Research on Teaching Process of "Flipped Classroom"

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Abstract

Since 2000 we have seen quite many researches on the "Flipped classroom", a new educational approach, however, the majority of these researches quite often leaned towards the aspect of the practice or the instruction system design, thus not abundant focus on its concrete process. This text would like to present a detailed description of a complete instructional process with five positive cycles, an experiment designed to compare diverse educational approaches, and the controlling method applied in it, all of which with a combination with the ASSURE model of instructional design; in this way, one could clearly get into the systematic but not rigid system of a Flipped classroom.

Key words: Flipped classroom; Educational approaches; Italian language teaching; The ASSURE model; Positive cycle

INTRODUCTION

"Flipped classroom" changes the roles of teachers and students in traditional classroom teaching mode, and it is a teaching model based on computer technology and Internet technology. The concept appeared in the forms of "inverted classroom", "flipped classroom" or "classroom flip" in the articles of Lage, Platt, Baker and et al. around the year 2000. Later, it was continuously applied in American classroom teaching (Zhong, Song, & Jiao, 2013). "Flipped classroom" practice of Jonathan Bergmann and Aaron Sams—chemistry teachers of Woodland Park and Khan Academy founded by Salman Khan in 2007 made more and more people began to focus on "flipped classroom". Many teachers accepted this new model and applied it to reform the original teaching mode. All these seemingly predict the arrival of a new round of educational innovation.

Generally speaking, traditional teaching process includes two stages: knowledge instruction and knowledge internalization. The teacher impacts knowledge in classroom, and students digest and absorb the knowledge through assignments. "Flipped classroom" readjusts teaching activities under the advanced information technology environment and "flips" original classroom form to the knowledge (aided by information technology) imparted to students after class in advance. Such teaching mode exploration was preliminarily seen in the educational concept of American educator Dewey at the beginning of the last century. He once advocated the role inversion between the teacher and students and let students become the core in the teaching process. The author considers that, the concept of "flipped classroom" could trace back to the teaching idea of Italian educator Montessori at the beginning of the 20th century, i.e. let students become the subject of teaching activities and let teachers serve as "observers". "Flipped classroom" gradually becomes popular with the development and popularization of Internet. Although many domestic and overseas scholars have carried out numerous researches on "flipped classroom", most researches focus on teaching practice and model building and lack systematic effect evaluation of "flipped classroom" (Wen, 2016) as well as normative, systematic and scientific research on the teaching process of "flipped classroom".

Economically, "virtuous cycle" is often used to describe sound development of the economy, while favorable operation has important significance for education and especially language teaching. Next, the author takes Italian teaching practice for example to describe the contrast experiment of traditional teaching mode and "flipped classroom" in detail so as to discuss how to form the classroom teaching model with virtuous cycle – the teacher motivates students' interest in learning Italian in classroom teaching and the later in turn can improve teacher's classroom teaching quality.

1. INSTRUCTIONAL DESIGN BASED ON THE ASSURE MODEL

The ASSURE model is proposed in 1989 by Robert Heinich, Michael Molenda and James D. Russell, three American experts on instructional system. In the name "ASSURE" each letter represents a step of the model respectively: Analyze Learners, State Objectives, Select Methods, Media and Materials, Utilize Materials, Require Learner Participation, Evaluate and Revise. Based on the cognitive theory on learning, the ASSURE model, itself learner-centred, is integrated with the Nine Steps of Instruction, Robert Gagné's famous educational theory. The model can assist with the conduct of an instructional design systematically, therefore quite worthwhile since it has been widely recognized and popular in classroom teaching, distance education, business training, etc. (Li, 2014). Thus, below this paragraph, a detailed description of an experimental teaching practice will be given to show clearly how the model works.

2. DETAILS OF EXPERIMENT

The experiment is the study on effect and applicability of "flipped classroom mode" in practical teaching process. The experimental subjects are Chinese (native language) users with zero basis of Italian who received special training of preparatory course before going abroad. They began to learn Italian for 5 class hours (3 periods in the morning and 2 periods in the afternoon), and 5 days per week from July 25, 2016. The experimental period is started from August 22, 2016 to September 2. There were 48 students in the two Italian classes taught by the author, including the experimental group and the control group. "Flipped classroom" teaching mode and traditional teaching mode were adopted respectively, each group included 24 students. Teaching contents the use of direct pronoun of Italy. In the experimental session, all students attended the class twice per week, and there was three periods every time. Our experimental hypothesis was that, "flipped classroom" teaching process with virtuous cycle could effectively promote language study.

2.1 Experimental Process

2.1.1 Experimental Group

The experimental group consisted of 24 students, including 8 male students and 16 female students. They attended the class twice per week, and there were three periods per week (08:30-11:20 am on Monday and Wednesday).

2.1.1.1 Preparation Before the Experiment

Based on analysis of previous performance, personality characteristics and learning habits of 24 students with "ASSURE", the whole class was divided into 4 groups, and each group included 6 persons. The learning objective was to proficiently master the use of direct pronoun. "Flipped classroom" mode was applied. Students were required to participate in it and interact. It was required to evaluate and improve the teaching link in time.

Teaching materials and media selection: paper materials: Digital data were gathered in the folder (including teaching video, preview material, exercises and answers) and uploaded on Baidu Cloud, QQ or public email. The explanations of grammar, difficult points and exercises were recorded in the audio form and uploaded to "Himalaya" APP.

The starting point of teaching process for the experimental group was Analyze Learners in "ASSURE" mode. Since the students of Italian preparatory courses were based on art strengths, most of their energy was used for fine arts or music courses. As a result, their foundation of English was poor. When the author applied "positive transfer" of English to teach Italian, some students soon had the feeling of "comprehending by analogy" and "taking a tumble", some students were still at a loss. So, it was very hard for the same class to understand synchronously. For such case, the author required the students to preview before class. Preview examination was first carried out. Usually, the author let the students who felt difficult in the study put forward questions and let the students with good academic performance answer questions. On this basis, the author commented and expanded the questions, let students generate learning initiative and promoted their active study. In this way, the teacher can really become the assistant, guide and cooperator, while students become the learning subject.

2.1.1.2 Experimental Process

Experimental process included three steps: teaching activity, consolidation activity and test. "Flipped classroom" mode was reflected in the teaching process and consolidation process. To be specific, knowledge instruction process was completed in the "family learning activity", and knowledge internalization process was finished in "campus learning activity" and consolidation process,

(a) Teaching activity

The teaching activity included family learning activity and campus learning activity.

i. Family learning activity

Students needed to spend the time 1.5 times longer than the specified video duration in watching the video course at home. They were required to take notes in the watching process and summarize the content after watching, which contributes to propose targeted questions after class. Before class, students were required to fill in the questionnaire on video course study and exercise.

ii. Campus learning activity

When students attended class, the author organized to answer questions according to students' questions in the preview process in the first period of the class (three periods on Monday). In the next period, the author looked back the knowledge learned through the targeted exercises. In the final period, the author listed some common mistakes and discussed with students.

After the first class, the author assigned the group task—to make PPT for the use of direct pronoun, and the teaching time was totally dominated by students. Students completed a learning plan and assignments through cooperative learning. Before the second class (before 08:30 am on Wednesday), the assignments were submitted through the public email, and then the author assessed them.

(b) Consolidation activity

For the second class, two periods were first used to let students show their assignments. During team exhibition, other teams made comments. The author only took charge of the targeted questions. In the final period, the author summarized and commented the teamwork and triggered students' thinking. In the third period, the author expanded relevant knowledge on the basis of observation and students' feedbacks, and helped them to consolidate and digest the knowledge.

2.1.2 Control Group

The control group consisted of 24 students, including 10 male students and 14 female students. They attended the class twice per week, and there were three periods per week (08:30-11:20 am on Tuesday and Thursday).

2.1.2.1 Preparation for Teaching Materials Before the Experiment

The teaching materials were mainly paper materials. The author used PPT to show teaching contents in class.

2.1.2.2 Experimental Process

Experimental process included three steps: teaching activity, consolidation activity and test. The teaching activity and consolidation activity were conducted in accordance with traditional classroom mode.

(a) Teaching activity

The teaching activity included family learning activity and campus learning activity.

i. Family learning activity

The author required students to preview at home through reading textbooks, doing exercises and translating texts, and recorded the questions in the preview process. Thus, the author put forward four requirements: To learn grammar and think; to browse and translate texts, and learn the use of new words and new grammar; to do exercises and check the mistakes by referring to the answers; to analyze the mistakes and check grammar for better understanding.

ii Campus learning activity

In the first period, the author first spent about 10min in understanding students' preview through asking questions and found that only 8 students (33%) previewed the lesson. Next, the author taught students with the traditional mode, explained the grammar with 1.5 periods and applied PPT courseware. In the teaching process, the author made detailed an explanation through asking questions and observation. In the third period, the example in Italian textbook was applied to help students understand the use of direct pronoun. In the end, the author assigned the homework.

(b) Consolidation activity

In the second class, the author first spent one period in checking and explaining students' homework. The other two periods were assigned to students to do exercises. In the third period, the author explained the exercises and expanded relevant knowledge so as to help students to consolidate and digest the knowledge.

2.2 Experimental Results

To better test the learning effect and know students' teaching feedbacks, we tested the teaching effect and conducted satisfaction survey.

2.2.1 Teaching Effect Test

Unit test was conducted uniformly at 08:30 am on August 31. The content contained 50 closed questions, and the score of each question was 2, with the total score of 100. The test aimed to evaluate the practical learning effect of two teaching modes.

The questions were of gap filling type and composed of short sentences. Students were required to fill in the correct pronoun according to the situation, such as "(Lucia) ____ va in Francia.", "Ho visto Luca à ___ ho ___" and "Leggi il libro à Leggi___" . The detailed score as shown in the following table.

We can see from Table 1 that, the teaching effect of: "flipped classroom" is obviously better than that of traditional face-to-face teaching mode.

2.2.2 Satisfaction Survey

The satisfaction survey aimed at the experimental group, including self-made questionnaire and interview. The questionnaire was generated by Mike form. The questionnaires were collected via WeChat. Students' individual ability gap, individual wish, learning process needs and learning environment requirement were taken into account. Bu focusing on the four dimensions, the researchers designed 25 questions in the questionnaire,

Table 1
Comparison Table of the Test Scores

	"Test" group	Normal group
Group size	24 (students)	24 (students)
Gender	8 m.& 16 f.	10 m.&14 f.
Teaching method	Flipped classroom	Traditional, face to face
100 (full score)	17	3
90-99	4	6
80-89	2	5
70-79	1	6
60-69	None	2
Fail (<60)	None	2

where 16 questions adopted statement evaluation question form of Likert scale, and other multiple choice questions and descriptive questions were described by frequency statistics. For example, what do you think is the most difficult point in this chapter? Which is your favorite teaching material presentation mode?

Table 2
16 Likert Scale

No.	Contents of the survey	No.of participants	Min.	Max.	Average
1	lmportance of learning direct pronouns	24	4	5	4.38
2	It is not easy to master the grammar of direct pronouns	24	4	5	4.54
3	Satisfaction with how you have been taught	24	5	5	5
4	Satisfaction with the textbook and other teaching material of this chapter	24	5	5	5
5	Satisfaction with the arrangement this chapter	24	4	5	4.46
6	Satisfaction with your own learning process	24	3	5	3.54
7	Approve of the *Flipped classroom*	24	4	5	4.17
8	Approve of group activities organized in the classroom in order to complete a certain task	24	4	5	4.32
9	Approve of traditional way of teaching	24	1	3	2.03
10	Ifind it very convenient using the network to find information,to submit a work and to give feedback	24	3	5	3.76
11	I find it sufficient to learn with the digital textbook,thus no need for the paper noe	24	1	3	1.47
12	I find the *Flipped classroom* improve the learning efficiency	24	3	5	3.98
13	I find the *Flipped classroom* improve the self-learning ability	24	4	5	4.63
14	I find the *Flipped classroom* motivate the learning	24	3	5	4.74
15	I find the *Flipped classroom* motivate the learning	24	3	5	4.58
16	I find the *Flipped classroom* suitable 24	24	3	5	3.54

According to Table 2, the students showed high satisfaction for "flipped classroom". Their learning ability improved. Compared with traditional teaching method, they preferred "flipped classroom" mode. Besides, they did not think digital teaching material could replace paper textbooks. 22 students considered that, although digital teaching material is very convenient, they still hope paper teaching material is still used. During the interview of students, the author found that, students mostly applied "Himalaya" APP for study because of the advantages of low cost, easy operation and liberation of both hands. Thus, the author presented the teaching material in the audio form and updated it anytime.

2.2.3 Experimental Conclusion

According to the test and satisfaction survey, we consider that, the teaching effect of "flipped classroom" mode is superior to traditional face-to-face teaching mode. The students in the experimental group are much better than the students in the control group in terms of learning initiative, enthusiasm and autonomy.

3. THEORETICAL THINKING ON THE EXPERIMENT

3.1 Five Sub-Cycles in the Teaching Process

In the teaching practice of "flipped classroom", the author organized the classroom in the mode of cooperative learning, triggered students' thinking by asking questions and motivated the discussion through thinking, guided students to discover and solve problems, regarded "question" as the topic treated students' study with the mentality of a researcher and formed such virtuous cycle that "teaching benefits teachers as well as students".

To drive the virtuous cycle, virtuous cycle of each link in the teaching process is required. The whole teaching process could be divided into 4+1 sub-cycles. The first

four sub-cycles needed the teacher's participation. To be specific, the four sub-cycles include a virtuous cycle in the preview process, virtuous cycle in classroom, virtuous cycle in the consolidation process and the virtuous cycle of thinking. Besides, in the teaching process of "flipped classroom", students can also become the teaching executor. So, the last cycle is "virtuous cycle in the cooperative learning".

The essence of any education mode is to motivate the process of students' "introspection → study". So, the teaching process that the teacher participates in can be expressed as follows:
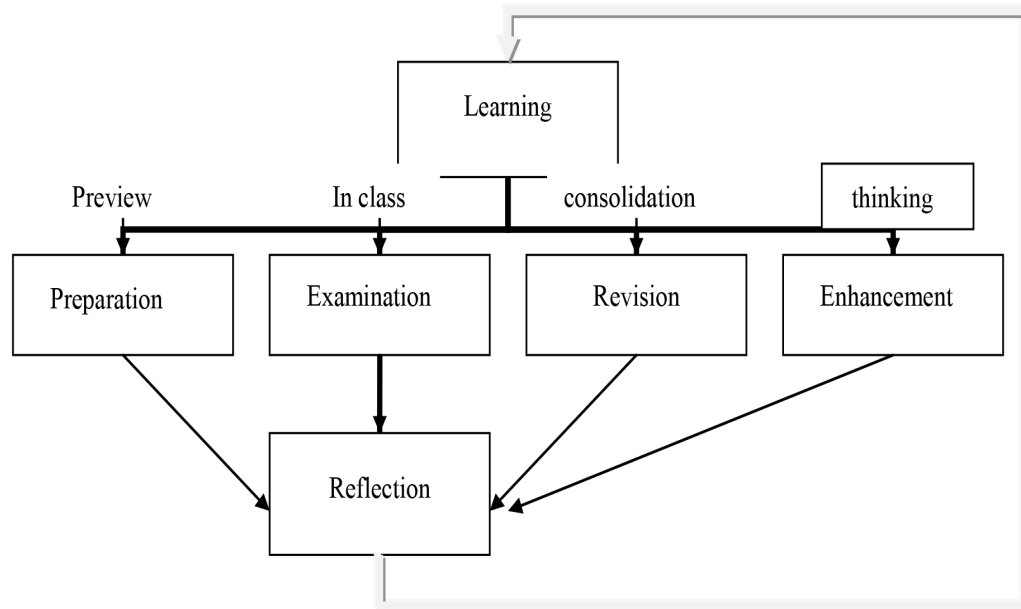

Figure 1
A Positive Cycle of Teacher-Centered Instruction

As shown in Figure 1, the cycle in which the teacher serves as the teaching subject contains the four virtuous cycles:

(a) Virtuous cycle in the preview process

The author offered teaching materials for students to preview at home to help them achieve the set teaching objective. Students could test their learning effect through finishing the exercises and checking the answers, and objectively evaluate their learning process. If their results are unsatisfactory, they may choose to repeat the learning process and learn the targeted textbook. The virtuous cycle of preview is first established before class though such mode.

Therefore, the virtuous cycle established by the students in the preview process is "preparation, introspection and study"

(b) Virtuous cycle in classroom

Now that students preview the lesson before class, such preparation may be combined with learning behavior in the classroom to form a virtuous cycle. In the teaching practice of "flipped classroom", the teacher can help students to achieve the virtuous cycle of "test, introspection and study" through the teacher's explanation.

(c) Virtuous cycle in the consolidation process

In the initial stage of each lesson, students may put forward questions to the author through free statement of their doubts. The author may answer the questions through combining examples. Next, the author may require students to propose the question to be discussed for discussion. The process of consolidating knowledge forms another virtuous cycle. In the virtuous cycle, students complete the process of "review, introspection and study" and enhance their understanding of knowledge.

(d) Virtuous cycle of thinking

In the whole learning process, students think continuously from the learning activity and further internalize their study. Thinking brings improvement; improvement promotes introspection; introspection helps study; study generates improvement. Thus, in the process, students complete the virtuous cycle of "improvement, introspection and study".

(e) Virtuous cycle in cooperative learning

In the cooperative learning without teacher's participation, students discover and propose questions to trigger thinking on the basis of team cooperation. In the process of solving the problem together, the new problems which deserve discussion will be found. Such repetition will form another virtuous cycle, as shown in Figure 2.
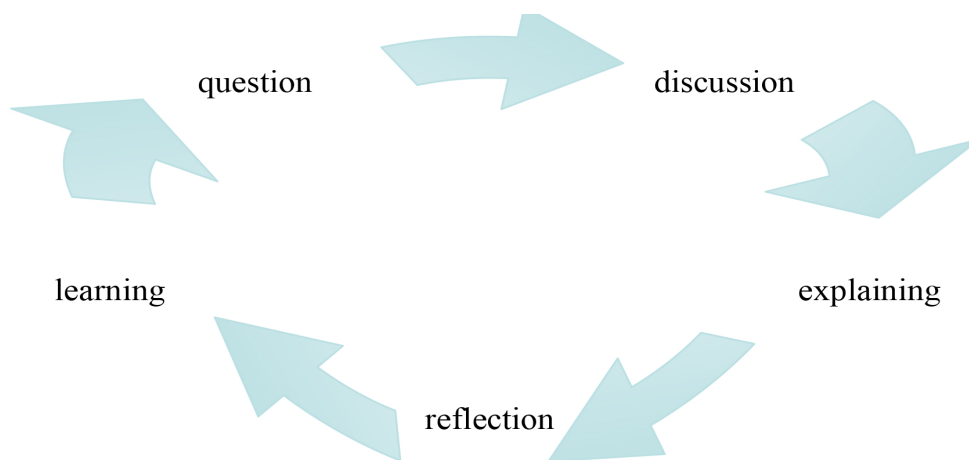
question

discussion

learning

explaining

reflection

Figure 2
A Positive Cycle of Student-Centered Instruction

In the teaching, the process of asking questions and answering questions is a virtuous cycle. Foreign language teaching in such environment not just brings students language knowledge, but also trains their critical thinking and gives them the chance for cooperative learning.

3.2 Cooperative Learning in "Flipped Classroom"

In cooperative learning, learning team serves as the unit, and the collective performance serves as the evaluation criterion. The teaching activity is conducted by systematically applying the interaction among dynamic factors of teaching. Such learning mode contributes to active classroom atmosphere, training students' awareness of active participation in study and improving their oral expression ability. Meanwhile, it is beneficial to interact between the teacher and students, enhance the relationship between the teacher and students and strengthen the team spirit and the sense of group honor. In the flipped classroom, just as New Curriculum Standard indicates, teachers should "actively initiate autonomous, cooperative and exploratory learning style" (Wang, 2002).

3.3 Reflective Teaching in "Flipped Classroom"

In the educational research field, the transformation from pure discussion on education methods to the research on teacher's professional development has become a trend (Wu, 2015). In this research, reflective teaching has become a core problem that teachers focus on (Gao & Wang, 2003). The key to virtuous cycle of flipped classroom is whether we can make the best of students; feedbacks, subdivide teaching links, analyze the behaviors of teaching and learning, diagnose teaching problems and effectively combine reflective teaching in the teaching process.

In the teaching experiment, the author screened students' learning difficulties through the questionnaire so as to well prepare the lessons and prepare corresponding teaching measures. For example, 100% positive

feedbacks may easily appear in the initial stage of the experiment. So, the author rethought it. Firstly, the author guessed that students might the mentality of catering deliberately. The author told them that all feedbacks and evaluations would be carried out anonymously and stated that the feedbacks and evaluations would not be related to term assessment. Finally, the author requested students to respect and guarantee objectivity of the experiment and to give the teaching feedbacks truly. In the preview before class, the author gathered students' feedbacks through Mike Form, and supplemented relevant preview materials through analyzing the feedbacks so as to improve the learning contents. The author noticed that some students did not dare to express their opinions in public due to introversion or got used to think independently and passively stated their views in class. The author modified the ways to answer some questions. For example, the discussion zone was set up on WeChat to gather and integrate students' views, and the author encouraged students to participate in classroom in the mentality of sharing.

CONCLUSION

Under the background of educational informationization, paper teaching material as the classroom teaching carrier cannot adapt to current educational concept. The development of new form of teaching material which integrates paper teaching material and digital resource has become inevitable. Digital teaching material should be advocated, used and developed as the main or auxiliary teaching material. The core problem for digital teaching material construction is to solve the optimization and combination of course teaching contents, i.e. express the course contents to learners optimally through picture, audio/video, animation and network, etc. (Cai & Zhao, 2009). The digitization of teaching materials

has great significance for virtuous cycle of teaching. The development of teaching materials must adapt to the development trend of individuation, modularization and three-dimension and achieve the transformation from "teaching material" to "learning material" (Luan, 2014).

Italian is a non-general language in China. The number of students learning this language is small. Due to the limit of the number and corresponding periods, the defects inevitably exists in the experiments. The author expects to deepen the study in the future Italian teaching and further explore the measures to improve the teaching effect of "flipped classroom".

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