

Practical exploration of bilingual teaching in programming courses

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Abstract: Programming is a compulsory general education course for science and engineering students in various universities, and bilingual teaching is one of the important ways to cultivate international students. At present, many schools in China have opened bilingual teaching of programming courses, but there are many problems in the process of bilingual teaching. Therefore, bilingual teaching of programming courses requires research and practical exploration. This paper briefly analyzes the existing problems in bilingual teaching in colleges and universities, takes the bilingual course of "programming" as an example, and puts forward possible solutions to the problems in bilingual teaching in colleges and universities, so as to provide reference for the development of bilingual courses.

Key words: programming; bilingual teaching; teaching strategies

1 Introduction

Bilingual teaching is an important part of the professional teaching reform in China's colleges and universities in the new era, which mainly refers to the use of English and other foreign languages to teach the core courses of each major [1]. The aim of bilingual education is to enable students not only to acquire the necessary professional knowledge and skills, but also to learn to express themselves in a foreign language. The Ministry of Education's *Several Opinions on Strengthening Undergraduate Teaching in Colleges and Universities and Improving the Quality of Teaching* puts forward the requirement that "in order to meet the challenges of economic globalization and scientific and technological revolution, undergraduate education should create conditions for the use of English and other foreign languages in the teaching of public and professional courses" [2].

2 The necessity of bilingual teaching in programming courses

Education should be oriented to modernization, the world, and the future in order to meet the challenges of the scientific and technological revolution. Therefore, bilingual talents who are proficient in professional knowledge and foreign languages have become the highlight of the demand for high-level talents. Programming is a compulsory general education course for science and engineering students in various universities, so doing a good job in the bilingual teaching construction of programming courses has a good demonstration effect on the bilingual teaching of computer courses and even some engineering courses. Therefore, it is necessary to create conditions to promote bilingual teaching of programming courses in undergraduate education in colleges and universities.

3 Problems in the bilingual teaching of programming courses in colleges and universities

At present, many colleges and universities have adopted bilingual teaching in programming courses, but there are some problems in the process of bilingual teaching. Although some colleges and universities have taken the lead in using original English textbooks in China, teachers still use Chinese for classroom teaching and student communication, and for assigning homework and examinations. In some colleges and universities, the textbooks are in English, and the teachers also use foreign languages to communicate with students in their lectures, but the content of the lectures is the knowledge that the students have already learned. The fundamental reason for the prevalence of these problems lies in the lack of correct understanding of the essence and purpose of bilingual teaching on the part of teaching administrators and teachers.

4 Bilingual teaching strategies for programming courses

4.1 Target design

Therefore, the teaching objectives of this course are: to enable students to have a solid grasp of the basic knowledge of computer algorithms and programming and be proficient in the use of relevant technologies and related methods of programming; to train and improve students' computational thinking ability and make them be able to use the knowledge they have learned to complete the analysis, design and implementation of various problems. At the same time, through bilingual teaching, it improves students' professional vocabulary and foreign language proficiency, promotes the gradual "internationalization" of students' language and thinking, and improves students' professional foreign language and public foreign language proficiency, so as to cultivate high-quality compound talents and promote the improvement of teachers' foreign language proficiency.

4.2 Teaching methods

Due to the differences in students' English proficiency and taking into account some of the characteristics of students' academic situation, that is, they have just transitioned from the high school stage of basic education to the first year of university with a clear professional orientation, and they are facing a new major for the first time, and are also taking a programming course for the first time, their learning methods and thinking patterns need to be gradually formed and improved [3]. Therefore, in the process of bilingual teaching in programming courses, teachers need to coordinate the relationship between bilingual teaching and English language teaching, because bilingual teaching emphasizes the teaching of foreign languages in non-linguistic subjects and the acquisition of foreign languages through the learning of knowledge of non-linguistic subjects.

Secondly, it is necessary for teachers to coordinate the relationship between promoting bilingual teaching and ensuring teaching effectiveness, because bilingual teaching requires teachers not only to be proficient in their profession, but also to express professional knowledge in English, analyze professional vocabulary and fully understand and use the original textbooks. Therefore, it is necessary to adhere to regular inspection and evaluation, improve and truly achieve the reform goal of bilingual teaching in a timely manner, and avoid ignoring the teaching effect due to blindly promoting bilingual teaching.

Third, teachers need to coordinate the relationship between the introduction of foreign language original teaching materials and the selection of excellent Chinese teaching materials, establish a strict review system, select truly excellent teaching materials that can reflect the frontier of subject development, and should not completely abandon the selection and construction of excellent domestic teaching materials due to the introduction of foreign language original teaching materials.

Fourth, it is necessary to coordinate the relationship between theory and practice, encourage and support teachers to strengthen the study of bilingual teaching and have a comprehensive understanding of the specific situation of the students they teach, as well as the specific environment in which they live. Teachers must not copy the experience and model of

foreign countries, but should explore teaching models in line with the national conditions in practice, so as to promote the all-round development of students.

Fifth, it is necessary to coordinate the relationship between the native language and the foreign language, make appropriate use of the advantages of the mother tongue, pay attention to eliminating the interference of the mother tongue, and strengthen the monitoring output.

Finally, teachers need to carefully study the selection of teaching materials, which must meet the requirements of the syllabus. At the same time, the textbook needs to be concise and clear, with a strong logical type and a relatively new knowledge system. Teachers should not only cultivate students' ability to think visually, but also cultivate students' ability to solve practical problems and apply foreign languages. In terms of assessment methods, it is necessary to study and formulate flexible and diverse assessment forms according to the specific characteristics of bilingual teaching, and pay attention to the examination of students' comprehensive ability, not only to examine students' professional subject knowledge, but also to pay attention to the examination of students' practical application ability, including the application ability of foreign languages.

4.3 Step by step

It will be difficult for college freshmen to receive bilingual teaching. Therefore, according to the actual situation of students' foreign language proficiency and professional knowledge, the policy of "active preparation, gradual progress, and practical results" is adopted in the process of implementing bilingual teaching. For example, the C Programming course can be based on the *The C Programming Language* by Brian W. Kernighan and Dennis M. Ritchie. In terms of implementation, it can be selectively carried out according to the following three methods:

Mixed: The original textbooks or handouts in foreign languages are used, and the teaching in Chinese is the mainstay, and the titles or main conclusions in the board book are in foreign languages.

Semi-appearance: the original foreign language textbooks or foreign language lecture notes are used, mainly using foreign language lecture notes and using foreign language board writing.

All appearances: The original textbooks or handouts in foreign languages are used, and all lectures are taught in foreign languages.

Only in this way can we establish and further improve the operational model of bilingual teaching in practice, which is divided into three stages: primary, intermediate and advanced, each with specific requirements and operating methods. Moreover, it is necessary to study how to shorten the transition period from the primary to the advanced stage of bilingual teaching as much as possible, so as to meet the requirements of bilingual teaching as soon as possible.

In short, bilingual teaching needs to be carried out at different levels and cannot be one-size-fits-all. In the exploration, we try different teaching methods, homework requirements, assessment methods and course quality evaluation methods, and explore a bilingual teaching mode that can fully reflect the theoretical system of the curriculum and the frontier of discipline development, so as to achieve the effect of bilingual teaching, promote the improvement of bilingual teaching level and lay a solid foundation for cultivating students who go abroad for further study.

5 Conclusion

Through the systematic design of bilingual teaching objectives and teaching methods, the implementation of hierarchical bilingual teaching methods according to the needs of students, the focus on teacher-student interaction in the teaching process and the all-round enhancement of the interaction of second-language teaching resources and teaching environments, as well as the teachers' proficiency in the use of teaching materials while choosing appropriate original teaching materials for their students, the quality of teaching and the quality of human resources training can be improved.

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Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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