Teaching Practice of Flipped Classroom in German Medical College

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ABSTRACT

The development of information and network technology has brought about the change of educational resources and methods, as well as providing an opportunity for medical education reforming traditional education model. The author expounds the teaching mode, main characteristics and application status of "flipped classroom" in German medicine through field exchanges and visits in German famous medical college, and aims to provide reference for medical education workers and decision-makers that promote medical education reform in line with China’s situations under the new situation.

KEYWORDS

Medical education, Flipped classroom, German famous medical college.

INTRODUCTION

Flipped Classroom is translated from "flipped Classroom" or "inverted classroom", which is readjustment of time inside and outside the classroom, and make the decision-making power of learning transferred from the teacher to the student. Under this teaching model, students can focus more on active project-based learning in the valuable time in class, jointly study and solve challenges of localization or globalization and other issues real world facing, thus obtaining a deeper understanding. Teachers no longer spend the classroom time teaching information, this information requires students to complete autonomous learning after class, the students can watch video lectures, listen to podcasts, read enhanced e-books, discuss with other classmates on the web, consult the materials needed at any time. Teachers have more time to communicate with everyone as well.

Flipped classroom mode is part of a larger education campaign, which overlaps in meaning with blended learning, inquiry learning, and other teaching methods and tools, all are in order to make learning more flexible and initiative, and make students' participation stronger. Students learn rich online courses via the Internet in the Internet age, and they do not necessarily have to go to school to receive teachers' lecture. The Internet, especially the mobile Internet has given birth to the "flipped classroom" teaching mode. "Flipped classroom mode" is a complete transformation of the traditional classroom teaching structure and teaching process based on printing, which will trigger a series of changes of teacher's role, curriculum pattern and management pattern and so on.¹¹

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German Medical education has a reputation for practical and high-quality training and a good reputation internationally. At present, there are 36 universities (medical college) in Germany that set up medical majors, how about the application conditions of flipped classroom in German medical education? When the author is studying in Germany, I visited and investigate several famous medical colleges in Germany, including medical department of Universitaet Heidelberg, Charité–Universitäts Medizin Berlin (Berlin State), Medizinischen Hochschule Hannover (Lower Saxony) and Albert-Ludwigs-Universität Freiburg (Baden-Württemberg).

There are quite diversified teaching methods in Germany, the combination of traditional teaching and modern teaching is good. The teaching methods of flipped classroom are widely used in primary and secondary schools; higher education in Germany does not study the teaching of flipped classroom separately, however, commonly used teaching methods in flipped classroom are widely applied to subject teaching with strong practice and comprehensiveness. The Seminar, Presentation and Project which improve students' learning ability widely applied the teaching methods of Flipped teaching. The "flipped classroom" teaching applications mainly present the following characteristics in the German medical education:

**DIVERSITY OF MEDICAL EDUCATION METHOD CHOICES**

Taking Heidelberg Medical Department for example, this department has special URZ/E-Learning-Center, which supports in e-learning of medical students with digital educational media and communication tools, and it has three different education programs to choose (Fig. 1).

![Fig. 1. Different education programs to choose.](image)

The first are the added classroom programs. Namely, courses increase classroom teaching, centered on teaching materials (Vorlesungsskripte) resource downloads. Students can through E-learning center, download learning content (including videos, image, video, simulations and animation) a series of visualization materials and so on. The classroom teaching is centered on traditional teaching. However, students by enhanced classroom; obtain the Course declines and study the information, which greatly improved the teachers' interaction and teaching depth. Through enhanced classroom learning, it usually shows higher activity and more students' participation than traditional classroom teaching.

The second is a blended learning program. The "blended learning" e-learning of this education program and the use of digital educational media play an important role. The main content of the course is similar to the traditional classroom teaching, but
there are learning guidance and online communication that face the students and complements the classroom teaching. Its core structure is: "learning platform + lecture recording (E-lecture) + Web conference." One of the learning platforms, Lerplattform uses open Moodle platform, which is widely used in the medical college of Humboldt-Universität zu Berlin and the Universität Leipzig. Blended learning requires good planning and coordination of online and offline content and time. Such a learning platform is daily use (Fig. 2), which is mainly based on Web training, through the construction of online learning materials ((practice, simulation, video and other open resources)) and online communication tools (forums, e-mail, instant messaging).

![Fig. 2. Learning platform.](image)

The main teaching forms are:

- Offline seminars + virtual classroom form of online web conference.
- Another is that students study independently and develop lectures through web-based training (WBT). For example, podcasts are created and used through a joint design with Wikipedia Moodle course. This blended learning program is used in medical case discussion. The form of Web online meeting is more flexible, there are small-scale seminars for small scales; lectures and conferences with guest speakers, and research conferences that face the research group. The blended teaching method is a form used more, which is conducive to solve complex problems, facilitate problem solving and teamwork.

The third is a fully virtualized online learning scheme. Finding learning and teaching arises almost entirely online in the typical "full virtualization". Research process, teaching and learning are almost entirely replaced by online. The main steps are:

- learning tasks distributed on Moodle platform (and submit to BBS, Wiki);
- discuss through several BBS
- text, audio + video data integration (learning materials, learning online platform supply)
- students' self-examination
- communicate collaboration online proposed by students and teachers (synchronous and asynchronous)
Online cooperation, raise claim, clarify course design! (In the beginning, the meetings are usually started by a personal meeting, and then slowly follow and study, make more people participate in meeting process.

The status of "teacher as facilitator" is especially important under this model.

This model is widely used in the later stage of open learning of medical postgraduate education.

INDEPENDENT LEARNING WITH A HIGH DEGREE OF OPENNESS AND STRONG PARTICIPATION

The history of German medical education dates back to 1386, and German oldest medical school was established at University Heidelberg. In Germany, the time to complete undergraduate medical education is usually 6 years and divided into 12 semesters. Since the amendment of the medical license had issued in 2002, the undergraduate medical education has changed. Even obvious differences of course systems and teaching methods appeared in different regions and schools, however, all are expressed as emphasis on medical practice learning and the adoption of innovative teaching method. The medical education which emphasizes the practice as orientation, there are more definite rules on teaching methods, for example: from the past teaching mode that take lecture form as the main, the teacher as center, explicitly stipulate various innovative teaching method unified, and the practical clinical examination as an important part of course assessment and the federal examination.

Driven by this big national policy environment, the proportion of developing teaching method innovation has greatly increased in medical colleges and universities, 90% of medical colleges and universities carry out PBL learning based on problem orientation and CBT teaching method based on computer training. To advocate students as the center, problem-based learning (PBL) teaching, learning method are highlighted in clinical teaching. Unlike teaching in school, most of the clinical knowledge requires self-learning. Teaching doctor mentors are more often take on guidance role, the next is the role of data analysis, and the last is the teaching role. Teachers encourage students to ask questions, which can guide students to analyze and summarize the literature on specific cases, carry out judgment and summary of the data, and deepen the understanding of knowledge points with the expression, application and feedback knowledge and other learning methods, application and feedback, rather than simply emphasizing certain clinical operation. In addition, there are many kinds of lectures inside and outside the college; there are regular joint clinical discussions among departments and so on. In a word, everything is based on clinical evidence rather than follows blindly some authority, namely emphasizes the training of students' creativity and develops students' ability to acquire knowledge, expand skills and train personality.

ABUNDANT UNIVERSITY DIGITAL SPORTS RESOURCES

Berlin, Baden-Württemberg in Germany, which are committed to the university overall digitalization activity and gradually strengthen the digital infrastructure for research and teaching. Although there is few open German education resources in Europe compared with the global online community. However, compared with the open programs of German universities, German large-scale online education platforms
are very open and dynamic, cloud computing, social media and other emerging ways are used many to create a refreshing learning environment and atmosphere. In order to guarantee the innovative characteristics of the education platform, the platforms often publicly solicit innovative programs of college network teaching modes from university professor, which have the forward-looking and pragmatic characteristics. Any students or persons with learning desires can register on the MOCO platform free of charge and choose to study course who are interested in from various courses.

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