Construction of Personalized Education Model for College
Students Driven by Big Data and Artificial Intelligence

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Abstract. The combination of big data, artificial intelligence and education has become a new mode of university education reform in China. This paper combs the help of big data and artificial intelligence for the individualized teaching of university teachers, the individualized management of college educators and the individualized learning of college students through the mining of common and individual data, the equal emphasis of process and result, and the combination of task learning and autonomous learning. The model of individualized education for college students is constructed, which is mainly composed of two sub-models: the individualized learning model of college students and the individualized education model of college educators. Thees two models promote each other and act together on the process of college students’ education.

Key words: Big Data, Artificial Intelligence, Individualized Learning for College Students, Individualized Education for College Educators

1. Introduction
As a new technical means, the combination of big data, artificial intelligence and education has become a new mode of university education reform in China. The Ministry of Education and the provincial education departments have issued many documents on the artificial intelligence innovation action plan of colleges and universities, which require the realization of scientific and technological guidance, seize the development opportunities of big data and artificial intelligence, and promote the teaching reform in colleges and universities [1]. The core of higher education is to educate and train college students, the essence lies in the interaction between college students and knowledge. The cognitive construction of college students' knowledge is the foundation of college learning. At present, the popular education mode can not meet the needs of the society. Paying attention to individualized education has become a new social trend. As we all know, individualized education is the common idea of world-class universities. It is also the typical characteristic of first-class undergraduate
education [2]. Personalized education of college students is the inevitable choice and requirement of the deep development of higher education.

An ideal core of individualized education is to respect and develop the uniqueness of each life entity, and finally achieve its personality perfection and life growth [3]. Personalized education of college students is helpful to cultivate students' independence, team and innovation, and it is the embodiment of carrying out the task of creating people by virtue in colleges and universities. The purpose of this paper is to explore the scientific and technological method of using big data and artificial intelligence, to construct the individualized education model of college students combined with the individualized learning and educational characteristics of college students, and to provide advice and reference for the development of higher education.

2. The core elements of individualized education for college students

The core elements of individualized education for college students need to be excavated from two levels. One is the concept level; the other is the practice level. They mainly involve the idea of college educators, the participation of college students, and the interaction between college managers and college students.

College educators must set up the concept of individualized education. They should take the students as the foundation, understand the students more, respect the students' personality, guide the students pertinently, and carry out the differentiated management to the students. College educators include counselors and teachers who face students directly, as well as top-level college principals and managers related to students' learning and life.

The traditional idea is that the individualized education of college students is the thing of educators, which separates the students themselves. In fact, the essence of individualized education for college students is the interaction between college educators and students. The participation of students is particularly important.

Socrates, the great philosopher and educator, once said that education is the awakening of one soul to another, the inspiration of one soul to another, the power of one life to ignite another, and the intellectual activity of the mysterious participation of the collective soul of mankind [4]. Educators pay attention to students' individuation, differentiation, targeted guidance and inspiration, accompany students' consciousness and thinking to wake up and burst out, so as to promote the realization of educational purposes. Higher education is in the advanced stage of education, but also needs the interaction between college educators and college students, and needs both to be integrated into the process of participation, feedback, adjustment and improvement.

Therefore, we believe that the core elements of individualized education for college students, as far as the subject is concerned, there are college educators and college students; as far as the process is concerned, there are participation, feedback, adjustment and improvement; as far as the direction is concerned, there are ideas leading, guiding participation and focusing on interaction.

3. Big data, artificial intelligence and personalized education for college students

Artificial intelligence, as a new popular technology, also has big data capability. On the one hand, artificial intelligence needs big data to establish its intelligence; on the other hand, big data also needs artificial intelligence technology to carry on the data value operation. In the field of education, artificial intelligence can not be separated from big data. It needs to rely on big data platform and technology to help complete deep learning evolution. Big data needs artificial intelligence to function, quantify and highlight its value and significance as a learning tool. The application of big data and artificial intelligence to the field of higher education can promote the individualized teaching of college teachers, the individualized management of college educators and the individualized learning of college students. Specifically, the main performance in the following three aspects.

3.1 Mining of common and individual data
In view of the learning situation of college students, it is necessary to excavate the differentiated information of students' commonness and individuality through big data, and store students' individualized data in cloud storage. Through the analysis of students' personalized information and other analysis, "Artificial Intelligence plus Education" and other platforms help educators understand the learning situation of students, so as to carry out accurate and effective training.

As far as teachers are concerned, students' learning process can be tracked and analyzed by big data, such as the participation and accuracy of answering questions in live streaming. On the one hand, teachers can find out the problems of students' interest and the whole situation of students' mastery of knowledge. On the other hand, teachers can also see the learning situation of different students and understand the different understanding of students to the same problem.

As far as counsellors who manage a class are concerned, they need to sort out and extract the different information of students' learning interest points, students' specialty and students' learning ability through big data in order to master students' personality characteristics and educate students pertinently. As far as the student management departments, such as the academic affairs department and the student department are concerned, through the data mining, they can understand the teacher's class situation and the student's feedback, analyze the students' acceptance degree, love degree and the degree of knowledge transformation, and design and optimize the undergraduate student training specifically. For example, in universities, general courses need to be set up in combination with the different needs of students.

3.2 Equal emphasis on process and outcome

In the case of the combination and action of artificial intelligence and big data, college educators can truly realize the "teaching according to their aptitude". The tracking and analysis of the process greatly promotes teachers' mastery of students' learning situation. It is also convenient to adjust the teaching content in time, optimize the design of the teaching scheme, and improve the teaching methods and means. As far as the study of college professional courses is concerned, teachers track students' interest, foundation, progress, difficulties and so on by using artificial intelligence, big data and other technologies, such as tracking students' time and duration of video learning, procrastination of video and so on. At the same time, teachers can also track the completion time, duration and accuracy of students' homework after class, and understand the mastery of different students' learning of the course. In addition, it is helpful to relieve students' weariness, improve students' enthusiasm and avoid bad psychological diseases. In the process of learning, many students often have depressed psychology about knowledge that they do not understand or are not interested in. Process tracking helps teachers find problems in time. Then they can customize personalized counseling programs and take personalized measures to help students solve problems, and to improve students' learning initiative and enthusiasm.

The application of the results has greatly promoted the optimization and perfection of the undergraduate talent training program, system and measures. Specifically, the big data combing and analysis of artificial intelligence, to a large extent, makes the teaching effect quantifiable and presented. For example, for college students' choice of minor courses in the second major, educators can often compare and analyze the results of student satisfaction between the middle and the end of each semester. As far as the leadership at the school level is concerned, the effect of cultivating students in each department needs to be presented through the data analysis of artificial functions. For example, through the data analysis of artificial intelligence, they can understand whether the top-level design of the school matches the practice of cultivating applied talents of college students.

3.3 Combination of task learning and autonomous learning

The mining of common and individual data and the equal emphasis of process and result are mainly analyzed from the angle of educating students by college educators, while task learning and autonomous learning really settle down to students themselves. Artificial intelligence and big data help students achieve the organic combination of goal-oriented and independent choice. On the one hand,
students can learn the content of the course and complete the teaching goal according to the teacher's teaching arrangement. On the other hand, students can use artificial intelligence platform, according to their interests and hobbies and learning ability, choose their own learning content, arrange learning progress and so on. In this process, technology and education achieve deep integration, students achieve personalized learning. Students' ability and personality have been fully and freely developed.

4. Model of Personalized Education for College Students

According to the core elements of individualized education for college students, with the help of artificial intelligence and big data platform and technology, the individualized education model of college students is mainly composed of two modules. One is the individualized learning model of college students, the other is the individualized education model of college educators.

4.1 Personalized learning model for college students

The endogenous motive force of individualized education for college students comes from the construction of self-learning model. Each individual student should have a learning model adapted to his own learning characteristics. In the process of building the model, teachers should constantly guide and inspire the student, so as to find his own learning rules [5]. The formation of learning model is a process in which students take the initiative to construct and understand the characteristics of self-learning and adjust the model according to the change of self-knowledge [6]. College students' learning is different from the early and advanced stage of learning. Their autonomy is greatly enhanced. In addition to the established content of professional courses, college students' learning life is more based on their own needs to choose general courses and the second major to learn.

With the arrival of the new scientific and technological revolution, the platform of artificial intelligence promotes the independent learning of college students. Because the artificial intelligence system can easily adapt to the individual learning needs of each student, and can be targeted according to the advantages and disadvantages of students to teach. It provides teachers with meaningful work, and provides students with a more meaningful learning experience. With the help of artificial intelligence, college students have the opportunity and space to discover the law of self-learning, so as to establish a self-personalized learning model and promote the real improvement of self-ability. The model is as follows:

4.2 Personalized education model for college educators

Artificial intelligence and big data provide good intelligence and service support for the interaction between college educators and college students. The individualized education model of college educators is constructed by the guidance and education of college educators, the feedback and evaluation of college educators' education and the dynamic observation of educational process.

First, college teachers use artificial intelligence platform to guide college students to study. With
the help of data reading and analysis, they find out the students' learning differentiation. According to the differentiation, they adjust their teaching plan in time to better adapt to individualized teaching. Second, artificial intelligence and big data can selectively push the learning content according to the individual differences of different students to better meet the individualized needs of college students. Third, college counselors and teaching managers can understand the learning ability and level of different students through data mining to carry out individualized guidance and education. Fourth, college students feedback on the task learning and self-learning of college educators. Individualized learning evaluation feedback based on artificial intelligence runs through the whole process of learners' learning [7]. Artificial intelligence through data mining and analysis, found where college students are good at and where they are weak, so as to focus on counseling and strengthening. The model is as follows:

5. Conclusion

This paper constructs a model of individualized education for college students driven by artificial intelligence and big data. It is mainly composed of two sub-models: the individualized learning model of college students and the individualized education model of college educators, which promote each other and act on the process of college students' education. On the one hand, the individualized model constructed by college students through artificial intelligence and big data accords with the law of higher education. It pays more attention to the exploration of students' autonomy and individuation, cultivates the exclusive learning model, satisfies the individualized demand, produces the endogenous motive force, and truly promotes the internalized learning. On the other hand, the construction of individualized education model of university educators is based on artificial intelligence and big data. It emphasizes the participation of students and carries out precise and differentiated strategies. Artificial intelligence and big data make the individualized education of college students more effective. They promotes the training of undergraduate talents more accurate and the training of higher education talents more meritocratic.

References

[1] Fan Yaqin, Wang Zhihui. Path Design of Artificial Intelligence Promoting Personalized Learning [J]. Journal of Tianjin Academy of Educational Science, 2020 (1): 36-41.
[2] Gong Lejin. Teachers’ Professional Ethics [M]. 1999, Beijing: Capital Normal University Press.
[3] He Rongjue, Wang Shulin. Research on Personalized Learning Strategies Based on Artificial Intelligence [J]. Journal of Curriculum and Instruction, 2018 (11): 8-10+20.

[4] Jaspers, K. What is Education (Zou Jin, Trans.) [M]. Beijing: SDX Joint Publishing Company.

[5] Wang Lihua. A Practical Exploration and Future Prospect of Personalized Learning Model—The Basis of Learning Guidance: Recommending Personalized Learning Model (Part II) [J]. Class Adviser (Secondary Edition), 2016 (16): 54-57.

[6] Wu Po. Personalized Education for Graduate Students Driven by Artificial Intelligence and Big Data [J]. Teaching of Forestry Region, 2019 (7): 18-20.

[7] Zhou Jin. Action Factors of Individualized Education in World-class Universities and Its Insights [J]. 2017 (5): 96-101+124.