

# Evaluation of Bilingual Teaching from the Perspective of International Accreditation of Engineering Specialty: a Case Study of "Coalfield Geology"

Jianguo Wang<sup>1,a,\*</sup>

<sup>1</sup>Department of Geological Engineering, Qinghai University, Xining 810016, China

<sup>a</sup>lywjg467047@126.com

\*Corresponding author

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**Abstract.** Specialty certification is effectiveness checkout of discipline construction. Under the background of education internationalization, specialty certification is imperative. As one of the core courses of Resource Exploration Engineering Major, the course "Coalfield Geology" has been carried out in some comprehensive universities for many years, but it is still far from its requirements and conditions. Teaching practice shows that bilingual teaching is helpful to improve teachers' foreign language level, the ability to use foreign language teaching, and students' foreign language level. As an indispensable link in bilingual teaching, bilingual teaching evaluation should be considered from many aspects, such as influence factors, teaching model, effect test, existing problems, evaluation system and evaluation criteria, etc. The study found that bilingual teaching evaluation involves teaching links, teaching management system, quality of teachers and students, social utility, etc. However, there are still many problems that need to be solved, such as shortage of teaching hours, the lack of high-quality bilingual textbook, and weak bilingual teachers, etc.

## 1. Introduction

Discipline construction is system engineering, it is also a time-consuming and labor-consuming work, it needs long-term accumulation and special fund support, and specialty certification is also one test of the engineering construction effectiveness. Therefore, under the background of education internationalization, specialty certification is imperative. The engineering specialty certification requires comprehensive assessment to students themselves, training objectives, graduation requirements, continuous improvement, curriculum system, teaching staff, support conditions, etc. Bilingual teaching, as the supporting point of specialty certification, which playing an important role in training and improving professional competitiveness<sup>[1]</sup>. From the world perspective, many countries have a long history of bilingual teaching, such as the United States, Canada, Malaysia, Singapore, Luxembourg, Finland, and China's Hong Kong, Macao regions, etc. It has formed one theoretical system that suitable for themselves in bilingual teaching specifications, teaching methods, classroom management, academic evaluation, etc. Bilingual teaching embodies the identity of different cultures in different countries and regions, their history, present situation, problems, teaching contents, teaching methods, teaching environment, etc. Some foreign scholars think that the evaluation is to get the data through the measurement and calculation of the numerical value, and the evaluation is to make the value judgment of the data<sup>[2]</sup>. As an indispensable link in bilingual teaching, bilingual teaching evaluation should be considered from many aspects, such as influence factors, teaching models, effect tests, existing problems, evaluation system and evaluation criteria, etc.

## 2. The significance of bilingual teaching

The research field of "Coalfield Geology" is constantly improved and its contents are updated day by day, the research direction of coal accumulation basin, coal bearing rock series, coal resource

distribution, coal rock metamorphism, microscopic characteristics, coal seam associated minerals and industrial uses is deepening. The undergraduate "Coalfield Geology Course " in Resource Exploration Engineering Major in Qinghai University has always adhered to the close combination of theoretical teaching and practical teaching. However, only a part of the content adopt bilingual teaching (here referring to english and chinese bilingual teaching). However, many colleges and universities are still in the stage of preparation or demonstration, which is far from the requirements and conditions. On the one hand, the "Coal Geology Course " has its own characteristics, for coal mine production enterprises to develop resources or for scientific research institutions to train talent, comprehensive analysis of mine geological problems. On the other hand, the course needs to be in line with international standards, to develop teaching and research, to train innovative talents, to discuss the existing problems. In the future, students should have the ability to follow up and learn advanced earth science ideas, to communicate geoscience, to establish a perfect bilingual teaching evaluation system suitable for their own characteristics with an international perspective.

### 3. Bilingual teaching evaluation system

Table 1. Bilingual teaching evaluation index weight.

Target	Primary index	Secondary index
Bilingual teaching evaluation system	influencing factors(0.29)	hardware condition(0.38)
		software condition(0.26)
		teachers and students' quality(0.36)
	theoretical connotation(0.06)	curriculum features(0.43)
		developing process(0.12)
		necessity(0.45)
	evaluation methodology(0.13)	literature method (0.30)
		questionnaire survey methods (0.35)
		interview methods (0.35)
	evaluation criteria(0.10)	domestic standards (0.50)
		international standard(0.50)
	evaluation content (0.18)	teachers' quality (0.35)
		students' quality(0.30)
		evaluating index (0.35)
	evaluation effect(0.24)	questionnaire survey (0.20)
		statistical data analysis (0.30)
		evaluation results (0.40)
		existing problems(0.10)

#### 3.1 Influence factors

There are many factors affecting the evaluation of bilingual teaching quality(Table 1), such as hardware facilities, curriculum orientation, classroom interaction, books and materials, specialty courses, teachers' qualities, student characteristics, teaching methods, teaching objectives, language use, management system, atmosphere and social resources, etc. As far as teachers are concerned, they are mainly reflected in their professional background, foreign language learning experience, teaching management ability, scientific research ability, application of educational experience methods, attitude towards work and learning, etc. Students' foreign language proficiency, ability to acquire knowledge and learning attitude also play an important role in bilingual teaching<sup>[3]</sup>. The evaluation of bilingual teaching process, the form of teaching organization, the selection of english original teaching materials, the training and examination of English application ability, the systematic teaching of professional knowledge, the teaching methods and techniques, the rationality of teaching experience and methods, school management system, incentive mechanism, evaluation criteria selection and many other content are the core of bilingual teaching evaluation, the evaluation of bilingual teaching quality is a complex system, which composed of interrelated and

restricted factors. Index weight classification see Fig 1, among them, distinct secondary index weight have different evaluation results, secondary index weight value see Fig 2.

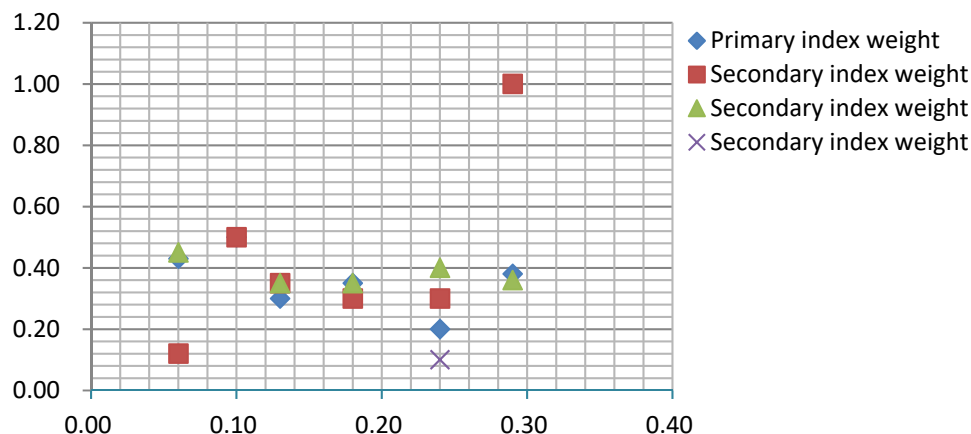


Fig. 1. The diagram of index weight classification .



Fig. 2. The diagram of secondary index weight value tendency.

### 3.2 Evaluation models

Evaluation model refers to puts different levels of indexes in the same system according to the evaluation objectives. The bilingual teaching research in Qinghai University is based on the local cultural characteristics, and we should grasp the development direction and trend of bilingual teaching evaluation. It is convenient for us to adjust the direction at any time in the course of discipline and specialty construction in the later period, and to carry out the evaluation research of generality and bilingual teaching of geoscience specialty effectively. The evaluation of bilingual teaching in "Coalfield Geology Course" is an important part of the subject development and international certification with the practice of bilingual teaching in Department of Geological Engineering, Qinghai University. Because of the particularity of bilingual teaching, we can't directly apply the existing teaching evaluation standards that are not suitable for ourselves in many aspects<sup>[4]</sup>. Therefore, it is necessary and feasible to establish evaluation system. In the course of actual construction and practice, we should grasp the principles of directionality, science, objectivity, acceptability, maneuverability, etc. By taking the practice of bilingual teaching in Qinghai University, the author constructs the evaluation model of bilingual teaching, consist of the

evaluation of bilingual teaching teachers, the evaluation of bilingual teaching students, etc. The evaluation model should be highly integrated with the characteristics of curriculum, flexible use, and should not adopt impractical model<sup>[5]</sup>.

### 3.3 Evaluation methods and guidelines

The commonly used evaluation methods include literature method, field investigation method, questionnaire survey method, index method, statistical method, software simulation method and comprehensive method, etc. Through searching the literature data of bilingual teaching, for instance, monograph, materials and bilingual teaching documents, the author preliminarily grasps the present situation of bilingual teaching in "Coal Geology Course", the situation of industry demand, the theory of bilingual teaching, and studies and analyzes the teaching results. On the basis of the comprehensive judgment and research, the bilingual teaching "Coal Geology Course" is followed by a random class to keep in touch with the teaching administrators, bilingual teachers and other teachers. In order to ensure the objectivity, representativeness, timeliness and truthfulness of the evaluation materials of bilingual teaching, the purpose of regular discussion, face-to-face conversation with students, printing statistics and issuing questionnaires is to obtain firsthand information of bilingual teaching evaluation in order to ensure the objectivity, representativeness, timeliness and truthfulness of the evaluation materials. Then, through the analysis of these data, thinking about the problems in the process of teaching and education practice, comparative study, summed up a more objective analysis results. It is the basis and premise of curriculum design, content selection, teaching implementation and evaluation.

#### 3.3.1 diversification of evaluation subjects

As the direct object and subject of bilingual teaching, at first, students' evaluation results directly represent the effect of bilingual teaching about "Coalfield Geology Course", it is also the direct feedback to the satisfaction of learning effect, as well as the advantages and disadvantages of bilingual teaching. Only in this way can it be truly reflected. Secondly, as the implementer of the bilingual teaching of this course, teachers should pay more attention to the teaching ability, teaching content, teaching methods, teaching means, etc. The bilingual teaching evaluation system should carry out an all-round comprehensive evaluation of teachers, and teachers themselves can use the feedback of students or classroom participants. Finally, peer evaluation is one of the most effective means to improve bilingual education teaching methods and improve teaching quality. In addition, the participation of school management teaching assistants in curriculum evaluation can enhance the importance of bilingual teaching in schools and departments.

#### 3.3.2 evaluation content systematization

The evaluation of bilingual teaching should include the whole teaching process and links into the scope of evaluation, including teachers' preparation before teaching, the implementation of classroom teaching, after-school student guidance and examination methods, etc. The problems must be solved in time, we should give full play to the function of bilingual teaching evaluation system, supervise dynamically, popularize high-quality bilingual teaching courses, improve bilingual teaching quality, improve bilingual teaching methods and evaluation index system. The quality of teachers in colleges and universities includes professional accomplishment, teaching ability, foreign language ability, educational technology ability, value orientation and professional attitude, and all this will directly affect the quality of bilingual teaching. Therefore, before the implementation of bilingual teaching, teachers must make a comprehensive evaluation of the students, and then choose the appropriate bilingual teaching model, teaching materials and teaching content according to the students' ability. Secondly, teachers should pay enough attention to the selection of teaching materials, the design of teaching contents and the analysis of students' foreign language ability.

#### 3.3.3 professionalization of evaluation criteria

Bilingual teaching evaluation is one of the key links of bilingual teaching. In bilingual teaching, bilingual teaching is more difficult than mother tongue teaching, and bilingual teaching is the



second language besides mother tongue to study professional knowledge, curriculum teachers should learn to use their mother tongue and second foreign language flexibly, the language of instruction should be based on students' understanding of the subject knowledge, and should not go beyond the scope of speciality knowledge, however, the teaching content should not be lower than the standard of Chinese teaching to avoid students losing their interest and confidence in learning. In the limited classroom time, teachers should try their best to create a good language atmosphere, reasonably design teaching activities, use effective teaching methods, adopt multimedia, network and other teaching techniques, interact with each other in learning and teaching, and conscientiously carry out teaching activities. The establishment and promotion of network communication platform can reduce the workload of teachers' on-the-spot tutoring and promote the interaction between teachers and students. Bilingual teachers should assign learning tasks to students and arrange time for answering questions, especially for students with low language proficiency. Bilingual teaching includes two teaching objectives: foreign language and subject, and teaching effect evaluation should also include two fields of knowledge: language and subject. Learning experience from the foreign bilingual teaching evaluation, and constructing a reasonable and perfect evaluation system is beneficial to the quality of bilingual teaching, at the same time, it is of great help to evaluate teachers' professional ability, improve teachers' professional level and teaching quality.

### **3.4 Evaluation effect tests**

The function of bilingual teaching evaluation is to collect the important and key information in the course of bilingual teaching, to make scientific analysis, to draw conclusions, and to guide the reform of bilingual teaching in colleges and universities. The examination of bilingual teaching is embodied in the following aspects: questionnaire survey, discussion, level test and follow-up investigation after graduation to understand the effect of bilingual teaching, the problems in the implementation of bilingual teaching, to reflect on the planning of bilingual teaching and the frontier of discipline development. Through bilingual teaching evaluation, we can understand the relationship between teaching and learning in time, grasp the teaching quality of courses, give feedback to teachers and students in time, improve management methods and the disadvantages of bilingual teaching, to overcome the existing problems and shortcomings. Through the bilingual teaching evaluation, we can adjust the teaching methods of bilingual teaching timely, adjust the proportion of English and Chinese at any time, adjust the teaching plan and content according to the feedback information of bilingual teaching evaluation. Through the bilingual teaching evaluation, we can reflect the teaching opinion to the management department and the teachers, may understand the student bilingual teaching study situation, rethinks the study methods, urges the school, teachers try to improve the effectiveness of bilingual teaching indicators and methods, actively promote and constantly improve bilingual teaching research results. As we all know, bilingual teaching in specialized courses is very difficult, so schools administrators should establish necessary incentive mechanism to improve teachers' enthusiasm in bilingual teaching.

## **4. Discussions and conclusions**

### **4.1 Discussions**

The teaching practice shows that bilingual teaching is helpful to improve the teachers' specialty foreign language level and the ability of using foreign language teaching, and to improve the students' foreign languages. According to the practice of bilingual teaching curriculum arrangement in Qinghai University, combined with the research and analysis of bilingual teaching. Evaluation of bilingual teaching of the "Coal Geology Course" mainly refers to the comprehensive understanding of all aspects of information in bilingual teaching practice, the purpose is to reform the bilingual teaching plan and adapt to the international professional certification. From the perspective of bilingual teaching practice, there are still many problems that need to be solved, including: less class hours, the lack of cohesion and coherence among courses in their major, and bilingual courses

are taught as an isolated course, neglecting the overall construction of the whole international certification curriculum system and the inherent connection between the various courses in content, resulting in the inability to integrate the knowledge of bilingual courses with other courses. The shortage of bilingual teaching teachers, most of the teachers' English proficiency is not comprehensive, their oral English is poor, and their writing ability is poor. The emphasis of bilingual teaching is that teachers' comprehensive ability to use foreign languages, especially their oral and writing abilities. Due to the lack of suitable original English teaching materials, the bilingual teaching materials available for selection are rather scarce, bilingual teaching has to be carried out in Chinese textbooks, which cannot improve students' English level and impart advanced knowledge from abroad. The theoretical basis of bilingual teaching lies in the fact that bilingual teaching embodies the combination of foreign language teaching and professional subject teaching, which makes it an effective way to train compound high-level talents.

## 4.2 Conclusions

(1) The undergraduate "Coalfield Geology Course" is offered in Resource Exploration Engineering Major in Qinghai University, which always insists on the close combination of theory teaching and practical teaching, but only part of the contents are bilingual teaching, and its influence is weak. This phenomenon also exists in other colleges and universities that offer the course.

(2) Combining the directionality principle, the acceptability principle, the objectivity principle, the maneuverability principle, the scientific principle, beginning with the influence factor, the appraisal model, the evaluation criteria and evaluation effects of bilingual teaching, which are related to teaching links, teaching management system, teachers and students' quality, social utility, etc, it needs bilingual teaching evaluation system that suitable for their own development.

(3) As far as bilingual teaching is concerned, there are many problems that need to be solved at present, for example, the teaching hours are less scheduled, the bilingual teaching materials of high quality are scarce, the bilingual faculty is quite weak, etc. Therefore, the teaching management departments revise the teaching appraisal documents as soon as possible, supported with special funds, and setting up bilingual teaching courses in the whole school to meet the needs of international certification of engineering education.

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