

# A Study on Self-regulated Micro-course Learning and Implicitly Layered Flipped Classroom

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**Abstract**—The paper firstly introduces the developing process of flipped classroom home and abroad, and then illustrates the connotations, models and practical strategies of micro-courses and flipped classroom. The highlight of the paper is in the third part which details how the study of self-regulated micro-course learning and implicitly layered flipped classroom designed and developed. To divide the students into five implicit layers and to upload five-levelled micro-courses and preview learning materials are two preparatory steps. In-class teaching tasks mainly cover providing the critical review of learning material and settling the common questions raised by QQ group members; asking the main points of the text to check preview effects; selecting different-layered students to play different roles in the scenario; consolidating new knowledge with exercises and giving assignments in the form of discussion, translation or writing. After teaching practice and feedback analysis, we can get the result that ILFC (implicitly layered flipped classroom) enables 80 percent of the students to take active part in teaching activities, especially in text analysis and theme discussion. Moreover, it promotes multi-dimension interaction and increases deep-levelled cooperation and understanding. English learning interests and learning atmosphere are simultaneously inspired and improved.

**Index Terms**—micro-course, implicitly layered, flipped classroom, practical strategies

## I. INTRODUCTION

In the autumn of 1996, Maureen J. Lage and Glenn J. Platt firstly put forward a design of Flipped Classroom and made experiment accordingly in the college. (Lage, Platt, Treglia, 2000) Four years later, Wesley J. Baker constructed Model of Classroom Flipping which includes pre-class self-regulated learning about teaching materials in the form of teaching video and in-class interactive and cooperative learning between teachers and students. (Baker, 2000) when it came to 2007, two American chemical teachers in senior high school recorded videos for their lectures and PPT and uploaded them into the network, which exceeded expectations greatly. Hence, this new teaching reform of Flipped Classroom gained popularity from then on. At the moment, the teaching practice and research were carried out by western countries led by America, and they have achieved abundant fruits. In 2010, 140 students in Clinton & Dell High School got much higher academic records, failing rates in different subjects descending from 50 percent to 35 percent. (Liu & Wang, 2014) After experiments of Marcey, Brint and Grandgenett in 2013 and 2014, most of participants believed that flipped classroom helped them fulfill the pre-class task of collecting research information and in-class task of comprehending those conceptions. (Zhao & Lin, 2014) It is revealed that an increasing number of western teachers are applying the flipped classroom in their teaching practice with positive teaching feedbacks.

In recent years, Chinese educators and teachers started their initial research into flipped classroom, drawing a primary conclusion on the components of Flipped Classroom Model (FCM). Our flipped classroom model also adheres to the basic model of knowledge learning after class and knowledge internalization in class. Different teaching procedures are almost reproductions of western flipped classroom without Chinese peculiarity. It is known to all that the teaching activities can be existed and developed under the specific educational and cultural backgrounds. As the imported goods, flipped classroom should be reconsidered and reconstructed in correspondence to the Chinese educational peculiarities and the status quo of Chinese students. The paper explores the possibility of constructing implicitly layered flipped classroom in college English teaching in order to solve the problems of differentiation in English learning and realize the traditional Confucius concept of teaching students according to their aptitudes in the form of implicitly layered flipped classroom.

## II. THEORETICAL STUDY OF MICRO-COURSE AND FLIPPED CLASSROOM IN CONNOTATIONS AND PRACTICAL STRATEGIES

### A. The Analysis of Micro-course in Composition and Applied Teaching Model

There is no definite or unified definition of micro-course at present, but each micro-course is a video course characterized by single objective, less content, short learning period and good structure. Micro-course, in essence, is a new course resource supporting teacher's teaching and student's learning. Micro objective, micro teaching plan, micro teaching material and micro exercise, all these components compose Micro-course which belongs to the category of curriculum theory. When the students begin learning through micro-course, conducting on-line discussion and face-to-face communication to fulfill meaningful teaching and learning activities. In this process, micro-course belongs to another category of teaching theory. From the perspective of the whole process of teaching activity, Professor Hu advances that micro teaching video, micro teaching plan, micro teaching software, micro exercise, micro reflection, micro assessment, and micro feedback are seven elements of micro-course resources. (Hu, 2013) Professor Liu Mingzhuo, from the perspective of curriculum nature, upholds that it should possess the necessary curriculum elements, such as teaching objective, teaching content, teaching activity, teaching resources, teaching assessment, and other technological support like learning tools of notebook and comments. (Liu & Zhu, 2013) However, micro-course as a digital teaching resource should include such elements as objective, content, teaching activities, interaction, and multi-media. Their inter-relationships are reflected in Fig.1.

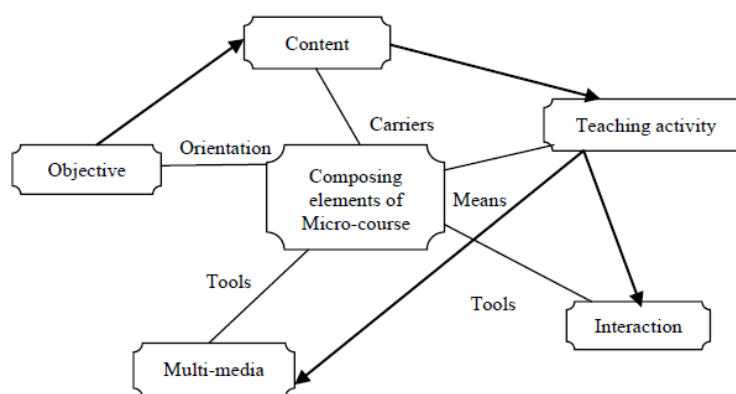


Fig.1: The composing elements of Micro-course (Su, Guan, Qian, Zhu, 2014)

The applied teaching models of micro-course generally include supporting flipped classroom, in-class differentiated teaching and after-class counseling. According to the arrangement of flipped classroom, micro-course can be arranged before class or in class. The key feature of flipped classroom is that the students learn micro-course before the teacher organizes the question exploring or gives lectures, which is defined as “to learn first, and to instruct afterwards.” After learning micro-course, the students are assigned appropriate pre-designed assignments. Teachers can obtain the students mastery of micro-course, providing feedback information for the follow-up teaching decisions. As to the in-class differentiated teaching model, teachers tend to require students to finish the corresponding tasks in order to test their learning effects or expand teaching materials. But due to the learning differentiation among students, some students cannot finish in-class assignment smoothly. Fortunately, these students will watch prepared micro-course to review relevant language points, sentence structures and grammatical explanations which help students fulfill the assignments without hindrances. Often times, the students encounter difficult problems while doing exercises after class. On this occasion, teachers record the micro video to help students analyze these difficult problems and solve them ultimately. Table 1 illustrates these three applied teaching models in college English teaching practice. Overall, there are two chief features of micro-course teaching application: it's suitable for individual learning in or after class; owing to the time limitation, it's generally arranged before or after class.

TABLE 1:  
THE APPLIED TEACHING MODELS OF MICRO-COURSE IN TEACHING PRACTICE (SU, GUAN, QIAN, ZHU, 2014)

| Applied teaching models     | Teaching procedures   | Functions of micro-course   |
|-----------------------------|---|---|
| Flipped classroom           | Learn micro-course →<br>Finish pre-designed tasks<br>Clarify problems and puzzles →<br>Teacher's lecture and group discussion<br>Teacher's decision after getting feedbacks<br>Individual or group learning | Pass on knowledge<br>Inspire the students' thinking and clarify problems and puzzles<br>Provide information for teacher's teaching decision |
| In-class different teaching | Students fulfill in-class tasks →<br>Students learn micro-course →<br>Individual or cooperative learning  | Review key points of English learning<br>Provide individual guidance  |
| After-class counseling      | Do after-class exercises<br>Learn micro-course, individual learning   | Provide target guidance for exercises<br>Provide counseling relevant to language points and exercises                                       |

### B. The Connotation and Basic Teaching Model of Flipped Classroom

The Flipped Classroom or Inverted Classroom refers to a kind of teaching pattern aimed at realizing teaching objectives through two steps, the first one is teacher making teaching videos and students watching video explanations at home or after class, and the second one is both of them coming to the classroom to engage in face-to-face sharing, communicating learning results and experiences. (Liu, 2012) This teaching pattern is guided by constructivism, which reverses the traditional one with the support of modern educational technology, following such procedures as teaching design, video making, online self-regulated study, cooperative study, individual guidance and teaching evaluation. Fig 2 records these teaching and learning procedures concretely and apparently.

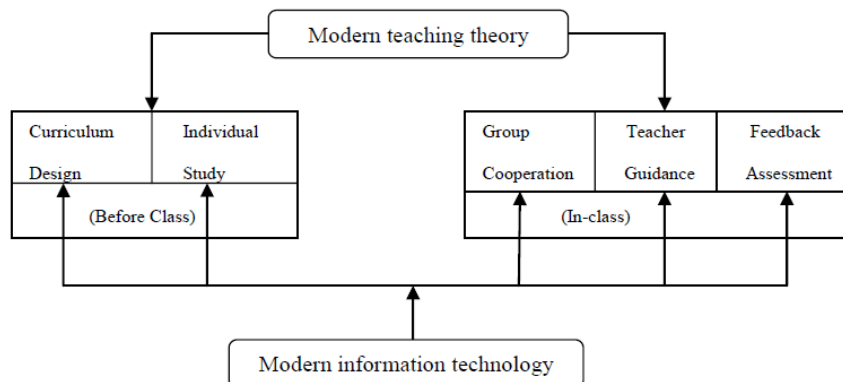


Fig.2: The basic pattern of flipped classroom (Jiang, Xu, 2014)

At present, there are three popularly typical flipped classroom patterns. The first pattern is quite similar to the one put forward by the experts of Baker and Talbert. The merit of this pattern consists in the clear presentation of its key element, which is to put teaching contents to outside the classroom, but to put homework to inside the classroom. The demerit lies in its over-brevity without demonstrating the students' learning activities. The second pattern is an improved and combined pattern based on constructivism learning theory and systematic teaching design theory. This pattern emphasizes information technology and activity learning as two levers to construct learning environment for flipped classroom, reflecting the students' learning activities clearly and completely. The only deficiency is its no easy operation. The third pattern, based on the experiment of flipped classroom, proposes two improved theoretical models of self-regulated flipped classroom and cooperative-explored flipped classroom. (David, 2004) This pattern put more emphasis on students' learning autonomy, making the teachers and students discover the advantages of flipped learning at the very start with the shortcoming reflected in lack of presentation for students' individual and autonomous activities.

### C. The Practical Strategies of Flipped Classroom

To explore the possibility of flipped classroom from the range of application: according to the recent survey, many teachers believe that flipped classroom is suitable for students in high school or college with learning autonomy and willingness to express viewpoints. In particular, the flipped classroom tends to practice in small-size class teaching experiment in USA, but in China, our classroom is normally large-scale class teaching more than 40 or 70 students, which increases the difficulty of operating individual teaching practice of flipped classroom. This is a difficult point for the Chinese teachers to straighten out in future research.

To explore the practicable teaching content for flipped classroom: the theoretical basis of flipped classroom is Mastery learning theory which stresses the objective targeting and feedback correcting. We have to understand and analyze the type of knowledge to target our teaching objective so as to bring the superiority of flipped classroom into full play. Generally speaking, knowledge can be classified into declarative knowledge and procedural knowledge. The first four teaching procedures for teaching declarative and procedural knowledge are similar including informing teaching objectives, recalling and consolidating the previous knowledge, presenting organized new knowledge, and explaining the relationship between new and old knowledge to promote understanding of the new knowledge. But for the second-staged learning, declarative knowledge learning pays more attention to guide students to review and memorize the new knowledge, but the procedural knowledge learning attaches importance to inspire the students to react to teaching activities, to offer feedback and correction. As a result, the preview effects are vital foundation of in-class teaching effects, so many a teacher concentrate on making micro-course videos, but in-class procedures are also as important as the previous one.

To explore the feasibility of flipped classroom from the teachers' fundamental qualities: it's not the technology, but the design of deep-leveled learning that constitute the core of flipped classroom. The professional qualities for the teachers contain personality, teaching design, teaching practice and teaching reflection. It's necessary for the teachers to be equipped with logical thinking ability in order to enhance class teaching intelligence. The ability of finding the problem is one of the basic internal capacities which can be displayed explicitly in organizing classroom teaching activities. The skill in asking questions corresponds to six levels of cognition: recalling, understanding, applying, analyzing, synthesizing, and evaluating. (Song, 2010) The American online learning counselor Andrew Miller reviews that if you are not a good teacher, the flipped classroom cannot ensure a better learning effects. (Rong & Peng, 2015) A

good teacher's external realization consists in solid teaching qualities, such as the analysis of teaching contents, the design of declarative teaching objective, the transformation from learning theory to teaching theory and technology, the flexibility in the use of learning tool software and traditional reading materials to implement teaching practice.

### III. CONSTRUCTION AND PRACTICE OF SELF-REGULATED MICRO-COURSE LEARNING AND IMPLICITLY LAYERED FLIPPED CLASSROOM

#### A. *The Precondition Analysis of Constructing Self-regulated Micro-course Learning and Implicitly Layered Flipped Classroom*

After consulting several academic recourses database, such as HowNet, Wanfang, Duxiu Network and bing Network, we found that there are many repeated applied researches into micro-course learning and flipped classroom without deep and meticulous research. The review for Netease open class, TED, and micro-course from Khan Academy is similar to the students' response to college English teaching: for the same teaching content, some students regard them as simple one, while others as difficult. These different reactions reveal that the micro-courses meet the individual needs in time, but neglect the difference in learners' cognitive levels. Only three papers have been indexed in HowNet till now, mainly revolving around information and English teaching in high school. According to our available information, there are no such researches as self-regulated micro-course learning home and abroad at the moment. But all these advantages of easy approaches, short period, concise content, and modular and scenario design from micro-course can only play their full play on pushing different-levelled course to different-levelled students so as to realize the educational goal of teaching students according to their aptitudes. At the same time, many researchers believe that implicitly layered teaching is better than explicitly layered teaching, for it is conducive to improve students' non-intellectual factors, and hence benefits the college students' English performance in larger scale. (Yan, 2008) The public basic courses represented by college English face the same problem that the students will be assigned to the same class with similar scores in college entrance exams but with different academic bases. College English classroom being characteristic of focusing on language points and text comprehension has been the normal state in vast number of colleges. The purpose of this research is to transform this awkward situation, providing a practicable and operational teaching way of thinking and empirical approach which not only utilizes the network software technology and corresponding teaching software to improve the students' abilities to straighten out the real problems in their careers, but also enhance the students' autonomy and flexibility in English learning in class and after class.

#### B. *Design of Self-regulated Micro-course Learning and Implicitly Layered Flipped Classroom*

The goal of the research is to construct an integrated teaching pattern with layered micro-course, cooperative student-and-teacher online learning community and implicitly layered flipped classroom.

Step one: Teachers divide the students into five (A, B, C, D and E) implicit layers through tests, classroom observations, questionnaires, students' reflection and evaluation by stage, making detailed analysis on the number, basic language abilities, and key language points to direct for different layers of students.

Step two: According to the analytical results, teachers prepare for the new lesson together, making different-leveled micro-courses to meet the needs of the students with different language bases and demands.

Before learning the new unit, teachers are required to select the main contents including basic language points, sentences, and paragraphs and design self-regulated preparatory materials for students. Teachers make teaching videos in teaching video-room and edit them in educational technology center, or make PPT with teachers' mob video and then change them into avi-form files. Different-leveled micro-courses are labeled as five levels of A, B, C, D and E, and the students choose to watch micro-course independently. Learning length and times to play depend on students' willingness and abilities. Table 2 displays the whole process of college English flipped classroom.

TABLE 2:  
TEACHING PLAN FOR COLLEGE ENGLISH IMPLICITLY LAYERED FLIPPED CLASSROOM PATTERN

| Time                     | Teachers' tasks   |   | Students' tasks  | Forms   |
|--------------------------|---|---|--|---|
| Preparatory stage        | To divide the students into five groups according to their English levels.  |   |  | Teachers prepare for lessons cooperatively                                      |
| Two weeks before class   | To write teaching design; to record five-leveled micro-courses; to assign different pre-exercises.  |   |  | Teachers prepare for lessons cooperatively                                      |
| One week before class    | To upload the micro-courses to QQ group.  |   | To watch micro-course suitable for one's English level, taking notes, learning relevant language points on one's own, doing exercises and writing down the questions.  | Students' self-regulated learning   |
|                          |   |   | To participate in QQ group discussion, putting forward questions, looking for answers and advancing the common questions of the group.   | Students' cooperative learning through online learning community                |
| The day before the class | To go into QQ group to check learning effects and analyze the main learning problems  |   | To interact with other students or teachers to present the questions and to explore them.  | Intercollegiate teacher-to-student online interactive learning                  |
| Flipped Classroom        | 20 min.   | Teachers give the concluding review of learning material, drawing the conclusion on the common questions put forward on QQ group. |  | Internal cooperative learning among teachers and students                       |
|                          | 25 min.   | Teachers ask the main points of the text, checking preview effects.   | Group discussion; teachers require the students to answer different-leveled questions according to implicit layering   | Implicitly layered teaching; group cooperative learning; individual guidance    |
|                          | break   |   |  |   |
|                          | 30 min.   | To assign training scenario, to participate in students' training, and to evaluate the training process in formative form.        | Teachers select different-layered students to play different roles in the scenario. The students improve their performance according to teachers' guidance, fulfill different-leveled scenario with newly-learned knowledge. | Implicitly layered teaching; multimodality interaction; exploratory activities  |
|                          | 15 min.   | To consolidate with exercises and give assignments in the form of discussion, translation or writing.                             | To review and consolidate the main points of the text as requested.  | Teacher-to-student interaction  |
| Next day after class     | To evaluate the whole learning process and results, answering the remaining questions, emphasizing the assignment and training projects   |   | To watch micro-course appropriate for one's abilities; to review learning together; to write reflection; to finish assignments to consolidate the main points of the text.   | Self-regulated learning; interactive learning through online learning community |
| Next week after class    | Students can keep on scenario training through network platform, QQ or WeChat in order to internalize the knowledge of the text and improve teaching effects in classroom. Teachers can join in their interaction or collect those unclear questions, answering them online. It is required that all students should reflect on the whole process of flipped classroom, concluding learning procedures, results, the remaining puzzles, improvements, and the comparative study with the traditional classroom. All these reflections can offer good food for teachers to improve teaching pattern and contents of flipped classroom. |   |  | Intercollegiate cooperation; ubiquitous interactive learning                    |

### C. Teaching Practice and Feedbacks of Self-regulated Micro-course Learning and Implicitly Layered Flipped Classroom

After careful designing for the flipped classroom in college English, teachers start teaching experiment in the English class, and the subjects are freshmen coming from the department of Criminal Technological Investigation. In the first procedure, the students watch micro-course and learning materials through QQ group or learning platform. The highlight of the learning materials is division of five levels and the students can select materials appropriate for their abilities to preview. These five levels include key words and expressions, structural analysis, discussions, quotations and scenario training. Fig. 3 and Fig. 4 are the presentations of the 2<sup>nd</sup> and 3<sup>rd</sup> level of preview learning materials.

Part Division of the Text

| Parts | Para(s) | Main Ideas   |
|-------|---------|--|
| 1     | 1       | John Blanchard was expecting someone at Grand Central Station. |
| 2     | 2~6     | How John Blanchard had fallen in love with Miss Maynell.       |
| 3     | 7~15    | Miss Maynell put Blanchard to a test.                          |
| 4     | 16~17   | It was wise of Miss Maynell to give such a test.               |

Fig.3: The 2<sup>nd</sup> level of preview learning material for Unit 6: A Valentine Story in flipped classroom

## Group Discussion

Do you think that cyber love is believable and reliable? Why or why not?

Fig.4: The 3<sup>rd</sup> level of preview learning material for Unit 6: A Valentine Story in flipped classroom

After following the whole teaching procedures from preview, in-class explorative discussion and critical thinking, and after-class consolidation and expansion, teachers finish the questionnaires about this flipped classroom practice. Table 3 recorded the different feedbacks of eight questions about the teaching effects of flipped classroom.

TABLE 3:  
ANALYSIS OF THE FEEDBACKS OF IMPLICITLY LAYERED FLIPPED CLASSROOM

| Questions   | Feedbacks  |   |  | Reasons  |
|---|--|---|--|--|
| 1. Compared with traditional teaching pattern, flipped classroom pattern is   | Better<br>81%  | Same<br>16%   | Worse<br>3%  | Better: Active learning atmosphere; interesting and innovative; increasing the opportunity of discussion and independent study<br>The same: Have their own advantages and disadvantages; autonomous learning is more important<br>Worse: providing no reasons  |
| 2. Compared with the previous unified preview, this one providing different-levelled learning material without strict requirements is | Better<br>71%  | Same<br>26%   | Worse<br>3%  | Better: Enhance learning efficiency; teach students according to their aptitudes; free and convenient self-learning; understand the text further; with good preview result; bring the students' potentiality into full play; have clear direction for preview<br>The same: Too much learning material for preview; being difficult to understand learning material<br>Worse: Have no self-control; being unable to preview independently |
| 3. Compared with the previous units, the number of new words and expressions that you can remember is                                 | More<br>52%  | Same<br>45%   | Less<br>3%   |  |
| 4. Preview time?  | 20min.<br>10%  | 30-45min.<br>82%  | Around 1 hour<br>8%                                      |  |
| 5. Times for answering questions?   | 3-5times<br>50%  | 1-2 times<br>30%  | 0<br>20%   |  |
| 6. Are you satisfied with the design of this flipped classroom?   | Very satisfied<br>16%  | Satisfied<br>78%  | Dissatisfied<br>6%                                       |  |
| 7. Which is the important part to discuss in the flipped classroom?   | Consolidation of language points(explanation)<br>49%   | Cultural backgrounds and text theme (discussion)<br>26% | Expansion and deepening of the theme (case study)<br>25% |  |
| 8. What you have gained the most in this flipped classroom?   | Enhance English learning interests; understand the theme of the text deeply; expand thinking space; enlarge vocabulary; increase the abilities in group cooperation; increase interaction with teachers and other students; understand others' ideas and levels through active discussions |   |  |  |

According to the feedbacks from students of Grade 2015, Class 3 and 4 in Criminal & Technological Investigation, we come to the following conclusions: compared with the traditional teaching pattern, FCM possesses the huge advantages over the traditional one; the implicitly layered flipped classroom can provide different-levelled learning materials and micro-courses to correspond to different-levelled students, which helps attain the educational goal of teaching students according to their aptitudes; FCM enables most of the students participate into teaching procedures and activities focusing on profound, wide-ranged and critical-thinking questions; FCM promotes multi-dimension interaction and increase deep-levelled cooperation and understanding. Learning interests and learning atmosphere are greatly inspired and improved. In a word, FCM for College English teaching is a beneficial attempt worthy of further exploration and improvement.

#### IV. CONCLUSIONS

This implicitly layered flipped classroom allows students to adopt the most appropriate learning approach to watch the micro-course and preview learning materials according to their real English capabilities so as to enhance learning efficiency and results. They can also have opportunities to fulfill some professional assignments as virtual roles with the teachers and students from different colleges or universities. The multi-mode interaction in flipped classroom can not only train the students' cooperative ability and team spirit, but also work out the practical problems in the future work by applying English knowledge points. As to English teachers, they can be free from the simple and repeated explanations of language points and careful preparation for each unit, putting more efforts into those challenging and flexible work in putting forward meaningful and critical questions to discuss, coordinating multi-dimension cooperation and exploration, and making profound conclusion on the themes and connotations of the text.

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