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硕士学位论文

（教育硕士）

An Empirical Study on Flipped Classroom Model Based on Micro-Lectures for English Teaching

基于微课的英语翻转课堂实证研究

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Abstract

Flipped classroom is emerging as the new paradigm of modern education, but the effect differs. The study used the research of literature, case analysis method, the qualitative and quantitative research methods. The study introduced English flipped classroom model based on micro-lectures on the basis of previous studies and analyzed key elements of the model. Besides, the study made a survey on whether students were satisfied with the model. Meanwhile, according to six dimensions: learner, instructor,course, technology, design and environment, deeply research were also carried out to explore the critical factors that affected students' perceptions of and attitudes towards the English flipped model. What's more, on the basis of interview and analysis, some suggestions were given by the author on the features that micro-lectures should obtain since the micro-lectures have got high evaluation in the perspectives of instructional usability and efficiency.

It was concluded that flipped classroom model based on micro-lectures was also accepted by vocational students, and has gained great satisfaction. Among six dimensions,design dimension was proved to have a significant effect on students satisfaction. Micro-lectures in flipped classroom should be in performance mode, on some specific language points,less than 10 minutes, in two languages, with normal speed and animated characters.

Since the English flipped classroom has been proved to be a success to some extent, four features that flipped classroom model were concluded from the study, with the hope of giving some suggestions and inspiration for educators who are planning to apply flipped classroom model into practice.

Keywords: flipped classroom micro-lectures qualitative and quantitative research critical factors students satisfaction

摘要

翻转课堂教学模式在国内外引起了极大关注，但实践效果各有不同，尚有待验证。

本研究采用文献分析法、案例分析法、定量研究和定性研究的方法，在深入研究的基础上提出了基于微课的英语翻转课堂教学模式，并对该模式中的关键要素进行阐述。此外，本研究调查分析了学生对该教学模式的满意度，并在此基础上从学习者、教师、课程、技术、设计和环境六个维度进行深度分析，总结出了影响翻转课堂实施的关键影响因素。同时，从有用性和可用性两方面对所应用的微课进行了基于用户体验的评价，结合深度访谈和分析，作者给出了翻转课堂中使用的微课应具备的特征以及制作建议。

研究结果发现，尽管职业院校学生的英语水平不如大学生的英语水平，但是基于微课的翻转课堂教学模式仍受到了职业院校学生的欢迎和接纳。数据分析发现，六个维度中的“设计”维度是影响学生对翻转课堂满意度的关键因素。翻转课堂中使用的微课最好采用情景模式、聚焦具体知识点、时长 10 分钟以内、以正常语速双语讲解，微课中的人物采用动画形象比较受学生欢迎。

鉴于英语翻转课堂教学模式在本研究中成功实施，本文也对翻转课堂应具备的特征进行了总结和归纳，借此机会，希望能给更多想要尝试翻转课堂教学模式的研究者一些建议和灵感。

关键词： 翻转课堂　微课　定量定性研究　关键因素　学生满意度

Contents

Chapter One Introduction

1.1 Background of the Study

The flipped classroom model is a pedagogical approach that has become something of a buzzword in the recent years. During the past years, a number of corresponding terms, such as inverted classroom (Lage & Platt, 2000), just-in-time teaching (Novak, 2011), flipped classroom (Bergmann & Sams, 2012), and inverted learning (Davis, 2013), have been listed in the literature. Origination stories differ, but most credit Jonathan Bergmann and Aaron Sams, high school chemistry teachers from Colorado, who began to use recorded lectures in 2006 to meet students individual needs by allowing the teachers to personalize the students' education. Bergmann and Sams were science teachers in a high school who had students missing a lot of classes. Their high school was located in a remote area and students were required to go through long distances for school events and other activities. Frustrated by the amount of time that students were missing from class, Bergmann and Sams decided to record their lessons on video so that students could review their lectures outside of class. The response they had from students was extremely positive, so they continued to record more video lessons. Bergmann and Sams saw an improvement in their teaching effectiveness and the engagement of their students. They noted that this was not due to their video lectures, but due to increased face-to-face time they had with their students because they were not spending time lecturing. By replacing the traditional lectures with lesson videos, Bergmann and Sams could use their limited classroom time to work with students one-on-one, conduct more labs, and answer more questions. The original idea was to help those who were absent from class, but they soon realized this model was beneficial for all students (Bergmann & Sams, 2012). They described their new learning model as the *Flipped Classroom*. As its name suggested, the idea of flipped classroom is:Instead of coming to class to watch the teacher lecture and then going home to practice what they learned- home work- students watch the lecture at home and then come to class to practice what they've learned- that is, they're now doing homework in class(Sams &

Bergmann, 2013).

Allowing students to watch videos before class, at anytime they choose, as often as they wish, and stopping wherever they feel necessary, is a revolutionary of the traditional model of classroom learning. Therefore micro-lectures have been a key component to successful flipped classroom practices. At the present writing(till December, 2016), more than 646 clips have been presented on EBSCO host with the key words “flipped classroom model”, ranging from mathematics, biology, nursing, computer and physics, to name only a few. Only 4 clips of these studies on EBSCO host are involved in English or English learners, while 8 clips on CNKI are found. In terms of the key words of micro-lecture and flipped classroom, only 1 clip about micro-lecture in flipped classroom is listed on EBSCO host and 6 clips listed on CNKI. The paucity of empirical research on the implications of using flipped classroom model in English learning process is what promoted me to conduct this study.

1.2 Purpose and Significance of the Study

Since 2011, flipped classroom has been introduced into China and applied in secondary schools such as Chongqing Jiangjin Jukui School and Shandong Changle No. 2 Secondary School, and higher education institutes such as Tsinghua University, University of Electronic Science and Technology of China. The advantage of the flipped classroom is that the content, often the theoretical-based component of the lesson, becomes more easily accessed and controlled by the learners. A major roadblock or barrier to the implementation of this model is that many educators do not know what to do in the classroom with the time once spent doing lectures. For educators, who are used to use the didactic model, a framework is needed to assist them with the implementation of the flipped classroom and the effect of the flipped classroom needs to be proved. In view of this, the main purpose of this study is to make a survey on the effect of the English flipped classroom model after research and analysis of domestic and foreign flipped classroom models. With the practice of the English flipped classroom model, what learning materials offered , what teaching procedures are and how to evaluate students’ learning could be clearly illustrated. Meanwhile, analysis was made to explore whether students were satisfied with the model. Deeply research was carried out to

examine the critical factors that affect students' perceptions of and attitudes toward the English flipped model since this would determine whether the teachers would continue with this application. It is also necessary to survey whether students were satisfied with the micro-lectures applied in English flipped classroom model and some suggestions for teachers on using micro-lectures in flipped classroom were given.

In traditional classroom, teachers are the center of classroom activities and students are the passive receivers of knowledge. The transmission of knowledge occurs in class, and digestion and absorption of knowledge is left for students as the homework. Therefore, to some extent, the traditional teaching methods limits students' learning and the development of higher level thinking. However,flipped classroom model based on micro-lectures is able to make up the disadvantages of the traditional teaching model. The transmission of knowledge is finished before class, and teachers' instructional lectures are replaced by micro-lectures, and digestion and absorption of knowledge is done in class. It can simulate students' interests, cultivate students' active learning ability, skills of finding and solving problem, cooperating learning ability by a series of class activities and the aid of teachers. So the flipped classroom model based on micro-lectures is necessary and essential.The main influencing factors summarized in this study and suggestions on micro-lectures would provide instructions for the educators who want to establish and apply flipped classroom in their own teaching. It is hopped to supplement and develop the application of flipped classroom model based on micro-lectures in teaching practice, and strive to provide new ideas for our educational reform.

1.3 Organization of Thesis

This paper is made up of five chapters. In Chapter One, the background and significance of the study are mainly introduced . The second chapter provides a review of the flipped classroom and micro-lectures in China and abroad. The theoretic foundation of flipped classroom is also introduced. The third chapter presents the empirical analysis. A new flipped classroom model for the study of EFL is introduced. Research methodology, as well as data collection and analysis are also discussed. The results of the study are shown in the fourth chapter, in which shows students attitudes towards English flipped classroom and

micro-lectures, as well as the critical factors affecting learners satisfaction and suggestions on micro-lectures used in flipped classroom. The final chapter,Chapter Five, presents the conclusions and implications of the study and also provides areas recommended for future research.

Chapter Two Literature Review

2.1 Review of Micro-Lecture

2.1.1 Definition of Micro-Lecture

Because of rapid development of information technology and the rapid popularization of smart phones,laptops, computers and mobile terminal, many colleges and universities have established a digital campus with wireless campus network. Mobile learning has entered the university campus due to its advantage of convenience. Micro videos or micro lectures have become a kind of new learning resource,which is very popular with college students. The application of micro-lectures is good for students' learning,for teachers' teaching,and definitely benefit for the development of college education,especially has realistic significance in college teaching.

The definition of micro-lecture given by Wikipedia is to actual instructional content that is formatted for online and mobile learning using a constructive approach. More specifically, as described in the Chronicle of Higher Education, these are approximately 60 second presentations with a specific structure. They are not just brief (one minute) presentations. The concept of micro-lecture is initiated by David Penrose, a senior teaching designer and College online service manager in America New Mexico San Juan College in 2008. David Penrose is called the One Minute Professor and he calls the micro-lecture “Knowledge Burst”. Since then, micro-lecture used as a teaching method was not only spread in the United States, but also begun to be introduced to the rest of the world. (from https://en.wikipedia.org/wiki/Microlecture)

Micro-lecture, is also known as micro course, refers to the video as the main media for ten minutes time to recording the teacher’s lecture for a certain knowledge point, including activities of teaching and learning. Educause defines a micro-lecture as, “a short recorded audio or video presentation on a single, tightly define topic”(Educause, 2012).Compared with the previous teaching videos or video courses, micro-lecture video is shorter, absorbs more various resources, and pays more attention to the integrity of segmentation knowledge.

By the time micro-lecture came to China, the length of micro-lecture has been changed from 60 seconds to around 5 - 8 minutes, normally no more than 10 minutes. It is not the only thing that the length was adjusted; just like many other new things from abroad, it has to adapt to China's national conditions. Consequently, the concept of micro-lecture is redefined by many educators.

Researcher	Definition	Features
Tiesheng, Hu	Micro-lecture, also named as micro video, is a kind of new online video lectures supporting a variety of learning styles with micro teaching videos as its carrier, and focusing on some specific language points or teaching procedures.	Emphasize online video courses to support multi-learning styles such as mobile learning,automatic learning and collaborative learning.
Jianli, Jiao	Micro-lecture is online teaching video with explaining some language points as its goal, short snappy online video as its form and learning or applying as its aim.	Focus on the form and the application objectives.
Jiahou,Li	Micro-lecture is a mini course which is within 10 minutes,possessing clear teaching goals to clarify a question.	It does not only include micro-lectures, but also consists of records,PPT, formative materials and learning lists or activity arrangements.
Yichun,Zhang	In order to acquire best learning effect, micro-lectures are informatively designed as short but complete teaching activities which focus on some language points in the forms of steam media.	It defines micro-lectures as teaching activities and highlights the importance of teaching design.
Xiaojun,Zheng	In order to support flipped learning,blended learning,mobile learning and fragmented learning etc.,micro-lecture works as a well-designed visible digital resource bundle to clarify some language points in the form of short micro teaching videos.	It's a kind of resource bundle serving various learning styles in the form of videos.
Bingjian, Wu	To meet individual needs,teachers and students could make short videos or flashes to share information and skills and realize context experience and semantic interconnection. The videos can become customized by the learners and also can be embedded in the wiki as sharing resources.	Bring in the concept "customized by the learners" and "embedded in the wiki" to enhance the maximum effect of micro-resources.

Generally, Micro-lecture refers to the information instruction design meticulously, in the form of streaming media explaining certain knowledge or completing teaching activities that promote the learners' autonomous learning to the best effect. It is filmed and uploaded to the network platform, easily for learners to access and study.

With the development of society, the mobile Internet time directly changed the way people live and learn. Because of the speeding up of people's life and the popularity of smart phones, reading fragmentation time for Chinese people has arrived. According to the survey of the Chinese academy of press and publication, the rate of digital reading in 2014 is 58.1% which is 8.0 percentage point risen from 50.1% in 2013. Along with the diversification of university curriculum, colorful campus life, and the complete compulsory professional courses, students also have to take courses which are interesting and helpful to their personal development. English as a public basic course, its learning style, methods and time are increasingly facing challenge. The emergence of micro-lecture kept up with the current situation and met the times trend. It is a brand new way to transmit and teach knowledge. As a new type of learning and teaching resource, micro-lecture provides a new method for both students and teachers. It also has a profound impact on traditional English teaching model, teachers' teaching concepts and professional skills as well as the relationship between teachers and students.

2.1.2 Function of Micro-Lectures in English Teaching

Digital media has become a part of students' daily life because of the arrival of digital technology. More and more students want to use hi-tech electronic devices for learning. Typically students are interested in using new technology like mobile phones, tablet computers, laptops, iPhones, iPods, iPads and social media programs like Facebook, YouTube and wechat. Therefore, there is a demand for the creation of learning tools that enable students to learn with their current habits, at their own pace and time. This is where the term micro-lecture comes into play. Micro-lectures provide a self-help resource for students, either at the time of the class or later for review, explaining key language points or demonstrating techniques that might be difficult to master. The brief format of these lectures has high effect on focusing students'

attention on a single topic for a short time, limiting the chances for distraction. Students could playback, refer to the instructor's instruction as often as needed. Micro-lectures are a great addition to the classroom and have great influence on teaching and learning. It is useful because it will help make knowledge accessible to all. Also, it is believed that using new technology in learning may raise students' learning interest and motivation since it is easy to use and enables students to learn outside the classroom.

Since micro-lectures use multiple media methods in their delivery and are available to students, the brief nature of micro-lectures allows them to be easily shared. "Using micro-lectures as brief introductions of summaries can help students get ready for new learning, review for exams, or prepare for the application of skills."(Sweet Dawn, 2014). It is important to ensure that the micro-lectures are used to create a learning environment for students to take some responsibilities for their own learning. Students can watch the video as many times as necessary; "... Students can pause their teacher, rewind their teacher, and make sure they actually learn the important concepts" (Bergmann & Sams, 2012).

"The advantages of micro-lectures in a flipped classroom include the differentiation of instruction and the increased engagement during face-to-face class time."(Sweet Dawn, 2014).Micro-lectures can be seen as the core resource of flipped classroom because it is accordance with the idea of learning "whenever and wherever". The video of micro-lecture is short, so the way of presentation avoids the students feel boring and makes them concentrate on learning. The features of micro-lectures allow students at various learning levels to achieve course objectives at a pace suitable for them ,alleviate some of the pressures caused by class size and time limits, and provide for more individualization.(Sweet Dawn, 2014).

2.2 Review of Flipped Classroom Model

2.2.1 Overview of Flipped Classroom

Flipped classroom, also named "upside down classroom" or "the inverted classroom", is a radical change of the traditional teaching: lecturing by day and doing homework by night.

The concept of flipped classroom can date back to Woodland Park High School in Colorado Rockies. Because of poor traffic and extreme weather, lots of pupils were absent

from school. In 2007, the school teachers Jonathan Berman and Aaron Sams put their classroom PowerPoint presentations and audio materials on videos and uploaded them to web, so that the absent students would learn by themselves at home. Later, this way was extended to those students present at class, who watched the video at home or after class and did homework in class. In class, teachers would not lecture but help students to solve problems and do activities. This teaching method was defined by Sam and Bergmann(2012)as simply watching lectures at home that were traditionally done in the classroom, and then completing the homework in the classroom.. More importantly, Salman Khan and Khan Academy (www.khanacademy.org) contribute a lot to the popularization of flipped classroom. Salman Khan made lots of videos on mathematics and published them on the net. All these videos were highly popular with students and teachers in other schools. Some teachers and schools changed their teaching style after watching Khan's videos. This model is soon very popular across America1 and the Canadian "Globe and Mail" in 2011 granted to the model the most radical technological innovation of class teaching.

As its name suggests,flipped classroom is that rather than taking up limited class time for an instructor to introduce a concept (often via lecture),the instructor can create a video lecture, screencast, or vodcast that teaches students the concept,freeing up valuable class time for more engaging (and often collaborative) activities typically facilitated by the instructor. It is complemented in many forms, such as interactive engagement,just-in-time teaching, and peer instruction.And when they are in class,students do the homework,working to solve problems with their instructors or peers,and applying what they learn to new contexts.They continue this process on their own outside class.(Berrett, 2012). It is important to note that the strategy should involve more than just the "take home" video lecture (or screencast or podcast).It should also incorporate formative and summative assessment,as well as meaningful face-to-face (F2F) learning activities.(Milman，2012).

It is also necessary to focus on the interaction of the participants since the roles of the teacher and students in the flipped classroom undergo significant changes. Firstly, in the flipped classroom, students have opportunities to control their own learning. They can study at their own pace because of availability and accessibility of all necessary resources. Moreover, students can choose when and where to study within the limited time allocated for this or that

task, and they can review the material anytime they need or get assistance from the teacher or peers through chats and forums. A continuous access to online materials allows students to keep pace with the class if they have to miss some lessons due to illnesses or other reasons. Secondly, the flipped classroom encourages students to cooperate with each other for they undertake mutual projects and group work. Collaborative projects make students learn to work together with each other, learn from each other and help each other. Finally, the flipped classroom increases students' responsibility for their own learning. They become more motivated than in a traditional classroom environment. Students have to learn to manage their time working with online materials, developing active learning skills. In other words, students' role in the learning process is changed, making them active participants of the process. The flipped classroom has an effect on the teacher's role as well. The role of the teacher is changing from delivering concrete knowledge to facilitating students' learning abilities. In the flipped classroom there is more reliance on students' self-directed learning and the teacher, therefore, needs to help students be more responsible for their learning. The teacher also has to guide students who have not had the experience of learning autonomously to gain time-management skills and make their learning process more efficient. The flipped classroom involves a lot of e-learning activities in which students are engaged. Thus, the task of the teacher is to contribute to creating a friendly online environment for the interaction of students with each other. Thus, because of the technology of flipped classroom, the teacher undertakes a number of different roles. The teacher has to encourage and motivate students, guide and monitor learning activities, give feedback, boost confidence, and maintain motivation. New roles of the teacher and students are considered to be particularly important for the process of teaching and learning.

However, as any innovative concept, there are some challenges that have to be overcome for the successful integration of the flipped classroom technology into the learning and teaching process. One of the challenges is concerned with extra workload that the teacher is designing the content of the micro-lectures. Recording lectures, developing learning materials and searching for supplementary resources require a lot of time, skills and efforts from the teacher. Nevertheless, when the electronic course is integrated into the teaching and learning process, the teacher has additional time for doing research and methodological work. Another

important issue that plays a vital role for the flipped classroom is the integrity of the classroom teaching and online course, which means that all stages of the teaching and learning process should be logically connected. All tasks and assignments that students have to do before class must be checked and assessed in class. No tasks should be left without check and assessment. This will contribute to raising students' motivation for diligent studying and increasing the efficiency of the learning process.

2.2.2 Theoretical Foundation of Flipped Classroom

The philosophy behind the flip is that students themselves acquire knowledge outside class with the help of information technology, and they apply what they know in class with the help of teachers and other students. The flip in practice is a completely student-centered teaching mode, where teachers become real organizer, directors and facilitators. Lectures will go on only when students need to make clear each point. Moreover, teachers could spend the time they save in working together with students to solve problems students meet in their learning or homework and cultivate skills students need to develop, which could be considered as the most important responsibility for the teacher.

Bloom's Mastery Learning

Mastery learning (or as it was initially called, "learning for mastery") is an instructional strategy and educational philosophy, first formally proposed by Benjamin S. Bloom in 1968. Mastery learning maintains that students must achieve a level of mastery (e. g. , 90% on a knowledge test) in prerequisite knowledge before moving forward to learn subsequent information. If a student does not achieve mastery on the test,they are given additional support in learning and reviewing the information, then tested again. This cycle will continue until the learner accomplishes mastery, and may move on to the next stage.

Mastery learning methods suggest that the focus of instruction should be the time required for different students to learn the same material and achieve the same level of mastery. This is very much in contrast with classic models of teaching, which focus more on differences in students' ability and where all students are given approximately the same amount of time to learn and the same set of instructions.(from https://en.wikipedia.org/wiki/Mastery_learning)

Guskey(2007) noted some of Bloom's major contribution in the article *Closing Achievement Gaps: Revisiting Benjamin S. Bloom's Learning for Mastery.* Bloom observed

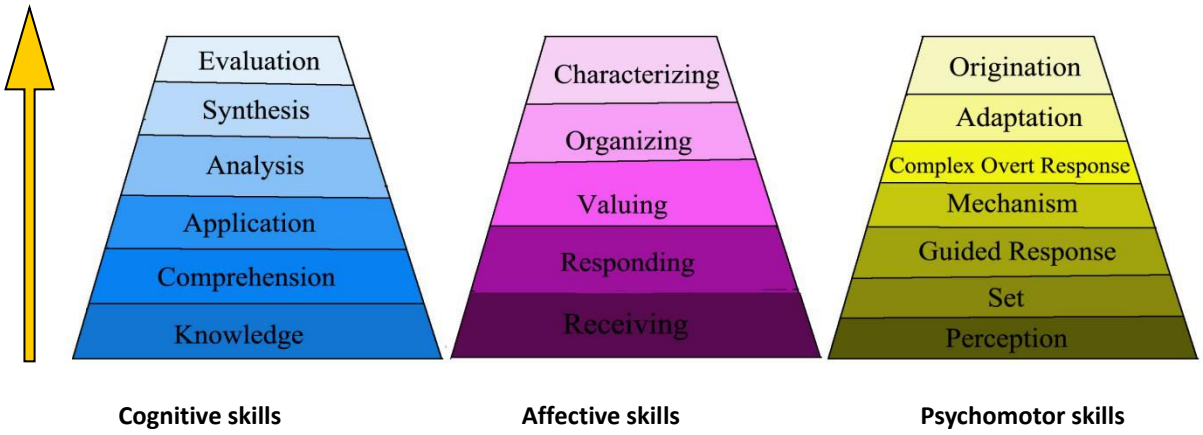
that teachers made little variation in students learning although they used different teaching ways. In order to meet individual needs of learning, Bloom suggested that all educators should differentiate assessment, because he insisted that teachers use classroom assessments not only for evaluation,but also as a kind of learning tool to give students feedback on their progress. It is obvious that since no individual methods of instruction worked for all students, Mastery Learning could offer opportunities for educators to work with students through corrective activities when students do not understand the initial knowledge. Guskey addressed that there isn't enough classroom time for effective implementation. It is a question that traditional teaching model could not solved, but flipped classroom could provides the opportunity to afford the increased classroom time.

Bloom's Taxonomy of Educational Objectives

Bloom's Taxonomy was created in 1956 under the leadership of educational psychologist Dr Benjamin Bloom in order to promote higher forms of thinking in education, such as analyzing and evaluating concepts, processes, procedures, and principles, rather than just remembering facts (rote learning). It is most often used when designing educational, training, and learning processes.

Till now Bloom's taxonomy has been widely used in education. Specifically, educational objectives of Taxonomy have been adapted by educational administrators, teachers, teacher educators, curriculum coordinators, and assessment specialists across the board. Because of Bloom's taxonomy, human's learning behavior is not abstract but concrete and can be precisely delineated according to different effective, psychomotor, or cognitive levels. Specifically, skills in Cognitive domain involve knowledge, comprehension, and critical thinking; skills in effective domain deal with attitudes, emotion, and feelings; and skills in the psychomotor domain focus on manipulative, manual or physical behavior. Each domain is divided into several categories from lower-order skills to higher-order skills. (from https://en.wikipedia.org/wiki/Bloom%27s_taxonomy) .

Table2.1: Bloom's three psychological domains



However, Bloom is best known for the research in cognitive domain. In this domain, cognitive processes were classified into six categories, i.e. Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. ranging from lower to higher and simple to complex levels of cognitive thinking.

One of the benefits for flip teaching is that students in the flipped classroom are given more opportunities to develop higher level thinking under teachers' guidance and with peer support as needed, because in-class lectures that often require only lower levels of thinking skills in Bloom's taxonomy are replaced with instructional videos.Class time could be designed to guide students to apply, analysis and create through various activities and practice.

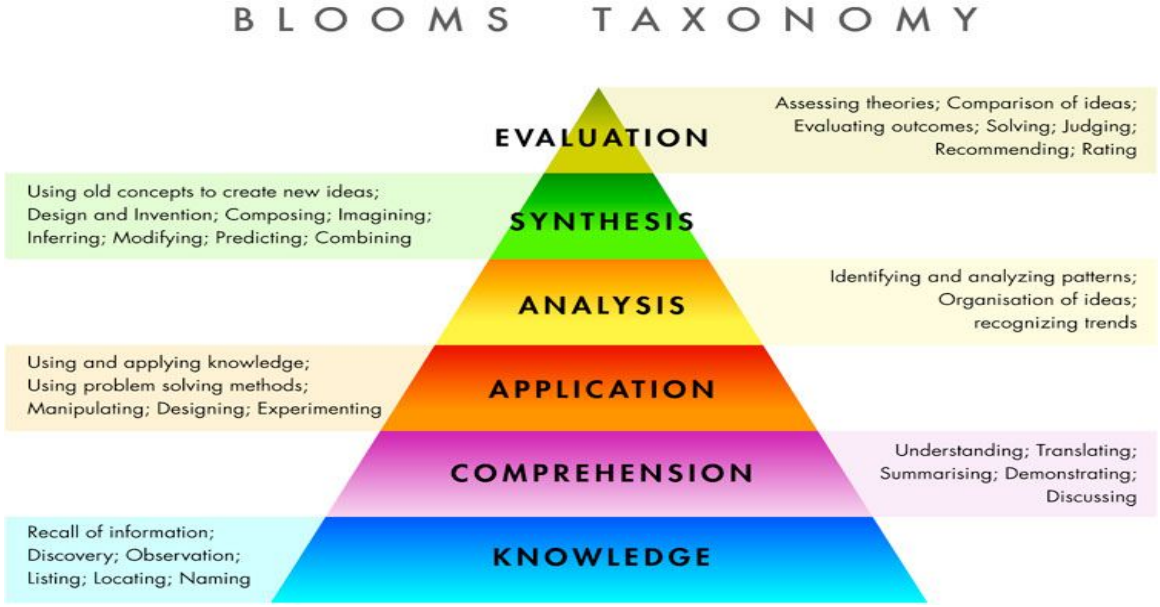


Table 2.2: Bloom's taxonomy

Active Learning

Active learning is a teaching method that strives to more directly involve students in the learning process.

The term active learning "was introduced by the English scholar R W Revans (1907 – 2003)." Bonwell (1991) "states that in active learning, students participate in the process and students participate when they are doing something besides passively listening." (Weltman, 2007) Active learning is "a method of learning in which students are actively or experientially involved in the learning process and where there are different levels of active learning, depending on student involvement." (Weltman, 2007) It is a model of instruction that focuses the responsibility of learning on learners. It indicates that to learn, students must do more than just listen: They must read, write, discuss, or be engaged in solving problems. In particular, students must engage in such higher-order thinking tasks as analysis, synthesis, and evaluation. Active learning engages students in two aspects – doing things and thinking about the things they are doing (Bonwell and Eison, 1991).

There are diverse range of alternatives for the term "active learning" like learning through play, technology based learning, activity based learning, group work, project method, etc. the underlying factor behind these are some significant qualities and characteristics of active learning. Active learning is the opposite of passive learning; it is learner-centered, not teacher-centered, and requires more than just listening; active participation of each and every student is a necessary aspect in active learning. Students must be doing things and simultaneously think about the work done and the purpose behind it so that they can enhance their higher order thinking capabilities. Many research studies have proven that active learning as a strategy has promoted achievement levels and some others say that content mastery is possible through active learning strategies. Active learning should transform students from passive listeners to active participants, help the student understand the subject through inquiry, gathering and analyzing data to solving higher order cognitive problems. Table 2.3 Learning Retention pyramid constructed based on Bloom's taxonomy. Active learning is above, passive learning below.

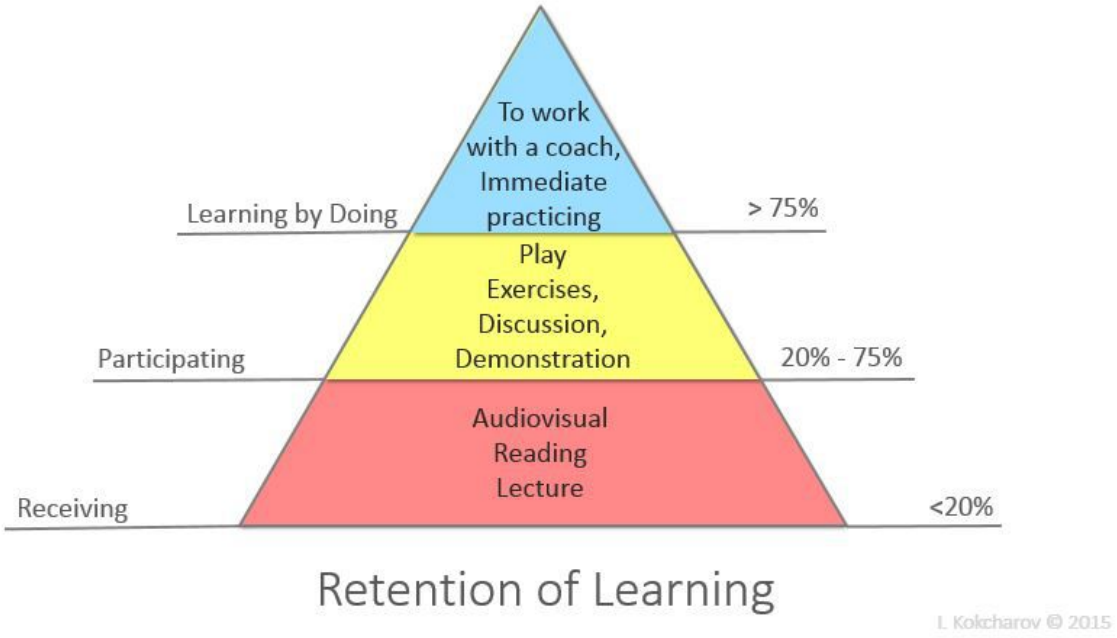


Table 2.3 Learning Retention pyramid

Student -Centered Teaching

Student-centered learning, also known as learner-centered education, broadly includes methods of teaching that shift the focus of instruction from the teacher to the student. In original usage, student-centered learning aims to develop learner autonomy and independence (Jones, 2007) by putting responsibility for the learning path in the hands of students.Student-centered instruction focuses on skills and practices that enable lifelong learning and independent problem-solving.(Young,Lynne E.;Paterson,Barbara L., 2007).Student-centered learning theory and practice are based on the constructivist learning theory that emphasizes the learner's critical role in constructing meaning from new information and prior experience.

Student-centered learning puts students' interests first, acknowledging student voice as central to the learning experience. In a student-centered learning space, students choose what they will learn, how they will learn, and how they will assess their own learning.(Young,Lynne E.;Paterson,Barbara L., 2007).This is in contrast to traditional education, also dubbed "teacher-centered learning", which situates the teacher as the primarily "active" role while students take a more "passive", receptive role. In a teacher-centered classroom, teachers choose what the students will learn, how the students will learn, and how the students will be assessed on their learning. In contrast, student-centered learning requires students to be active,

responsible participants in their own learning and with their own pace of learning.(Johnson, Eli, 2013)

Usage of the term "student-centered learning" may also simply refer to educational mindsets or instructional methods that recognize individual differences in learners.In this sense, student-centered learning focuses on each student's interests, abilities, and learning styles, placing the teacher as a facilitator of learning for individuals rather than for the class as a whole.

In the traditional approach to college teaching, professors are lecturing with students watching and listening most of the time. The students work individually on assignments, and cooperation is discouraged.

Student-centered teaching methods shift the focus of activity from the teacher to the learners. These methods include active learning, cooperative learning and inductive teaching and learning. In active learning,students solve problems, answer questions, formulate questions of their own, discuss, explain, debate, or brainstorm during class; in cooperative learning, students work in teams on problems and projects under conditions that assure both positive interdependence and individual accountability; and in inductive teaching and learning, students are first presented with challenges (questions or problems) and learn the course material in the context of addressing the challenges. Inductive methods include inquiry-based learning, case-based instruction, problem-based learning, project-based learning, discovery learning, and just-in-time teaching. Student-centered methods have repeatedly been shown to be superior to the traditional teacher-centered approach, a conclusion that applies whether the assessed outcome is short-term mastery, long-term retention, or depth of understanding of course material, acquisition of critical thinking or creative problem-solving skills, formation of positive attitudes toward the subject being taught, or level of self-confidence in knowledge and skills.

2.2.3 Research on Flipped Classroom Model in China and Abroad

2.2.3.1Research on Flipped Classroom Model Abroad

Full Picture of Flipped Classroom Model by Jackie Gerstein

The new teaching resources micro-lectures and the teaching model flipped classroom have been widely applied in western countries, and many educators conducted different flipped

classroom models according to their own teaching experience. Jackie Gerstein and Robert Talbert could be the representatives. Jackie Gerstein divided flipped classroom into four phrases, including experiential engagement, concept exploration, meaning making and demonstration & application. According to Gerstein, The Flipped Classroom Model: The Full Picture is a model where the video lectures and vodcasts fall within a larger framework of learning activities. It provides a sequence of learning activities based on the learning theories and instructional models of experiential learning. And it also provides a discussion of how video lectures fall within a larger framework of learning activities; strategies for using technology to support a full cycle of learning and address a full spectrum of learning activities and learning styles; and ideas for using technology to support a broad range of student learning including reflection and demonstration of knowledge (Gerstein, J. 2012).

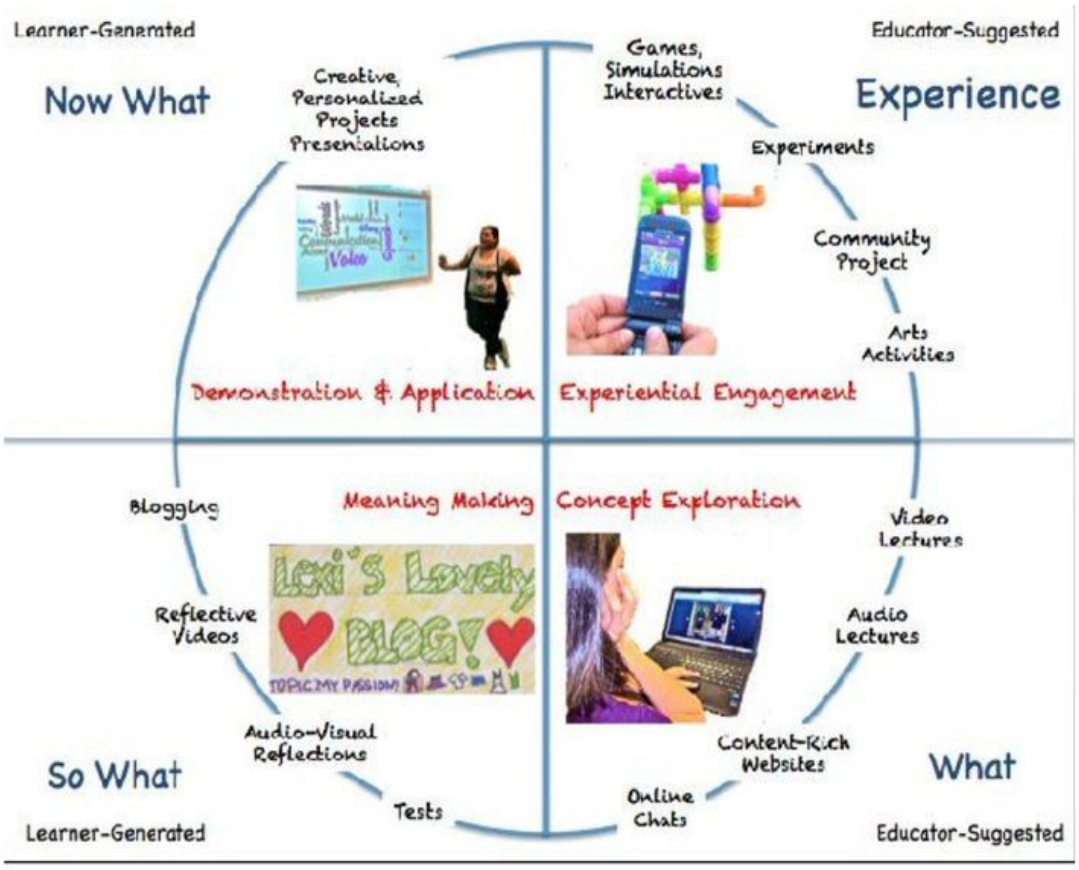


Table 2.3: Full Picture of Flipped Classroom Model

(Jackie Gerstein, 2012)

Inverted Classroom Structure by Robert Talbert

Robert Talbert, a professor of mathematics, was drawn to flipped classroom model because it requires students to be active in their own learning, rather than depend on their teachers. He insisted that the whole point of college for the students is to learn how to teach themselves--that's what the rest of their life is going to require. Students have to know how to find their own resources, make sense of them and put them work as best as they can.Therefore,Robert Talbert designed the inverted classroom in three modes. It is noted that the inverted classroom model is particularly well-suited for linear algebra, which combines relatively straightforward mechanical calculation skills with deep and broad conceptual knowledge. It is concluded that the inverted classroom design can be applied to linear algebra as a one-time class design to teach a single topic, as a method to design a series of workshops, and as a way of designing an entire linear algebra course. (Robert Talbert, 2012).23

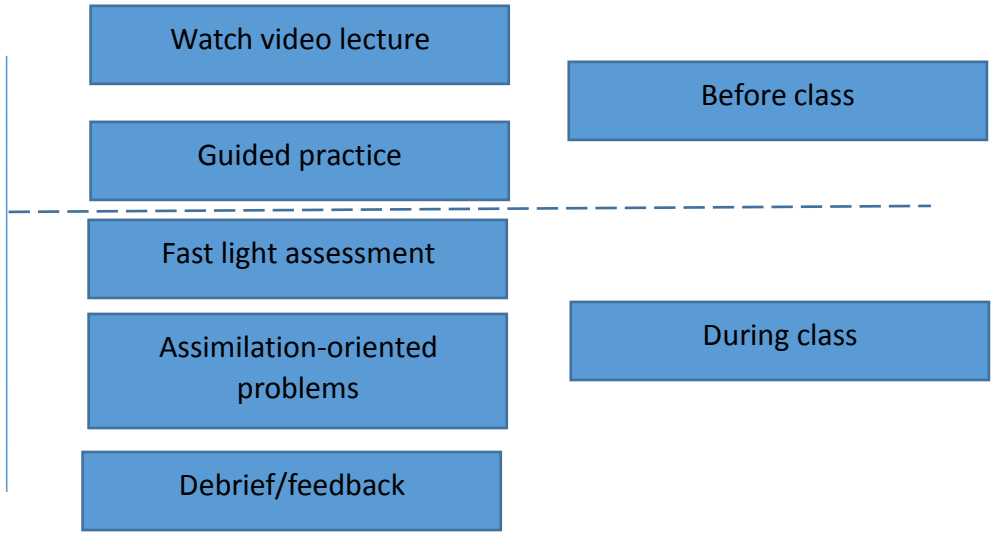


Table 2.4: Inverted Classroom Structure（Robert Talbert, 2012）

2.2.3.2 Research on Flipped Classroom Model in China

Research on Flipped Classroom Model in China mainly focuses on three following aspects:

A. On Flipped Classroom Teaching Model Nativization

Flipped Classroom Teaching Model by Zhang Jinlei (2012)

Based on the analysis of literature of flipped classroom and some typical cases like Robert Talbert's Inverted Classroom Structure, the author constructed a flipped classroom teaching

model consisting of before-class stage and during-class stage,in which information technology and activity set an individuation and cooperative learning environment for learners to create new learning culture. It clarified each element of flipped classroom, for example, students could watch micro-lectures to learn knowledge and make real time intercourse with teachers on the platform. At the stage of before class, students have to do pre-class practice when learn by watching video lectures. At the stage of during class, the teacher should confirm the problems that students feedback during pre-class learning, and solving these problems should be the first task in class. Whereafter, students should work individually or cooperatively with the guidance of the teacher. During the class, the teacher works as a guide to create personalized learning environment and collaborative learning environment. As the entire educational process, technology could be a powerful tool and learning activities could be the core work for the teacher and student.

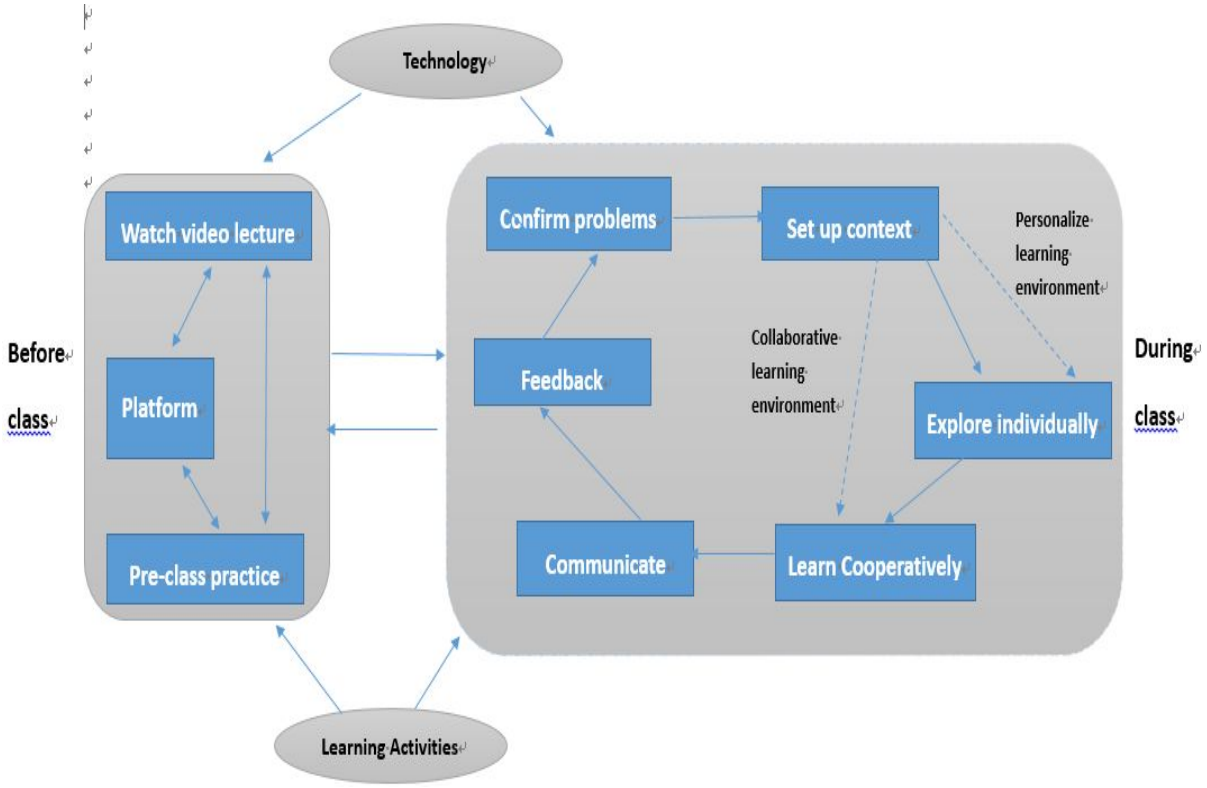


Table 2.5: Flipped Classroom Teaching Model (Zhang Jinlei , 2012)

"Tai Chi Academy" by Sang Xinmin (2012)

The author made a deeply research on traditional teaching model, had a high opinion of the current innovative course and teaching reforms.He revealed that converting traditional teaching method into effective teaching model has been a times trend. The author contributed

to making research on innovative theories and putting them into practice.Based on extensive research and experiments in college learning during the emerging information age, the “Tai Chi Academy” inherits and carries forward Chinese traditional culture and education wisdom, combines the eastern and western university spirits, and absorbs the non-linear concepts and methodology from the sciences. The result was summarized after practicing in Nanjing University. It put forward a guideline for changing consuming learning into productive learning and formed an integrated strategy for the teaching innovation in universities.

Tai Chi Ring Flipped Classroom Model by Zhong Xiaoliu(2013)

In this flipped classroom model, Tai Chi thinking in traditional Chinese culture and Bloom’s taxonomy of educational objective were combined and a Tai Chi Ring Flipped Classroom Model was summarized. It divided teaching and learning process into four sections, that is, preparation, understanding,application and analysis. It focused on exploring flipped classroom instructional design models in ICT environment. It’s a pity that the Tai Chi Ring Flipped Classroom Model was not put into practice and its effect needs to be tested.

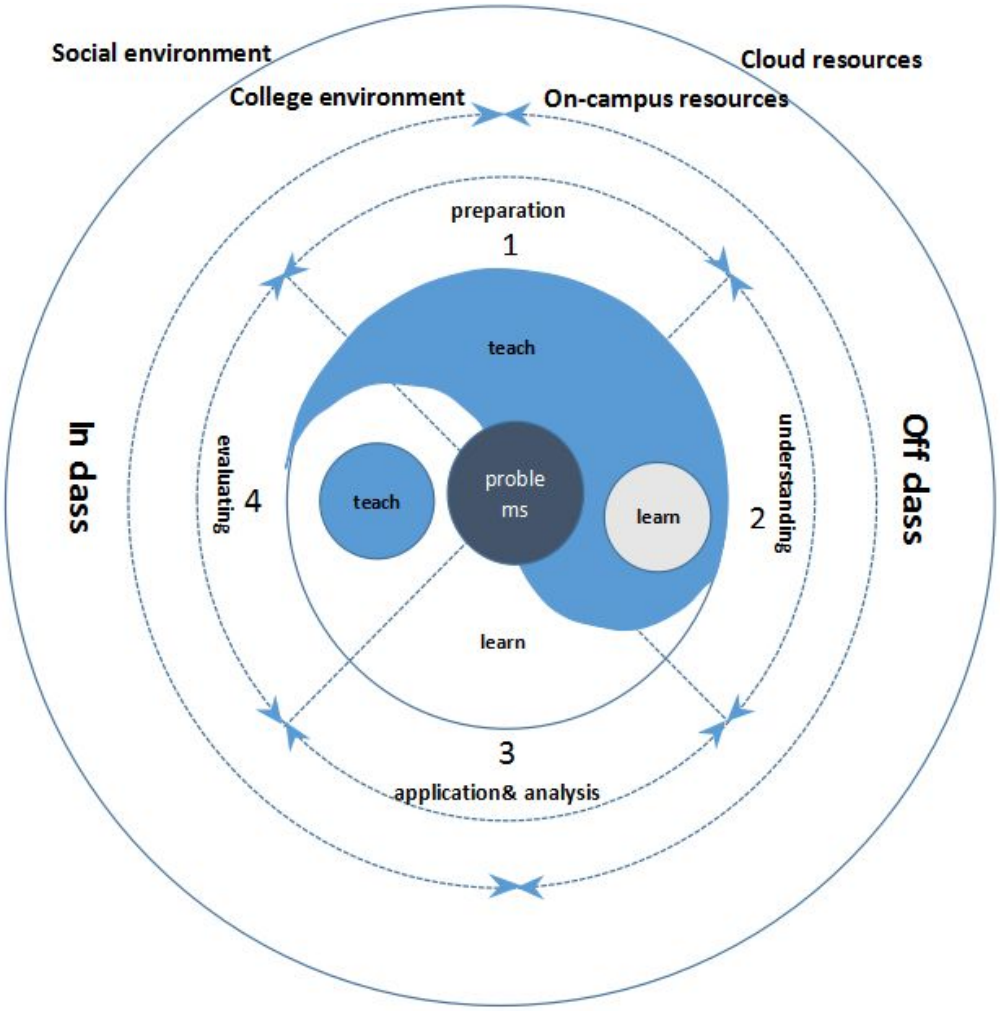


Table 2.6: Tai Chi Ring Flipped Classroom Model (Zhong Xiaoliu , 2013)

B. Flipped Classroom Model Based on Some Platforms

Flipped Classroom Model Based on QQ +Tablet PC by Zhang Xinmin(2013)

The author established the flipped classroom model based on QQ +Tablet PC, which is called to be easily practiced and implemented. The model was composed of three procedures: curriculum development, pre-class introduction and knowledge internalization, during which QQ and Tablet PC have become the powerful tools to make sure that the information was available for teachers and students and learning activities could be carried out smoothly. The main steps of teaching and learning are similar with precious research, only with the technology relying on tablet PC. However,the limited resources in this model became one of the influential factors.

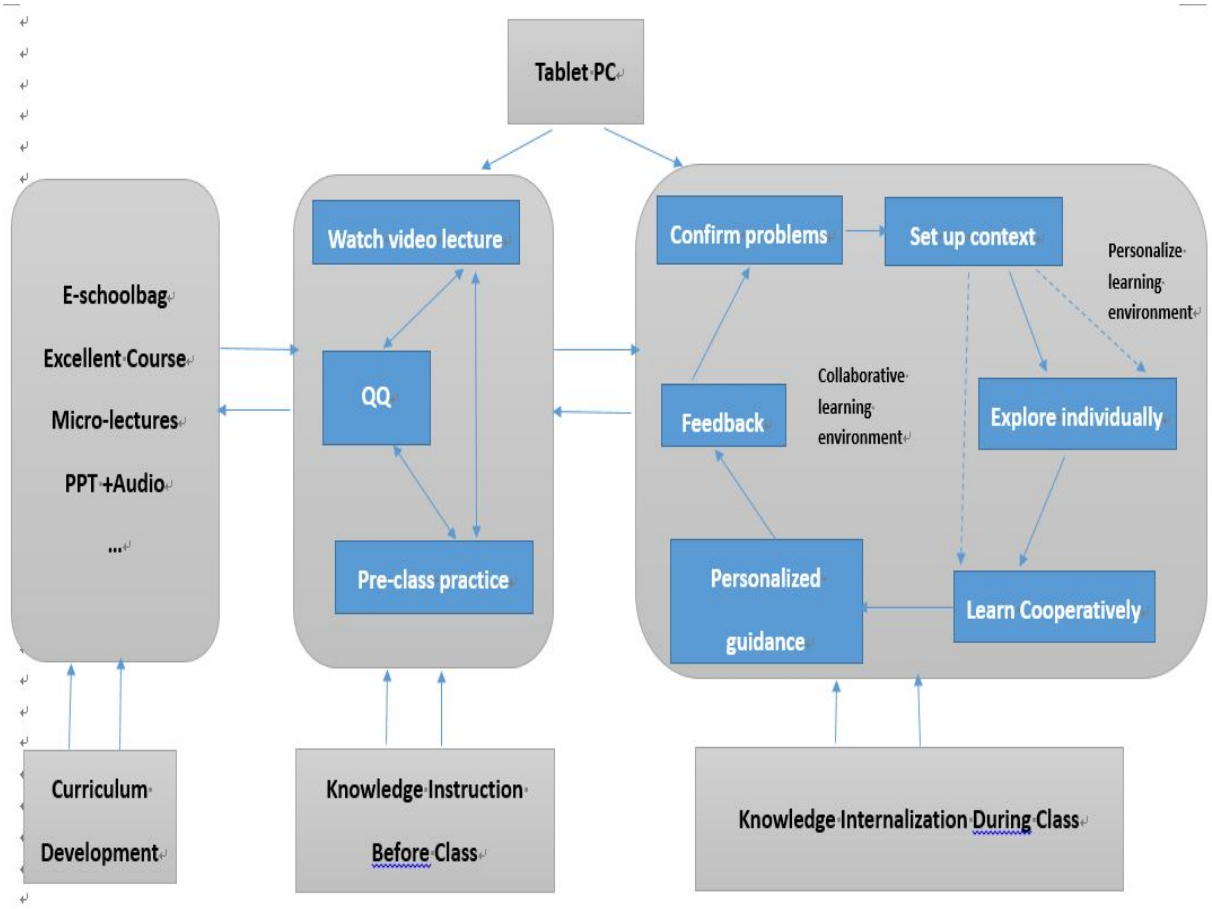


Table 2.7: Flipped Classroom Model (Zhang Xinmin, 2013)

Teaching Model of Flipped Classroom Based on Electronic Schoolbag by Yang Yanjie& Zhang Shibo (2015)

The article introduced electronic schoolbag and analyzed the structural characteristics and typical models of flipped classroom. To provide guidance and reference for application of flipped classroom,the author combined electronic schoolbag and flipped classroom and constructed the model which included three parts: before class, during class and after class. In each part ,the author explained in detail the tasks and activities that students and teachers need to do, which could be a detailed model so far. But there are still some details that need to be illustrated,and the practicality of this model still needs to be proved.

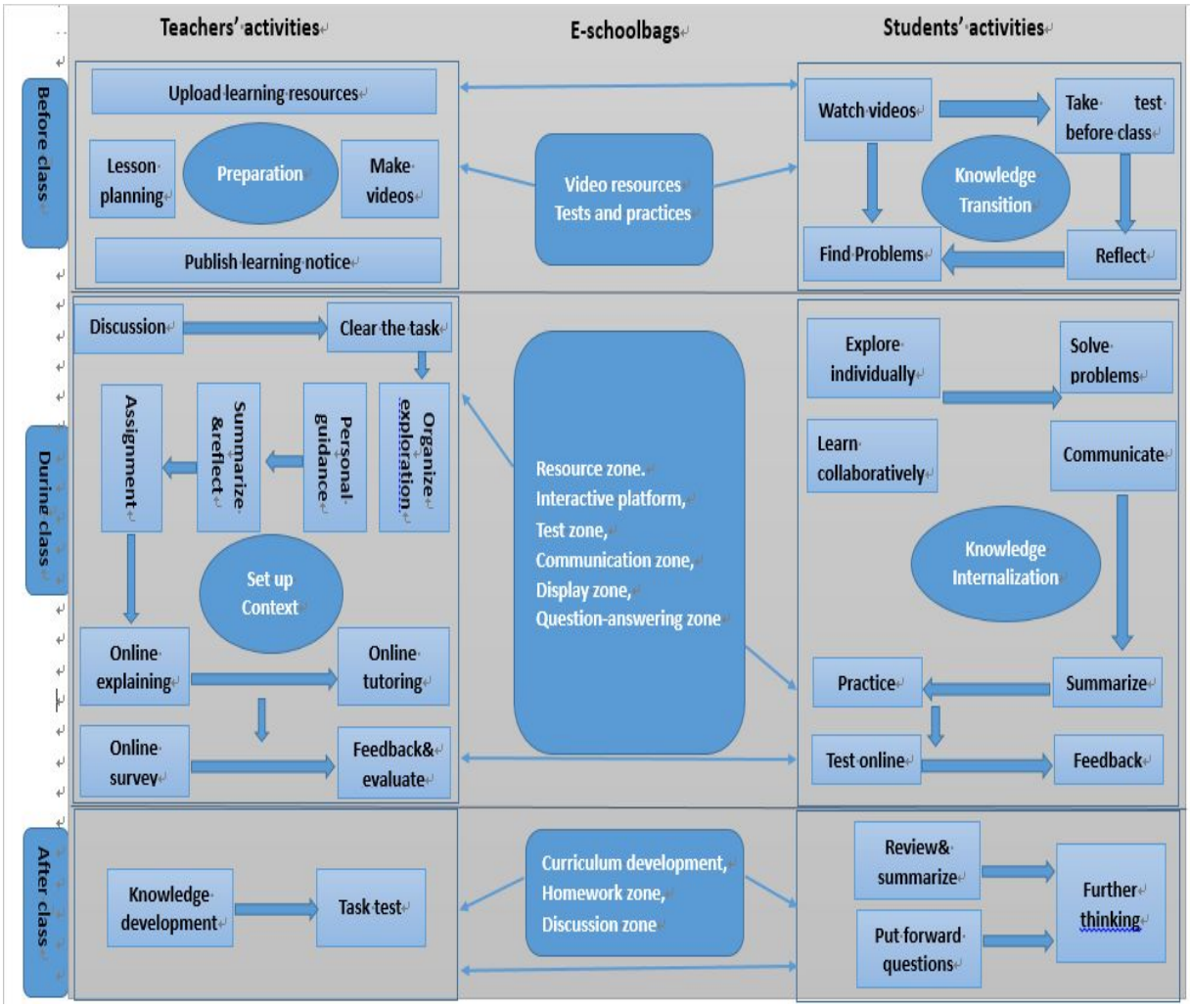


Table 2.8: Flipped Classroom Based on Electronic Schoolbag (Yang Yanjie, 2015)

C. Flipped Classroom Model Based on Some Resources

Flipped Classroom Teaching Model Based on Micro-Lesson by Liu Rui & Wang Haiyan（2014）

The authors constructed Flipped Classroom Teaching Model in teaching flash animation, focusing on the design and splice issues of activities before, during and after class in flipped classroom. It verified the effects of this teaching model in practice on the basis of the existing resources and activities of micro-lessons from home and abroad. Moreover, the teaching model achieved knowledge transferring, building, internalization, consolidating and expanding through managing pre-class clearance tasks, in-class typical tasks and post-class expanded tasks. Whether the model is suitable for other subjects is yet to be seen.

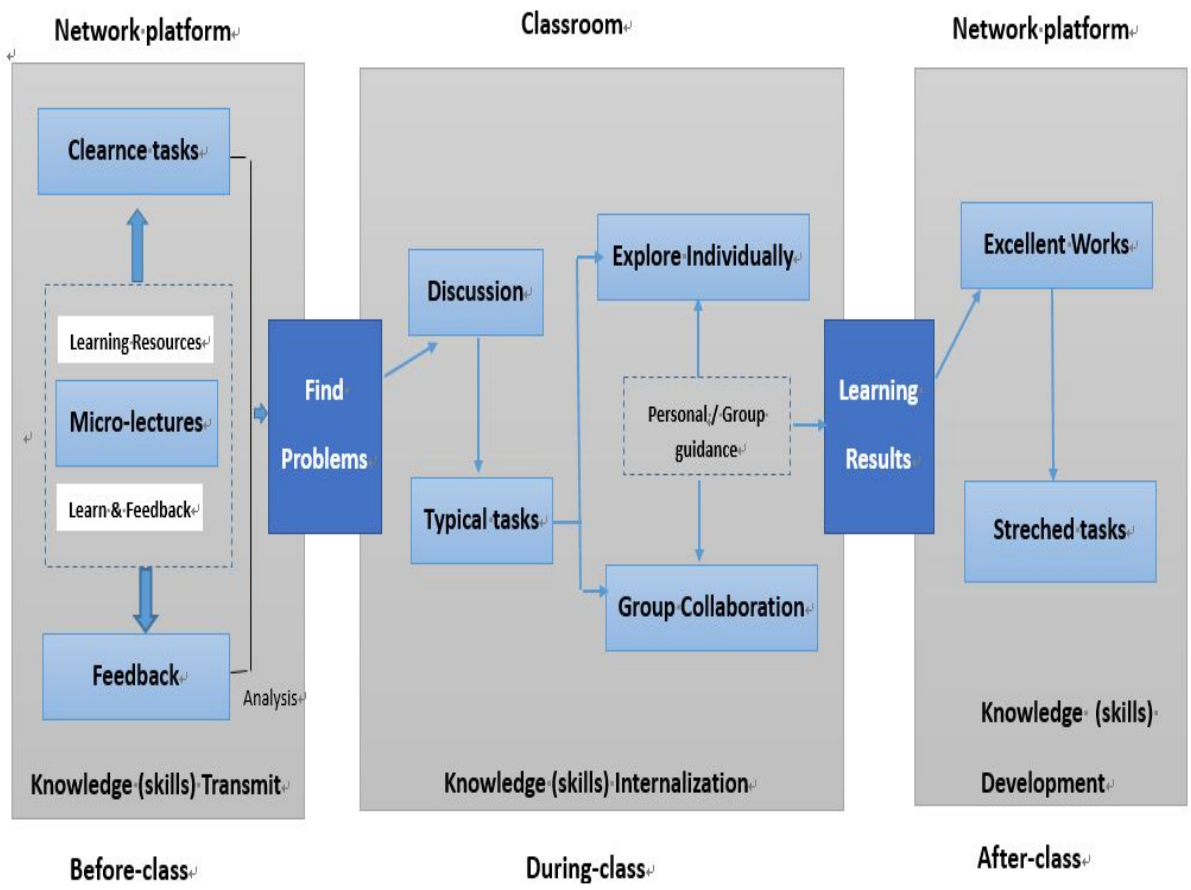


Table 2.9: “Three Tasks”Flipped Classroom Teaching Model(Liu Rui, 2014)

Flipped Classroom Model Based on MOOC by Zeng Mingxing(2015)

The author constructed a new flipped classroom teaching model based on MOOC through the organic bond of MOOC resources and flipped classroom, including MOOC video alternative mode, "MOOC video +homemade video” mode and secondary development mode. The three kinds of modes and the complement methods were also introduced and explained by the author for different universities to choose.

These studies above generally reflects the development situation of flipped classroom and reports the educational value of flip teaching in relation to enhance class preparation, increase classroom engagement, and improve learning ability. More or less, there are still some limits and paucity in flipped classroom model research:

1.Stay more on theoretical perspective, less on experimental perspective. Therefore, from the present research, we could not know which kind of model has got a successful practice and what experience and lesson have been obtained.

2. Focus more on science, less on language teaching.

3.Rarely find out students perceptions on and attitudes towards on the practice of flipped classroom.

By contrast, the use of video lectures for transferring knowledge tends to be of little significance.While Raymond Szparagowski(2014) indicates that “One important aspect needed to make a successful flipped classroom is to choose videos and create handouts that are the right level of difficulty to build confidence.” Therefore, what kind of micro-lectures are suitable and how to apply flipped classroom to college English teaching practice have become focus of domestic FLT researchers. However, current research on micro-lectures are mostly in the interpretation of their ideas and prospects phase, so there is current need for the practice to examine the effect of the micro-lectures, explore effective strategies to better play the micro-lecture "micro" advantages and achieve teaching activities to maximum effect. Moreover, Lu Haiyan (2014)has studied the concepts of micro-class and flipped classroom, the characteristics of the college English teachers and students, the present college English teaching model, as well as the teaching environment. She analyzed and concluded that there was feasibility of applying micro-class based flipped classroom mode to college English teaching. Hu Jiehui & Wu Zhongjie(2014) introduced a university-based foreign language educational experiment on flipped classroom instruction based on self-developed college MOOC. Quantitative and qualitative data analysis of the learners’ feedback has shown that the MOOC-based flipped classroom instructional model is suitable for college English teaching. Until now, both MOOC and the flipped classroom design are highly recognized by the university students. However, it is still necessary to research on different flipped classroom model applied on different levels of students with different micro-lectures.

Chapter Three Research Design

3.1 Research Questions

(1) What is students' attitude towards the English flipped classroom model?

(2) What are the critical factors that affect learners' satisfaction of English flipped classroom model?

(3) What is the students' perception of the micro-lectures? And What are the features of the micro-lectures applied in flipped classroom model?

3.2 Subjects

The subjects of this research were 181 EFL learners, the age of whom are between 16-18 years old, making up two intact classes of first-year non- English majors. Students were randomly assigned to classes consisting of 80-97members and none of them had any flipped classroom experience prior to this research. The students enrolled in this research met weekly for three 45- minute period of English lessons in multimedia laboratory with non-native teachers who were well trained with flipped classroom idea and had more than one-year flipped teaching experience. Since the research was conducted during the 90-minute weekly class over a two- month period, learner absences were unavoidable.

Each of the students ensured that they have a smart phone to install the English APP matched with the English textbook. On the APP, students can see the pre-class task designed for each lesson and learn the audios, micro-lectures, or micro-videos assigned. The micro-lectures used in this study were mainly made to explain new words, difficult sentences or grammar points, which were aiming to undertake some of the teachers work that give lectures in class.

This research was carried out in period of eight weeks and divided into three major phases, including (1) a preparation phase for technology orientation,(2) an instruction phase for complement of flip classroom, and (3)an evaluation phase for the assessment of teaching and learning.

At the start, the preparation phase took place in the first two weeks, in which teachers made students familiar with flip classroom idea and teaching procedures, gave some instructions on how to use the APP or network to finish learning, how to use micro-lectures to learn and review and what the formative assessment system are. Next, the instruction phase covered two units that were distributed over five- week period. Each unit took up seven 45-minute class periods. With regard to teaching procedures in each lesson, the students typically were directed to (1)have some tests on pre-class learning,(2)learn new knowledge by teacher's instruction or peer instruction,(3)work in pairs or groups to complete a communicative task in oral or written forms. Finally, in the evaluation phase, the eighth week, all the participants were asked to fill in a learning experience questionnaire and some focal participants were invited to have a interview on an individual basis.

3.3 Instruments

3.3.1 Questionnaire

Flipped classroom teaching has gained a lot of attention. Previous researchers done under different environments have suggested a variety of factors affecting learner' satisfaction of flipped classroom. The survey was conducted to investigate the critical factors that affect learner's perceived satisfaction in English flipped classroom model. So the questionnaire 1 (See Appendix 1)developed an integrated model with 47 items in six dimensions: learner, instructor, course, technology, design and environment according to the questionnaire which was revised with help from experts (including academics and practitioners) and used on empirical investigation on E-learning(Sun P, Tsai R, Finger G, et al， 2008) . Some items were revised and deleted. A 5-point Likert scale ranging from A as strongly disagree to E as strongly agree was used for the measurement.

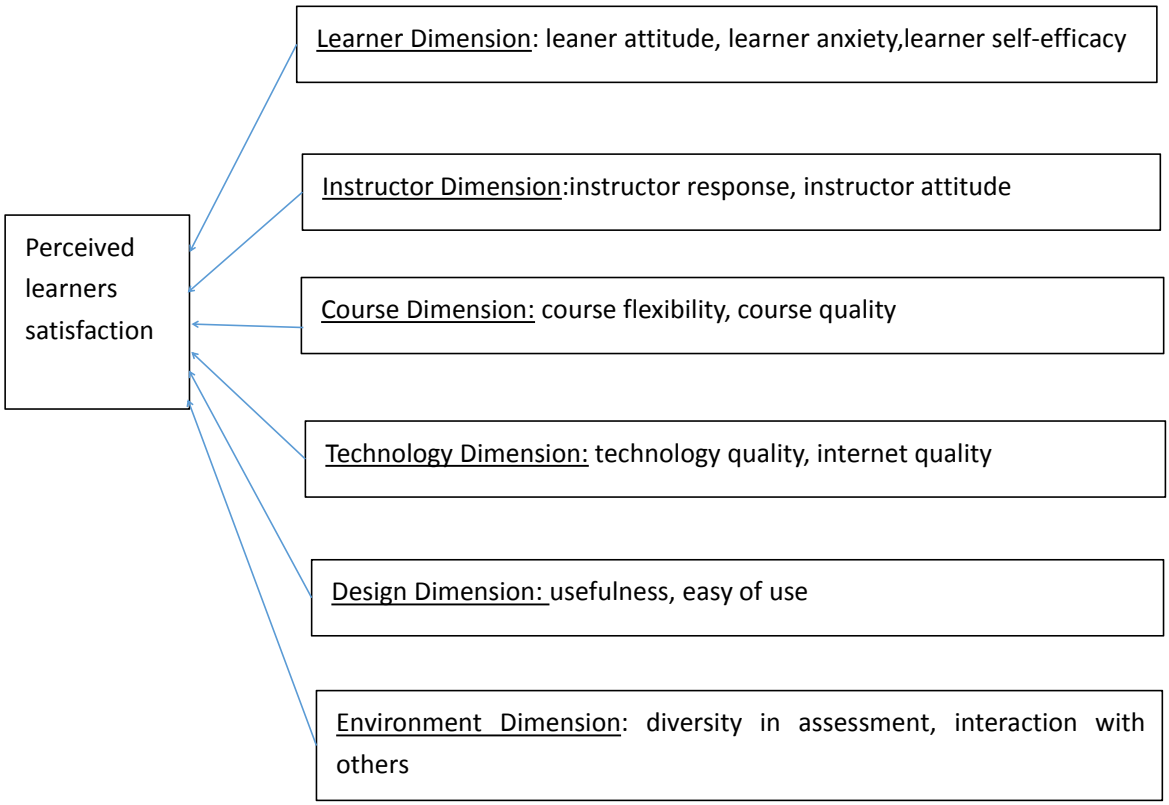


Table 3.1 Dimensions and antecedents of perceived learner satisfaction

This research conducted another survey to investigate the students' attitude towards the micro-lectures applied in the course. The questionnaire 2 (See Appendix 2)was developed according to micro-lecture evaluation system from the perspective of user experience with the aid of acceptable model of Nielsen's computer system(Sun Pin,2015). The system formulates two dimensions that are instructional usability and efficiency of micro-lectures, and designs seven second-class indicators, namely choosing subject,content selection,activity design,easy to learn,efficient use,easy to remember,and high satisfaction.

Table 3.2 Micro-Lecture Evaluation Scale

First-class indicator	Second-class indicator	Standard
Instructional Usability	Choosing subject	The subjects chosen to make micro-lectures are mainly to solve difficult and important language points.
	Content selection	There should be no or few errors.
		The content should be easy to understand and emphasize the key points.
	Activity design	The design should be interesting and innovative.
		The design should promote students' initiative.
Efficiency of Micro-Lesson	Easy to learn	The micro-lecture should be with a clear picture and voice which is easy for students to learn.
	Efficient use	The micro-lecture should be able to meet students' needs,solve their problems and promote their abilities in certain way.
	Easy to remember	The language and words used in the video are easy for students to remember the points.
	High satisfaction	The users feel satisfied and give highly evaluation.

3.3.2 Interview

The interview questions were mainly designed to explore students' attitude towards the micro-lectures applied in the course, aiming to summarize popular features that micro-lectures should possess. Fifty-six students who were considered fully using micro-lectures in their learning were selected from the subjects. These students were asked to answer ten open questions. These questions were summarized on the basis of thirty-two micro-lecures used in the English course which were designed and filmed by the research team, consisting of mode, type, length, language, speed, scripture, voice, figure, numbers and learning times.

The interview questions are as follows:

1.Which mode of micro-lecture do you like best, Performance mode, Lecture mode,or Dialog mode?

2.Which kind of micro-lecture do you like best,on vocabulary ,on sentence structure,on passage structure,or on writing?

3.How long is each micro-lecture suitable for you to learn?

4.Should the Language in micro-lectures be in English, in Chinese or bilingual?

5.How fast should the speed be suitable,in normal speed, faster or slower?

6.Do you like computer-generated voice or teachers' voice?

7.Which kind of figure do you prefer, your own teacher or the animated characters?

8.How much time do you usually use to learn each micro-lecture?

9.How many times do you use to learn each micro-lecture?

10.How many micro-lectures are suitable for pre-class learning?

3.4 Introduction of English Flipped Classroom Model

In this study, a flipped classroom model based on micro-lectures was used in the English language teaching, including four important factors: information technology platform, rich and suitable micro-lectures, various curriculum design and sound assessment system. In order to match with the flipped classroom concept, the textbook was designed and edited by the research team during the last two years.it is insisted that the textbook do not only provide a framework for teachers in achieving teaching aims and objectives, but also serve as a guide to the teacher when giving lessons. The content of English language textbook influences what teacher teach and learners learn.

The textbook (*English for Application and Communication Elementary Course)*used in flipped classroom was published in 2015. It includes eight units. The theme of each unit is as follows: Unit1 My College, Unit2 Dream,Unit3 Communication,Unit4 Let's Learn Actively, Unit5 Volunteering, Unit 6 You Are What You Eat, Unit7 Travel and Experience, Unit 8 Safety. In each unit, there are seven sections such as Section 1 warm up, Section 2 watch listen and speak, Section 3 phonetic tips, Section 4 intensive reading, Section 5 practical writing and Section 6 practical project, as well as vocabulary development.

In order to match with the flipped classroom concept, we provided the textbook with rich learning materials including 24 audios, 32 micro-lectures designed and filmed by the research team, and 32 task lists.All the resources were uploaded onto website *www.XGTBOOK.com,* which are synchronized with material on mobile APP. Students could learn on PC or their mobile phone.Thus it could make sure the learning resources are enough and easily access.

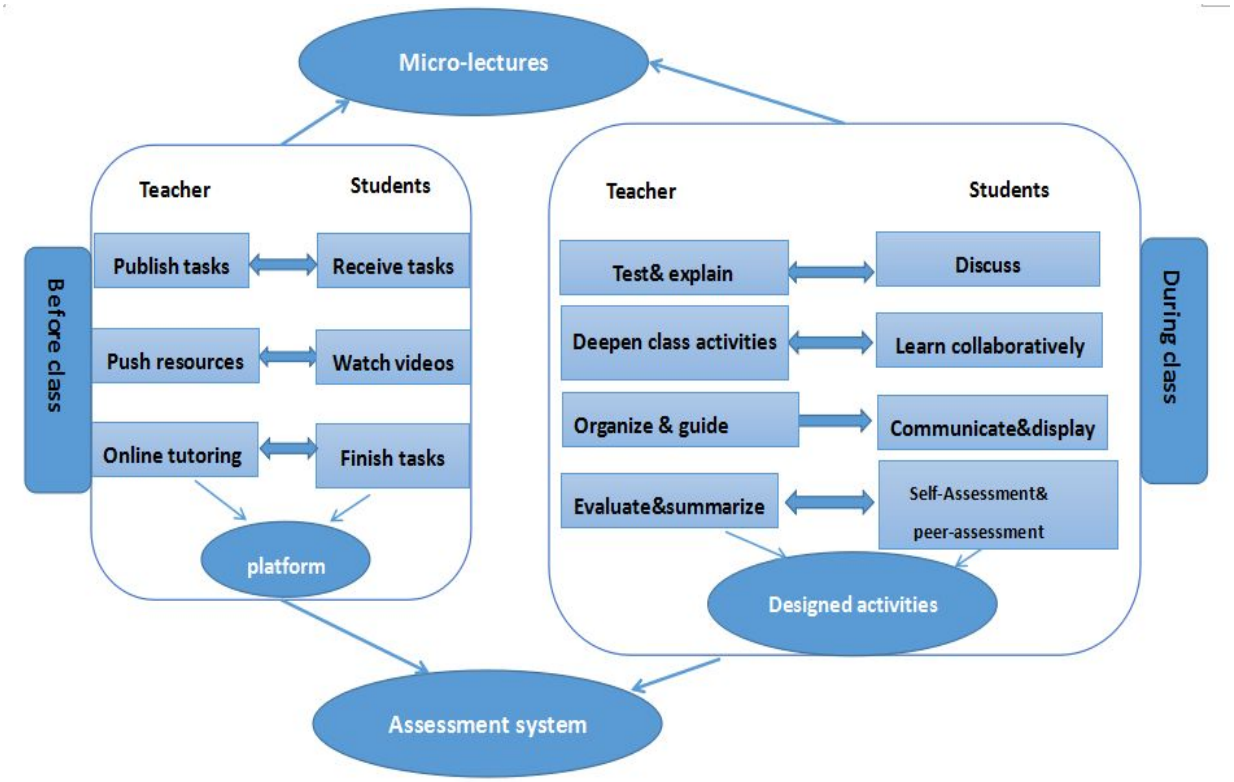


Table 3.3: English Flipped Classroom Model

The teaching activities were divided into two stages,that is, before class and during class. During before-class stage, teachers published a task list and pushed resources on the website, with which students could know the teaching content, learning goals,learning materials, pre-class tasks and during-class activities. The task lists helped students clear learning aim and do simple preparations for the following learning. Students could get textual materials, audios or micro-lectures for self-paced learning and prepared for class learning and activities. At this stage, a feasible platform such as website or mobile APP was a powerful and necessary tool for students to ensure the implementation of pre-class learning and communicating. Otherwise, the effect of flipped classroom would be affected. At during-class stage, teachers worked as a

director to design various activities and organize the students play with them, aiming at helping students deeply understand and apply the knowledge.

Usually,English flipped classroom procedures are carried out as the following five steps:

Step 1 At the first beginning,teachers must make sure that students understand how flipped classroom model learning works so that students know what to expect from the model and how to learn. This includes consequences if they fail to do the work.

Step 2 Teachers and students register on the website *www.XGTBOOK.com,* and construct classes.

Step 3 Make sure learning resources available to each of the students and help students understand the information on the task lists. Students could get learning objects,learning materials, pre-class task, class activities from the task lists. Teach students how to watch video(taking notes, pausing and re-watching as they need).

Step 4 Design classroom activities.

Check: Teacher check students' notebooks and answer individual questions about pre-class learning. This is a useful way to check whether students have watched what they were supposed to. And it is also a critical step to cultivate students active learning skills. If the teacher omitted this step, the classroom activities and the effect of flipped classroom would be discounted.

Assign deeply learning tasks: Make the first task one that they cannot participate in if they haven't watched the video, which would be the driving motivation as it works well.For example,teachers could divide learning tasks into given parts that could make sure each group assigned with equivalent tasks. After being assigned the designated task, students were given some time to review and discussion, which was called peer instruction time. During this period, students worked in group to prepare for the task. They may relearn the micro-lectures once again by own or insult with group members. At the same time, the teacher went through students and offered help if necessary.

Presentation and display: Ask students to present their deeply learning results. It could be conducted in various forms such as role play, speech or just some discussion in group. Teachers could design it depending on class-size and the content of course.

Step 5 Evaluate and summarize:Teachers could announce the results of each group and

give a summary on the important points or make some correction.Teacher's evaluation, and peer assessment could be collected as part of the formative assessment.

A sound formative assessment system was critical and essential for the implementation of flipped classroom. In this study, we constructed a formative assessment from four dimensions with ten aspects:

Item 1 is to examine and cultivate students' autonomous learning ability from two aspects of notebook and the performance of pre-class learning.

Item 2 is to check and motivate students' engagement in classroom activities from two aspects of absence rate and performance in classroom activities.

Item 3 is to test and develop students' team spirit from three aspects of contribution degree, collaboration and participation.

Item 4 is to verify and collect students' learning fruit from three aspects of language level, content selection and forms.

The A through-E scales were given to each aspect with 10 total marks. The teacher,group leader and student themselves make teacher assessment, peer assessment and self-assessment with 50%,50% ,30% weight according to the standards.

As for the English flipped classroom model, micro-lectures were the basic condition to supply learning materials in a new form. Technology platform was the necessary condition to make flipped learning an easy way and make sure students could learn whatever, whenever and wherever they want. Activity design was the critical condition which was affected by pre-class learning and connected with the efficiency of learning. Since at the beginning, students didn't have high autonomic learning abilities, there could be a sound assessment system as a supporting condition to stimulate student's interest and motivation , helping them develop good learning habit and ability. Any of the four conditions can not be neglected when carrying out flipped classroom model.

3.5 Data Collection and Analysis

Data in this research was collected using both quantitative and qualitative methods.As for questionnaire 1, SPSS was used to analyze the data. A multivariate linear regression analysis was used to prove the significance of the variables. First, Skewness &Kurtosis was used to assess whether the data obeys normal distribution. Second, the reliability and validity of the questionnaire were analyzed. Finally,the Person correlation coefficients was made to measure the correlation between two variables. As for questionnaire 2,the result for each of the 9 questions was presented in a bar graph and the percentage of students' response for each question was also explained.

In addition to quantitative data, it was also important that the study include an understanding of the students' perceptions of the micro-lectures applied in this course. Each student's response was written into common themes that emerged through the 9 questions. Themes were drawn from significant similar multiple responses to a question, for example there were 48 of the 56 (86%)students surveyed who responded that both English and Chinese should be used to explain language points in micro-lectures.

What's more,some of the comments that students noted were collected and displayed, which demonstrated students visual feeling and perception of flipped classroom model and micro-lectures.

Chapter Four Results and Discussion

4.1 Students' Attitude Towards English Flipped Classroom Model

Since the absence cannot be avoided and some of the students who were absent from the English course more than 8 classes during the study period were separated.One hundred and sixty five questionnaires on the survey of flipped classroom were collected. The number of male respondents is 25, which is accounting for 15.2 percent, and the number of female respondents is 140, which is accounting for 84.8 percent. The result shows that male is 69.6% less than female involved in this questionnaire. The result shows that the number of answer Agree in Learner satisfaction 1-3 are the largest, accounts for 60.6%, 63.0% and 57.6%; respectively, the number of answer Uncertainty and Agree in Learner satisfaction 4 are approximately equal, accounts for 39.4% and 36.4%; the number of answer Disagree in Learner satisfaction 5&6 is the largest, accounts for 59.4% and 57.0%, respectively.

Item 1 stated:*If I had an opportunity to take another course with flipped classroom, I would gladly do so.* The result from this item is positive. Sixty-seven percent students surveyed agree and strongly agree with this statement. Around 12% of the students responded that they were disagree or strongly disagree.

Item 2 stated that: *I am very satisfied with the course.* The result from this item is the same with the percentage of item 1 who chose agree and disagree, that is sixty-seven percent, which is comply with students preference towards flipped classroom.

Item3 stated that: *I will take as many courses with flipped classroom as I can.* Sixty percent of students strongly agree or agree with this statement, where as 26% of the students are uncertainty on this item. That could explain that if students take other courses with flipped classroom model, it may not be a good way for students because the learning time can not be guaranteed.

Item4 stated that: *I feel that this course meet my needs well.* The result for this item is not positive,whereas about 43% of the students agree or strongly agree. and it is worth to note that around 40% of the students fell uncertainty about this item.

Item 5 stated that: *I am disappointed with flipped classroom model in this course.* The response shows that 64% of the students disagree. That means most of the students are satisfied with flipped classroom model in this course. While it should be noted that there are still 25% of the students haven't made their judge about this new model. It may have some relationship with item 4. It could be conclude from another aspect that students are more rational and practical to a new approach.

Item 6 stated that: *I will not take flipped classroom model in this course if I have to choose again.* The response demonstrated that 63% of the students disagree or strongly disagree with the statement. That is to say, the English flipped classroom model was accepted by most of the students.

Above all,data analysis reveals that students are satisfied with the English course and would like to take another course with flipped classroom model. This finding resembles similar findings from previous studies that there is feasibility of applying micro-class based on flipped classroom mode in English teaching(Lu Haiyan,2014). Also,the study findings replicates similar findings that both MOOC and flipped classroom design are highly recognized (Hu Jiehui&Wu Zhongjie,2014). There is also a difference from the previous findings that flipped classroom was highly recognized by vocational students although their English level were not as high as university students. These findings could prove well that flipped classroom has advantage over traditional teaching model, because in flipped classroom environment, students could arrange time required to learn at their own space. This is very much in contrast with traditional teaching, which focus little on differences in students' ability and where all students are given approximately the same amount of time to learn and the same set of instructions.

Learner satisfaction

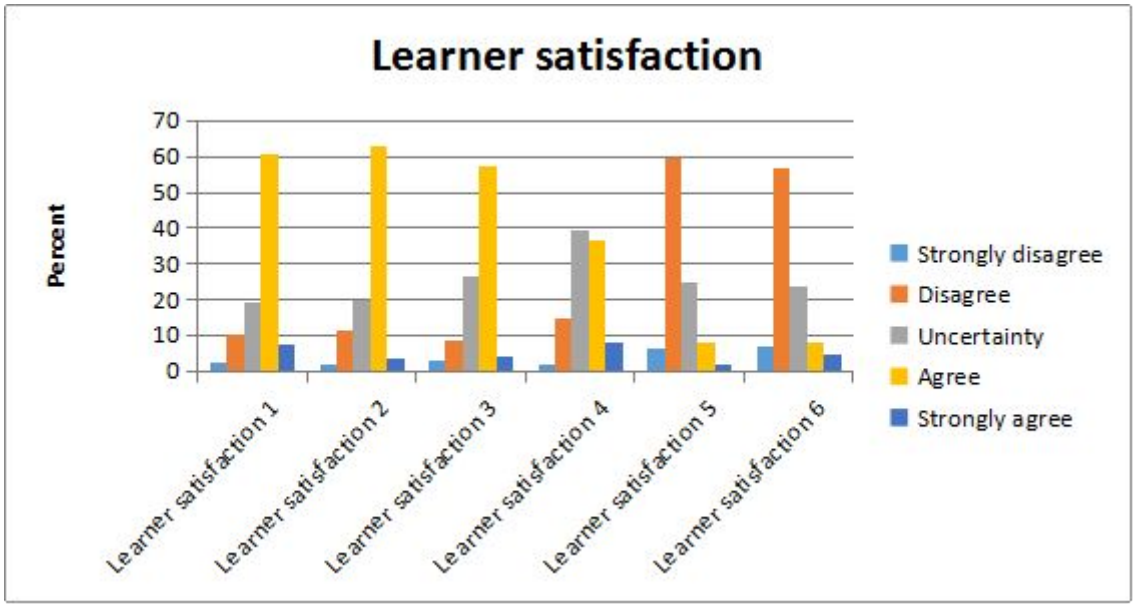


Table 4.1:Learner satisfaction

4.2 Critical Factors that Affected Learners' Satisfaction of English Flipped Classroom Model

Whether the data obeys normal distribution will have a crucial impact on the subsequent analysis. The results represent that the mean of each item is situated between 2.0 and 4.0, and both of Skewness and Kurtosis is lower than 3. So each topic can obey the normal distribution and can be directly used in the reliability and validity analysis.（See Appendix 3）

Reliability

It is necessary to analyze the reliability of the questionnaire. Cronbach's Alpha coefficient is a commonly coefficient to judge the reliability level of the questionnaire. Generally speaking, the greater the number of alpha coefficient indicates the higher the reliability of the questionnaire. Table 4.2 indicates that: the Cronbach's a coefficient of Learner attitude, Learner anxiety, Self-efficacy, Instructor response, Course flexibility, Course quality, Technology quality, Internet quality, Usefulness, Ease of use, Interaction with others and Learner satisfaction is 0.696, 0.744, 0.708, 0.815, 0.877, 0.695, 0.716, 0.743, 0.860, 0.800, 0.747 and 0.739, which is close or greater than 0.7, indicating that the reliability of questionnaire is completely acceptable.

Table 4.2: Reliability Analysis

Variable- scale		Cronbach's α Coefficient		
Learner	LAT	0.696	0.721	0.818
	LAN	0.744		
	SE	0.708		
Instructor	IR	0.815	0.815	
Course	CF	0.877	0.854	
	CO	0.695		
Technology	TQ	0.716	0.787	
	IQ	0.743		
Design	UF	0.860	0.863	
	EOU	0.800		
Environment	DIA		0.796	
	IWO	0.747		
Degree of satisfaction	LS	0.739	0.739	

Validity analysis

Since the reliability level reaches the standards, in order to ensure that the set of questions in the questionnaire can effectively reflect the meaning of our real variables, we also need to continue to analyze the validity of the questionnaire, because the size of the validity is an important index to reflect the validity of the questionnaire. This paper adopts the method of factor analysis to test validity of the questionnaire.

Table 4.3 indicates that: the KMO value in the questionnaire is 0.835, larger than the reference standard 0.7, which can indicate that there are many common factors among variables, Approx. Chi-Square is 3682.526, the degree of freedom is 1035, while P value is 0.000, lower than 0.05, which is in line with two conditions of the factor analysis, so we can continue the factor Analysis.

Table 4.3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.835
Bartlett's Test of Sphericity	Approx. Chi-Square	3682.526
	df	1035
	Sig.	.000

The result of the principal component analysis is shown in appendix 4. This paper aggregately extracts 12 common factors from the 46 items, and the cumulative interpretation of 12 common factors to the total square deviation is 66.409% which can indicate that the extracted 12 common factors can effectively explain the 47 items in the questionnaire.(See Appendix 4).

After rotating the extracted 12 common factors with the maximum-variance algorithm, we can obtain the component matrix after rotation as shown, and the result is very good. (See Appendix 5).

Correlation analysis

We usually use Pearson correlation coefficients to measure the correlation between two variables for the scales in the research. If the correlation coefficient is range -1 from 1, at the same time the absolute value is bigger, the degree of correlation of the two variables is stronger. If the correlation coefficient is almost close to -1 and 1, the correlation is stronger. Otherwise the correlation is weaker.

The correlation coefficient of independent variable with dependent variable Degrees of satisfaction are shown in appendix 6: Learner attitude ($r = .076$, $p > .05$); Learner anxiety ($r = -.005$, $p > .05$); Self-efficacy ($r = .198^{*}$, $p < .05$); Instructor response ($r = .161^{*}$, $p < .05$); Course Flexibility ($r = .284^{**}$, $p < .01$); Course quality($r = .148$, $p > .05$); Technology quality($r = .225^{**}$, $p < .01$); Internet quality ($r = .062$, $p > .05$); Usefulness ($r = .453^{**}$, $p < .01$); Ease of use ($r = .395^{**}$, $p < .01$); Diversity in assessment ($r = .202^{**}$, $p < .01$); Interaction with others ($r = .308^{**}$, $p < .01$) (See Appendix 6).

Learner attitude, Learner anxiety, Course quality and Internet quality have no correlational dependence with Degree of satisfaction. Self-efficacy and Instructor response have positively correlational dependence with Degree of satisfaction. Course Flexibility, Technology quality, Usefulness, Ease of use, Diversity in assessment and Interaction with others exhibited remarkable and positively correlational dependence with Degree of satisfaction.

Regression analysis

Multivariate linear regression analysis is essential to remove the interaction among these independent variables and definite the relations between the independent and dependent variables through this method.

Table4.4 Model Summary indicates that: R Square is 0.290, Adjusted R Square 0.234, which can indicate than Learner, Instructor, Course, Technology, Design and Environment can explain the variation of the Degree of satisfaction reaching 23.4%, and Durbin-Watson is 2.120,close to 2. No autocorrelation problems exist .

Table 4.4: Model Summary [b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.539[a]	.290	.234	.29996	2.120
a. Predictors: (Constant), Interaction with others, Learner anxiety, Internet quality, Diversity in assessment, Course quality, Self-efficacy, Instructor response, Course Flexibility, Learner					
b. Dependent Variable: Learner satisfaction					

Table 4.5 ANOVA results indicate that: when the regression equation (Constant) contains these independent variables(Learner, Instructor, Course, Technology, Design and Environment), the F value is 5.176, and its significance probability value is 0.000 (≦ 0.05), reaching the remarkable level, which can indicate that the regression equation can accepted.

Table 4.5: ANOVA [a]

Model		Sum of Squares	*df*	Mean Square	F	Sig.
1	Regression	5.589	12	.466	5.176	.000[b]
	Residual	13.677	152	.090		
	Total	19.266	164			
a. Dependent Variable: Learner satisfaction						
b. Predictors: (Constant), Interaction with others, Learner anxiety, Internet quality, Diversity in assessment, Course quality, Self-efficacy, Instructor response, Course Flexibility, Learner attitude, Technology quality, Ease of use, Usefulness						

Using Degree of satisfaction as the dependent variable and Learner attitude, Learner anxiety, Self-efficacy, Instructor response, Course Flexibility, Course quality, Technology quality, Internet quality, Usefulness, Ease of use, Diversity in assessment and Interaction with others as the independent variables, the coefficient result shows that (See Appendix 7)：

Standardized coefficient of independent variable Learner attitude, Learner anxiety, Self-efficacy, Instructor response, Course Flexibility, Course quality, Technology quality, Internet quality, Diversity in assessment and Interaction with others to Degree of satisfaction are 0.136, 0.040, 0.073, -0.043, 0.040, 0.038, -0.023, 0.012, -0.064 and 0.125, respectively; the Sig. of them are 0.102, 0.641, 0.345, 0.591, 0.654, 0.603, 0.786, 0.863, 0.446 and 0.099, respectively, which are not significant at the 0.05 level (2-tailed). This shows that the Learner attitude, Learner anxiety, Self-efficacy, Instructor response, Course Flexibility, Course quality, Technology quality, Internet quality, Diversity in assessment and Interaction with others have no influence on Degree of satisfaction.

Standardized coefficient of independent variable Usefulness to Degree of satisfaction is 0.297 (Sig. = 0.004), which is significant at the 0.05 level (2-tailed). This shows that the Usefulness have positive influence on Degree of satisfaction.

Standardized coefficient of independent variable Ease of use to Degree of satisfaction is 0.253 (Sig. = 0. 008), which is significant at the 0.05 level (2-tailed). This shows that the Ease of use have positive influence on Degree of satisfaction.

Therefore, the results indicate that design dimension including two variables of usefulness and ease of use is the critical factor affecting learners' perceived satisfaction.

Table 4.6:Summary of the results

Dimensions	Independent variables	Significant
Learner Dimension	Learner attitude	No
	Learner anxiety	No
	Self-efficacy	No
Instructor Dimension	Instructor response	No
Course Dimension	Course flexibility	No
	Course quality	No
Technology Dimension	Technology quality	No
	Internet quality	No
Design Dimension	Usefulness	Yes
	Ease of use	Yes
Environment Dimension	Diversity in assessment	No
	Interaction with others	No

From the table above, we could see the relationships between each dimension with learners' satisfaction.

Learner dimension examined the links between the learners themselves and learners' satisfaction.Among them,learners' attitude, anxiety and self-efficacy have no effect on learners satisfaction with flipped classroom. From this, we can see that students in modern times are prepared and eager to accept new learning approaches and methods to solve learning problems. Users' attitude,efficacy should no longer be considered as an issue in the flipped classroom learning. Therefore, Educators should not give too much concern on this aspect and make the research and reform stagnate. On the other hand, once anxiety of flipped classroom do not emerged, the barrier to flipped classroom is reduced and the abilities to use flipped classroom learning are effectively improved. Therefore, in order to increase students' satisfaction and further improve the effectiveness of flipped learning, it is important to strengthen the education and training of the students to give them better understanding of flipped classroom and related skills.

Instructor dimension examined the relationship between the instructors and learners satisfaction. In this research, both instructors' attitude and response are insignificant. Corresponding to previous findings,instructors' attitudes towards flipped learning should have a significant effect on students' satisfaction and learning activities. In this research,although we chose two different teachers, both of them were well trained with flipped classroom concept

and had more than one-year flipped teaching experience. From this, we could say that it is not the instructors' attitude and response that have insignificant effect on flipped classroom, it is because the instructors were well prepared for the flipped classroom teaching. It greatly depends on the instructors' idea and ability. Therefore,instructors should be selected and trained carefully since the effectiveness of learning and students success will be discounted according to instructors attitudes and response.

Course dimension examined the effects of the course. Course flexibility and quality are both proved to be insignificant in this research. In contrast to traditional classroom learning, flipped learning is not constrained by space, time and location, therefore students have a high degree of flexibility and a lot of self-paced learning opportunities. In this research, no significance was proved because we explore the advantage of the new model and design courses with maximum flexibility to meet students needs.Meanwhile, the course scheduling, discussion arrangement and types, teaching materials were properly prepared.

Technology dimension examined the relationship between technology and learners' satisfaction. In this research, no factors in the technology dimension has a significant influence on learners satisfaction. From interactions with students and observations of the technology in use today, it is reasonable to assume that the technologies used in flipped learning are fairly mature. As mentioned in earlier sections, the insignificant effect in this research doesn't suggest that technology is not important; it implies that technology used in the flipped classroom environment is satisfactory to the students. In flipped classroom environment, poor technology with frequent technical difficulties will definitely discourage students from taking the course.

Design dimension examined the effects of design and learners' satisfaction. In this research,usefulness significantly influences students' satisfaction. For students, if a new model could raise their learning efficiency and learning achievement, the model could be accepted greatly.Otherwise,it could be doubted and considered time-wasting and a heavy burden. Hence, the higher the perceived usefulness of flipped classroom approach, the more satisfaction learners had. Ease of use also has a significant impact on students satisfaction. The ease of use flipped classroom approach makes it possible for students to devote their attention to learning the course materials instead of spending additional effort learning the instrument.

Environment dimension examined the relationship between environment and learners' satisfaction.However, diversity in assessment and interaction with others both have no positive influence on learners' satisfaction. For instructors, a variety of assessment methods enable instructors to evaluate learning effects from different aspects so that instruction can be more effective. As for students, diversified assessment systems motivate them to do their best efforts to achieve the best results. In this research, formative evaluation assessment criteria were designed in coordination with the course. In addition to instructors' evaluation of students performance, self-assessment and peer assessment were also incorporated in the system, motivating students to monitor their own achievements. Hence, higher learning satisfaction occurred.

4.3 Research on the Micro-Lectures Used in Flipped Classroom Model

4.3.1 Students' Perception of Micro-Lectures Used in English Course

In questionnaire 2**,**Question 1-5 were designed to test the first dimension instructional usability from the perspectives of choosing subject,content selection and activity design. Question6-9 were designed to test the second dimension efficiency of micro-lectures from the perspectives of easy to learn,efficient use,easy to remember and high satisfaction.

Table 4.7 shows that the result of students' attitude towards the micro-lectures in this course.

Item 1 stated that :*They include difficult and important language points.* The result of response is overwhelmingly positive. Ninety-one percent of the students agree and strongly agree that micro-lectures used in the course could cover the difficult and important language points. Because all the micro-lectures were designed and filmed by the teachers who are familiar with students cognitive level and English level. It well proves the usability of these micro-lectures.

Item 2stated that :*They are with serious content and no errors.* In terms of content selection and errors, students gave a relatively low evaluation and the results shows that 32% of the students felt uncertainty on the content of micro-lectures. Students' responses put forward high requirements for the teachers who make micro-lectures. Because when a teacher

gave lectures in class, he or she could correct errors at any time if possible, while once the language points with errors exists in micro-lectures, it would cause a bad and unchangeable influence on users learning.

Item 3 stated that :*They are easy to understand and emphasize the key points.* The result shows that 84% of the students agree or strongly disagree with the statement, with 5% of the students disagree.

Item 4 stated that :*The design is interesting and innovative.* Similar to the most items, it is clear that students favored the micro-lectures. Eighty-four percent of the students agree and strongly agree with the statement, with no one disagree. Micro-lectures must differ from teachers' lectures in class. Videos should be designed and made fun and helpful. Only when students are interested in micro-lectures learning, could the learning motivation be aroused.

Item5 stated that :*They could promote my initiative.* This item has a one-side results with 90% choosing to agree or strongly agree. Only 3% of the students disagree with the result and no student respond that they strongly disagree with the statement.

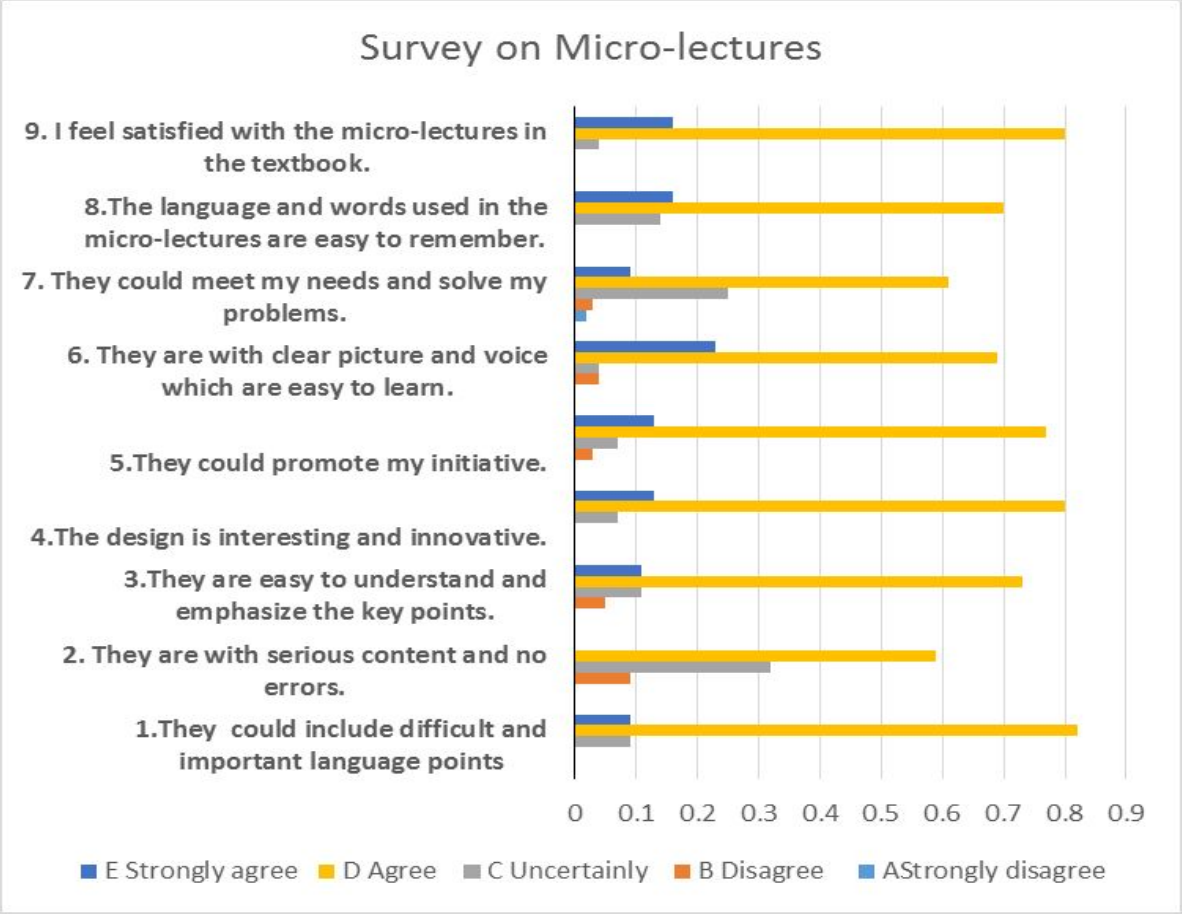
Item 6 stated that :*They are with clear picture and voice which are easy to learn.* There is a overwhelming positive result, and 92% of the students claim that the picture and voice are clear enough to learn easily. No one strongly disagree.

Item7 stated that :*They could meet my needs and solve my problems.* For this item, 70% of the students agree or strongly agree with this statement. It is also worth mentioning that 25% of the students show uncertainty the effect that the micro-lectures has met their needs and solved their problems， which could support why usefulness has positive influence on Degree of satisfaction with flipped classroom. This findings are almost in the same percentage with that of students' satisfaction with flipped classroom.

Item 8 stated that :*The language and words used in the micro-lectures are easy to remember.* Eighty-six percent of the students agree or strongly agree with this statement. While there is still 14% of the students show uncertainty, and no one disagree or strongly disagree with the statement.

Item 9 stated that : *I feel satisfied with the micro-lectures in the textbook.* Ninety- six percent of the students agree or strongly agree with the statement, and only 4% of the students are uncertain. It is clear that students are satisfied with micro-lectures.

Table 4.7: Survey on Micro-Lectures



4.3.2 Suggestions on Micro-Lectures Used in Flipped Classroom

Question 1: Which mode of micro-lecture do you like best, Performance mode, Lecture mode,or Dialog mode?

Mode

Mode of Micro-lectures	A Performance mode	B Lecture mode	C Dialog mode
	61%	18%	21%

In terms of the three modes (Performance mode,Lecture mode,Dialog mode) applied in English course,61% of the students show that they like micro-lectures with performance mode most because this kind of micro-lectures could involve them into context learning with high interest. Meanwhile micro-lectures with lecture mode are mostly unpopular with students

because of its similar forms to teachers lectures in class. Thus give some instructions for teachers that the design which is different from classroom lectures is very important in motivating students' learning interests and keeping their attention on learning.

Suggestions: Set up some context in micro-lectures to mingle knowledge with the natural setting, which could make students learning in context.

Question 2:Which kind of micro-lecture do you like best,on vocabulary ,on sentence structure,on passage structure,or on writing?

Type

Content of Micro-lectures	A On vocabulary	B On sentence structure	C On passage structure	D On writing
	35%	33%	25%	7%

In term of four kinds of video content, 71% of students prefer vocabulary and sentence structure video. It is easy to conclude that specific targeted micro-lectures could meet students needs to great extent, especially for the students with poor English level. From the opinion of teachers, micro-lectures on writing would be the most popular ones because it is comprehensive and practical,while this kind of video are only accepted by 7% of the students. The content and difficulty of micro-lectures must comply with students cognition level and English level, otherwise it will bring great burden for students to watch and crack down students' confidence in continuing to learn.

Suggestions: Teachers should offer suitable micro-lectures according to students perception and English level, aiming at making hard things simple. Language points in micro-lectures could not increase students' burden of learning.

Question3:How long of each Micro-lecture is suitable for you to learn?

Length

Length of each Micro-lecture	A Within 3mins	B Within5mins	C Within 10mins	D 10mins-15mins
	35%	33%	25%	7%

In terms of length of each micro-lecture,93% of the students could accept micro-lectures within ten minutes. Most students claimed that the length of micro-lectures in English course should range from 3 minutes to 5 minutes, which could be comply with their learning habit and avoid brushing classes because of heavy burden. Micro-lectures should not be too long. The younger the students are, the shorter micro-lectures should be. Hence, before we make or collect micro-videos for flipped classroom, the age of students could be taken into consideration.

Suggestions: Three minutes to five minutes could be the golden length for each micro-lecture, during which students' acceptance, attention and learning efficiency could be at the highest level.

Question 4:Should the Language in Micro-lectures be in English, in Chinese or bilingual?

Language

Language in Micro-lectures	A In English	B In Chinese	C Bilingual
	2%	13%	86%

Eighty-six percent of the students hoped that the language could be bilingual. Students recommended that English expressions used in micro-lectures should be as simple as possible, and it is necessary to use Chinese explanation for some difficult points. While the micro-lectures in this study taking English as the interpretation of the language affect students' satisfaction more or less.

Suggestions: The micro-lectures should aim to be easily leaned and solve students problems instead of pursuing to be superior and high level. The languages used in different videos should vary from content to content, for example, micro-lectures focus on teaching grammar points should use Chinese most.

Question 5:How fast should the speed be suitable,in normal speed, faster or slower?

Speed

Speed	A Normal speed	B Faster speed	C Slower speed
	84%	11%	5%

For this question, 84% of the students are prone to micro-lectures with normal speed. By contrast, many researchers assumed that micro-lectures should be made in faster speed because they thought the users could pause and replay at any time if necessary. Actually, students stated that the faster speed let them lack of self-confidence to learn, let alone watching videos again and again. However, lower speed will decrease interest in learning and easily cause burnout.

Suggestions: Normal speed in micro-lectures would be accepted by most students. Never use slower speed.

Question 6:Do you like computer-generated voice or teachers' voice?

Voice

Voice	A Computer-generated	B Teacher's	C Either
	6%	48%	46%

In terms of voice in micro-lectures, 48% of the students liked the teacher's voice better than computer-generated voice,while 46% of the students showed that both of them were OK. Compared with the two kinds of voices, teacher's voice is more familiar and amiable and computer-generated voice is more standard and authentic. No matter what kinds of voices you use, make sure it clear and nice. Otherwise, learning could become boring.

Suggestions: Computer- generated voice could be another good choice for the video-makers who do not have a good and standard voice.

Question7:Which kind of figure do you prefer, your own teacher or the animated characters?

Figure

Figures in Micro-lectures	A Teacher himself	B Animated character	C Either
	21%	59%	20%

Before the survey, we assumed that students could be more excited seeing their teacher in the video.Fifty-nine percent of the students expressed that animated characters in micro-lectures could raise their attention and interest. And also some students claimed that the teacher on the screen would distract their attention.

Question 8:How much time do you usually use to learn each micro-lecture?

Learning Time

Time for studying each Micro-lecture	A Within 10mins	B 10mins-20mins	C Above 20mins
	34%	66%	0%

As for the time spent on learning each micro-lecture,66% of the students choose 10 minutes to 20 minutes. Students expressed that it would be a heavy burden if each micro-lecture took them more than 20 minutes.

Question 9:How many times do you usually use to learn each micro-lecture?

Learning Frequency

Frequency of studying each Micro-lecture	A Once	B Twice	C Above three times
	23%	63%	14%

As for the frequency of learning each micro-lecture,86% of the students indicated that it was enough for them to learn once or twice for each video. From this, we can conclude that most videos in this course accords with acceptance capability of the students and students like learning English in forms of micro-lectures.

Question10:How many micro-lectures are suitable for pre-class learning?

Quantity

The number of Micro-lecture for pre-class learning	A 1-2	B 3-4	C More than 5
	61%	39%	0%

As for the numbers of micro-lectures for pre-class learning, 61% of the students claimed that two micro-lectures was enough. More than five micro-lectures would not be acceptable.And if there are such videos in other courses, they cold not afford it and it could be a heavy burden.

Suggestions: we can see that less than two micro-lectures for pre-learning are suitable for students, which would allow them to use 10-20minutes.This could be a golden rule for teachers when carrying out flipped classroom teaching.

4.4 Students Comments and Notes

Here are a collection of the statements that students made at the end of this research study.

Students' comments on the benefit of flipped classroom:

--It's a good way to learn.

--It makes me more efficient and involved in class.

--I can understand the knowledge more deeply.

--It's a unique method. It offers more chance to communicate, which makes me become interested and confident in English.

--It makes me learn more than knowledge.Teamwork and automatic learning are more important for me.

--I learn more out of class.

--Firstly, It makes me become brave and confident; Secondly, I learn more English knowledge.

Students' comments on the weakness of flipped classroom:

-- Learning burden before class is a little heavy .

--It's a great challenge for students who lack of automatic learning ability.

--we need more instruction and guidance.

--There is nothing to fall back on if you didn't finish pre-class learning.

--Sometimes videos don't load if internet is bad.

Students' comments on the micro-lectures in the flipped classroom:

--It's great. We like learning through watching videos.

--Videos make the class more different than traditional class.

--It makes learning more interesting than before.

--I could control my learning.

--Sometimes the information in videos is too difficult, but sometimes is too easy.

These comments give a student point of view of the flipped classroom and micro-lectures.Some key comments to note are some of the benefits and weaknesses of the flipped classroom. Some of the benefits like being more visual for students. Students being

able to work at their own pace, learning with peers, and gaining not only knowledge but confidence and interest demonstrate that flipped classroom based on micro-lectures could help create more different atmosphere for learning and teaching and will help students get more out of the time they are spending working on English outside of class.

Chapter Five Conclusion

5.1 Findings and Implication of the Research

The flipped classroom is a teaching model in which students previewed the learning resources before class through video lectures made by instructors or other pre-class learning materials, and in-class time is used for student-centered active learning. Video is widely utilized as a typical pre-class learning material in the flipped classroom. Findings demonstrate that students had positive attitudes towards the flipped classroom based on micro-lectures. From this finding, the research could conclude that flipped classroom model based on micro-lectures was not only accepted by university students with high English level ,but also accepted by vocational students and has gained great satisfaction.

Among six dimensions that affects learners' satisfaction, although only design dimension was proved to have a significant effect on students satisfaction; it simply implied that the learners dimension, instructors dimension, course dimension, technology dimension and the environment dimension were satisfactory to students. It has proved from another aspect that the implementation of flipped classroom model for the English course has become a success, and the more work we need to do is to offer more opportunities to test the function of flipped learning approach in improving students learning performance and efficiency.

This study provides insights for educators to strengthen their flipped classroom implementations and further improve learner satisfaction. An unsatisfactory perception will hamper students' motivation to continue their learning. The twelve critical factors cannot be neglected when implementing a successful flipped classroom environment.

This research reveals several meaningful findings on micro-lectures.First,from users perspective,we gained a in-depth understanding on students' attitude on the micro-lectures matched with this English textbook. Second, some features has been concluded from this research. Micro-lectures with flipped classroom should be in performance mode, on some specific language point,less than 10 minutes, in two languages, with normal speed and animated characters. Third, from interview, a golden rule could be concluded that one or two micro-lectures for pre-learning was suitable for students who will use10-20minutes to learn once or twice.

Since the English flipped classroom has been proved to be a success, here we conclude four features that flipped classroom model should have:

Feature 1: Use information technology to ease faculty and students into flipped mindset.

In the information era, technology needs to support learning and allow for easy access by teachers and students. Mobile learning would be a good choice because once the students install the learning APP, they will feel easy to learn the materials whenever and wherever they want. In flipped classroom model, learning resources and materials are mostly uploaded onto the website. It is more practical for students to have a mobile phone than a PC, therefore,it must be convenient and effective if students could learn through mobile APP which is synchronized with what have been learned on the internet.

Feature 2: Offer rich and suitable micro-lectures to replace teacher's classroom lecture

Whether students have positive attitudes towards pre-class learning in the flipped classroom is another critical factor that affects flipped classroom teaching. Usually we have four types of learning materials including audios, videos and text-formatted materials. Videos are widely utilized as typical pre-class learning materials in the flipped classroom. If possible, using home videos made by teachers could be the best choice.

Feature 3:Design various classroom activities to promote knowledge application

Classroom activities are designed to complete the process of knowledge digestion and absorption. In flipped classroom model, classroom activities are arranged instead of teachers' instruction. Teachers work as a leader role who guide the students to internalize knowledge through various activities, such as classroom discussion, inquiry experiment and project-based learning. In the process of classroom activities, the teacher should fully consider the

background knowledge and students' level. The difficulty level which is too high or too low would have negative influence on teaching and learning. And it is vital to design the class activities connected with students online learning before class.

Feature 4: Provide sound and diverse assessment system to protect students' motivation

A comprehensive assessment should be given to the students with a standard A-through-E scale in terms of the students' auto-learning ability, the classroom engagement, collaborative learning attitude and learning achievement. On the basis of it, the teacher, classmates and students themselves give assessment on students' learning activities. In these activities the students could develop project results, results of exchanges, and mutual evaluation.

To conclude, implementation of the flipped classroom approach definitely poses a challenge to educators. One condition can not be neglected is that the flipped classroom may not attain its goal unless teachers and students are available to change their idea of teaching and learning. Proper implementation of flipped classroom approach is helpful in developing active learners.

5.2 Limitation of the Research

This research has certain limitations that should be considered for further research. First, its small sample limits its generalizability. Second, the research proposes an integrated model covering a variety of factors affecting learners' satisfaction. It might not comprehensive due to time and resource limitations. Third, in Questionnaire 1, the dependent variable is a single indicator,the learners' satisfaction. Learning performance and student scores could also be considered as dependent variables. Forth, the suggestions on micro-lectures given based on self-made micro-lectures. Some may be one-sided and some may not be considered. Fifth, The flipped classroom was carried out in large classes with more than 80 students, which could be another limitation for the implementation of flipped classroom. Learners satisfaction would be effected by class size. Sixth, the research lasted for two months. Since developing or changing a habit need time, the longer the research lasts, the better the result will be.

Despite the limited sample, the research data provides a different view on the flipped classroom approach. A new English model with rich micro-lectures resource, developed

network platform, designed course activities and sound assessment system was put into practice and it has been proved a success to some extent. Critical factors that affecting learners satisfaction were conclude clearly. From the findings, it reminds us of the effect on improving students learning performance(usefulness of flipped classroom)was not given fully play to meet students needs.In future research, it is vital to extend this kind of research to examine different kinds of micro-lectures with different flipped classroom models. Also, it would be helpful to study how to motivate pre-class learning because it can make great effect on the implementation of flipped classroom.

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Appendices

Appendix 1 Questionnaire Survey on Flipped Classroom Model

大家好！本调查问卷旨在调查影响翻转课堂实施的影响因素，你的答案将只用于数据分析，不会用于其他途径，请放心如实填写。非常感谢你的配合！

专业：　　性别：　（　　）男　　（　）女

		题目	选项				
一 学习者	学习者态度	1 我觉得翻转课堂学习很难。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 我觉得翻转课堂学习很复杂。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		3 翻转课堂学习给我很大的心理压力。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		4 我认为翻转课堂学习需要技术能力。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		5 我认为翻转课堂学习只适合有耐心的人。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		6 我认为翻转课堂学习可以让一个人的学习更有成效。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
	学习者焦虑	1 翻转课堂学习让我感到很紧张。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 翻转课堂学习让我不适应。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		3 翻转课堂学习让我感到不安和困惑。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
	自我效能	1 我能够自信地开始翻转课堂中的学习任务。	A 一点不自信	B 一般	C 非常自信		
		2 我能够自信地完成翻转课堂中的学习任务。	A 一点不自信	B 一般	C 非常自信		
二 教师	教师反馈	1 我能即时收到老师对我在本门课程中作业和测试的评价。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 与传统课堂相比，我的老师认为翻转课堂更有用。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
三 课程	课程灵活性	1 翻转课堂让我更有效的安排我的学习。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 通过翻转课堂模式学习这门课的优点胜于缺点。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		3 通过翻转课堂学习这门课让我在无关的活动中花了大量时间。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		4 通过翻转课堂学习这门课没有严重的缺陷.	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		5 通过翻转课堂学习这门课让我坚持上课不逃课。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意

	课程质量	1 与其他课程相比，翻转课堂提高了这门课的质量。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 这门课的质量要好于其他课程。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		3 我感觉这门课的质量并没有因翻转课堂而改变。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
四 技术	技术质量	1 我感觉翻转课堂中使用的信息技术简单易用。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 我感觉翻转课堂中使用的信息技术有很多有用的功能。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		3 我感觉翻转课堂中使用的信息技术有很大的灵活性。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
	网络质量	1 我对网速满意。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 我觉得上网很方便。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
五 设计	有用性	1 翻转课堂学习能提高我的学习效果。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 翻转课堂学习能提高我本门课的成绩。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		3 我觉得翻转课堂学习模式有用。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		4 翻转课堂能提高我的学习效率。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
	可用性	1 熟练地使用翻转课堂模式来学习对我来说容易。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 学会使用翻转课堂学习对我来说容易。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		3 我发现通过翻转课堂来学习自己想学的知识比较容易。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		4 我觉得翻转课堂学习方式简单易用。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
六 环境	多元评价	翻转课堂对我的学习实行多角度评价（测验、笔试、口试等）	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
	互动	1 与其他课程相比，学生之间的互动更难了。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 与其他课程相比，课堂讨论更加难以参与。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		3 与其他课程相比，我在课上从同伴身上学到了更多。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		4 我发现课堂讨论的质量高了。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		5 很容易跟上课堂讨论。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		6 课堂活力与其他课有很大的不同。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
满意度	学习者满意度	1 如果有机会参加其他课的翻转课堂学习，我很愿意。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		2 我对这门课很满意。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		3 我会尽可能多地通过翻转课堂模式学习其他课程。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		4 我觉得本门课很好地满足了我的需求。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		5 我对这门课采用翻转课堂模式感到失望。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意
		6 如果重新选择，我不愿以翻转课堂模式上这门课。	A 非常不同意	B 不同意	C 不确定	D 同意	E 非常同意

Appendix 2　Questionnaire Survey on Micro-lectures

1.教材中的微课能够涵盖学习中的重点和难点。

A 非常不同意 B 不同意 C 不确定 D 同意　E 非常同意

2.教材中的微课内容严谨，没有科学性的错误。

A 非常不同意 B 不同意 C 不确定 D 同意　E 非常同意

3.教材中的微课简单易懂，过程清晰。

A 非常不同意 B 不同意 C 不确定 D 同意　E 非常同意

4.教材中的微课设计新颖，方法有创意。

A 非常不同意 B 不同意 C 不确定 D 同意　E 非常同意

5.教材中的微课能提高我的学习主动性。

A 非常不同意 B 不同意 C 不确定 D 同意　E 非常同意

6.教材中的微课画面清晰、声音清楚、易于学习。

A 非常不同意 B 不同意 C 不确定 D 同意　E 非常同意

7.教材中的微课能解决我的学习问题。

A 非常不同意 B 不同意 C 不确定 D 同意　E 非常同意

8.教材中的微课的语言和文字便于我记忆。

A 非常不同意 B 不同意 C 不确定 D 同意　E 非常同意

9.我对教材中的微课感到满意。

A 非常不同意 B 不同意 C 不确定 D 同意　E 非常同意

Appendix 3 Descriptive Statistics

Variable-scale	Items	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
LAT	LAT1	165	1.00	5.00	2.5152	.84540	1.055	.189	.534	.376
	LAT2	165	1.00	5.00	2.5939	.84027	.823	.189	-.056	.376
	LAT3	165	1.00	5.00	2.4242	.92494	1.114	.189	.771	.376
	LAT4	165	1.00	5.00	2.9697	1.01467	.132	.189	-1.177	.376
	LAT5	165	1.00	5.00	2.6242	1.03212	.638	.189	-.438	.376
	LAT6	165	1.00	5.00	3.4667	.82294	-.656	.189	.043	.376
LAN	LAN1	165	1.00	5.00	2.6000	.96777	.755	.189	-.448	.376
	LAN2	165	1.00	5.00	2.5636	.90588	.730	.189	-.316	.376
	LAN3	165	1.00	4.00	2.4121	.86241	.651	.189	-.387	.376
SE	SE1	165	1.00	3.00	2.1030	.45026	.442	.189	1.587	.376
	SE2	165	1.00	3.00	2.1212	.49124	.277	.189	.843	.376
IR	IR1	165	1.00	5.00	3.6061	.75464	-.841	.189	.607	.376
	IR2	165	1.00	5.00	3.8788	.86100	-1.098	.189	1.620	.376
CF	CF1	165	1.00	5.00	3.3818	.88671	-.884	.189	.231	.376
	CF2	165	1.00	5.00	3.6000	.77144	-.784	.189	.458	.376
	CF3	165	1.00	5.00	2.6485	.96149	.632	.189	-.531	.376
	CF4	165	1.00	5.00	2.9818	.87981	-.236	.189	-.598	.376
	CF5	165	1.00	5.00	3.7455	.90159	-1.091	.189	1.382	.376
CQ	CQ1	165	1.00	5.00	3.5636	.74319	-.898	.189	1.014	.376
	CQ2	165	1.00	5.00	3.2000	.82047	-.453	.189	-.171	.376
	CQ3	165	1.00	5.00	2.8545	.90564	.342	.189	-.904	.376
TQ	TQ1	165	1.00	5.00	3.5273	.86647	-.910	.189	.280	.376
	TQ2	165	1.00	5.00	3.5636	.80616	-.669	.189	.107	.376
	TQ3	165	2.00	5.00	3.5212	.78545	-.529	.189	-.338	.376
IQ	IQ1	165	1.00	4.00	1.4727	.73720	1.759	.189	3.077	.376
	IQ2	165	1.00	5.00	2.0606	1.13534	.842	.189	-.532	.376
UF	UF1	165	1.00	5.00	3.5576	.71867	-1.102	.189	1.257	.376
	UF2	165	1.00	5.00	3.4606	.76904	-.925	.189	1.188	.376
	UF3	165	1.00	5.00	3.6606	.73665	-1.126	.189	1.697	.376
	UF4	165	1.00	5.00	3.5697	.79805	-1.105	.189	1.445	.376
EOU	EOU1	165	1.00	5.00	3.1818	.91912	-.227	.189	-.883	.376
	EOU2	165	1.00	5.00	3.3091	.93455	-.610	.189	-.509	.376
	EOU3	165	1.00	5.00	3.4485	.89991	-.911	.189	-.046	.376
	EOU4	165	1.00	5.00	3.4121	.87644	-.635	.189	-.450	.376
DIA	DIA	165	1.00	5.00	3.6848	.73090	-1.138	.189	1.363	.376
IWO	IWO1	165	1.00	5.00	2.3939	.78629	1.156	.189	1.000	.376

	IWO2	165	1.00	5.00	2.3818	.79229	1.215	.189	1.438	.376
	IWO3	165	1.00	5.00	3.5394	.85181	-1.233	.189	1.073	.376
	IWO4	165	1.00	5.00	3.6424	.77264	-1.290	.189	1.830	.376
	IWO5	165	1.00	5.00	3.5273	.80822	-1.177	.189	.766	.376
	IWO6	165	1.00	5.00	3.7152	.73920	-1.232	.189	1.572	.376
LS	LS1	165	1.00	5.00	3.6000	.86108	-1.039	.189	.936	.376
	LS2	165	1.00	5.00	3.5515	.81455	-1.127	.189	.837	.376
	LS3	165	1.00	5.00	3.5152	.83085	-1.082	.189	1.142	.376
	LS4	165	1.00	5.00	3.3394	.88688	-.193	.189	-.211	.376
	LS5	165	1.00	5.00	2.4000	.79480	.997	.189	1.200	.376
	LS6	165	1.00	5.00	2.4727	.91441	1.099	.189	1.075	.376

Appendix 4 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.790	25.630	25.630	11.790	25.630	25.630	7.810	16.977	16.977
2	3.615	7.859	33.489	3.615	7.859	33.489	3.845	8.358	25.336
3	1.987	4.319	37.808	1.987	4.319	37.808	2.734	5.944	31.280
4	1.910	4.151	41.960	1.910	4.151	41.960	2.434	5.292	36.571
5	1.838	3.995	45.955	1.838	3.995	45.955	2.225	4.836	41.407
6	1.659	3.607	49.561	1.659	3.607	49.561	1.981	4.307	45.714
7	1.423	3.093	52.655	1.423	3.093	52.655	1.747	3.798	49.512
8	1.413	3.071	55.726	1.413	3.071	55.726	1.711	3.719	53.231
9	1.358	2.952	58.677	1.358	2.952	58.677	1.688	3.669	56.900
10	1.281	2.785	61.463	1.281	2.785	61.463	1.518	3.301	60.201
11	1.244	2.704	64.167	1.244	2.704	64.167	1.496	3.251	63.452
12	1.031	2.242	66.409	1.031	2.242	66.409	1.360	2.957	66.409
13	.982	2.136	68.544						
14	.943	2.050	70.594						
15	.888	1.929	72.523						
16	.821	1.785	74.308						
17	.775	1.684	75.992						
18	.762	1.655	77.647						
19	.730	1.586	79.234						
20	.682	1.483	80.716						
21	.617	1.342	82.058						
22	.605	1.315	83.373						
23	.597	1.298	84.671						

24	.568	1.235	85.906						
25	.552	1.199	87.105						
26	.475	1.032	88.138						
27	.460	1.000	89.138						
28	.443	.964	90.102						
29	.432	.939	91.041						
30	.384	.835	91.876						
31	.350	.761	92.637						
32	.337	.732	93.369						
33	.333	.724	94.093						
34	.306	.665	94.758						
35	.296	.643	95.401						
36	.275	.597	95.999						
37	.262	.571	96.569						
38	.231	.503	97.073						
39	.225	.489	97.562						
40	.207	.450	98.012						
41	.198	.431	98.443						
42	.172	.374	98.817						
43	.161	.350	99.167						
44	.148	.323	99.489						
45	.127	.275	99.764						
46	.108	.236	100.000						
Extraction Method: Principal Component Analysis.									

Appendix 5 Component Matrix[a]

	Component											
	1	2	3	4	5	6	7	8	9	10	11	12
LAT1	-.336	.515	-.295	.079	-.090	.024	-.223	.219	-.051	-.305	.018	-.180
LAT2	-.379	.663	-.186	.061	.027	-.007	-.129	.158	-.042	-.155	.101	-.028
LAT3	-.369	.653	-.085	.258	.057	-.035	.078	-.160	-.043	.107	.000	.007
LAT4	-.190	.612	-.131	.111	-.303	.259	-.062	-.051	-.030	.045	-.134	-.015
LAT5	-.344	.502	.138	.187	-.203	.139	-.005	-.016	.081	.023	-.346	.184
LAT6	.204	.512	.201	-.090	-.233	.169	-.150	.111	.099	-.352	-.251	.267
LAN1	-.265	-.038	.637	-.060	.133	.143	.139	.094	-.053	.231	-.094	-.030
LAN2	-.401	.051	.508	-.194	.247	-.142	.212	.047	-.088	.030	.270	.189
LAN3	-.387	-.098	.570	-.163	.187	-.187	.267	.012	-.037	.179	-.008	.120
SE1	.556	-.193	-.155	.204	.123	-.229	-.174	.368	-.202	.098	-.053	.113
SE2	.521	-.148	-.132	.348	.082	-.364	-.226	.170	.020	.177	-.104	-.003
IR1	.171	-.098	.141	.163	-.215	.151	.176	-.048	-.058	-.403	.559	-.002
IR2	.051	.035	.272	-.143	.100	-.225	.097	.312	-.233	-.028	.546	.141
CF1	-.054	-.093	.261	.051	-.043	.290	.663	-.086	-.099	.014	.021	.255
CF2	.149	.073	.335	-.089	.000	.098	.635	.189	-.113	-.182	-.084	-.208
CF3	-.341	.293	-.131	.009	-.064	.079	.514	.205	.118	-.019	-.165	-.170
CF4	.178	-.054	.026	.081	-.019	.084	.547	-.023	.435	.078	-.109	-.458
CF5	-.149	.055	-.272	-.234	-.192	-.153	.521	.225	-.020	-.001	.219	-.266
CQ1	.067	.214	.359	-.125	-.035	.044	.008	.564	.149	.276	.021	-.200
CQ2	.023	.169	.275	-.111	.174	.129	.140	.530	.133	.281	.268	.024
CQ3	-.082	.043	-.026	.274	.228	.096	.067	.514	-.273	.033	.068	-.213
TQ1	.239	.007	-.012	.086	.601	.343	-.024	.165	.017	.119	.235	.065
TQ2	-.032	.101	-.182	.084	.579	.392	-.191	.348	.063	.104	.112	.023
TQ3	-.009	-.074	-.305	.007	.525	.228	.015	.323	.208	.190	.090	.175
IQ1	.015	.028	-.150	.525	-.331	.199	-.356	-.232	.108	.114	-.250	.077
IQ2	.056	.069	-.239	.580	-.394	.234	-.300	-.049	.004	-.103	-.144	-.023
UF1	.024	.242	.012	-.043	-.040	-.060	.003	-.160	.748	-.122	.116	-.011
UF2	-.259	.240	.006	-.103	-.082	-.069	-.103	.124	.686	-.050	.065	-.074
UF3	-.045	.321	.192	-.015	-.007	-.119	-.155	-.061	.724	.134	-.014	-.106
UF4	-.296	.177	.093	.027	-.063	-.088	.022	.070	.706	.313	-.052	-.011
EOU1	-.002	.016	-.110	.412	.297	.100	.165	-.030	.119	.651	-.127	-.104
EOU2	-.191	-.075	-.164	.310	.418	-.056	.174	-.025	-.051	.585	-.091	-.025
EOU3	-.184	.160	-.198	.156	.225	.238	.195	-.198	-.221	.565	-.040	.036
EOU4	-.232	.026	-.090	-.040	.285	.042	.296	-.062	-.121	.617	.119	.072
IWO1	-.390	.264	-.053	.196	.243	.515	-.316	-.052	.120	-.268	.109	-.096
IWO2	-.436	.210	-.056	.188	.186	.589	-.275	-.111	.154	-.019	.254	-.052
IWO3	.146	.200	-.142	.082	-.257	.518	-.138	-.316	-.094	.094	.206	-.079

IWO4	-.118	.178	-.061	.246	-.239	.591	-.015	-.128	-.013	-.051	.106	.261
IWO5	-.098	.033	-.251	-.073	-.265	.532	.122	-.349	-.126	.201	.132	.099
IWO6	.239	.119	-.294	-.041	-.057	.648	.094	.037	-.258	-.115	.286	.236
LS1	-.034	.299	-.134	-.118	.123	-.176	-.026	-.129	.098	-.143	-.107	.631
LS2	.074	.257	-.031	.059	-.039	-.148	.015	-.105	.067	-.062	-.047	.689
LS3	.060	.281	.249	-.057	.056	-.258	-.013	-.032	.102	-.036	-.326	.544
LS4	-.019	.155	.094	.234	-.029	-.019	-.134	-.089	.229	.075	-.118	.690
LS5	.132	-.005	.122	.303	.080	.160	-.049	-.082	-.022	.169	.112	.679
LS6	.219	-.127	.099	.121	.063	.147	.211	.139	.162	.037	-.029	.726
Extraction Method: Principal Component Analysis.												
a. 12 components extracted.												

Appendix 6 Descriptive Statistics & Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
Learner attitude	2.7657	.57791	165
Learner anxiety	2.5253	.74276	165
Self-efficacy	2.1121	.41449	165
Instructor response	3.7424	.62373	165
Course Flexibility	3.2715	.42596	165
Course quality	3.2061	.44853	165
Technology quality	3.5374	.65497	165
Internet quality	1.7667	.80117	165
Usefulness	3.5621	.63462	165
Ease of use	3.3379	.71770	165
Diversity in assessment	3.6848	.73090	165
Interaction with others	3.2000	.36123	165
Learner satisfaction	3.1465	.34275	165

Correlations

		Learner attitude	Learner anxiety	Self-efficacy	Instructor response	Course Flexibility	Course quality	Technology quality	Internet quality	Usefulness	Ease of use	Diversity in assessment	Interaction with others	Learner satisfaction
Learner attitude	Pearson Correlation													
	Sig. (2-tailed)													
Learner anxiety	Pearson Correlation	.508**												
	Sig. (2-tailed)	.000												

Self-efficacy	Pearson Correlation	-.212**	-.305**											
	Sig. (2-tailed)	.006	.000											
Instructor response	Pearson Correlation	-.204**	-.202**	.183*										
	Sig. (2-tailed)	.009	.009	.019										
Course Flexibility	Pearson Correlation	-.123	-.202**	.148	.416**									
	Sig. (2-tailed)	.115	.009	.058	.000									
Course quality	Pearson Correlation	.040	.139	.012	.136	.227**								
	Sig. (2-tailed)	.612	.075	.882	.081	.003								
Technology quality	Pearson Correlation	-.164*	-.224**	.230**	.276**	.425**	.100							
	Sig. (2-tailed)	.036	.004	.003	.000	.000	.199							
Internet quality	Pearson Correlation	-.075	.021	-.035	-.039	.030	.016	.167*						
	Sig. (2-tailed)	.339	.788	.651	.622	.706	.840	.032						

Usefulness	Pearson Correlation	-.116	-.166*	.292**	.408**	.553**	.203**	.461**	.105					
	Sig. (2-tailed)	.138	.034	.000	.000	.000	.009	.000	.179					
Ease of use	Pearson Correlation	-.247**	-.232**	.343**	.366**	.427**	.087	.480**	.168*	.557**				
	Sig. (2-tailed)	.001	.003	.000	.000	.000	.266	.000	.031	.000				
Diversity in assessment	Pearson Correlation	-.109	-.090	.238**	.316**	.253**	.026	.411**	.066	.473**	.472**			
	Sig. (2-tailed)	.165	.250	.002	.000	.001	.743	.000	.398	.000	.000			
Interaction with others	Pearson Correlation	.133	-.005	.128	.144	.168*	.137	.160*	-.057	.352**	.233**	.148		
	Sig. (2-tailed)	.088	.949	.102	.064	.031	.079	.040	.465	.000	.003	.058		0
Learner satisfaction	Pearson Correlation	.076	-.005	.198*	.161*	.284**	.148	.225**	.062	.453**	.395**	.202**	.308**	
	Sig. (2-tailed)	.332	.953	.011	.039	.000	.057	.004	.427	.000	.000	.009	.000	
**. Correlation is significant at the 0.01 level (2-tailed).														
*. Correlation is significant at the 0.05 level (2-tailed).														

Appendix 7 Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.430	.349		4.100	.000
	Learner attitude	.081	.049	.136	1.646	.102
	Learner anxiety	.018	.039	.040	.467	.641
	Self-efficacy	.060	.063	.073	.947	.345
	Instructor response	-.024	.044	-.043	-.538	.591
	Course Flexibility	.032	.072	.040	.450	.654
	Course quality	.029	.055	.038	.521	.603
	Technology quality	-.012	.045	-.023	-.272	.786
	Internet quality	.005	.031	.012	.172	.863
	Usefulness	.160	.054	.297	2.947	.004
	Ease of use	.121	.045	.253	2.688	.008
	Diversity in assessment	-.030	.039	-.064	-.765	.446
	Interaction with others	.119	.072	.125	1.661	.099
a. Dependent Variable: Learner satisfaction						

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