



# Build Up Peer Instruction Based Flipped Classroom with Social Network

Ying Chen<sup>1(✉)</sup>, Fei Lang<sup>2</sup>, Zeguang Lu<sup>3</sup>, and Hui Shi<sup>4</sup>

<sup>1</sup> School of Mathematics and Information Engineering, Taizhou University,  
Taizhou, Zhejiang, China

ychen222@tzc.edu.cn

<sup>2</sup> School of Foreign Language, Harbin University of Science and Technology,  
Harbin, Heilongjiang, China

langfeihust@163.com

<sup>3</sup> National Academy of Guo Ding Institute of Data Sciences, Beijing, China

ZeguangLu@icpcsee.org

<sup>4</sup> Henan Electric Power Transmission & Transformation Engineering Company,  
Zhengzhou, Henan, China

stone\_xia@sohu.com

**Abstract.** Nowadays, the rapid development of information technology provides a great support for Flipped classroom. We introduce the features of Peer Instruction (PI) and a social network APP which is named Wechat and its public platform. We introduce how to apply Wechat into classroom teaching by building a mixed Flipped classroom teaching mode based on PI with Wechat public platform. We take Computer Network Experiment course of Taizhou University as an example to illustrate the practice process. The feedback and investigation result indicate that this new Flipped classroom teaching mode can improve students' participation in the classroom activities and arouse students' interest in study. Students have thought highly of this new teaching mode.

**Keywords:** Peer Instruction · Flipped classroom · Teaching mode  
Social network · App · Wechat public platform

## 1 Introduction

Flipped classroom, also known as reverse classroom, is a new teaching mode, which exchanges the order of teaching and learning in conventional class and at the same time reallocates the class time [1]. To be specific, students are required to watch videos before taking the class and internalize what they have learned from the video, so the new mode of teaching has changed the role of teacher and students in conventional class in this regard. Flipped class redefines the order, focus and mode of teaching, from conventional “teaching and learning” to “learning and teaching” and from “learning results focus” to “learning process focus”, and from “teaching leading to learning” to “learning leading to teaching” [2]. Flipped class enables student to learn individually based on their own interests and level. Personalized learning is exactly what the teachers in the conventional class have been devoting to, but remains unsolved problem.

With wide application of the Internet, college students are highly dependent on the Internet, and it has been an important part of their lives and their studies. Nowadays, most college students own a smart phone (using Android or IOS operating system) and a great number of them have their own laptops and tablets. Besides, campus networks, especial campus wireless networks and networks provided by network providers are covering the entire campus, which enables students to study with their mobile devices connecting to the Internet on campus. On the other side, social networks have already been students' day-to-day communication tool. Being new technology and latest fashion pursuers, students are willing to pursue new inventions and use new products and technologies. At present, nearly all the Chinese college students' cellphones are loaded with Wechat - a social network app like Facebook. They visit and refresh their Moments often even in the class or voice-talk with long-distance friends on Wechat.

As spreads of the teaching philosophy of "use video to reinvent education" proposed by Khan (founder of Khan Academy) in his famous talk [3], Flipped classroom quickly attracts attention all over the world. Therefore, it is of great significance to build Flipped classroom on the basis of Wechat platform, taking advantage of Massive Open Online Courses [4] to put study into students' real-time network lives. On one hand, it can improve student's self-learning awareness and make the Internet assisted learning much easier than before; On the other hand, it explores the possibility to unify modern in-class learning and post-class assisted learning, which is of practical significance.

## 2 Related Work

### 2.1 Peer Instruction Teaching Strategy

Peer Instruction is a kind of student-oriented mutual support teaching strategy. It can be used to examine the level of mastery of learners and their peers. In the case of the team learning, every student can teach the team members from teachers' perspectives. At the same time, they can receive guidance and help from the companions. It will greatly enhance the enthusiasm of learning, broaden the thinking dimension, depth understanding of knowledge, and improve the ability to innovate and so on [5, 6]. The learners themselves to improve the efficiency of learning at the same time to overcome the basic ability of different courses difficult, inadequate teaching resources and other issues, which reduce the burden of teachers in the experimental course.

### 2.2 Flipped Classroom Based on Wireless Terminal

The wide use of smart devices gives a great support for the second classroom. Many educational researchers start to explore building and practicing the Flipped classroom based on wireless terminal [7-9].

At present in China, the teaching mode based on wireless terminal mainly use QQ (a social network software) or Wechat to assist teaching. QQ assisted teaching mode divides the whole class into several groups and lets the student and the teacher of the same group discuss and exchange learning materials. The advantages of Wechat are:

firstly, the teacher can upload the learning materials to the ‘Wechat cloud’ permanently, and students can read the material or watch the video on Wechat platform without downloading them; secondly, Wechat has functions of group chatting, video transferring, voice-texting, photos and emoji transferring, so the teacher can have one-to-one or one-to-group lecturing on Wechat; thirdly, as the most popular App in China, Wechat is welcomed by teachers and students.

In summary, Wechat assisted teaching has more competitive edges than others. So, the Flipped classroom based on Wechat platform greatly benefits the classroom teaching reform.

### 2.3 Wechat Public Platform

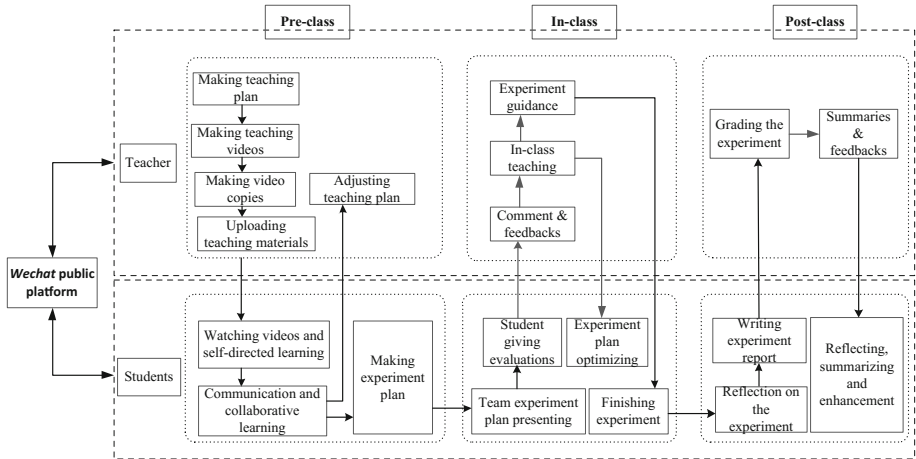
Wechat public platform was released by Tencent®, offering services to group subscribers, once known as ‘official platform’ or ‘media platform’, and finally named as ‘public platform’ officially. Through Wechat public platform, users can receive customized services like notification sending, brand spreading, QR (Quick Response) code, etc. Wechat public platform is free to the public. Users can get their own Wechat public account by registering with email, and it provides many functions such as text messaging, hold-to-talk voice messaging, broadcast (one-to-many) messaging, sharing of photographs and videos, etc. It is easy to use for any beginners. Moreover, it provides real-time interactions and sends accurate notifications. QR code has been widely used by media, websites, shops, etc. It also meets the college students’ life style and communication habits. Due to above advantages, almost every college student’s smart phone is installed with Wechat. In addition, the college teachers are willing to try use new inventions, which makes the Flipped classroom possible based on Wechat public platform.

## 3 Flipped Classroom Mode Building and Practice

### 3.1 The Building of Flipped Classroom Based on Wechat

The conventional class is the place where teachers give lectures to students, whereas Flipped classroom is the place for question raising, discussion and problems solving. After reviewing the literature on Flipped classroom [10–14], combining the advantage of Flipped classroom and Wechat platform, this paper presents a new Flipped classroom mode based on the mode [15] initiated by Robert Talbert from Franklin School in America. We take Computer Network Experiment as an example, and show it in Fig. 1.

This mode includes three steps, namely pre-class knowledge transfer, in-class knowledge internalization and post-class knowledge enhancement. With students focused, this mode uses the Wechat function of one-to-one and one-to-group to facilitate effective communication between students and teacher, which enables the teacher to play the role of organizer and students the role of participators. (1) Pre-class knowledge transfer. The teacher takes students’ level into consideration and make appropriate teaching videos and materials to help students review what they have learned previously and preview what they are about to learn. Students are asked to learn



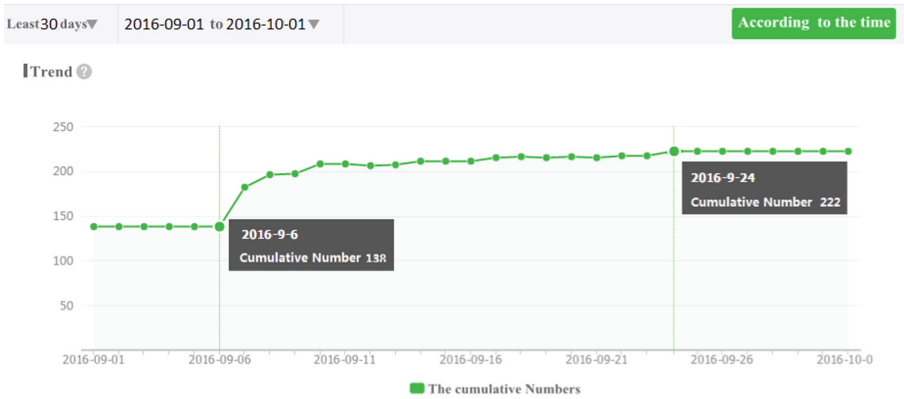
**Fig. 1.** The flipped classroom mode for Computer Network Experiment course based on Wechat public platform

those materials by themselves and later have discussions with their classmates on Wechat. (2) In-class knowledge internalization. The in-class knowledge is passed on from teacher to students should follow the rule of “attention-interest-exploring-action-sharing”. In other words, learning contents should first arouse students’ interests and then make them explore further and master them in the end. The last step is that they share their ideas with classmates and teacher. (3) Post-class knowledge enhancement. Students upload the problems they could not solve on Wechat public platform, and the teacher organizes discussions with focus on key points and difficulties, leading students to summarize and reflect on what they have learned, which gradually improves their capability of solving problems.

### 3.2 The Effects

The trial has been taking for a semester, and students have a better master of the experiment contents, explore further than previous students and are more involved in the study. Secondly, teachers and students have more communications and get more closed than before, which encourage students to have more participation in the study. Thirdly, students’ communication skills have been practiced greatly and critical thinking has been cultivated.

As indicated in the “users analysis” released by Wechat platform data statistics, students give much attention to Wechat platform of Taizhou University Network Laboratory. There are 4 classes totaled 108 students taking the course of Computer Network Experiment last semester. All of them have followed Wechat platform of Taizhou University Network Laboratory. As shown in Fig. 2, the following rate reaches 100%.



**Fig. 2.** The number of followers of Wechat public platform ‘Taizhou University Network Laboratory’

Also, we take the final scores of the latest four semesters and previous three semesters for comparison. In the latest four semesters, we adopted the Flipped classroom approach. The final score was composed of experiment operations 30%, presentations 30% and experiment reports 40%, while in the traditional approach, the final score was composed of experiment operations 50% and experiment reports 50%, see in Table 1.

**Table 1.** Students’ scores comparison

Semester	Student number	Experiment operating (average score, 30%)	Experiment report (average score, 40%)	Presentation (average score, 30%)	Final score (100%)
Spring, 2017	92	93	88	90	90.1
Fall, 2016	119	92	86	90	89
Spring, 2016	59	91	86	88	88.1
Fall, 2015	84	92	84	85	86.7
Semester	Student number	Experiment operating (average score, 50%)	Experiment report (average score, 50%)	Final score (100%)	
Spring, 2015	56	75	82	78.5	
Fall, 2014	103	81	85	83	
Spring, 2014	58	77	82	79.5	

From the data in Table 1, there exists a gap among the students' scores. In the Flipped classroom approach students watching videos and making presentation before taking the experiment get a higher score in 'experiment operations'. Traditional approach merely focused on 'operations and reports'. In the Flipped classroom approach, students achieve a unified goal in presentations. The latter makes the results comparable and improves the overall level due to their mutual encouragement. Meanwhile, the rule that the presentation score marked before the experiment enable the evaluation of final scores more fair and objective.

## 4 Conclusions

Building and practicing the Flipped classroom based on Wechat platform not only brings the advantages of the Flipped classroom into full play, but also improves students self-learning awareness. It focuses on personalized study and realizes the goal of stratify teaching. Meanwhile, it can strengthen the communications between teachers and students and make them get closer than before. It combines students' network life and study. It also greatly inspires their motivation.

The Flipped classroom based on Wechat platform has proved that the teaching quality has been raised greatly and the college students have been inspired to work harder on study. However, this mode requires much more for college teachers. Teachers need to spend more time and put more efforts on their teaching notions, teaching methodology and teaching skills in order to keep abreast of the modern age of teaching.

Much work has to be done as to the experimentation in adopting the Flipped classroom in our teaching. Further suggestions and comments are most welcome.

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