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An Exploratory Study on the Matching of Learning Style and Teaching Mode of College Students under the Trend of Personalized Learning[1]

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Abstract: At present, artificial intelligence, learning analysis, machine learning and other information technologies are transforming education in an all-round way. The deep integration of information technology and education has given birth to a large number of new things, such as Micro-Teaching Assistant APP, Rain Classroom APP, Blue Ink Cloud Class APP, Super Star Learning APP, smart classroom and virtual reality. The "class system" and "batch system" teaching mode, which emerged in industrial society and lasted for nearly 400 years, have been challenged unprecedeningly. Starting from the general trend of individualized learning, this paper discusses the conflict between the mass teaching mode of "class system" and individualized learning, as well as the dilemma of matching learning style and teaching mode, and puts forward four coping strategies based on this, so as to provide reference for the policy making of education administration department and contribute to the development of education and teaching.
Keywords: Personality; Learning Style; Teaching Mode

1. Research background and current situation

1.1 Research background

For quite a long time in the future, teaching will be a mixture of "online" and "offline". Online teaching mode is rich and diverse: audio, video, lecture, documentary, classroom recording, coherent, fragmented, and time varying; offline teaching mode is also rich: traditional teaching method, discussion method, experiential teaching, Flipped Classroom, PAD CLASS, and various teaching technologies (Micro-Teaching Assistant APP, Rain Classroom APP, Blue Ink Cloud Class APP, Super Star Learning APP), etc. Things like this are too numerous to mention. However, a student's learning style can not adapt to all the above teaching modes. There is a problem of preference, selection, matching and effect optimization, that is the matching problem between students' learning style and teachers' teaching mode. In order to adapt to personalized learning, there will be many new problems in the whole teaching ecology, such as: the cultivation of learners' personality traits, the compilation of learning style scale, cross department learning system, cross class learning system, online credit recognition, teaching management, university operation mode, etc. Therefore, the research in this area is necessary and urgent.

1.2 Review of research status

Personalized learning is a new learning form after the deep integration of information technology and education. With the development of artificial intelligence technology, its impact on society is increasing. Artificial intelligence, like the power of industrial society, penetrates into all fields of society, and education is no exception. With the advent of "artificial intelligence +" era, on the basis of integrating education big data, learning analysis, machine learning and other advanced technologies, "artificial intelligence + education" can provide personalized learning services for learners and support their independent development, which solves the century problem of insufficient education in personality cultivation[1] (MOU Zhijia, 2017). At present, "the generation after 00s" is about to become the main body of university campus. They have new psychological characteristics, new behavior patterns, independent personality and diverse styles.These "Digital Natives" or "Net Generation " new learners have a strong sense of dependence and intimacy on the network, like interactive learning, timely feedback, task orientation, and tend to

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carry out group activities and pay attention to learning experience[2] (Sona 2018). Horizon Report 2013 (Higher Education Edition) emphasizes that personalized learning should be one of the key development trends in the future learning society[3]. Horizon Report 2018 (Higher Education Edition) points out that it will take 2-3 years to improve artificial intelligence and adaptive learning technology to promote personalized learning. Horizon Report 2019 (Higher Education Edition) emphasizes that redesigning learning space is the key trend to drive the application of technology in higher education field, that is, under the support of information technology, information technology is integrated into classroom teaching through changing or upgrading teaching methods, and a personalized, intelligent, digital and integrated classroom teaching environment is constructed, so as to effectively create training a new classroom for students' intellectual ability[4] (Wang Yajun, he Xiaoping, 2019). Based on this situation, the guiding ideology of education informatization in The thirteenth Five-Year Plan clearly puts forward that the construction of a learning society with unlimited time, place and object will be taken as the directional goal of the whole country's education development in the future[5].At the same time, the outline of the national medium and long term education reform and development plan (2010–2020) puts forward that "we should pay attention to teaching students according to their aptitude, pay attention to the different characteristics and individual differences of learners, and develop the advantage and potential of each learner"[6].

Learning style was developed by American scholar Herbert Thelen. It was first put forward in 1954. It is a common way that learners unconsciously use to learn and process information. It is a kind of inborn preference shown in the process of learning. It is the inherent personality characteristics of learners, and in different learning process to maintain relatively stable, with integrity, consistency and persistence. The study of learning style theory began in the 1950s. The representative figures include Kolb[7], Professor of organizational behavior and Dunn & Dunn[8], etc. Gregorc Style Delineator[9], The Learning Style Inventory(1976)and Experiential Learning style(1984)were used to measure learning style. The focus of Western learning style research is to explore and demonstrate the various factors of learning style by scientific experiments, formulate corresponding teaching strategies according to different learning styles, and discuss whether it is helpful to improve students' performance. Although learning style is an important concept that scholars pay close attention to, there is no consensus on it. Grigerenko and Sternberg (1995) believe that the study of style in psychology can be divided into three schools: "personality centered approach", "cognitive centered approach" and "activity centered approach"[10]. Lu Genshu (2003) pointed out that learning style not only includes the consistent processing and management strategies of students' habitual processing information, but also includes students' learning views and learning orientation. Learning style is composed of learning concept, learning orientation, cognitive processing strategy and management strategy, In a certain period of time, it is a relatively stable complex[11]. Green & Oxford (1995)[12] and Luo Zhongmin (2005) [13] distinguished the differences between learning styles and learning strategies. Domestic scholars have carried out empirical research on teaching mode and learning style, and the results show that the matching of teachers' teaching mode and students' learning style helps to improve learning performance (Liu Yougui 2007[14], Lu Genshu 2010[15], Zhou Wenjun 2015[16], Yang Xue 2016[17], Sona 2018[2]).

From the above, we can see that the prominent contradiction in the current teaching is the contradiction between students' personalized needs for learning methods and learning contents and the reality of the simplification of school teaching mode. Under the trend of personalized learning, the study of learning style has been paid more and more attention. However, at present, the compilation of learning style scale is less and out of repair, which is out of touch with the learning situation in the data age. At the same time, the research on the matching of learning style and teaching mode has not been paid enough attention.

2. The dilemma

2.1 The conflict between the batch teaching mode of "class system" and personalized learning

"Class system" is a method of "batch" training talents in the industrial era, which is characterized by uniformity and neglect of individuality; nowadays, education in the data age is more tailored to meet the personalized learning needs. With the in-depth development of big data, learning analysis, computing science and other technologies, personalized learning has ushered in a realizable opportunity at the technical and practical level. Learners can learn what they need at any time, which is in line with the personality characteristics of contemporary college students' pursuit of flexibility and autonomy. And "artificial intelligence + education" further provides personalized learning service mode for learners, including content push, learning process management, learning effect feedback, etc., so as to realize teaching according to learning and precise teaching. Therefore, it is worth studying the conflict between the batch teaching mode of "class system" and personalized learning, and how the "class system" evolves to meet the needs of personalized learning in the future.

2.2 The matching of learning style and teaching mode

Learning style and teaching mode correspond to two aspects of teaching process: learning and teaching. In the context of personalized learning, the relationship between the two becomes more complicated. This problem is not prominent in the teaching mode dominated by class system and teaching method. It is due to the limitation of technology that individual differences can not be fully considered, which objectively leads to the neglect and obliteration of different students' learning styles. This hinders the development of personality and difference, affects the learning effect, and violates the educational idea of teaching students according to their aptitude. It is the development and perfection of educational theory to explore the matching of learning style and teaching mode of College Students under the trend of individualized learning. At the same time, it has a direct guiding role in the teaching reform of class system, course selection system, credit system, assessment system, teaching management, operation mode of colleges and universities.

3. Coping strategies

3.1 Reviews the teaching and learning under the trend of personalized learning

In a long period of time, personalized learning will not completely replace "batch" learning, but as a supplement to varying degrees, so there are problems of convergence and integration between the two. A series of problems need to be clarified, such as how to integrate, the form of integration, and what changes it brings about. Therefore, it is necessary to comprehensively sort out the impact of artificial intelligence and information technology on personalized learning, and predict the possible scenarios of personalized learning in the future, so as to clarify the development process and future trend of personalized learning from a macro perspective.

3.2 Developing a scale of learning style for Contemporary College Students

In order to solve the matching problem between students' learning style and teachers' teaching mode, it is necessary to have a set of scientific tools for evaluating learning style—College Students' learning style scale. Dunn (1998) once said in an interview: "it is difficult for teachers to determine students' learning styles without tools. Only reliable and effective measurement tools can provide accurate information, and only comprehensive measurement tools can diagnose many learning style characteristics of students and ultimately affect students." The quality of learning style measurement tool is an important factor affecting the study of learning style, and it is also one of the important contents of learning style research. According to preliminary statistics, there are more than 70 measuring tools for learning styles. However, these tools are out of repair for a long time, and they are out of touch with today's information-based teaching environment. Therefore, it is necessary to analyze the learning habits, learning characteristics and learning behaviors of contemporary college students, and develop a practical learning style scale based on it, and test its reliability and validity. Different styles can be distinguished: field independence and field dependence, contemplation and impulse, holistic strategy and serial strategy, convergence and divergence, introversion and extroversion, partial hearing, partial vision, partial operation, etc. At the same time, it is necessary to analyze the current teaching models with various names to explore the matching relationship between the two, so as to maximize the learning effect.

The establishment of the scale is a very complex and systematic work, which involves many procedures, including: making a test plan, editing test items, sampling and selection of subjects, prediction and item analysis, standardization of test, appraisal test (reliability, validity, norm), etc. However, this work is urgently needed for the current education and teaching, so we must fully realize its difficulty, importance and urgency, and give full play to the team wisdom and multidisciplinary advantages to overcome.

3.3 Cultivating students' personality traits to adapt to individualized learning

Personalized learning has a great impact on both learners and teaching ecology. Good learners in personalized learning need to have self-discipline, self-control, self-management, goal management, learning perseverance, learning progress control, self-learning knowledge construction and so on. Not all students' mental characteristics and personality traits adapt to personalized learning, that is to say, personalized learning should first grasp and analyze students' mind and personality, and make corresponding screening and training, which is very lack of research. Secondly, personality is relatively stable, and the cultivation of personality traits is difficult. How to cultivate the personality traits to adapt to personalized learning and what are the feasible ways? This is a new problem given by the era of personalized learning.

3.4 Construction of teaching ecological environment for individualized learning

From the perspective of learning style and teaching mode, this paper explores the future teaching ecology from the perspective of supply and demand matching. Personalized learning is not only limited to the matching of learning style and teaching mode, but also the remodeling of the whole education ecology. For example, in the level of education system, students are allowed to choose cross department and interdisciplinary courses; the elective courses and credit recognition among different universities; the evolution of class system; the recognition and conversion of online credits; the conversion and recognition of extracurricular practice, community, entrepreneurship and other credits; the credit recognition of international exchange students. In a word, personalized learning is based on technology and the transformation of teaching philosophy, which makes education return to the original state of freedom, flexibility and humanity, and meets the needs of learners with a more open and inclusive attitude. Therefore, individualized study is bound to have an impact on the traditional teaching ecology and create a new teaching ecological environment.

4. Conclusion

The deep integration of information technology and education makes personalized learning usher in a realizable opportunity at the technical and practical levels, which solves the century problem of insufficient education in personality cultivation, and also puts forward new challenges for learning and teaching. In accordance with the general trend of personalized learning, our research group takes the learning style from the perspective of psychology and the teaching mode from the perspective of pedagogy as the breakthrough point, discusses the difficulties faced by the traditional teaching mode under the impact of personalized learning wave, and puts forward four coping strategies, and will do more specific and detailed research on the coping strategies in the future.

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