Exploration and Practice of Ideological and Political Teaching in Professional Curriculum
Taking the Course of Data Analysis Using Python as an Example

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Abstract. Integrating the ideological and political teaching into all courses is an important direction of education reform in colleges and universities. This paper explores a specific implementation mode how to conduct the ideological and political education in every link and aspect by optimizing course content, designing teaching process, refining ideological and political elements. “A line, a ring” path is built to impart knowledge, promote ability and guide moral values of students throughout the whole process of teaching of Data Analysis Using Python. It is demonstrated that the teaching mode is feasible and effective by several teaching practice. The students have achieved comprehensive development by ideological and political teaching.

Keywords: ideological and political teaching · fostering virtue through education · teaching case · data analysis using python

1 Introduction

Comprehensively promoting the ideological and political theories of students is a fundamental task of fostering virtues through education, which was pointed out in the report of the 19th National Congress of the Communist Party of China. It is also an effective means of improving the quality of personnel training of students [2]. Especially, President Xi addressed those foster virtues of students should be regarded as the core work of developing students’ good qualities at the National Conference on Ideological and Political Work in Colleges and Universities [6]. In order to implement the instruments of “Guiding Outline of Ideological and Political Construction of College Curriculum”, issued by the Ministry of Education, and the “Implementation Plan of Ideological and Political Construction of College Curriculum”, issued by the Provincial Department of Education, we should permeate the ideological and political theories into the whole process and all corners of teaching in each professional course to guide students to establish a correct outlook on values, life and time [1]. So as, the professional courses and ideological-political courses play interdependent roles to impart knowledge and foster virtues for students simultaneously. However, in the past, the professional courses, focusing on the

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cultivation of intelligence and ability, and the ideological-political courses, focusing on moral education, can’t form join forces in developing a perfect student. Therefore, we support students should be actively guided to worry about the development of science and technology of China [4]. They should set up a life goal in the light of our country’s fate. This paper explores an executable way to implement virtue education in teaching of professional course in the Internet of Things Project.

2 Course Analysis

The technology of Internet of Things (IoT) refers to embedding all kinds of sensors into everything and realizing the conversation between people and things with the help of wireless network technology [7]. It integrates computer network, electronic technology, communication engineering, automation technology, embedded technology, etc. With the rapid development of big data and artificial intelligence, IoT technology has changed from simple node control to focusing on intelligent analysis and prediction. That is, massive data generated by IoT will be processed and analysed to form advanced intelligent applications, which is the core value of IoT. Therefore, the educational objectives of IoT major are cultivating high-end talents who can make analysis with big data in the future. In order to meet this demand, we offer the course Data Analysis Using Python, which aims to cultivate students’ ability to analyse and process the big data of IoT using Python. At the same time, the humanistic, legal, ethical and social issues should be discussed in classroom in addition to knowledge and skills. To inspire students’ emotion, touch their soul, stimulate their thinking, we should introduce persuasive story and utilize some unusual teaching strategies, tools and models to make the classroom lively. Consequently, the correct opinions about world, value and life are established unconsciously for students.

3 Designing the Ideological and Political Teaching

3.1 Overall Design Basing on Moral Education

A comprehensive course design includes formulating teaching syllabus, making teaching plan, arranging teaching content, implementing teaching process, conducting assessment and feedback, which composes a teaching line. We should implant the moral education in each link of above line, which can result in the synchronization of professional ability and moral cultivation. The illustration is shown in Fig. 1.

On the general requirements of ideological and political teaching, the professional quality and moral values education should be integrated into professional knowledge and ability in teaching process [5]. In the course of Data Analysis Using Python, we build an all-round ring, which indicates comprehensive quality requirements including mastering data analysis methods, developing data analysis and processing skills, cultivating responsibility, teamwork, adventurousness, cherish life, self-awareness, living habits, time management and so on. The illustration is shown in Fig. 2.
3.2 Integrate the Ideological and Political Theories into Course

After learning a course, students should achieve three objectives: professional knowledge and ability, professional quality, ideology and morality \([3]\). Specifically, the requirements of *Data Analysis Using Python* are as followings:

To understand the latest technology and frontier research;
To cultivate collaboration and innovation professional quality;
Table 1. The teaching projects and their objectives of ideological and political theories.

<table>
<thead>
<tr>
<th>Chapters</th>
<th>Teaching Projects</th>
<th>Teaching Content</th>
<th>The Objectives of Ideological and Political Teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Introduction to course</td>
<td>/</td>
<td>The status, objectives and content, teaching methods, assessment plans and prospects of course.</td>
<td>Cultivating students’ patriotism, national confidence and innovation consciousness. Enhancing their self-confidence and happiness.</td>
</tr>
<tr>
<td>2 Python fundamentals</td>
<td>/</td>
<td>Programming grammar, data type, operations, functions and modules</td>
<td>Cultivating students’ responsibility and mission to explore the unknown. Guiding them to stand on solid ground and pursue truth.</td>
</tr>
<tr>
<td>3 Data crawling</td>
<td>Crawling Top 250 movie Information</td>
<td>Regular expressions, RE module, URLlib module, Requests module and BeautifulSoup module</td>
<td>Teaching students to abide by the law, abide by professional ethics, and form a bottom-line thinking. Guiding them to establish the idea of persistence.</td>
</tr>
<tr>
<td>4 Data pre-processing</td>
<td>COVID-19 data analysis and mining</td>
<td>Data cleaning, data transformation, NumPy module and Pandas module</td>
<td>Cultivating students’ awareness of data and information protection. Introducing life education to cherish the life and be grateful. Developing good life style and health habits.</td>
</tr>
<tr>
<td>5 Data exploration</td>
<td>Job information analysis and processing</td>
<td>Statistical indicators analysis and correlation analysis, NumPy module and Pandas module</td>
<td>Guiding students to have a correct self-cognition. Encouraging them to build up the confidence of success and set lofty life goals.</td>
</tr>
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(continued)
To develop self-recognition, self-learning and a good sense of time;  
To cultivate credibility, integrity and responsibility.

So, we take project-driven teaching method to achieve the goals of course. That is, we permeate the idea of good morality into each project. Table 1 shows all projects and their goals achieved. Figure 3 shows an example of how to overlap the ideological and political theories on teaching content.

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</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Classification models</td>
<td>Iris data set analysis</td>
<td>Decision tree classifier, Bayesian classifier, KNN classifier, and Sklearn module</td>
</tr>
<tr>
<td>7</td>
<td>Regression analysis</td>
<td>Boston housing price analysis</td>
<td>Linear regression, logistic regression and Sklearn module</td>
</tr>
<tr>
<td>8</td>
<td>Clustering analysis</td>
<td>Airline customer relationship analysis</td>
<td>K-means clustering, DBSCAN clustering, Mean Shift clustering and Sklearn module</td>
</tr>
<tr>
<td>9</td>
<td>Data visualization</td>
<td>Achievement data analysis and visualization</td>
<td>Data visualization types, matplotlib module, seaborn module</td>
</tr>
</tbody>
</table>
Fig. 3. An example of teaching case, which shows how to integrate the ideological and political theories into teaching content.
Fig. 4. The illustration of score histogram for Data Analysis Using Python in the last three year.

Fig. 5. The illustration of relationship of course grade and learning attitude.

4 Teaching Results and Introspection

To verify the effectiveness of teaching, we analyse the course grade for last three years. The illustration of histogram is shown in Fig. 4. As we can see, the results basically follow the normal distribution and the average score is increasing year by year.

For further analysis, we also draw a scatter diagram about the relationship of course grade and learning attitude, which is shown in Fig. 5. It represents the impact of ideological and political teaching for academic record. From this figure, we can see that the course grade has a great relationship with ideological and political level.

In general, ideological and political teaching plays an important role in cultivating talents. However, the key of good ideological and political teaching is teacher, who should not only be a good imparter of knowledge, but also a good guide for students. Unfortunately, most professional teachers usually have high professional skill, but weak ideological and political knowledge. In order to strengthen educational function, it is necessary to improve the docking ability of professional teachers in ideological and political theories on teaching, which can be carried out from the followings:

- Constantly improving the understanding of ideological and political theories and patriotism in teaching, setting up a good role model for students, and gaining respects from students with their personal charisma.
- Greatly enhancing the ideological and political education skills through studying, communication and training.
• Exploring how to mine the moral elements from knowledge and how to look for entry points of technology and mind for “dual education” classroom.
• Focusing on the extracurricular activities, such as practical courses, innovation and entrepreneurship projects, competition, etc., in addition to classroom.

5 Conclusions

The ideological and political theories are required to be integrated into professional courses in New Engineering Disciplines. It is the main task of cultivating excellent talents. This paper focuses on the top-level design of course to impart morality education into professional knowledge. It explores implementable strategies to cultivate students’ positive outlook on life, values and morality and guide them to achieve desired career objective for our country.

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References

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