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A Study on Personalization Education Model of Intelligent Planning Learning Path

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Abstract: ***Personalization education is the goal that education circle always pursues. It implements personalization cultivation according to specific situations of students, so that students can maximize their potential. Under the traditional offline lecture-based education mode, large amount of the teaching tasks are completed by the teaching auxiliary staff, and it is difficult to popularize the personalization education due to the high marginal cost. With the extensive application of information technology in the field of education, more and more links in the teaching process are completed by the information platform, which greatly reduces the marginal cost of the education, makes personalization education form scale and the educational resources more balanced.***

Keywords: Personalization Education, Marginal Cost, Internet + Artificial Intelligence

1. Development Situation of Personalization Education

Personalization education, simply known as "teaching students in accordance with their aptitude", has been the goal that educators at home and abroad always pursue, and aims to maximize the students' potential. Personalization education is defined as follows at the first council meeting of International Personalization Education Association (IPEA): customize and enforce educational objectives, educational plans, educational training methods and counseling plans for educatees, organize relevant professionals to provide educatees with learning management strategies and knowledge management techniques and integrate effective educational resources, and help educatees to realize self growth, self realization and self transcendence. [1] The scholar Lin Zhanzhan believes that personalization education is such that educators make real-time feedback on the real-time status of each student's different knowledge level, emotion and motivation. [2] To sum up, any personalization education includes at least one cycle consisting of two basic processes: knowing about the students and providing targeted feedback.

In the traditional offline education mode, it needs to allocate the hardware resources, e.g. teaching places, etc. according to the scale of students, and maintain a relatively stable teacher-student ratio, so it is difficult to significantly reduce the marginal cost. The implementation of personalization education in this mode will inevitably lead to high education costs, which cannot be implemented on a large scale. The development of information technology has promoted the innovation of the education industry, and the cost of knowledge production, particular knowledge communication, has greatly reduced the marginal cost of the education and made the popularization of personalization education possible.

2. A Study on Personalization Education Model of Intelligent Planning Learning Path

2.1 Development of Personalization Education Driven by "Internet+"

At the two sessions in 2015, Ma Huateng, board chairman of Tencent, proposed to accelerate the promotion of "Internet+". In this proposal, he explained "Internet+" as "connecting Internet with various industries, including traditional industries by the use of Internet platform and information and communication technology to create a new ecology in new fields". [3] Li Yanhong, chairman of Baidu, believes that "Internet+" is a mode combining Internet and other traditional industries. [4] With the formulation of "Internet+"action plan first proposed by Premier Li Keqiang in the 2015 government work report, "Internet+", as a national strategy, has become an important means to upgrade traditional industries and enhance core competitiveness. [5] For the education sector, more and more links in the teaching process are completed through information platforms, e.g. course knowledge learning, learning data collection, learning effect evaluation, learning path planning, learning progress control, etc. In recent years, breakthroughs have been made in artificial intelligence, and the symbolic event is Google AlphaGo defeating top human go players, which has made the intelligence degree of information processing far exceed that of human beings in some aspects. The application of artificial intelligence in personalization education can replace a lot of repetitive work of the teachers, and reduce the marginal cost of the education, so that the education is more in line with the actual situation of students and is more personalized.

2.2 Personalization Education Model Framework of Intelligent Planning Learning Path

From the current development trend, the information platform will be deeply applied to the personalization education in terms of course knowledge learning, teaching behavior monitoring, student data collection, learning effect

evaluation, learning path planning, learning progress control, etc. Common personalization education model framework of intelligent planning learning path is shown in Fig. 1. It should be noted that students' data collection activities run through the whole process of learning, including course knowledge learning, learning effect evaluation, learning path and progress planning.

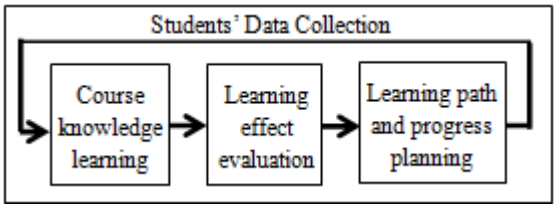

Figure 1: Personalization Education Model Framework of Intelligent Planning Learning Path

Typical operation flow of personalization education model framework of intelligent planning learning path.

1) The course knowledge network is designed by experts, including the segmentation of course knowledge points and the design of knowledge network.
2) Course experts record video courses according to the knowledge network.
3) The personalization education platform generates the personalized course learning path and progress planning according to the collected student data.
4) Students learn course knowledge.
5) Learning effect is evaluated.
6) The personalized course learning path and progress planning are re-generated according to the latest student learning data.
7) Steps 4-7 are repeated.

3. Personalization Education Innovation of Intelligent Planning Learning Path

3.1 Marginal Cost Reduction of Education

The main costs of traditional offline education include venue rents, teachers' salaries, marketing costs, operating costs, etc. Personalization education platform of intelligent planning learning path will use the information platform to complete course knowledge learning, student data collection, learning effect evaluation, learning path planning and learning progress control, etc., which will greatly reduce the amount of such work for teachers; teacher's video courses are "recorded once and used repeatedly"; no fixed teaching place is needed in the teaching process; these factors will greatly reduce the marginal cost of education.

3.2 Knowledge Granularity Miniaturization, Knowledge Organization Networking

Knowledge granularity miniaturization means that students learn less knowledge in a single continuous study, which lasts for a short time, generally not more than 15 minutes. There are two reasons. On one hand, personalization education platform of intelligent planning learning path generally adopts video course learning. Research shows that when students learn knowledge through videos, their attention span does not exceed 15 minutes. On the other hand, the knowledge points of the course should be miniaturized to evaluate the learning effect of students timely and accurately, so that students can, every ten minutes, learn a small knowledge point, and then make timely assessment and adjust the learning path and progress in a timely manner to achieve better learning effect.

Knowledge organization networking means that various knowledge points constitute the knowledge network according to the dependency relationship to set the personalized knowledge learning path for students based on the knowledge network through learning data collection and learning effect evaluation, and thus improve the targeted learning.

3.3 Intellectualization of Learning Path and Learning Progress Planning

In the traditional offline teaching mode, students' learning progress and path keep pace with teachers, and students in the same class are all the same. Due to the different speed of knowledge acquisition, different students are inefficient in learning according to the same learning progress. As the lack of knowledge points varies from student to student, the same knowledge learning path has poor pertinence, which brings students a large number of inefficient and repeated learning tasks. The introduction of artificial intelligence into learning effect evaluation and the generation of personalized learning path and progress based on the collected learning data can greatly improve the pertinence and efficiency of learning.

3.4 Specialization of Teachers' Occupational Division of Labour

Under the personalization education model of intelligent planning learning path, a lot of work in the teaching process are completed by the information platform, and teachers' work contents will be more professional. Logically, teachers' work is divided into three parts: course knowledge network design; course knowledge teaching; course content offline tutoring: discussion, Q&A, etc. As the work results of knowledge network design and teaching can be copied by the information platform at "zero cost", the number of these two types of jobs will be greatly reduced, and only a few "high-quality" teachers at the top of the pyramid are engaged in this work. A large number of teachers will be engaged in teaching and tutoring work, which helps make educational resources more balanced, and reduce Matthew effect in the education industry correspondingly.

4. Conclusion

To sum up, the rise of personalization education of intelligent planning learning path will greatly reduce the marginal cost of the education and popularize the personalization education. Students' personalized learning needs have been greatly met, and the teaching mode has

shifted from offline teaching to online-offline mixed teaching. The work contents of teachers will be more professional, and a small number of teachers will focus on course development and teaching, and more teachers will be engaged in teaching and tutoring work. For personalization education model of intelligent planning learning path, there are still some problems to be solved, e.g. teaching atmosphere and community-based learning, which are not well implemented through the network. This remains to be further studied and resolved.

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