

Investigation and Exploration of ‘Student-Centered and Teacher-Led’ Teaching Model in English Medium Instruction (EMI) Calculus Course

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Abstract

The internationalization of higher education in China is constantly improving with an increasing level of diversification and globalization of education. High-level international English Medium Instruction (EMI) course is crucial to the cultivation of innovative international talents. Taking the Calculus course as an example, this article first demonstrates the importance and connotation of ‘know thy enemy and know yourself’ in the construction of EMI courses. Then it elaborates on the construction methods and significance of the ‘Leaning Community’, ‘Teaching Community’, and ‘Teaching-Learning Community’ through studies of the relationship between ‘teaching’ and ‘learning’ from the student-centered aspect. Such research provides a useful reference for the teaching model reform, especially the effective construction of EMI courses in non-native English-speaking countries.

Key words: English Medium Instruction (EMI); Student-centered; teacher-led; Teaching model

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INTRODUCTION

Since the beginning of the 21st century, the rapid development of science and technology has brought unprecedented opportunities and challenges to all fields. Along with the introduction of the concept of ‘global community with a shared destiny’ (Xu and Guo, 2016), the ‘thousands-year-old’ education field has entered the process of globalization (Spring and Zhao, 2010; Mao and Wu, 2012; Zhang, 2013). To cultivate high-quality talents with international awareness, international communication ability, and international competitiveness, to enhance mutual influences, exchanges, and competitions among higher education countries, and thereby to optimize our educational resources and elements and cultivate high-quality talents has become the key focus of the future development of Chinese universities.

In order to achieve these goals, the primary task is to vigorously promote the internationalization of higher education in universities (Ren, 2016; Gu, 2006), including the internationalization of management concepts, the internationalization of students and teachers, the internationalization of courses, and the internationalization of teaching and research cooperation. The famous American educator Bond pointed out that “there are nearly 20 elements related to the internationalization of higher education, but none of them is as important as the internationalization of the course!” (Bond, 2003; Bond, et al, 2003) Therefore, to promote the internationalization of higher education, we first need to rely on the construction of an international EMI course (Doiz, et al, 2012; Hu and Lei, 2014). The realization of the ‘student-centered’ EMI course construction in non-native English-speaking countries with modern teaching methods and cutting-edge teaching concepts has important practical and strategic significance.

The construction of the EMI course is a systematic project and an object-oriented project. Therefore, this article takes the course as the starting point, and discusses

explicitly the importance of 'know thy enemy and know yourself' in the course construction during the EMI teaching process and the relationship between 'teaching' and 'learning' in the teaching process.

1. 'KNOW THY ENEMY AND KNOW YOURSELF' IN EDUCATION

Whether in a non-native language teaching environment or a pure mother-tongue teaching environment, it is very necessary and meaningful for teachers to have a comprehensive grasp and understanding of all aspects of teaching activities. In other words, a full understanding of teaching information is a solid foundation for high-quality education. The so-called 'know yourself' indicates teachers and preparation of class materials. Are the teachers knowledgeable? Is the choice of teaching materials and supplementary materials appropriate? Is the class preparation complete and sufficient? The above preparations are crucial. However, in order to give the best lectures, it is also necessary to 'know thy enemy', that is, to fully grasp the information of all aspects of teaching, of which the most important are the students and the teaching environment.

1.1 Know the Students

To achieve the student-centered education, we must begin with knowing the students. First, we need to know the number of students. The choice of teaching modes differs with the class sizes. Under normal circumstances, small classes receive better teaching results. However, large classes still dominate the higher education in China, especially for the general courses of mathematics, physics and other science and engineering courses. Extra-large classes exist, as well. Therefore, at the beginning of the course design, the instructors must know the class size. Second, the instructors need to know the education background of students. As the 'director' of the course, teachers should pick the starting point and the level of difficulties of the course based on the education background of the students for a more effective education. Taking higher mathematics course as an example, Chinese students already have the basic ability to do derivatives and integrals during high school, but some international students may not have learned the basic knowledge of Calculus. Hence, the instructors should pace the course and pick lecture materials based on the actual education background of the students. Third, the instructors need to understand the cultural background of the students. Students from different countries have different religious beliefs, learning styles, and lifestyles, which lead to differences in students' learning habits and ways of thinking. Thus, during the course material preparation and design of teaching

modes, instructors should take the cultural differences of students into full consideration so that students are more active and participate more during class activities. Fourth, instructors need to know the language level of students. For teachers and students whose native language is not English, EMI is a real challenge. This means that during an EMI course, it is necessary to fully consider the English level of students in listening, speaking, reading, and writing. Teachers need to decide the language level to be used according to the students' English level. In this way, English is truly a medium for education, rather than a barrier to learning professional knowledge. Last, instructors need to pay more attention to the students. Students' recognition of the instructors is directly correlated to their participation in the class. With a well preparation of the class, an increasing in instructors' emotional communication with the students will enhance their sense of identity if instructors know their students by person, can remember their names, and understand their personalities and their learning situation. Instructors should not only teach knowledge and help students with their ability development but also pay enough attention to the students during the process.

1.2 Knowing the Teaching Environment

Before the course starts, teachers must know the teaching environment. First, they need to know the arrangement of tables and chairs in the classroom. The classroom arrangement directly determines the way teachers interact with students and interactions among students. For small classes, the movable table and chair allow students to form groups and conduct seminar-style teaching. In the large classrooms with fixed tables and chairs, interaction between teachers and students becomes more difficult. Therefore, teachers need to design their teaching modes and interaction with students according to local conditions in the preparation of the course for different teaching environments. Second, the preparation of multimedia devices and platforms. The use of multimedia devices and platforms provides a possibility for multi-sensory, three-dimensional design of audiovisual courses, etc. To effectively use multimedia and other auxiliary equipment in the classroom is also an important factor that needs to be considered in course design. However, due to the long update cycle of hardware, each school's teaching resources have their own characteristics. Therefore, in order to optimize the teaching effect, the teaching design should be adjusted according to the actual teaching environment and audiences. Especially when the hardware conditions are not perfect, it is necessary to carry out thinking and innovation on the teaching method from the perspective of people-oriented and achieve the purpose of improving the teaching effect.

2. CONSTRUCTION OF 'TEACHING-LEARNING COMMUNITY'

The so-called 'education' has two crucial elements: 'teaching' and 'learning', which are inseparable. 'Student-centered' is the fundamental principle in teaching, and the key issues in teaching reform are the implementation of such principle and the teacher's role in the classroom. No matter how much we emphasize the importance of students in education, teachers should always take the leading role in course preparation and classroom arrangement. The relationship between the student and the teacher is like the relationship between the driver and the navigation. In an unfamiliar and unknown environment, in order to reach a certain destination, the driver must drive under the guidance of the navigation. Navigation itself requires a complete map, optimized road design, and timely reminders and warnings of road conditions. Therefore, no matter how science and technology develop, teachers must take their dominant roles in the teaching process and assume corresponding responsibilities to protect students. Especially in the non-native English teaching environment, from the organization of the course to the preparation of the course materials, teachers need to make more detailed and comprehensive preparations, and take control of the course rhythm and students' learning. The realization of the above design concepts requires further construction and refinement of the relationship between teachers and students in teaching.

2.1 Learning Community

The 'Learning Community' among students can also be called 'Think Pair Share', which is a very important part of the teaching process. Formally speaking, it is necessary to set up group discussions. The main purpose is to allow students to fully participate in the teaching activities, to fully stimulate students' initiative, and change the class from passive infusion teaching to active learning and communication. Especially for the EMI course, students have certain difficulties in the understanding, communication and giving feedback of the materials. Therefore, group discussion should be adopted to give students a chance of digesting, exchanging, refining, and perceiving the knowledge. In order to make in-depth establishment of the learning community, teachers should also consider ways and methods of construction of the learning community. For example, students can be put into groups based on their education background, their levels of language, and their cultural backgrounds, and students should switch groups regularly. At the same time, it is necessary to pay attention to the conditions for face-to-face communications among students, such as forming groups of two, three, and four students. In addition, teachers need to pay attention to the rational design of the problems and requirements of group discussion so that

each student could participate in the learning, discussion, and summary process of the class.

2.2 Teaching Community

The establishment of the 'Teaching Community' among teachers is also an important mean to improve the teaching effect. The vast majority of the teacher-student ratio in a single class has a "1:n" form. However, the time and energy of a teacher is limited. What is more important is that under this teaching mode, multiple teachers of the same course will prepare and teach the course separately, which will inevitably lead to repeated labor and waste of teaching resources. Therefore, if conditions permit, the instructors can be combined into groups to build the "Teaching Community", which is to build a modern teaching team. Through a reasonable allocation of labor and organization, we will achieve the teaching effect of 1+1>2. There is no single model for the establishment of the community, which needs to be designed according to the specific course. Teachers in the same fields can be combined, or teachers in different disciplines can be combined to complement each other. For example, in the teaching of higher mathematics courses, the typical teaching mode is to have one teacher responsible for teaching the theories in the big class, other teachers take charge of the exercises in small classes, and the graduate assistants are responsible for grading. Nowadays, the continuous development of multimedia online education provides more possibilities for the establishment of 'Teaching Community'. We can use Massive Online Open Course (MOOC) to try mixed teaching model based on flipped or partially flipped classroom.

2.3 Teaching-Learning Community

The establishment of 'Teaching-Learning Community' of teachers and students will add the finishing touch. After we established the 'Learning Community' and the 'Teaching Community', the teaching effect will be greatly reduced if we do not combine these two. This community is based on Initiation Response Feedback (IRF), which is a process of group discussion to answer the questions or issues proposed by the teacher, and students will receive feedback from the teacher after answering these questions. In this process, teachers need to pay attention to the design of questions or issues, that is, whether they can inspire students for meaningful thinking and discussion. A good teacher must be a good questioner (Gall, 1970). In other words, classroom teaching is not a single instillation of knowledge, and teachers should focus more on guiding students to think actively. At the same time, we must grasp the rhythm of the class and arrange the class time reasonably. Teachers must be fully prepared for the questions they ask, have an estimate of the time they need, and let the students know at the beginning of the discussion. In addition, during the group discussion, although the students are free to

discuss, teachers still need to pay attention to the progress of each group, to listen carefully to their discussion, and to effectively intervene and terminate it in a timely manner. Finally, after the discussion, teachers should give appropriate feedback to students when they are answering the statement, pay attention to the methods and ways when evaluating in order to encourage and inspire students to think critically, and to make appropriate corrections on the basis of affirming students' efforts. After class, teachers should also conclude the class based on the class situation and fully prepare for the next class and the next round of courses.

CONCLUSION

Starting from the construction of EMI calculus course, this paper first discusses the importance of understanding the situation of students and the teaching environment in the construction of EMI course. Secondly, it deeply explores the orientation and relationship of teachers and students in the course, and introduces the three communities in the EMI course, namely the 'Learning Community', the 'Teaching Community', and the 'Teaching-Learning Community', and their establishment and importance. All in all, to be truly 'student-centered', the course must be based on a comprehensive understanding of the student's situation, the teacher's own situation, the characteristics of the course and the teaching environment. Teachers need to continue to explore research methods and teaching techniques from the aspects of learning, teaching, and combination of teaching and learning. Especially under the teaching background of EMI, since the mother tongue of students and teachers are not English, it is necessary to carry out relevant teaching research and practice to cope with the opportunities and challenges brought by English teaching!

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