and students in classroom teaching.

2.4 How to avoid weakening the relationship between teachers and students

With the deep integration of high-tech into the field of education, artificial intelligence has been enough to replace teachers to complete most of the teaching tasks. Teachers are no longer the only carrier of teaching and the authority of imparting knowledge. The relationship between teachers and students is no longer dominated by the relationship between teaching and learning, but more manifested as a democratic and equal "learning partner relationship". Therefore, the traditional relationship between teachers and students will be greatly challenged, and the relationship between teachers and students will be constantly "weakened".

First of all, teachers transfer part of their teaching functions to AI, which weakens the emotional communication between teachers and students. The change of students' emotion is an important feedback of classroom teaching. Artificial intelligence only helps teachers to understand students' emotional state to a certain extent and scope, rather than really communicate with students. Teachers and students need more communication and guidance. Secondly, the emotional communication between teachers and students presents an unequal one-way interaction. Of course, teachers can know students' emotional state at any time through artificial intelligence, while students lack effective ways to perceive teachers' attitudes and emotions, resulting in teachers and students can not produce emotional resonance and receive each other's emotional signals. Benny, an American educational psychologist, pointed out: "in classroom teaching, nonverbal behaviors such as movement, posture and expression are an effective and economical auxiliary means to replace word expression^[6]." Thirdly, as we all know, "no matter how the technology develops, teachers' teaching by words and deeds and face-to-face communication are all indispensable links in educating people^[7]". The object of education is living people. Compared with knowledge teaching, the growth of students' emotional thinking and the communication between teachers and students are obviously indispensable. Artificial intelligence does not have real feelings, nor can it replace teachers to control students' emotions in time and make corresponding guidance.

3. How to deal with classroom teaching in the age of artificial intelligence

3.1 Correctly understand the value and function of artificial intelligence

If human teachers want to cooperate with AI teachers, they should do the following two things

First, teachers should regard students as an independent person. The purpose of artificial intelligence should be to help students better achieve self-development, rather than maintaining the absolute authority of teachers, so teachers should not use artificial intelligence to strictly control students and constantly strengthen their own authority. ^[8]By using artificial intelligence, teachers can

more specifically implement classroom teaching, make accurate analysis of students' behavior, and release students' nature through daily teaching activities, so as to achieve better development.

Secondly, teachers should establish a correct view of technology and clarify the auxiliary role of artificial intelligence in classroom teaching. Teachers should be aware of the limitations of artificial intelligence teaching in education, and realize that the main role of artificial intelligence is to help solve some problems in teaching, rather than as a tool to replace classroom teaching. In the process of daily teaching, teachers should be clear about the identity of artificial intelligence tools, always ensure that they are in the dominant position of classroom teaching, and prevent the machine "cross-border" behavior. No matter what kind of teaching role and function teachers play in the classroom teaching, the ultimate goal should be unified in the development of students. "Double Teachers" should start from the theme of education, so that classroom teaching is no longer limited to imparting fixed knowledge. Teachers can use the virtual game scene created by artificial intelligence to organize normalized classroom innovative practice activities, encourage students to carry out communication and interaction, jointly complete teaching tasks, and achieve the goal of Education under the background of artificial intelligence, namely "awakening human value" [9].

3.2 Reasonably standardize the teaching content

Artificial intelligence is still in the process of continuous innovation and progress, but it has not yet reached the state of perfection. Unlike human beings, artificial intelligence lacks the ability of understanding human nature and complex communication, and the pushed teaching content is often lack of systematization and integration. In view of the drawbacks and defects of AI teaching content, teachers must make up for them: on the one hand, teachers must start with teaching resources and actively participate in the selection and customization of teaching resources. Through the development of the syllabus, the reasonable range or key words of teaching content can be defined to make the teaching resources more targeted and valuable, and reduce the generation of useless resources from the source. On the other hand, teachers should pay more attention to the cognitive characteristics of students, focus on the combination of knowledge imparting and ability training through a variety of teaching activities and teaching processes, promote the development of students in cognitive and non cognitive fields, and focus on cultivating students' ability to discover and summarize problems, so that students can understand the meaning of what they have learned from the bottom of their hearts, and then through understanding and reflection, they can understand the meaning of what they have learned. The fragmented knowledge is constructed as a complete system.

With the continuous progress of artificial intelligence technology, artificial intelligence can handle more and more affairs, even will become more and more like people, but emotion is the essential difference between human and artificial intelligence, so the formulation of teaching content should focus on the development of students' ability of criticism, innovation and practice, so as to develop independent and sound personality.

3.3 Realizing the diversification of teaching evaluation subjects

Teachers should realize that artificial intelligence technology can provide data reference for teaching evaluation, but it can not replace teachers and students as teaching evaluation itself. As the object of teaching evaluation is living people, people not only have rich emotions and subjective initiative, but also accept the influence of different environments. Only by taking people as the subject of evaluation, can we deeply understand the subjective emotions contained in the evaluation objects and make more targeted evaluation according to different situations. Therefore, the evaluation of "people" must be participated by "people". Therefore, teaching evaluation needs the joint participation of teachers, students, artificial intelligence technology and education management departments. If there is no one, it is not conducive to the objective and fair evaluation. Only by realizing the diversification of teaching evaluation subjects, can we synthesize the different perspectives of "people" and "things" and make an all-round and multi angle evaluation. In the classroom teaching, it is necessary to build an intelligent evaluation platform for teachers and students to create and share. Using all kinds of classroom data collected by artificial intelligence monitoring technology, it is necessary to establish a student behavior analysis database. Teachers can extract students' classroom data at any time to generate real-time evaluation. If they can't make a judgment at present, they will continue to extract students' earlier data for proofreading until the results are obtained. The reliability and validity of teaching evaluation can be enhanced only through the multiple judgment and analysis of teachers and artificial intelligence.

3.4 Give full play to teachers' role in educating people

Teachers cannot completely transfer their roles and responsibilities to AI. Artificial intelligence devices can assist teachers to complete part of the teaching work, including accurate analysis of students' details, targeted selection of teaching strategies and collection and collation of knowledge information. It can be seen that artificial intelligence has its own advantages in skilled and knowledge work. But as the engineer of human soul, the key to the development of students lies in the influence teachers bring to students from the physical and mental aspects. In addition to helping students acquire skills and knowledge, the responsibility of teachers should be more focused on "education", that is, to enhance students' spiritual realm and enrich students' spiritual world. Only under the influence of teachers' words and deeds, can the educational goal of "educating people" be realized. Therefore, teachers should be more active in taking on the humanistic care that artificial intelligence does not have, consciously strengthen the cultivation of teachers' ethics, focus on the "education" work, through the establishment of positive contact with students, with good ideological and moral demeanor to influence students, shape students, truly teach by words and deeds, cultivate morality, and achieve the balance and stability of the relationship between teachers and students. In the era of artificial intelligence, education should recognize the value of technology, but should not ignore the importance of the relationship between teachers and students, and the construction of a good relationship between students in the classroom. ^[10]In the classroom teaching, teachers should not only as a teaching assistant, create a suitable learning environment for students in the classroom teaching, guide students to correctly use artificial intelligence to obtain and process information, but also design personalized learning plans for students to help students solve some difficult problems, so as to form a guiding, mutual promoting and cultural interaction in the classroom teaching. Students and other multiple teacher-student relationship, to ensure that teachers "education" role to give full play.

In short, entering the era of artificial intelligence, artificial intelligence has brought great changes to classroom teaching, but also brought many challenges to classroom teaching. However, AI does not mean that teachers will be abandoned. Teachers should be more actively integrated into AI teaching, and play an important role in cultivating students' good moral character, caring for students' growth and guiding students' studies.

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