From the Industry 4.0 to Intelligent Personalized Education Model

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Abstract. German Industry 4.0 and Chinese Manufacturing 2025 are all through the large data and the information system to make information about supply, manufacture and sale more data and wisdom, and to achieve rapid, effective and personalized product supply. This paper puts forward on the network information, intelligence and personalization model of the future education and on the function and route of the guidance system. In this paper, we also make recommendations for the reform and development of modern education, and propose our views on the efficient, scientific education and hope to lead to more discussion.

Introduction

"Industry 4.0" [1] is the concept of the German Federal Ministry of Education and the Federal Ministry of Economics and Technology at the Hanover Industrial Fair in 2013, based on the Internet, Internet of things and service network integration of information physical integration system CPS, using the network entity system as a technical support, making the supply, manufacture, sales information more data and wisdom, and then, to achieve fast, effective and personalized product supply. The project was funded by the German Federal Ministry of Education and the Federal Ministry of Economics and Technology, with the help of German Academy of Engineering, Fraunhofer Association, Siemens and other German academia and industry, has risen to be a national strategy. At present, the German federal government has invested 200 million Euros. According to the German government, estimating by 2025, "Industry 4.0" will bring € 78 billion in economic benefits to Germany, also bringing about 1.7% of economic growth each year. Industry 4.0 solves the problems of mass production of manpower, material resources, resources and other waste. In March 2015, Li Keqiang proposed "China Made 2025" grand plan at the first time in the Two Sessions "Government Work Report". "China Made 2025" clearly concludes nine tasks and five major projects, while equipped with eight support policies and safeguards to ensure that the tasks and projects smoothly implement. "Industry 4.0" connotation reminds of modern education reform, but also urgently needs to solve the problem of mass education.

Figure 1. The Relationship of Individual Requirements and Large Data.
1. The Problems of Modern Education Training Mode

From the Spring and Autumn Period, Confucius set up a private school and all classes of authors propagate their theories, until the Han Dynasty set up the Imperial College. The ancient private school lays a foundation for the formation of Chinese modern education pattern. With the implementation of universal education in the world, the scope of the object of education has been extended to all the people, regardless of race, sex, religion, nationality and class. Students in the school are the subjects and representatives of the education. From the beginning of the pre-school education to compulsory education for nine years, until finishing the higher education, teachers are batch, cycle operation, while because of the number and workload of teachers personalized education is too hard to achieve. This kind of mode is faced with the problem of manpower waste and material resources waste [2].

1.1 In Teaching Process, Teachers Make Students rigidly Uniform

Due to differences in interest, students’ learning ability and the demand for knowledge, the bulk of the teaching mode cannot be across the board in accordance with their aptitude, forced to accept the same teaching plan, the lack of personalized features. Some students do not have enough to learn, but some students can not totally understand. It will deny the students' talent and creativity and make students have no talent to show themselves finally.

1.2 The Waste of Time in the Teaching Process

As a result of the differences of intelligence and family education, most people go to schools from their childhood to adulthood, even up to 20 years. A considerable part of the students don’t need so much time. Although most schools have jumping system, students actually jumping are very few. A large number of surveys show that college students have a lot of free time, but they usually spend it on chatting and housing in the dormitory. This way of study will reduce students’ learning enthusiasm over time and teachers are also suffering.

2. Thinking about the Future Education Mode

Analogy to industry 4.0, Chinese education should also enter the big data, network and intelligent era, which we also called China Education 2025 [3]. In this mode, the needs of people can change to knowledge need. Human development goals are made up of a series of knowledge and skills, so entering your goals, the intelligent guidance system, which is similar to the car navigation system, will give you a unique learning program. The program includes courses you need to study and experiments to complete. In addition, system provides optimized courses and learning methods, such as teaching materials and reference books, teaching videos, E-edu education and diversified educational methods. For skills and experiments learning, system also provides experimental questions and contents. If you deviate from the guidance system, it will remind you to return back. And if you continue to deviate, system will give you a new learning program, just like the car navigation system. After a period of study and testing, system can give the result of everyone about promotion or studying continually. Meanwhile, it can recommend the next stage of the learning program. All in all, each learning program is specialized and personalized and study time is controlled by the individual.
In this modern time, China Education 2025 is really valuable. First of all, people's learning habits are turning to the network. Mobile phones, as a kind of knowledge reader, have been accepted by most people, which can meet peoples' individual needs and there is the big network data behind the mobile phones. Usually, students cannot afford their spirit listening to teachers in classroom. In the modern time, compared to the traditional learning methods, personalized methods are more and more popular with students and teachers.

Educated people receive education from their primary school, secondary school and university, the traditional teaching form is no longer in the line of "custom scale production" trend [4]. The education industry is facing new challenges, not only emphasizes the gradual changes in the form of teaching, should pay more attention to the individualized education of the educated, and ultimately achieve the wisdom education, several new requirements have been put forward about the education training model:

2.1 Promote Digital, Intelligent, Multimedia Teaching Model to Improve the Boring Form of Teaching According to Books.

Traditional teaching takes books as a medium. From the pre-school education to the higher education, each educator has hundreds even thousands of textbooks. But simple words and pictures in the textbooks are difficult to accurately describe a phenomenon, a process, a scene, or a whole thing. And sometimes, the description of the book with a personal understanding bias and language bias, the readers also have different understanding of the text, heavy textbooks cannot effectively disseminate knowledge. Under the industrial 4.0, digital teaching materials and network teaching mode have caused more and more attention. Textbooks will be changed from paper books to digital e-books that a book of 350 pages only takes 1.1M computer memory. Moreover, the gradual formation of the cloud network teaching methods can easily solve the problem of fixed time and teaching environment. People can choose their free time to have a convenient learning for anytime and anywhere. This view has been elaborated specifically in the e-books and educational revolution papers.

2.2 Establish a Diversified Teaching Classroom, Improve the Diversification Evaluation Mechanism.

With the popularity of the Internet, large data has brought education reform. The traditional teaching mode is teachers and students face to face, while under the industrial 4.0, large data for the education industry building a new platform about online learning. In order to solve the problem that each individual has different understanding of the teaching content in the same form and students have the desynchronized learning ability, the traditional teaching form is gradually from large classes to the network self-learning, such as cloud classroom, mobile phone, distance learning, and online learning. Open learning platform is more able to achieve the full use of resources and makes the personal learning efficiency maximize.
To improve the diversity of evaluation mechanism should make the study ability as a guide and focus on learning performance. Based on the traditional form of test papers, the concept of performance network evaluation has been put forward. The establishment of a set of network evaluation system can achieve the goal about testing learning results of every student and should belong to the formal performance evaluation model. Finally, we can form the new evaluation mechanism combined with social identification, enterprise evaluation, college accreditation, examination papers and network evaluation.

2.3 The Change of "Teacher Teaching" to "Private Learning".

Industry 4.0 leads the factory production line to the customization of personalized production. However, the traditional education makes teachers' teaching content and work plan as center, which is similar to the wholesale production of 3.0 in form. Under the individual demands of customized production, the teaching methods need to be reformed from "teacher teaching" to "private learning". Education object is independent people. In the future, we should strive to achieve personalized education and professional training goals.

2.4 Grasping the Direction of Intelligent Manufacturing and Developing a Personalized Education Model.

The development of personalized education system is conformed with the needs of the development of industry 4.0. Through the study of the behavior patterns and learning characteristics of different sex educators in different countries and different stages of the world, by the page views of the large data records, combined with the individual personality differences, analyzing peoples' character and individual learning ability, as well as their learning reactions of different content in different education model, a set of personalized education model can be established. And then, we can use the new learning method of the combination of books and electronic products, develop the best course of study, realize the wisdom education and make greater contributions for economic and social development.

References


