The Application and Research of the Flipped Classroom

Yue Peng

ABSTRACT

Flipped classroom is a new teaching form supported by information technology. The application and study on flipped classroom show that learners are the dominants in flipped classroom. Teacher, content of courses and adaptability of the learners should be taken into account. It is necessary to select suitable teaching content and according to the characteristics of learners, to design the teaching in class and out of class to guide the learners’ study demand, construct reasonable learning values, and mobilize learning enthusiasm of learners. Flipped classroom pays attention to the individual difference to cultivate innovative talents.¹

INTRODUCTION

In the time of innovation and development, with the information technology changing rapidly, the active college students need new teaching forms to satisfy their individualized learning needs. The individual differences of learners are neglected in the traditional classroom. It is difficult to satisfy the learning requirements of the undergraduates in the new era only by the face to face teaching form. With the support of information technology, a new teaching form, Flipped Classroom, came into being. It uses information technology to transfer knowledge out of class and internalize knowledge in class [1][2], which reverses the traditional teaching form out of class and in class [3][4]. The teacher is the center in the traditional classroom, mainly in teaching the content of the course. The students are the center in the flipped classroom [5], mainly in the exploration of knowledge. At present, the teaching form of flipped classroom is used more in primary and secondary teaching than undergraduate teaching, because of many subjects and professional teaching

¹Yue Peng, College of Chemistry and Environmental Protect Engineering, Southwest Minzu University, Chengdu, China, 610041.
content in university. In this paper the flipped classroom was applied and researched in the university in order to explore the pattern of the flipped classroom design which takes the learners as the dominants and conforms to the practice of undergraduate teaching.

MATERIALS AND METHODS

General Mode of Flipped Classroom Teaching Design

In the application of flipped classroom, instructional design is the key. The instructional design is different between flipped classroom and traditional class. The traditional class teaching is mainly designed for the teaching in class, while the flipped classroom is designed not only for the teaching in class, but also for the teaching out of class [6]. The design for teaching out of class involves more content than the design for teaching in class. The learners of flipped classroom need detailed PPT for the self-learning of the course. Then the learners can know the course well through self-study.

Problems to Be Solved in the Application of Flipped Classroom

ADAPTABILITY OF CONTENT

Flipped classroom requires students to learn knowledge through self-study. According to the study, the effective time of self-study is usually about 20 minutes. So teachers need to fragment teaching contents when preparing PPT for students' self-learning. The content of every teaching fragment should not be too long.

In self-study, it is difficult for students to understand abstract, difficult basic theories and complex application knowledge. The fragmentation of teaching content makes it difficult for students to digest the teaching content that links multiple knowledge points. But when the flipped classroom is applied to thematic or case based teaching of applied basic theory, the teaching effectiveness is good. For example, in the course of teaching environmental chemistry, when we adopted the flipped classroom teaching method for the basic theory of photochemical reaction, some students failed to understand and master the basic process of photochemical reaction out of class. After students mastered the basic knowledge of photochemical reaction, the flipped classroom was applied to the teaching of photochemical smog, and the teaching results became good. So the flipped classroom is not suitable for all contents. Teachers should choose the appropriate teaching content according to the actual situation. Generally it is not appropriate to adopt flipped classroom in basic theoretical knowledge. Application knowledge is suitable for the flipped classroom.
LEARNERS’ INITIATIVE

The subject of the flipped classroom is the learners, the students. From out of class to in class, we need to mobilize the initiative of students. Some learners may not be satisfied with flipped classroom [7]. The interesting questions out of class should be designed, in order to let learners find their interest and finish the study out of class by exploring the problems. The learning interest and learning ability are different in students. If the designed problems are too difficult, students with poor learning background will give up the study out of class by their own frustrations. If the designed problems are too simple, students with good learning foundation will lose interest because of the lack of challenge in study. So some questions should be designed, and the degree of difficulty in the questions is different in order to help learners find their study interesting and stimulate the spirit of exploration.

In class learners display, test and exchange their achievement of self-study. They can gain a sense of achievement in learning, and study each other. If learners are unable to express positively, the presentation and discussion in class can’t be carried out, and the tasks in class can’t be completed. So teacher’s active guidance is necessary in class. Teachers should stimulate the enthusiasm of the learners to display and explore.

MONITORING OF LEARNING QUALITY

The monitoring of learning quality plays an important role in achieving the goal of flipped classroom. The learning of content in flipped classroom is completed by learners out of class, which is different from learning in class. There is no class teacher can control, and learning is completed by learner autonomy. So teachers need to monitor the effect of completion in time, correct and make up for the lack of learning out of class, in order to ensure the timely completion of teaching tasks and the realization of teaching objectives.

DISCUSSION AND RESULTS

The purpose of undergraduate teaching is to enable students to master the ways to understand and transform the objective world, and cultivate their scientific literacy and creativity by imparting knowledge. Constructivism holds that everyone has his own understanding of the objective world. This understanding is related to everyone's experience, psychology and belief. Knowledge is acquired by the construction of experience under certain circumstances. Knowledge is constructed by individuals rather than passively accepted. So Learners are the center. All aspects of flipped classroom should be around learners.
Selecting Teaching Content

The teaching content of the university can be divided into three types: the introduction about the development of the subject, basic content about basic theory and basic method, and applied content related to practice. Applied content is suitable to flipped classroom because of its practicality.

In the process of teaching, teachers should decide whether to adopt flipped classroom teaching form according to the content of teaching and the characteristics of learners. Research shows that flipped classroom is not a suitable teaching form for all teaching contents, so some scholars advocate mixed teaching form. No matter which teaching form is adopted, the ultimate goal of teaching is to acquire knowledge. The learner is both the teaching receptor and the subject of the teaching. It is more conducive to the realization of learning objectives by actively choosing suitable teaching forms. Therefore, before flipped classroom design, teachers and students can identify teaching forms together with teaching contents, which is beneficial to mobilize the enthusiasm of the students to study.

Guiding Learners' Learning Needs

Learning needs affect learning behavior. In the design of the flipped classroom, in addition to developing the PPT, tutoring materials and exercises of the course for self-study, we should carry out the problem design around the teaching content according to the characteristics of the learners. The learning needs of the learners are guided through the problems. The designed problems need to be from easy to difficulty. Learners are attracted by problems and eager to solve problems, thus producing learning needs. Learners finish learning in the process of solving problems out of class, and discuss the process of solving problems in class. Each learner learns from others' strong points and closes the gap, completes the internalization of knowledge, and meets the learning needs.

Check the Learning Situation in Time

After completing the learning out of the classroom, the students need to test the learning situation so that the teachers can master the learning situation in time and make corresponding adjustments. Through testing, students can understand their own learning deficiencies, improve and modify their own learning methods.

CONCLUSIONS

Learners are the dominant in flipped classroom. Teacher, content of courses and adaptability of the learners should be taken into account. It is necessary to select suitable teaching content and according to the characteristics of learners, to design
the teaching in class and out of class to guide the learners’ learning deeds and mobilize learning enthusiasm of learners.

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