

Exploration and Practice of Data Literacy Talent Model based on DT Era

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Abstract

With the rapid development and wide application of cloud computing, big data, Internet of Things, artificial intelligence, global information technology has entered an era of pan-intelligence; and data-driven, pan-intelligence has become the basis of transformation and upgrading of all walks of life, promoting the IT technology application-oriented talents to DT technology thinking-oriented talents to upgrade, emerging technology is not only it has brought about changes in the way of life and production, as well as changes in the way of learning, which will inevitably promote the reform and innovation of teaching mode. Therefore, under the background of DT era, how to cultivate data literacy talents will be the historical mission of university education facing a new round of knowledge system model reform and innovation. Firstly, this paper introduces the demand for future talents in DT era, and analyzes the crisis faced by traditional application talents training. Then, according to the basic characteristics of the DT era, the data literacy talent model is constructed: the thinking literacy and professional literacy are proposed, and the data literacy talent training model is constructed. Finally, the practice of data literacy talents training model through the upgrade of talent training scheme, the reform of teaching mode and the innovation of management system shows that this model effectively improves students' interest in learning and achieves good teaching effect, which provides certain reference and practice value for the cultivation of quality talents in Universities.

Keywords

DT Era; Data Literacy; Teaching Mode.

1. Introduction

In recent years, with the rapid development of internet of things, cloud computing and artificial intelligence, big data has become the focus of attention of academia, industry and government departments all over the world. Especially as an educational sector, how to cultivate students with data integration, the original discrete data integration into a regular, valuable data literacy training is not only the inevitable trend of the DT era, but also the educational personnel training reform and innovation turning point. The basic principles of today's educational development concept are to stress student-centered, output-oriented and continuous improvement[1]. In order to achieve this basic principle, we must reform and innovate the teaching model and design a data literacy talent model suitable for the development concept of DT era. Therefore, under the background of DT era, how to cultivate data literacy talents will be the historical mission of university education facing a new round of knowledge system model reform and innovation.

2. Transformation of Personnel Training Mode

Ma Yun pointed out that the IT era is dominated by self-control and self-management, while the DT era is dominated by technology that serves the public and stimulates productivity. As early

as the rise of the internet, IT technology will be orderly data combination and transmission to readers, so as to truly reflect the value of technology.

DT is a data integration technology, the original discrete data integration into a regular, valuable. We can imagine that the future of competition will no longer be divided into regional competitions according to energy ownership, such as electricity, but the ability to compete for talent and innovative value, is how much value your data can create for society. Promote the company and enterprise's demand for talents, is not just application, that is, one skill and many talents, but two skill and many talents, that is, professional knowledge and data thinking. Only the accomplished talents who combine professional knowledge with data thinking are the new scientific and technological talents needed in the DT era[2].

Knowing the technology, understanding the value of data and algorithm will be the core competency of the new generation of talents. With the rise of entrepreneurship and shared economy, the new generation of start-ups and enterprises need a large number of scientific and technological personnel, depending on cloud computing as an infrastructure and big data as a new paradigm for new energy. Thus it can be seen that the traditional mode of cultivating applied talents with self-control and self-management must be transformed into the mode of serving the masses and stimulating productive forces to better meet the needs of enterprises and the development trend of society.

3. Data Literacy Talents Mode based on DT Era

Global information technology has entered a new accelerated explosion period, in the near future: the birth of service-capable robots will replace human knowledge workers; robots will greatly overtake industrial workers; smartphones will be replaced by virtual reality and augmented reality. "Understanding cloud computing, data thinking, understanding of intelligence," will be the future of every working technician and professional necessary qualities. Colleges and universities are the cradle of training technicians and professionals. How to cultivate the ability to obtain data, analyze data, process data and display data is the mission of DT era.

3.1. Basic Characteristics of Big Data

So far, there is no strict definition of large data, McKinsey's definition is: can not within a certain period of time with traditional database software tools for its content to capture, manage and process the data set[3]. Compared with traditional data, large data not only grows fast, diversity and complexity are constantly changing, but also has the characteristics of large volume, fast speed, large volume, large volume and high value. So how to take the basic characteristics of big data, data thinking and professional quality as the training model will be a new challenge to build the training model.

3.2. The Raising of Thinking Quality

Thinking accomplishment refers to the general thinking mode through observation, analysis and processing ability in the process of data information. Improving the ability of thinking literacy is the key link to cultivate students' core literacy. Only with good thinking ability can students improve their ability to observe and participate in society, enhance their ability to distinguish right from wrong, develop their ability to think and use knowledge, and better appreciate the fun and subtle ability of knowledge[4]. "Core accomplishment" refers to the students'ability to solve problems by means of school education, which is the necessary character and key ability for students to meet the needs of lifelong development and social development. Cultivating students' thinking quality is the core of core literacy[5]. The ability to autonomously learn and solve problems can be enhanced through a mental schema. Thus forcing us to explore a new way of thinking and dealing with problems.

The construction of disciplines and specialties related to large data is still very weak. Although we are in the era of large data, the construction of large data disciplines and specialties is just on the way[6]. Through the basic characteristics of large data, we can easily find that the era of large data brings people not only a kind of information resources, but also a new way of thinking, literacy model, thinking literacy changes will bring subversive changes in industry and technology[7].

Thinking accomplishment is the goal of cultivating qualified personnel. It should have the interdisciplinary thinking mode of statistics, journalism, finance, sociology, computer science data science and big data analysis technology, hacker's mind, data curiosity, commercial enthusiasm, influence and creativity. Ability to solve problems. The core purpose of data thinking is to predict the law of the development of things, on the basis of massive data, through machine learning related to various technologies and mathematical modeling to predict the possibility of things happening and timely take appropriate measures to achieve efficient and efficient work efficiency.

3.3. Professionalism Put Forward

The cultivation of literacy talents requires not only innovative thinking literacy but also professional quality. The "professionalism" discussed here refers to basic and professional competence, apart from emotional and attitudinal areas [5]. Basic abilities include: Mathematical Basis, Programming Basis, System Basis and Professional Abilities include: Data Management, Data Processing, data analysis. Therefore, it is the foundation of professional accomplishment training to grasp the teaching goal, teaching degree, teaching process and teaching effect accurately[8]. Without the professional knowledge of basic disciplines, we can not grasp the professional knowledge of disciplines, and then we can not grasp and use the domain knowledge. To this end, we must cultivate qualified personnel in the DT era, the quality of thinking is the foundation, and professionalism is the prerequisite.

In the process of teaching, combining the differences between students and teaching itself, we can regulate teaching and learning by guiding educational behavior and mode through the idea. If the idea is solid and the mode is to be practiced, we must cultivate the ability of subject professional accomplishment. That is to say, the improvement of professionalism is of great significance in the education work under the background of DT era.

3.4. Outline of Data Literacy Training

Because big data is promoting the reform and innovation of educational undertakings with a huge information force, it is necessary to cultivate students'ability to discover, analyze and solve problems so that they can apply knowledge to practice, cultivate students' comprehensive ability in various fields, and construct the reform and innovation of the mode of data-thinking talents in the DT era. It is an inevitable trend in the current DT era. Considering the characteristics of DT era and the needs of enterprises for talents as the goal, this paper puts forward the overall thinking, knowledge point norms, teaching objectives, teaching methods, teaching means, teaching contents, teaching methods, assessment methods and teaching evaluation of the course of data thinking for computer specialty. Constructing "data thinking type talent mode based on DT era".

Taking the training of data-thinking talents in the DT era as the direct objective and students and teachers as the active objective, this paper analyzes and sorts out the comprehensive and strong training methods which involve a wide range of knowledge, technology, application, practice and operation in the DT era, and analyzes the differences between students and teachers. The difference of teaching environment and curriculum system is the starting point to design the overall framework of the professional training model (as shown in Figure 1 below).

The focus of this model is how to monitor and guide students, how to let students choose, experience and explore the application of learning courses according to the talent model designed by teachers; and how to design teachers to close to students' real life practice, social practice, scientific practice of the curriculum theme, the lesson Course content, case comes from reality, and return to society's heuristic teaching mode.

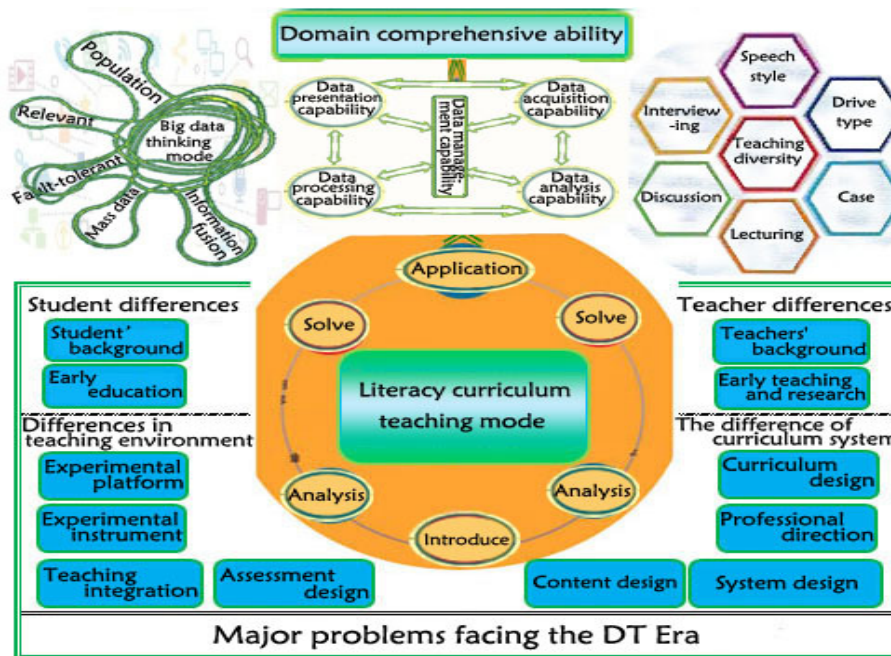


Fig 1. Block diagram

This model is mainly in the DT era of environmental form, for multi-disciplinary, interdisciplinary training mode of data thinking personnel reform and innovation. To cultivate students' ability to discover, analyze and solve problems, and finally to apply what they have learned to their thinking and professional qualities in social practice.

3.5. Taking University Education as a Case, Implementing Data Literacy Mode

Combining with the analysis of the demand for quality-oriented talents in DT era and the cultivation of comprehensive competence in the field, the reform and innovation of talent cultivation plan, teaching mode and management system are carried out in view of the shortage of quality-oriented talents in Colleges and universities.

3.5.1. Upgrading of Talent Training Programs

Talent cultivation plan is the fundamental and guiding document for the implementation of talent cultivation in Colleges and universities, the overall design and implementation blueprint of talent cultivation work, and the basic basis for arranging teaching content, organizing teaching activities, evaluating teaching effect and ensuring teaching quality. To further optimize the personnel training program, improve the quality of personnel training, promote the reform and innovation of personnel training mode in private colleges and Universities. In order to meet the DT era of data literacy talent training model, therefore, in the personnel training program settings: first, to strengthen the comprehensive quality of students and general education. As we all know, theoretical science, experimental science and computational science are the three pillars to promote the progress of human civilization and the development of science and technology. The training of theoretical thinking, experimental thinking and computational thinking ability is particularly important for the training of data literacy talents in the TD era. So we must change to have solid computer science, statistics and mathematics foundation.

Secondly, it is necessary to strengthen the training of professional courses, master the basic theories and methods of knowledge science, information science and computer science, and possess the abilities of system analysis, distributed modeling, large data mining, information processing and distributed application software development, so as to possess the comprehensive abilities in the field of data analysis and number analysis. Cross disciplinary talents based on management, system development and business intelligence applications. At the same time, the project education mode of CDIO (conceive, design, implement Implement, operate Operate) will be implemented [8] and the practice teaching mode of IASA (Introduce, analyze, answer Solve, apply Application) will be combined to provide thinking mode and training goal for training data literacy talents.

3.5.2. Reform of Teaching Mode

Under the background of DT era, how to use advanced educational methods and means to continuously improve the teaching level of higher education is a problem that every educator should think deeply. Aiming at the upgrading goal of data literacy talents training mode in DT era, we should systematically train students' ability to discover, analyze, solve and apply problems. We should not only train students to have the ability of thinking, but also to have the ability of professional quality, and strive to further improve the quality of teaching, to achieve the goal of the unity of learning and thinking, knowledge and practice [9]. To this end, a heuristic teaching model is proposed, that is, "from life (quotation) - to extract knowledge (analysis) - problem solving and optimization (solution) - applied to life (use)" as the main line, to guide students how to find problems in life, put forward problems; understand different solutions to the same problem ideas and methods; experience and Team atmosphere in which students work together to solve problems; learn to express basic methods and ideas for solving problems, and then enhance the overall ability. Every student should experience the process of "asking questions - analyzing problems - solving problems - applying problems" so as to feel the value of learning and experience the joy of success.

First, the basic principles of teaching mode reform.

The basic principles of the reform of teaching mode are as follows: taking the teacher as the leading factor and the student as the main body as the coordinating principle, being good at stimulating the students' curiosity and interest in learning, actively guiding the students' pioneering thinking activities, letting the students acquire knowledge actively, and Gradually have the ability to independently ask questions, analyze problems, solve problems and apply problems.

Second, the basic method of teaching mode reform.

The basic method of the reform of teaching mode is to inspire by quotation, that is, to use vivid, interesting life examples to introduce knowledge and key points in teaching, which not only enriches the teaching means and enlivens the classroom atmosphere, but also reveals the profound and subtle connotation of mathematical knowledge by a simple analogy.

Third, the key to the reform of teaching mode.

The key to the reform of the teaching mode is to introduce, analyze, solve and use the quotation, which refers to the introduction of a certain phenomenon and some shortcomings of a certain problem. Analysis refers to the elaboration and analysis of the problems introduced on the basis of knowledge points. Solution is to get a conclusion through the analysis of the problem, and to design, compare and optimize it. Usage refers to the practical work based on the application of the optimized design scheme and the prospect of its future application. In addition, in order to further test the students' learning situation, and designed a practical experience module for the experimental preview, practical training module of the actual combat, to achieve personal experience, immersive process.

Fourth, teaching mode reform, teaching strategy standardization.

The standardization of teaching strategies is intended to improve teachers' guiding role and stimulate students' enthusiasm. The teacher publishes the teaching content and experimental requirements in the form of micro-lessons, questions and assignments one day before the class, through the information platform, so that the students can preview and complete the corresponding preview tasks before class or experiment. The teacher's standardized teaching context is shown in Figure 2.

Introduce analytical solutions and applications to problems by means of heuristic teaching mode: introduction, illustration, analysis and guidance. Coordination, evaluation and other methods and means of process monitoring; and this lesson summary and answer questions and homework, as well as the next class assignment, homework preview and so on.

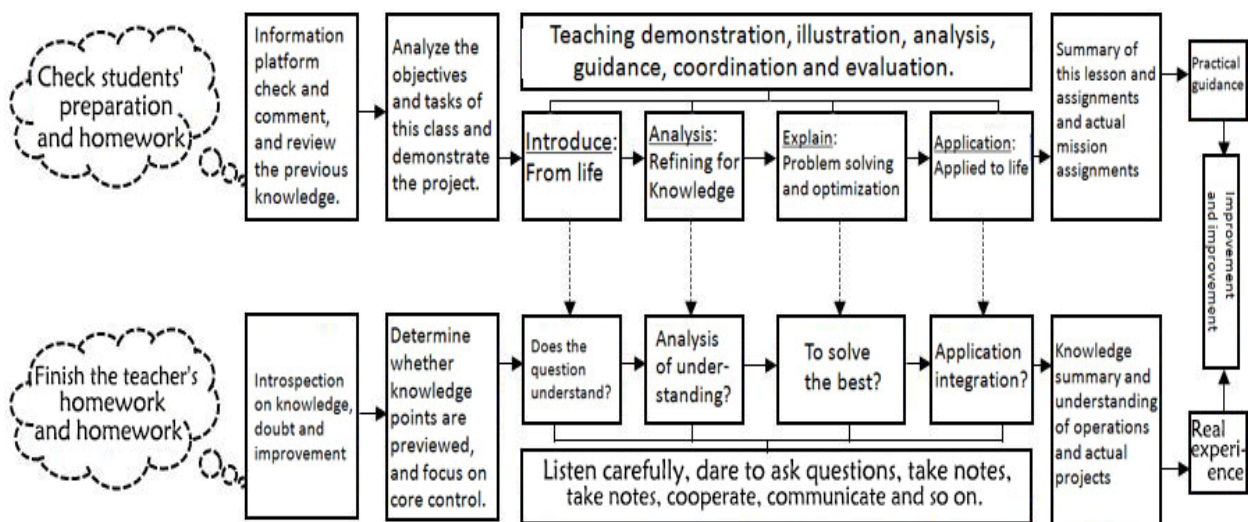


Fig 2. Teaching context

Fifth, teaching mode reform and standardization of learning methods.

The standardization of learning style aims at giving full play to students' subjective initiative and cultivating their ability of independent learning. Students' learning style should adopt the mode of cooperation and discussion [5]. Under the guidance and guidance of the teacher, to think, put forward problems, analyze problems, solve problems, application problems.

3.5.3. Innovation of Management System

To develop healthily, steadily and sustainably, schools need not only necessary hardware, but also perfect regulations and strict management measures. Because the training of data literacy talents is based on statistics, mathematics, computer as the three major supporting disciplines; Biology, medicine, environmental science, economics, sociology, management science as the application of development disciplines. Therefore, how to ensure that students can achieve good results in the study of related courses, in the system construction, innovation, implementation of a comprehensive upgrading of school management level is essential.

First, carry out the system of respecting teachers and teaching and developing academic evaluation system.

To develop schools and turn education upside down, we must first standardize students' ideological and educational behavior, establish the image of teachers, and strengthen respect for teachers. At the same time, we must respect the teachers and respect them so as to achieve good results.

To carry out the reform of students' academic evaluation system, we should focus on solving the shortcomings of the previous academic evaluation methods, such as one-sidedness,

simplification of content, simplification of subject and emphasis on Evaluation results. At the same time, we should adopt the three-level management mechanism of departments, colleges and schools to monitor and control the reform in an all-round way, so as to ensure the effectiveness of the reform.

Second, implement the semester mode and implement the full credit system reform.

Implementing the semester vacation system in the semester mode is beneficial to deepening the reform of the curriculum system in the DT era, promoting the balanced allocation of high-quality educational resources, perfecting the open school-running mechanism, improving the students' autonomous learning ability and promoting the organic combination of teaching and scientific research.

In the training of data literacy talents, a complete credit system and a semester vacation system should be implemented to enable students to flexibly arrange their study time and credit allocation. Implementing a complete credit system is more conducive to promoting the allocation of teaching resources, mobilizing the enthusiasm of teachers for scientific research and improving the overall quality of students in many ways.

Third, implement the management of teachers and enhance their professional capabilities.

Improve the professional ability of teachers, pay close attention to teaching management: formulate a series of rules and regulations on teaching management, and the Department of Education is responsible for inspection and evaluation. Teachers should consciously devote themselves to the task of "catching up with and surpassing others by comparing their studies" by carrying out the activities of "evaluating the best and giving priority to others" in teaching, grasping typical examples and setting benchmarks[10].

Pay attention to the professional development of teachers, improve the professional quality of teachers: the focus of school work is on teaching, the quality of teaching in teachers. Strengthen school-based training, carry out various skills evaluation, send out, please come in activities, lead teachers to carry out education and scientific research, organize open class teaching seminars and so on are effective ways to improve the professional level of teachers. With a diligent study, a love of research and a good summary of teaching staff, why do we worry about the quality of teaching? [11]

4. Concluding Remarks

Under the new normal of "Internet + education" in the DT era, it is a long way to go to cultivate talents with comprehensive abilities in many fields. Colleges and universities should adhere to the combination of thinking accomplishment and professional quality to enhance students' ability of data acquisition, analysis, processing and exhibition, and further improve problems such as finding problems, analyzing problems, solving problems, and applying questions. The ability of thinking and practice. In order to train qualified personnel with multi-field abilities, such as scientists, engineers and analysts, actively promote the reform of education and teaching, scientifically and rationally design personnel training programs, and strive to realize the "change from subject-oriented to goal-oriented, from teacher-centered to student-centered, from quality supervision" in the process of personnel training. Continuous improvement and transformation. It provides reference, reference and practical value for promoting the cultivation of data literacy talents in Colleges and universities.

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