

## On the Teaching Path of Ideology in Colleges and Universities Based on Culture of Students' Professional Quality

Lifen Zhang, Wenjie Zhang, Wenbin Ma, Shuoshuo Yan, Lina Wang

North China University Of Science And Technology, Tangshan, Hebei, 063000, China

**Abstract:** *In recent years, the research of data mining has developed very rapidly, the information construction of education management system has also developed well, and all kinds of education management systems have accumulated rich data. However, the application of data mining in education management system is still in the exploratory stage. During the teaching process, it can be found that some students' ideology and professional quality are not very satisfactory. Colleges and universities transport skilled talents for various market enterprises, and their professional quality and values are very important. Ideology can be integrated with professional quality training, so as to improve students' comprehensive qualities. Clustering algorithm is used to realize the relevant experience of ideological education for college counselors, which has certain reference significance for the management of ideology in colleges and universities. Therefore, studying the application of data mining technology in education management system has important theoretical significance and practical application value.*

**Keywords:** *Professional quality, Ideology, High school student*

### I . Introduction

With the diversification of the modern economic society's needs for higher technical application talents, higher vocational education has responded to this change in a timely manner, positioning "technical application talents" as the goal of colleges and universities, and advocating "skills-based" As the core training model [1]. Vocational education based values undoubtedly aim at cultivating students' vocational ability, emphasizing the cultivation of vocational ability. The goal of ideology is to pursue people's free and all-round development, and ideology should highlight "career". Many scholars have done a lot of research on the combination of vocational guidance and moral education [2]. In 2019, the State Council issued the "National Vocational Education Reform Implementation Plan", which strictly regulated and required the ideological theory education courses in colleges and universities. It pointed out that all kinds of professional courses should be combined with ideological courses, and the teaching and study practice of vocational courses should be guided by ideological and political theory, so as to ensure the cultivation of comprehensive vocational skills talents [3]. Teachers in colleges and universities integrate ideology, professional values and other educational content in the teaching of professional courses, strengthen their career planning and guidance, and can effectively solve the employment and entrepreneurship problems faced by students [4].

Students' personal professional quality plays a very important role in their future employment and career selection. Many enterprises will observe whether students have good quality in this aspect, and then consider whether to hire this student [5]. When students are studying, they must accept ideology. Under the background of new educational reform, all colleges and universities have integrated ideology into the teaching process, and integrated professional quality with ideology, in order to seek broader development prospects for students [6]. Ideology in Colleges and Universities education is a very important part of the education management database, an important standard for evaluating the quality of ideology education management, and an important sign for evaluating whether ideology education managers are effective in managing students' education [7]. With the deepening of the reform of education management system, especially after the student ideology counselor management system has become the mainstream, the evaluation method of ideology education manager management quality has developed from a single meeting and discussion and manual evaluation in the past to the form of work assessment quantitative form widely used today [8]. In view of the above problems, this paper introduces cluster analysis into the application of

ideology in colleges and universities education, and applies data mining technology to automatically analyze and mine a large number of evaluation data, so as to find out useful information, which can effectively overcome the defects and deficiencies of traditional analysis methods.

## **II . The Relationship between the Training of Professional Quality and the Effectiveness of Ideology Education**

### ***A. The Connotation of Professional Quality***

The comprehensive quality that people form under the influence of the acquired environment can be called literacy. Therefore, Professional quality can be understood as the comprehensive quality that people form under the influence of the acquired environment and are reflected in the corresponding professional activities, which generally include professional skills, Four aspects of professional awareness, professional ethics and professional behavior habits [9]. According to the “quality iceberg” theory, professional quality can be divided into easy to measure explicit quality and difficult to measure invisible quality. Professional skills mainly belong to the category of explicit quality, while professional consciousness, professional ethics and professional behavior habits mainly belong to the category of invisible quality [10].

Professional quality has three major characteristics: first, it has molding and stability. Professional quality itself is the result of the acquired environment shaping from scratch. Once it is formed, it becomes a relatively stable and unique quality of individuals, which is difficult to change. Second, it is universal and special. Professional quality needs to adapt to the needs of industries and positions. Therefore, the Professional quality required by different industries and positions generally differs significantly. At the same time, different industries and positions have some common and most basic professional quality requirements. Therefore, Professional quality has certain requirements. universality. Third, it is precipitating and contemporary. Professional quality is slowly accumulated and precipitated with career development. It has a strong traditional meaning, but it must adapt to the latest requirements of the times and must have distinctive characteristics of the times [11].

Since 2014, in order to meet the needs of further economic and social transformation and development, the CPC Central Committee and the State Council have made important decisions to guide some ordinary undergraduate colleges to transform into application-oriented, taking this as an important focus of structural adjustment of higher education, and raising the training of application-oriented talents to the national strategic level [12]. Cultivating application-oriented talents requires direct connection between college education and corporate work, so that students have good professional skills, behavioral norms, and character traits that are suitable for future jobs before graduation. Therefore, how to cultivate the professional quality of students to become applied colleges and universities teaching and educating people Important and even core topics [13]. However, at present, the cultivation of professional quality of students in many application-oriented universities mainly focuses on the cultivation of professional skills through professional courses, ignores the cultivation of hidden qualities such as professional consciousness, professional ethics and professional behavior habits, and completely separates the cultivation of professional quality from ideology education, Ignoring the inherent integration of professional quality education and ideology education.

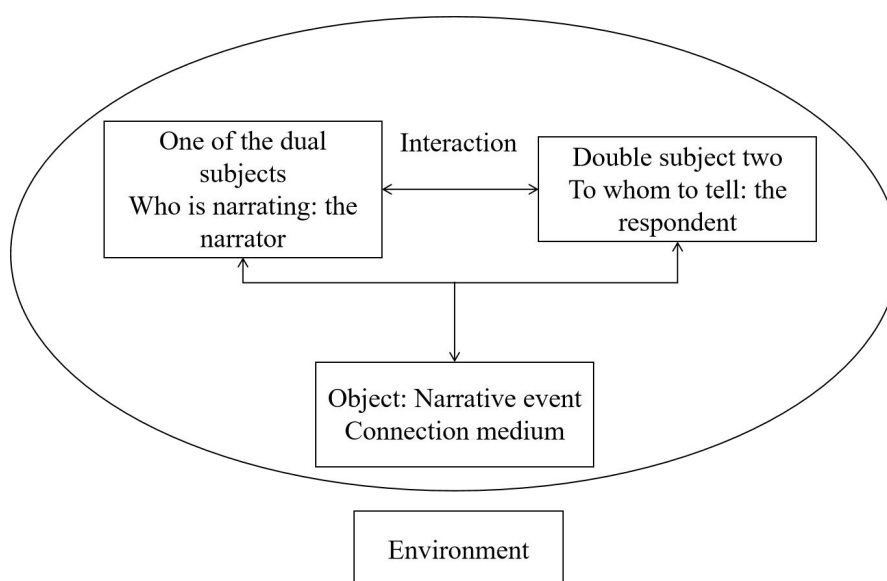
### ***B. The Relationship between the Training of Professional Quality and the Effectiveness of Ideology Education***

Pay attention to the importance of ideological and moral education in the cultivation of students' professional quality, emphasize the importance of professional quality to students' personal development, rely on professional development and students' personal development needs, strengthen ideological and moral education, and change students' employment concept [14]. Combining students' personal development expectations with their own career visions and ideals of society can not only change the neglected status of ideological and political work in colleges and universities, but also enhance the acceptability of ideology and improve the effectiveness of ideology work. The two complement each other, cooperate with each other and interact, and jointly guide students to form a correct and scientific outlook on life, world outlook and values [15].

The content of professional quality is very rich, among which the most basic is the ideological and moral quality. The students trained by colleges and universities are transported to various social jobs. Whether they are honest and down-to-earth in their work directly reflects the professional quality of a student and the professional quality of employees in the whole industry, and it is also a portrayal of the development of the ideological education of the student's school. There are various ways of ideology education. However, due to the particularity of its own existence, especially the emphasis on the cultivation of professional quality, colleges and universities inevitably require that ideology education should be closely integrated with it and widely infiltrated in the cultivation of professional quality, so as to further improve the effectiveness of ideology education. Therefore, strengthening the cultivation of students' professional quality has become an essential and important way to improve the effectiveness of ideology education.

Professional quality covers a wide range of content, involving all aspects of students' professional and personal development. To ensure that each aspect can play its due role, the development of ideology work is an important guarantee. In the specific education and teaching work, different levels of professional quality, such as professional ethics, professional knowledge, professional belief and innovation, and spirit of cooperation, can be incorporated into ideology work in a purposeful and planned manner. The ideology course is used as a platform to pass Relevant courses penetrate the professional spirit and will quality that professional talents should possess, build a new position for cultivating students' professional quality, help students establish a correct professional outlook, and improve their professional quality and ideology level.

Like ideology education, ideology in Colleges and universities education narrative has its constituent elements. As one of the subjects, the narrator tells the subject the story of educational events through "presence" to enlighten the educational object and achieve the purpose of sublimating the ideological realm. In this definition, it fully embodies the three elements of educational narrative of ideology in colleges and universities: subject, object and environment, as shown in Figure 1. These three elements are not independent models, but interact with each other, which makes the narrative of ideology in colleges and universities become a whole with flesh and blood.



*Fig.1 The Three Elements of the Narrative of Ideology in Colleges and Universities*

In terms of thinking wisdom, narrative is not only about telling stories. In the process of telling stories, educators are also the process of showing how they think. The story, the reasons, the solutions, etc., all reflect thinking. The process, which also affects the thinking ability of the educated to discover, view, and solve problems. In terms of psychological wisdom, educational narration focuses on the psychological and emotional interaction and communication between the two sides of education. Educators help the educated improve their psychological tolerance and psychological adjustment ability in the face of problems according to their psychological problems,

guide them to think calmly and solve problems, and cultivate good psychological quality and the function of adapting to the environment. As shown in Figure 2.

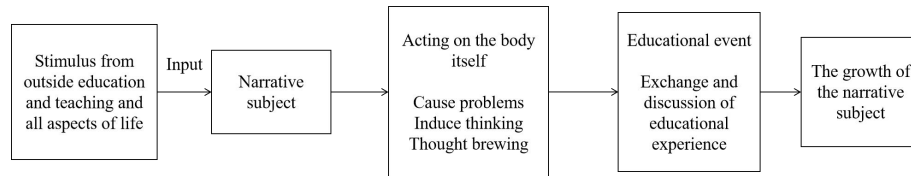


Fig.2 The Growth Path of the Narrative Subject

### III. Teaching of Ideology in Colleges and Universities Based on Cultivation of Students' Professional Quality

#### A. Cluster Analysis

Clustering analysis is a process of dividing data sets of imaginary or physical data objects into groups, the purpose of which is to make similar data objects form data sets. These data object groups produced by the clustering process are called clusters, which are a set of data objects. Objects in the same cluster have a high degree of similarity to each other, but objects in different clusters are different from each other. After clustering analysis, the researcher can determine the dense and sparse range, and thus find out the overall architecture framework and meaningful correlations between various attributes.

Let the clustering problem deal with  $N$  data objects, which represent various types, such as people, cars, goods, materials, etc. Generally, the data types in cluster analysis are mainly the following two types.

1). the data matrix selects  $p$  variables for all  $n$  objects to describe, for example, “commodity” objects are described by attributes such as price, format, use period, purpose and quality. These data types are measured by interval scale, and then they are expressed as relational tables, i.e.  $n \times p$  matrix:

$$\begin{pmatrix} x_{11} & x_{12} & \cdots & x_{1p} \\ x_{21} & x_{22} & \cdots & x_{2p} \\ \vdots & \vdots & \vdots & \vdots \\ x_{n1} & x_{n2} & \cdots & x_{np} \end{pmatrix} \quad (1)$$

2). Dissimilarity Matrix the Dissimilarity Matrix is Used to Place the Similarity between Two of  $n$  Objects, and Its Specific Expression Can Be Described as an  $n \times n$  Matrix:

$$\begin{pmatrix} 0 & & & & \\ d(2,1) & 0 & & & \\ d(3,1) & d(3,2) & 0 & & \\ \vdots & \vdots & \vdots & \ddots & \\ d(n,1) & d(n,2) & \cdots & \cdots & 0 \end{pmatrix} \quad (2)$$

Among them,  $d(i,j)$  is the specific quantitative form of the dissimilarity between two objects  $i$  and  $j$ . Generally, it is a value greater than or equal to zero. When the two objects  $i$  and  $j$  are extremely similar, then  $d(i,j)$  approaches 0. Conversely, when the two objects  $i$  and  $j$  are extremely different, the value of  $d(i,j)$  tends to be extremely large, and  $d(i,j)=d(j,i)$  can be obtained, and at the same time,  $d(i,i)=0$ .

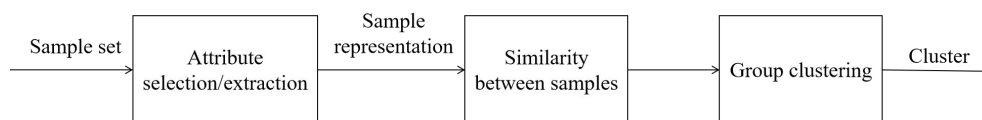
At present, many clustering analyses are based on dissimilarity matrix, but in some cases, the formation of data is described by data matrix, so the data matrix should be converted into dissimilarity matrix before using clustering algorithm. Next, we will further discuss the measurement method of dissimilarity  $d(i,j)$ :

The degree of dissimilarity (or similarity) between objects described by interval scale variables is usually measured by the distance between each group of objects. The most classic method of calculating distance is Euclidean distance. Researchers generalize its definition for:

$$d(i, j) = \sqrt{|x_{i1} - x_{j1}|^2 + |x_{i2} - x_{j2}|^2 + \cdots + |x_{in} - x_{jn}|^2} \quad (3)$$

In which  $i = (x_{i1}, x_{i2}, \cdots, x_{in})$  and  $j = (x_{j1}, x_{j2}, \cdots, x_{jn})$  are n-dimensional data objects.

Based on the similarity between samples, the data objects in the result set after clustering are very similar to each other. The similarity of data objects in different result sets is very small. Finally, the cluster analysis returns the sample clusters obtained by different clustering algorithms. The cluster analysis process is shown in Figure 3.



*Fig.3 The Process of Cluster Analysis*

By adopting the process of preprocessing data sample information, the data samples used in the analysis process are listed as shown in Table 1.

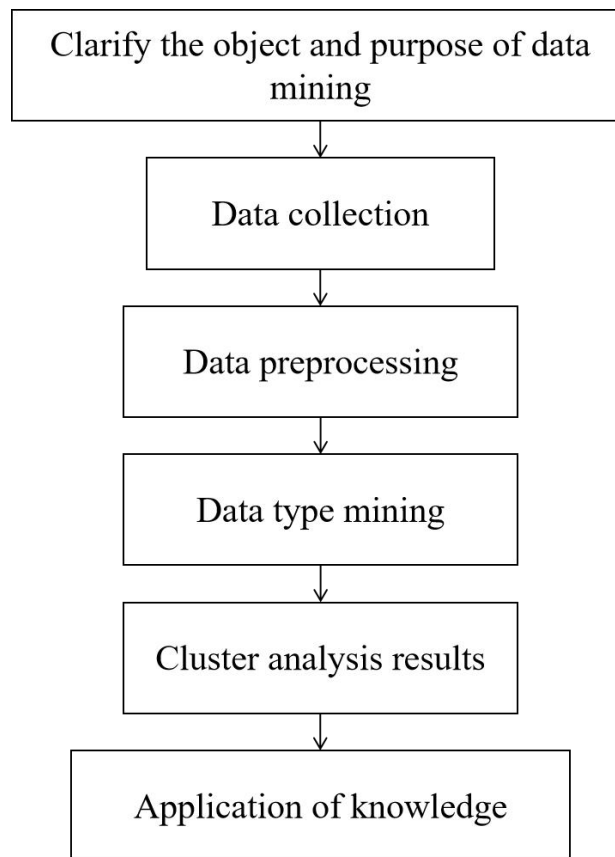
*Table 1 Data Sample For Clustering*

Management attitude	Management ability	Management method	Management efficiency
0.76	0.7	0.67	0.69
0.76	0.7	0.67	0.69
0.46	0.46	0.42	0.44
0.87	0.87	0.79	0.86
0.9	0.9	0.92	0.94

### 3) Cultivation of Students' Professional Quality 的 Ideology in Colleges and Universities

With the continuous development and popularization of higher education, more and more high school graduates enter the gate of the University, which has a lot of impact on the teaching and management of the University. In addition, with the enrollment expansion of colleges and universities, the performance requirements for students entering the school are also reduced, the homework foundation is relatively lack, and they are relatively lack in learning ideas, learning methods, self-discipline and other abilities. Many students do not have a good learning habit, which has brought many problems to the teaching of teachers. Because the study habits are not well developed, it brings great difficulties to the creation of the learning atmosphere. After the poor learning atmosphere is produced, it also has a great impact on the students' learning interest and motivation, which is often a difficult problem in the education and management of counselors in colleges and universities. In the past, most of

the data about the work effectiveness of counselors used the method of searching for a large amount of information. The data mining method of cluster analysis is proposed to process the data information of the counselor's work effectiveness, which can transform a large number of data into clustering results, and then make better use of this type of data. The data mining process is shown in Figure 4.



*Fig.4 Clustering Data Mining Process*

The cultivation of students' professional quality and ideology education complement and interact with each other, which determines that the relationship between them can not be separated in the work of these two aspects, but should go forward together and operate in coordination in the education of students. First, carry out ideological education to improve students' sense of responsibility and dedication. Second, carry out honesty education to improve students' honesty and moral quality. Third, strengthen psychological counseling and cultivate students' professional psychological quality. Fourth, strengthen service awareness and cultivate students' dedication to their posts.

#### **IV. Conclusions**

In recent years, data mining technology has attracted more and more attention from experts and scholars in the fields of international artificial intelligence and databases. Cluster analysis is to group physical or abstract data objects into a collection of objects. Cluster analysis is a very important research field in the field of data mining. With the national policy's inclination to the development of vocational colleges and the acceleration of the expansion of colleges and universities, higher vocational colleges have experienced a stage of vigorous development. The quality of ideology education in colleges and universities and the teaching effect have received extensive attention from all walks of life. The opinions on Further Strengthening and improving college students' Ideology Education issued by the CPC Central Committee and the State Council puts the ideology education of colleges and universities at an important ideological level. Policies guide the school running direction, update the educational content and improve the teaching methods without delay. Strengthening the cultivation of students'

professional quality is an important method to enhance the effectiveness of ideological education, because students are independent in thought, active and motivated, and simple theoretical teaching can no longer be accepted by students. Based on the actual situation of students, starting with the improvement of their own quality, ideological education will achieve twice the result with half the effort. Under the new situation, students' political and ideological work is facing great challenges. Therefore, it is necessary to continuously adjust the way of ideological work at the right time and strengthen the exchange of advanced experience, which can effectively improve the effect of Ideology in Colleges and Universities. In this regard, this article uses data mining to try, through the analysis of clustering results, the information mined has a certain reference value and reference value for students' work.

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