Construction of “All-faculty, Whole-process, All-around” Educational Objective System in Colleges and Universities Based on the research of Big Data

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Abstract. The core competency of big data is an essential objective of China's education reform. The selection and cultivation of core competency should comply with the characteristics of the universities and college students. Based on the cultivation of moral people, the training of professional talents should be focused. Under the premise of social cultivation, the all-round development of individuals should be valued to cultivate high-quality skilled talents with “both ability, integrity, and all-round development”. The whole process coverage refers to the cycle of practical education, and all faculty engagement is the target subject. The all-round linkage is taken as the carrier of practical education to implement the “base, engineering, standardization and diversification” of the working mechanism for practical education, explore the innovation path for the effective integration of socialist core values and vocational education, and improve the comprehensive quality of college students in an all-around manner. This paper studies and analyzes the construction of the three-round goal system through big data.

Keywords: Big Data, Core Competency, Colleges and Universities, Practical Education, Construction

1. Introduction

Xi Jinping clearly states at the National Conference on Ideological and political work in Colleges and Universities: “We should persist in taking the moral education as the central link, and integrate the ideological and political work throughout the whole process of education and teaching, to achieve full education and all-round education, and strive to create a new prospect for the development of higher education in China.”[1] In higher vocational education, high-quality technical talents are cultivated for the front line of production, construction, service, and management, emphasizes the practicality, openness, and professionalism of the teaching process, and emphasizes practical education on the basis of teaching, management, and service. In recent years, according to the requirements of ideological and political work and the characteristics of education in colleges and universities, Zhejiang International Maritime Vocational and technical college has constructed a “whole process, all staff, all-round” practical education system, and a “base, project, standardization, diversification” practical education mechanism, and actively explored the social practice mode of Ideological and political education in Colleges and Universities Based on the core competency of big data. The long-term mechanism, which has achieved good teaching effect, has important theoretical and practical significance.

2. Cultivation Means of Big Data Core Competency in College Students

The core competency of big data is a key factor in deepening quality education and promote teaching reform. As an imported word, core competency is defined in EU education as a set of knowledge, skills, and attitudes required for their self-development, blending into the society, and work competency, which complies with
the training objectives of higher education. According to China's national conditions and the reality of Chinese students, the Ministry of Education entrusted Beijing Normal University and domestic university experts and scholars to complete the research report of “core competency of Chinese students' development” in three years, which points out that the core competency is about cultivating “all-round talents” as the core, focusing on the cultivation and development of cultural heritage, scientific spirit, learning, healthy life, responsibility, and practical innovation Great accomplishment. The talent training objectives of college students have the characteristics of higher education and vocational education. According to the development of core competency in Chinese students, colleges and universities should focus on the cultivation of moral, professional, social and all-round personal big data core competency.

Some outputs of regional analysis of college students are cyclical. They can be divided into several parts according to the data sequence, provided that the histogram shape of each part is almost the same. However, some outputs of the training data are aperiodic. The first step is to separate data based on the shape of the histogram. In the process, the required output of training data is first sorted from the minimum value to the maximum value, as shown in Figure 1. Then, training samples are allocated to each part one by one along the data sequence.

After the training data are separated, we get several parts of the training data t. Matrix T consists of input and output parts as follows:

$$T = \begin{bmatrix} X & y \end{bmatrix}_{l \times N}$$ (1)

Where x is the eigenvector $x_i = \{x_{i,1}, x_{i,2}, \cdots, x_{i,l}\}$ composed $l \times N - 1$ Dimension input characteristic matrix, i.e

$$X = [x_1 \ x_2 \ \cdots \ x_{N-1}]_{l \times N-1}$$ (2)

Y is the desired output vector and l is the length of the input data. Therefore, the training data set has a structure

$$T = [x_1 \ x_2 \ \cdots \ x_{N-1}]_{l \times N}$$ (3)

We divide the desired output vector y by using linear quantization to the Q level, and Y follows the sequence of data in X. Therefore, matrix t becomes

$$T = \begin{bmatrix} x_{1,1} & x_{1,2} & \cdots & x_{1,N-1} & y_1 \\ x_{2,1} & x_{2,2} & \cdots & x_{2,N-1} & y_2 \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ x_{q-1,1} & x_{q-1,2} & \cdots & x_{q-1,N-1} & y_{q-1} \\ x_{q,1} & x_{q,2} & \cdots & x_{q,N-1} & y_q \end{bmatrix}_{l \times N} \begin{bmatrix} z_1 \\ z_2 \\ \vdots \\ z_{q-1} \\ z_q \end{bmatrix}$$ (4)

Figure 1. original training data (a) and sorted training data (b)

3. Establishment of an “All-faculty, Whole-process, All-around” Objective System for the
Cultivation of Big Data Core Competency in College Students

The objective system of "three aspects of practical education" in Colleges and universities aims to cultivate high-quality skilled talents with "both ability, integrity, and all-round development", the whole process coverage as the cycle of practical education, the participation of all staff as the main body of practical education, and the all-round linkage as the carrier of practical education, to implement the "base, engineering, standardization and diversification" of practical education mechanism, and explore the core of socialism. The innovative path of the effective integration of mental value education and vocational education can comprehensively improve the comprehensive quality of college students.

Firstly, the level and positioning of teaching objectives in the curriculum objective system should be defined (as shown in Figure 2). Based on the logic from abstract to concrete, the objective curriculum system in China includes three levels. At the highest level, it directly reflects the educational purpose of the national education policy, “it is for all Chinese people, and cannot be used to design courses directly. Hence, it is also necessary to determine the core competency for all students” 69. The further integration of core competency into curriculum teaching needs to be specified in specific learning stages and disciplines to form the middle layer of curriculum objectives - discipline core competency, which is the overall objective of discipline teaching, needs to act on the teaching process, and ultimately into the learning results of students, resulting in the “teaching objective layer”. The teaching objective is the teacher’s expectation of the teaching result, which refers to the achievement of the students after a period of study. Based on different teaching times, teaching objectives can be divided into the semester, unit, and class objectives. As the lowest level of curriculum objective, the teaching objective is the most specific and has outstanding operability. The starting point and destination of teaching activities are defined, which play a direct role in guiding and regulating teaching activities.

![Figure 2. Hierarchy of course objectives](image)

4. Construction of an Objective System in Three Aspects of Practical Education for College Students Based on Experience Summary and Innovation Path

According to the core competency system for the development of college students, the practical education model can be operated and implemented. The practical education model must closely focus on the development of the core competency of college students. The characteristics of core competency, such as comprehensiveness, portability, and development, especially the elements of a large number of tacit knowledge and attitude, require that the construction of a practical education model must emphasize operability and not cover all competency, which is neither realistic nor necessary. We should grasp the key and high-level qualities that are in line with the characteristics of college students, and cultivate the “necessary” character and “key” ability that college students need for their life-long personal development and social development through practical education programs.

The core competency of big data lies in the cultivation of individual competency to adapt to the current and future social development and change. Beside campus practice, it is also necessary to build a relatively stable, diverse, and solid practice base that is connected with the cultivation of professional capabilities of students and meet the needs of their career development. Secondly, strengthen the cooperation between universities and social practice bases. Colleges and universities should pay attention to the collaboration with practice units in line with the purpose of co-construction and win-win cooperation. It is necessary to build a
social practice base with professional characteristics based on the features of the industry, fully leverage the professional advantages of students to address the problems for the base units, identify and solve problems in practice activities, adjust and improve their knowledge structure, stimulate and cultivate their innovation ability. According to the characteristics of the students and the base, we should strengthen the top-level design based on demand to form a clear, practical project, clarify the responsibilities and obligations of both parties in the construction of the social practice base, and implement cooperation and co-construction. It is necessary to pool various resources of the society, give full play to the advantages of the base, define the development orientation of the base, and realize the healthy and sustainable development of the base. Firstly, colleges and universities should cooperate with well-known enterprises and institutions in different levels and stages according to the characteristics of the combination of theory and practice, features and market, to provide a learning practice platform for students with entrepreneurship as their career planning. Secondly, it is necessary to deepen students' understanding of social conditions and world conditions and establish their scientific, social values and sense of identity by organizing students to conduct such activities as on-the-job training, interview, and social research in the location of colleges and universities. Thirdly, we should explore and establish a long-term mechanism for volunteer service in practice, strengthen students' awareness of voluntary service, improve their voluntary service level, clarify the cooperative relationship between volunteers and society, and ensure the source of funds, so that the students and the society can benefit from each other, thereby promoting the brand of volunteer service actively, creating new volunteer projects. In this way, the students can learn and use what they have learned provide volunteer service in the process, cultivate and improve personal core competency.

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