

Discussion on the Construction of Case Base of Environmental Impact Assessment Course Teaching

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Abstract. Case method teaching is a common teaching method, and the construction of teaching case base is its important foundation. Environmental impact assessment (EIA) is one of the important courses for the students majoring in environment engineering. Compiling excellent EIA cases is very important to cultivate innovative engineering and scientific talents. The main problems existing in the current case database was analyzed and specific methods and suggestions were put forward.

Keywords: Case Base; Case Method Teaching; Environmental Impact Assessment Course; Practicality.

1. Introduction

China's economic and social development is in the transition stage, which needs higher requirement for the cultivation of innovative engineering and technological talents. In February 2017, the Ministry of education has issued the notice on promoting research and practice projects of "new engineering". Under the background, college education needs pay more attention to cultivating students' practical ability and innovation ability, and comprehensively improve student' humanistic and scientific literacy [1].

The training goal of environment engineering major is to cultivate high-level environmental engineering technical talents with solid foundation, strong practical ability and innovation ability for environmental protection and relevant departments. However, the current environmental engineering education can't fully keep up with the requirement of current social development. Therefore, in the process of teaching, we should follow the main line of cultivating "innovative excellent engineering and scientific talents", and continuously reform teaching methods for teaching quality improvement, and finally realize the goal of cultivating practical innovative talents.

Solving realistic environmental problems usually requires excellent engineering practice ability. Therefore, it is particularly important to establish typical engineering cases to solve environmental problems, and integrate them into teaching process. Case method teaching method is an approach of teaching, which takes typical cases as teaching materials, presents and simulates realistic situations, closely combines theory with practice, emphasizes students' independent exploration, and guides students to solve practical problem. Emphasizing case method teaching is an important way to strengthen the cultivation of students' practical ability, and promote the integration of theory and practice [2]. Establishing teaching case base is the basis of case method teaching, which can improve the attraction of course teaching and the teaching level of teachers. In addition, in the process of case method teaching, communication and discussion among teachers and students can exercise and improve students' team spirit. Overall, it can effectively promote students' learning initiative, and exercise and improve students' abilities of thinking, analysis, expression and teamwork. Therefore, the construction of teaching case base and its integration with course teaching is one of the effective ways to cultivate high-quality engineering professionals with professional practice ability.

2. The Current Situation of Case Base Construction

Environmental impact assessment (EIA) is one of basic courses for the students majoring in environmental engineering. EIA is not only a prediction and evaluation technology for the environmental impact of construction projects, but also a legal policy in China. Environmental impact

assessment is closely related to practical construction project, which has strong applicability and practicality. Therefore, the realization of the training objectives of this course is inseparable from high-quality case materials derived from the real construction project. However, there are many problems, such as some cases outdated, disconnection between the content and actual situation. Those seriously affect the effectiveness of cases, improvement of teaching quality and the training quality of applied practical talents.

Compiling excellent teaching cases is the basic requirement of case method teaching. Through the construction of case resource database, it can not only establish a standard system for the development of cases to improve the quality level of teaching cases, also it can lay the foundation for the sharing of case resources through building an open application platform. Through the construction of teaching case database, it can improve the effectiveness of course teaching, strengthen the cultivation of practical application ability and innovation ability of students, and promote the reform of teaching contents and improve the teaching quality in professional fields. The current problems of EIA case base were described below, taking University of Jinan as example.

2.1 Simple Cases Lack of Inspiration and Innovation

Case method teaching is one of important teaching means of EIA course. However, due to the lack of accurate and in-depth understanding of the concept of case method teaching, the effect of case method teaching has not been fully shown. Case is not just an example. Case method teaching is not only a simple example teaching. It is important to rationally design the case teaching process, adopt appropriate teaching methods, design scientific problems to arouse students' inspiration, analyze and solve problems, and finally achieve the teaching goal of the case teaching.

2.2 Lack of Typical Case Originated from the Actual Practice

The materials sources of most of the case are not obtained through investigation and survey, which is not in line with the real situation of production and construction project. At present, some cases lack the inspiration of students to think independently and improve their ability to solve practical problems.

2.3 Lack of Systematic Case Base

The environmental impacts of different industries are different, so the construction of case base should include diverse cases of typical industries. At present, lack of case base including typical industries is one of the main problems.

2.4 Lack of Platform Sharing Case Database

At present, most of the case bases design is based on the interests or needs of teachers. There are few sharing platforms on case database, lack of effective communication and cooperation among schools, universities and professional fields, resulting in poor case base sharing.

3. The Construction of Case Database for Environmental Impact Assessment Course

3.1 Design Scientific Structure of Case

Building a good case base is the key to effective case method teaching. The cases usually include text and multimedia materials, which integrates text, images, tables, animation and audio-visual. The case shall be prepared based on the facts of project and engineering. The material must be the first-hand material obtained through field research, survey and interviews.

(1) Title: the title of the cases; (2) Abstract and key words: summarizing the main content of the case, with several key words. (3) Introduction: it mainly introduces the background of the case and the basic information of project engineering. (4) Text: according to the requirements of case method

teaching, describe the whole case in detail and completely, including the process and results of the case, relevant figures, tables and other information. Usually, it should include main production/activity process, pollutants generation and emission, environmental protection facilities, environmental impact prediction, and basic information of the case. (5) Conclusion: it can be an incisive summary of the text, or it can raise decision-making questions to arouse students' thinking. (6) Questions: the questions to be answered should be closely related with the facts in the case, emphasizing to arouse students' thinking and solve the problem based on the theoretical knowledge of students. (7) Appendix: relevant materials that need to be understood by students, such as case data source, data description, supplementary figures, tables, images, videos, etc.

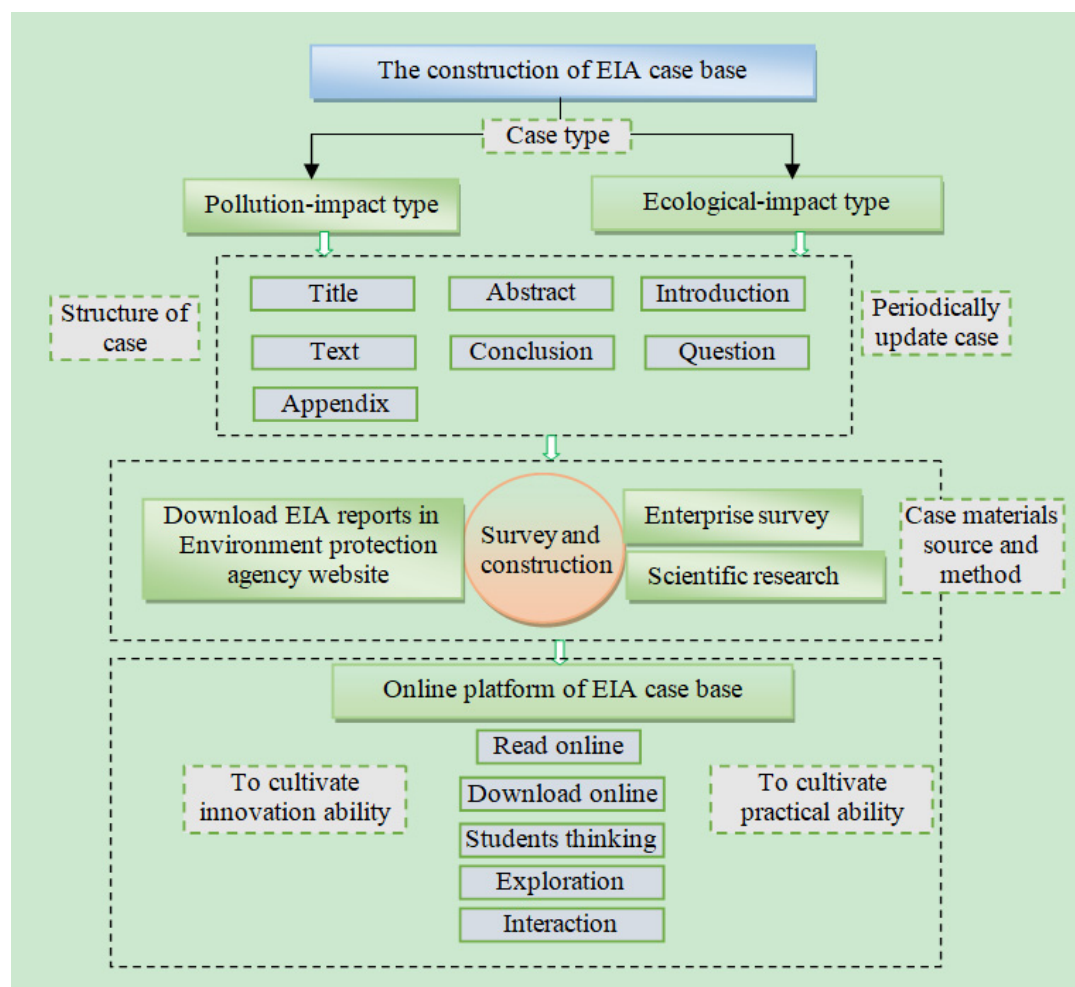


Figure 1. The procedure of case base construction

3.2 Diversify the Types of Cases and Include Typical Industries

According to the environmental impact characteristics of typical representative industries, it will be suggested to build more than 15-20 teaching cases involving various typical industries. At least 1-2 typical cases are designed for each type of industry to achieve diversification. Relying on the school and enterprise cooperation mode, the typical cases can be established through conducting research and original design. The designed case materials are mainly derived from local area and typical area, including representative industries in typical regions, hot issues in society and representative problems in practice.

The representative industries can include regional infrastructure construction project (e.g. sewage treatment, domestic garbage incineration treatment), building materials production and thermal power (e.g. cement production, combined heat and power production), mining (e.g. coal mine and metal mining), petrochemical and chemical industry (e.g. coke production, coal to natural gas),

transportation project (e.g. expressway construction, high-speed railway construction), water conservancy and hydropower (e.g. hydropower station construction, reservoir construction, water transfer project), metallurgy industry (e.g. automobile production, metallurgy project), livestock and poultry breeding (e.g. pig, cow, chicken) and other related industries. During the construction of each case base, special attention should be paid to the characteristic pollutants of each industry. For example, the environmental impact of garbage incineration project should pay special attention to the impact of waste gas and air pollutants control method, and expressway construction project should focus on the ecological impact and restoration.

3.3 Strengthen the Cooperation between Schools and Enterprises

It is very essential to strengthen the cooperation with enterprise and realize collaborative education for excellent case method teaching [3]. It is recommended to cooperate with production enterprises and environmental impact assessment enterprises to obtain first-hand materials, broaden the field of on-site practice, let students be familiar with the production process at the practice site, master the environmental impact and pollution control technology of various production processes, and lay a solid foundation for case construction.

4. Summary

To construe excellent teaching case base is required for cultivating practical innovative talents. It can not only improve the attraction of course teaching, promote students' practice ability and improve the teaching performance of teachers. Some suggestions are recommended for the construction of case base of environmental impact assessment course, such as designing scientific structure of case, diversifying the types of cases, and strengthening the cooperation between schools and enterprises to obtain case materials.

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