The Transformation of College Students' Learning Methods in the Background of Artificial Intelligence Era

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Abstract:

After the 21st century, artificial intelligence has become the mainstream development trend of the time. It has penetrated into all aspects of people's production and life and brought about significant influence. Among them, an important link is reflected in the innovation of education mode. The development of artificial intelligence has brought about three major subversive changes to the traditional way of learning for college students. At the same time, it has also caused many challenges that the traditional education mode has never faced, which puts forward new requirements for the different subjects. This paper deeply analyzes the changes, opportunities and challenges of college students' learning styles under the background of artificial intelligence and puts forward corresponding measures and suggestions accordingly.

Keywords: *Artificial Intelligence; Education; Learning style*

I. INTRODUCTION

In the context of the era of artificial intelligence, the development of the Internet and AI technology has provided more possibilities for the transformation of college students' learning styles. At present, the development model of "AI+ Education" has become the focus of attention of scholars. Li Weihong et al. (2018) studied the impact of artificial intelligence on the existing education system and its transformation methods [1]; Tang Jian (2019) studied the recognition of artificial intelligence and learning ability. Moreover, he also studied the advantages and disadvantages of the "Internet +" interactive learning system [2]; Wu Yonghe (2017) and others explored how to build an " AI+ Education" ecosystem [3]. It can be seen that artificial intelligence, with its cutting-edge technology and advanced learning mode, is irresistibly integrated into college education, empowering educational development and driving traditional education to usher in new vitality. In this context, the traditional way of learning for college students has welcomed lots of opportunities, but also faces many impacts and challenges. This article attempts to carry out a detailed analysis of the changes and impacts that artificial intelligence brings to college students' learning and proposes relevant development and reform

opinions.

II. AI PROMOTES THREE MAJOR CHANGES IN COLLEGE STUDENTS' LEARNING STYLES

As a new technology developed by the times, artificial intelligence is rapidly integrating into the learning of college students, promoting the transformation of college students' learning style to a higher level. Many platforms derived from it have advantages that traditional teaching models do not have. They can break the indoctrination teaching that teachers are accustomed to, turn students from passive to active, and provide students with personalized teaching content and rhythm that are more conducive to their own development. This will also cultivate students' lifelong learning ability.

2.1 From passive learning to active learning

Under the pressure of college entrance examinations and others, most of the students have adapted to the mode of completing the learning tasks assigned by the teacher. Traditional university teaching also follows the principle of "arrangement". The fixed curriculum system makes students to passively learn in order to obtain higher final exam scores. In essence, it is still restricted by the exam-oriented education framework. Teachers often pay more attention to whether their students have mastered the existing knowledge created by predecessors instead of excavating and cultivating students' creativity and their insight into problems. However, the training programs of most universities mentioned that they would focus on cultivating students' ability to independently research and explore unknown fields. Just learning knowledge for examinations is far from reaching this goal and will greatly reduce students' enthusiasm for active learning. In addition, the curriculum arrangement of colleges allows students to have more free time at their disposal. Without the ability and channels for active learning, students will not be able to make full use of their spare time for self-improvement, which is not conducive to the comprehensive training of talents. Thus, the autonomous learning ability of college students is becoming particularly important.
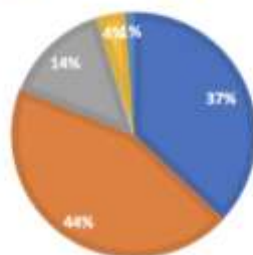
Fig 1: Students' views on online teaching to enhance self-learning ability

According to a survey of 879 students from a municipal university in Beijing, which is about their views on the improvement of self-learning ability through online teaching mode (Fig. 1), more than 80% of the students currently recognize the positive effect of online teaching mode on self-learning ability. Artificial intelligence education with its unique novelty, target dismantling advantages, giving independent choices and information interaction advantages, can greatly stimulate students' interest in learning, so as to achieve the effect of stimulating students' active learning. The teaching method of artificial intelligence is still in the initial stage of development in colleges and universities [1]. The teaching mode under artificial intelligence can be useful for learning. The goal is disassembled to make the knowledge structure more distinct. Besides, the relevant tests are usually set to test the learning effect in each part so that it can provide college students with a clearer sense of goal and fulfillment. Artificial intelligence learning provides students with more Independent choice of space. Students can choose the courses and teachers they are interested in to learn. Choosing independently can make students more conscious and responsible for learning than passive choice [4]. Compared with offline courses with decentralized content, artificial intelligence teaching can achieve rapid information exchange to a large extent, enrich students' learning content scientifically and reasonably. To sum up, the knowledge forms a complete logical chain, promoting students' active learning and avoiding the formation of knowledge Isolated island.

2.2 From generalized learning to personalized learning

Different from the pre-university exam-oriented education, due to the different knowledge background of college students and future development plans, even the professional knowledge required by students of the same major may be quite different. The traditional curriculum training program is difficult to take into account the different needs of each student for knowledge. Most of the knowledge taught has the characteristics of homogeneity. Teachers generally only teach one course of knowledge in one semester. If students cannot actively

communicate with teachers and ask questions, it is difficult for teachers to understand their accurate situation and existing problems, so as to provide targeted guidance.

Before the start of learning, AI technology allows students to customize the course content and schedule according to their own knowledge base, learning habits, hobbies, suitable learning methods and so on. Through the precise analysis of big data algorithms, the system can understand the students' knowledge needs and preferences to recommend courses before learning, so that it can realize the personalization of course design [5]. In the learning process, the system would comprehensively analyze the students' course learning progress and test accuracy, their learning status and mastery level, and realize the individualization of the learning process and inspection methods. The online learning time is more flexible. Students can concentrate on the time according to their own situation to complete the learning tasks, realizing the time freedom and personalization, so as to better achieve the required learning effect. Through the technical means of artificial intelligence, it is necessary to realize the logical main line that the college students themselves are the center and the curriculum is developed around their learning needs. Instead of a certain curriculum as the center to produce the education status quo of "doing more and not rich". So as to better realize the personalized development of students and cultivate unique talents needed in various fields [6]. The traditional "compensating for shortcomings" education needs to be transformed into "learning strengths" education at the university stage. Students have mastered most of the basic knowledge through pre-study. University education should pay more attention to cultivating professional talents and gathering students' personal potential through exploration. The education should develop and guide around this long board, so as to make the university become the creator of knowledge.

2.3 From staged learning to lifelong learning

Under the traditional staged-learning thinking, learning is usually considered to be the task of the student stage, and the attitude towards learning is usually relaxed after entering the employment stage. However, with fierce employment competition and fast-developing economical social needs, it is no longer enough to rely solely on knowledge input during the student period and knowledge output after employment. With the rapid development of science and technology, the explosive growth of knowledge, and the alternation of business models, lifelong learning has become the general trend. For college students, it is necessary to regard graduation as the beginning of lifelong learning, not as the end of phased learning. During the university, they should be committed to cultivating their own lifelong learning awareness, regarding learning as a habit of self-improvement rather than a means of completing tasks. Students should get rid of the thinking dilemma of "don't want to learn, can't learn, and don't have time to learn". After entering the workplace, maintaining a lifelong learning habit can promote

the improvement of their personal capabilities. The competition in the modern workplace is becoming more and more fierce. And "artificial intelligence + education" can give people more channels and choices, thereby improving their own comprehensive strength.

The artificial intelligence education model provides a powerful impetus for lifelong learning. The intelligent learning method breaks the learning barriers and changes people's inherent cognition of learning. Breaking learning barriers is mainly reflected in three aspects: time, space, and identity. From the perspective of time, learners can arrange time for online learning independently. There will be no difficulties for students to learn knowledge due to time conflicts. From a spatial perspective, just like the Chinese University MOOC app's slogan going, "A good university has no walls". With the internet, students do not have to study at a fixed location. Instead, home, commuting and other moments, they can have direct access to famous university teachers and learn cutting-edge knowledge. From the perspective of identity, listening to a certain teacher is no longer the patent of a certain college student. With the support of the curriculum system, anyone can become his or her student to study and research, breaking the invisible identity barriers set by society and schools. Intelligent learning promotes the transformation of consciousness, provides methodological guidance for lifelong learning, enables the concept of lifelong learning to run through all stages of students' personal development, expands the space for their career development, and adds more life value and possibilities to people.[7]

In addition to the above advantages, artificial intelligence education also includes teaching technologies such as virtual reality and augmented reality. For courses that require on-site inspections and observations, VR and other technologies can realize scene reproduction and make students feel more realistic. Instead of watching through slides and teacher's video and so on, it enhances the sense of reality and enhances students' learning interest. With the advancement of technology in the future, students need to experience the knowledge they have learned in an almost immersive way, which will enhance students' cognitive ability and comprehension, and make knowledge more vivid and three-dimensional.

III. THE CHALLENGES OF ARTIFICIAL INTELLIGENCE TO COLLEGE STUDENTS' LEARNING

Artificial intelligence has also brought many challenges to university education. "Artificial Intelligence + Education" is different from the traditional education model in many aspects such as technology, assessment, supervision, and communication, and has different effects on the work and learning mode and content of university administrators, teachers, and students. The introduction of artificial intelligence needs to play an auxiliary and extended role to facilitate

communication between teachers and students. If it is not possible to adapt to this change from all parties, and even affect the quality of school teaching, then the introduction of this technology will appear to outweigh the gains.

3.1 Challenges Faced by School Education and Teaching Management

The distance created to prevent the spread of the new crown epidemic has made most school education to shift from offline to online. The utilization rate of online teaching software has greatly increased, which has promoted the popularization of artificial intelligence education to a certain extent. However, the teaching supervision and management model of universities is still dominated by traditional methods. At present, the epidemic situation is stabilizing, and the promotion of artificial intelligence teaching models in universities has declined. However, with the development of the times and the diversified needs of education channels, the unique advantages of artificial intelligence education will eventually make it gradually popular, which will have a greater impact on traditional management models. Intelligent learning poses new challenges for college students' performance management system, assessment and proctoring methods, educational administration platform management system and technical requirements. Schools are required to update student performance composition and improve online proctoring technology in an appropriate proportion.

In addition, online courses need to fully understand the differences between online learning and traditional teaching before curriculum design. It includes scientific research on students' concentration, completeness of information transmission, and adequate communication [2]. The platform should redesign the length of the course videos which makes it difficult for students to focus enough time. The design should avoid completely following the traditional way of teaching design. which in turn reduces the quality of learning. Besides, it should redesign the teacher-student interaction method to improve the initiative of students to ask questions and the timeliness of teacher response in order to avoid delays in learning progress, etc. At the same time, online learning poses a great challenge to students' self-control. It is difficult to achieve the same supervision effect as offline.

Artificial intelligence learning is the general trend. Colleges and universities should not ignore the cost and cumbersomeness of their reforms, nor should they make drastic and eager reforms. They should be gradual and steadily promote the development of intelligent learning in universities, and change the teaching system and student learning habits [1]. When schools introduce artificial intelligence education, they must not pay too much attention to technological advancement and ignore its ultimate purpose: to truly enable students to master and practice the knowledge they have learned and promote personal development. Artificial intelligence should

make intelligent learning an auxiliary tool to promote education and teaching, rather than a yoke that restricts education.

3.2 The impact of platform limitations and volatility on teaching quality

The instability of the learning platform network will directly affect the quality of teaching and communication. At present, the teaching platforms used by universities are mainly live broadcast platforms such as Tencent Conference and Ding Talk, and recording broadcast platforms such as MOOC and Xue Xi Tong for Chinese college students. Among them, the live broadcast platform is most affected by network volatility. The quality of the multi-terminal network for teachers and students is difficult to guarantee. Moreover, there is a problem of poor communication in online teaching, and it is difficult for teachers to know whether their voices and PPT screens have been completely displayed on the student side.

The interactivity of students in online learning is significantly lower than offline. The obstacles of spatial distance and the anonymity of the Internet will greatly affect the quality of teaching. Since online teaching has been popularized in colleges, according to the statistics of student satisfaction within a certain college in Beijing (Fig. 2), it can be seen that the satisfaction of students with online teaching is far from reaching expectations. The degrees which are "very satisfied" and "satisfied" only account for half of the total, which are still a big gap compared with traditional offline teaching. This is mainly for the following reasons: If students are unwilling to speak and interrupt the teacher's initiative to ask questions, it will be difficult for the teacher to understand the student's learning state and mastery. There will be the situations where the teachers will speak by themselves and the students will find it difficult to digest. In addition, the teaching progress and thinking of teachers are easily interrupted by unexpected situations in online teaching, which is not conducive to the smooth development of teaching. In addition to language communication, body language plays a vital role in classroom teaching. The eye contact and facial expressions between students and teachers can help teachers understand their learning status and better adjust classroom progress. However, online teaching is difficult to achieve this.
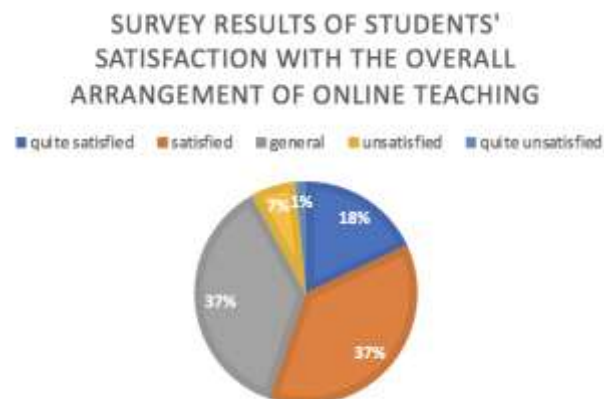
Fig 2: Survey results of students' satisfaction with the overall arrangement of online teaching

3.3 Challenges to Curriculum and Knowledge Quality

When students independently search for courses on major platforms, they will face a mixed situation of course quality. The current course screening and grading system of the intelligent education platform is not perfect. It is easy for students who are in the knowledge reserve period to accept wrong and not rigorous knowledge. [8] When choosing a course, students generally tend to choose through the ranking status of the teacher's college and platform recommendation. This selection method is difficult to carry out effective quality screening, which can easily lead to bad consequences such as wasting their time and misleading their thinking. This consequence runs counter to the purpose of artificial intelligence. In addition, online course platform video courses are limited by the length of time, and are generally concise and generalized. It is difficult for students to gain in-depth knowledge of knowledge and carry out effective knowledge and case expansion. As far as teaching in colleges and universities is concerned, besides the theoretical study, teachers will generally flexibly carry out case analysis and supplement, follow current events to expand, so that students can understand knowledge more deeply. However, the production and update cycle of recording and broadcasting teaching is relatively long, and most teachers find it difficult to be as comfortable as they are in the classroom when facing the camera. There will be problems of rigid intonation and text-based teaching, and the quality of video courses cannot be guaranteed.

The current online and offline courses are highly independent. It is difficult for them to achieve unified complementarity. Offline classrooms have limited and fixed class time, which will lead to insufficient teacher-student communication. Based on the current and long-term future, college teaching will still focus on offline education, the artificial intelligence teaching needs to supplement and expand this instead of repeating basic knowledge online. It will not achieve the purpose of complementing each other. Besides, courses on the same platform have

unevenness between good and bad. Therefore, if students want to learn higher-quality courses, they need to learn on different platforms. According to the data survey released by the CIQA (Fig. 3), it can be seen that the platforms used by Chinese colleges and universities in online teaching are relatively scattered, and the highest proportion of the use of Chaoxing is only 26.22%. This will make students not have a high degree of integrity and relevance when learning courses, and it will be difficult to form a complete system, which will lead to fragmentation of knowledge, which will affect the learning effect of students.
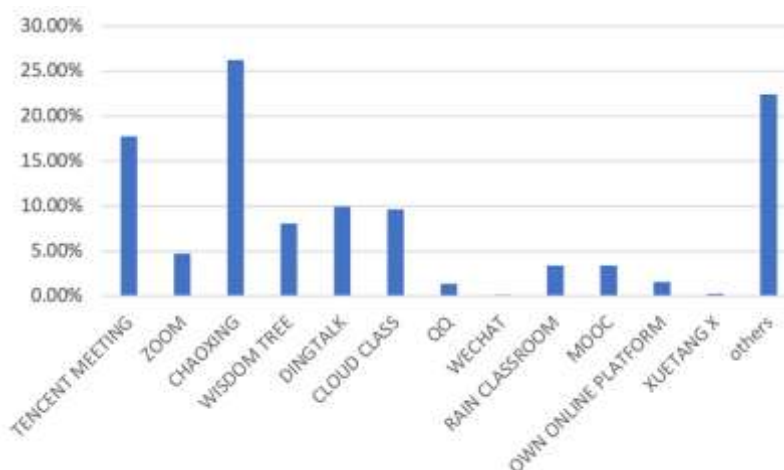

Fig 3: The usage of online teaching platforms in Chinese universities

IV. MAKE GOOD USE OF ARTIFICIAL INTELLIGENCE TO SERVE COLLEGE STUDENTS

The background of the artificial intelligence era provides new ways for college students to study and live. For college students, this is both an opportunity and a challenge. How to make good use of artificial intelligence to serve college students is a topic we must face. We must first clarify the logical relationship between artificial intelligence and learning, discuss how to use artificial intelligence to carry out learning activities from the perspectives of student group, teacher group, and evaluation effects. Only by fully understanding and mastering artificial intelligence equipment can learners better use artificial intelligence to serve their own learning and maximize the effects of artificial intelligence.

4.1 From the perspective of student group

Even in the era of artificial intelligence, the dominant position of college students in learning cannot be shaken or changed. Teachers mainly play a guiding role. Teachers should stimulate

students' curiosity through various learning methods and focus on cultivating college students' independent learning and thinking ability, and the skills to explore and collaborate on research issues, etc. In the era of artificial intelligence, student and teacher group should actively interact and work together to give full play to the technical support of artificial intelligence to help college students achieve changes in learning styles and satisfactory learning results.

First of all, the student group needs to follow the development of the times and the progress of artificial intelligence technology to continuously accept and deepen the understanding and mastery of artificial intelligence technology. Artificial intelligence is a new technology trend, which contains multiple modules and forms of technological display. Many learners have a superficial understanding of artificial intelligence technology and are not deep enough. Facing artificial intelligence, we must first realize the necessity and importance of learning artificial intelligence, and accept the new thing of AI from the ideological perspective. In addition, it is necessary to strengthen the learning and mastery of artificial intelligence related knowledge so that we can better understand and master the technology and make artificial intelligence work for us.

Secondly, we need to see that artificial intelligence still has some insurmountable skills, such as language and logic skills, social skills, teamwork skills, innovation and development skills, and so on. Therefore, we cannot completely rely on artificial intelligence to carry out learning activities. We need to cultivate the consciousness of self-learning. Artificial intelligence is still subordinate and dominated in learning activities. Learners are the protagonists of artificial intelligence learning. Student group should actively develop learning plans in line with their own learning and development in accordance with the teaching goals, carry out independent learning at various stages according to the plan. At the same time, it is necessary to make full use of big data technology to evaluate the learning process and learning effect of learners. Through timely review and inspection of the effectiveness of learning activities to objectively evaluate learning effects, and timely correct learning problems and blind spots. Ultimately achieve better learning goals.

4.2 From the perspective of teacher group

In the context of the era of artificial intelligence, the teacher group should have a keener sense and understanding of the impact and transformational effects of technological development on learning than the student group. Teacher group need to change the traditional teaching thinking, return the dominant position of learning to students. They should change the focus of teaching from imparting knowledge as the leading role to cultivating students' active learning habits and learning thinking mode as the main direction of education.

First of all, teachers need to train students to use and operate smart tools. In the era of artificial intelligence, learning to operate intelligent tools has become one of the necessary skills for the learning community. At present, most teachers are still more accustomed to using traditional tools for teaching, especially some older teachers are not strong in accepting new technologies and are reluctant to use them in teaching. Teachers must first have a good ability to use smart tools themselves, so as to better train the student groups to use them.

Secondly, teachers need to strengthen the cultivation of communication and teamwork abilities among students. Artificial intelligence has brought unprecedented experience and convenience to human learning. It has promoted learning from campus classrooms to the Internet, from traditional offline to online gradually, breaking through the limitations of time and space. The student group has changed from collective study to individual study. In the virtual environment, the requirements for communication, coordination and teamwork ability of the student group have been improved. In the virtual learning environment, student groups can conduct learning collaboration and exchanges with different groups across time, space and disciplines. It will strengthen their collaboration and communication skills, help students improve their online interpersonal learning capabilities. Then it will achieve the optimization of online learning effect and good experience.

If teachers want to use artificial intelligence as an assistive technology tool for teaching, it is necessary to adjust the teaching mode. A higher-quality curriculum can be created by flipping the classroom learning method. Students use artificial intelligence and the Internet to learn in their spare time. Teachers answer questions and ask questions in the classroom, and expand and supplement theoretical knowledge. This can not only fully improve the classroom effectiveness, and make the classrooms break away from the framework of scripting and propaganda; it can also strengthen students' understanding and memory, so that students can acquire more knowledge and skills. However, because students' offline learning requires more energy than traditional teaching, teachers should pay attention to the design of the curriculum and the proportion of content to prevent students from being overstressed and affecting their learning mentality.

4.3 Use AI to evaluate learning effects

Traditional learning evaluation methods are relatively simple, and the results are subjective and lagging, and it is difficult to achieve accurate evaluation of learning effects. The application of artificial intelligence technology in teaching effectively optimizes the process of data collection, data processing, data analysis and result display of student learning.[9] The use of AI

technology to provide timely feedback and evaluation of learning effects is an important part of learning. Artificial intelligence technology promotes the development of scientific and objective evaluation of the effect of college students' independent learning.

Students can use the platforms for self-evaluation, use artificial intelligence technology to establish a database of exercises, and lay a solid foundation for accurate assessment of learning effects. This kind of database includes not only the assessment of knowledge testing, but also of the learning process from six aspects: memory, comprehension, application analysis, evaluation and creation. Through the assessment, learners can understand their mastery of the content in time, judge whether they have achieved their goals, and get accurate feedback on learning effects.

In addition, AI technology can be used to build a network communication platform to provide a communication one for learners in different regions, colleges, age groups, and learning stages. Different types of groups can fully communicate and exchange in this diverse and open environment, effectively promoting learners to have a deeper understanding and mastery of knowledge. Besides, on the network platform built by artificial intelligence technology, students and teachers can communicate across different time and space, help learners maintain a strong interest in learning, and promote learners to make timely and reasonable adjustments.

V. CONCLUSION

With the assistance of the artificial intelligence learning platform, college students' learning has a trend from passive to active, from generalized to individualized, and from staged to life-long development. At the same time, the artificial intelligence education model puts many challenges on school education and teaching management, the limitations of the platform itself, and the quality of courses. Colleges and universities need to adapt to the trend of the times, make adjustments and reforms step by step, so that the management mechanism, teachers and student groups of colleges and universities can participate in it, adapt to and make full use of this new change in teaching mode, and promote their own comprehensive development.

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