

# *Research on the Key Problems and Methods of Building Mobile Teaching Platform Based on WeChat Subscription Account*

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**Abstract**—The WeChat subscription account was registered on WeChat public platform, which was most often used for teaching than other account types. Learner could pay attention to subscription account conveniently by the “scanning and scanning” function of mobile client App, and realized information interaction or accessed teaching resources on the WeChat public platform. Compared to other forms of mobile teaching platform, WeChat subscription account had advantages and disadvantages when it’s used in teaching. So it was important to foster strengths and circumvent weaknesses. Some key problems needed to solve in building mobile teaching platform based on WeChat subscription account. Some technology methods could be used in the following four stages: on pre-class stage, while-class stage, post-class stage and evaluation.

**Keywords**—WeChat; Subscription account; Mobile teaching platform; Platform design

## I. INTRODUCTION TO THE WECHAT PUBLIC PLATFORM

WeChat public platform was a function module of the instant messenger social software "WeChat" designed by Tencent in August 2012. It provided business services to individuals, businesses and organizations and user management capabilities. The platform provided four kinds of account types for individuals or companies to apply: subscription account, service account, enterprise WeChat, and small program. Subscription accounts had the ability to publish and disseminate information, mainly to convey information to users, and only send one message every day, which is suitable for personal and media registration. Service account had the capability of user management and business services, mainly focusing on service interaction. Four messages could be send every month. You could get more functions, such as opening WeChat payment. Service account was suitable for enterprise and organization registration. Enterprise WeChat had ability to reach the company internal communication and coordination

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management. It needed to authenticate when paying attention to it. Enterprise WeChat was used to manage the internal staff, and team for enterprise customers register. Small programs were a new kind of openness ability, and developers could quickly develop a small program that could be easily accessed and disseminated, suitable for businesses and organizations that have service content.

WeChat public platform had been widely used in business. Many merchants had established WeChat public account to promote products and expand sale channels and improve corporate influence. WeChat public platform also gradually was applied to teaching. And subscription account of WeChat public platform (hereinafter referred to as WeChat subscription account) was suitable to register by individual teacher, which is convenient to daily push teaching information and data. So subscription account was most often used in the teaching currently than other account types.

## II. THE CONTRAST BETWEEN WECHAT SUBSCRIPTION ACCOUNT AND OTHER MOBILE TEACHING PLATFORMS

Mobile teaching platforms mainly included: MOOCs platform, open course platform and online teaching platform of universities. For example: “xuetangx.com” which was a subsidiary of Beijing Muhua Information Technology Co., “Chinese university MOOC” which was launched by Netease Company and Higher Education Press. There were some open course platforms, such as “Netease Open Class” launched by Netease Company that brought together the domestic and foreign famous universities to public class. And Higher Education Press established “iCourse” website that was the official website of China’s universities boutique open courses. In addition, there are online teaching platforms established by colleges and universities for their teachers and students. Overseas mobile teaching platforms included Coursera, edX and Udacity.

### *A. The advantage WeChat subscription account*

WeChat subscriber account was the account of WeChat public platform. WeChat was more popular than any platform in college students. 100% of college students installed WeChat in mobile phone. That was the biggest advantage of WeChat public platform compared with other mobile teaching platforms. On August 4, 2017, China Internet network information center (CNNIC) released the 40th "Statistics Report on the Development of Internet in China" in Beijing. According to the report, as of June 2017, the number of Internet users in China reached 751 million. 96.3% were mobile Internet users. And the dominance of mobile Internet was strengthened. Online education users were up to 144 million, and the new education form was recognized by more and more learners. According to "the Report of WeChat User & Ecological Research in 2017", 34.6% of WeChat users used WeChat daily for more than four hours. Therefore, knowledge arrival rate was higher for the mobile teaching platform based on WeChat subscription account. And this platform was easy to be used.

The mobile teaching platform could be developed independently or co-developed with sufficient technical force. It was also feasible to purchase platform software or third-party outsourcing services if there was enough fund. However, the current allocation of education resources in our country is unbalanced, and most schools didn't have the relevant technical or financial strength. So it's a feasible policy to use existing platforms by transplanting and transforming function. WeChat public platform fully opened 11 class interfaces in 2015, and provided web development kit JS-SDK, which allowed WeChat public platform to access a third party server through these interfaces. WeChat could be used for Web-APP application development to better meet the functional requirements of teaching. And the human and economic input was relatively small. Computer technical personnel would participate in the design of subscription account's menus and functions. The course teachers were responsible for daily maintenance, including video recording, pushing notification, uploading reference material and answering questions etc., which required certain teaching organization ability and information technology level.

### *B. The Weakness of WeChat subscription account*

WeChat was social-based software, and WeChat public platform was one of its functional modules. There was congenital deficiency when it's used for teaching. First of all, WeChat's instant communication function easily interfered with students' learning process. When students were attracted to information from circle of friends and WeChat friends, they would interrupt the learning process. Second, there were limits to the size and duration of the audio and video uploaded to the platform: video is the maximum of 20MB with a minimum of 1 second and maximum 10 hours. The audio must not exceed 30 minutes, not longer than 30 minutes. If video was larger, you could only upload video to "Tencent Video" and embed it in the text through the addition of the material library. The teaching content recorded by audio and video needed to be "micro-sized" to control the duration and size. Finally, WeChat subscription account provided basic functions that were more suitable for pushing notification, unable to systematically

classify the course materials, and the key word response was not flexible. Therefore, the function of WeChat subscription account could be developed once again for more suitable to teach. There were higher computer technical requirements for the construction of the teaching platform based on it.

## III. THE KEY PROBLEMS OF BUILDING A MOBILE TEACHING PLATFORM BASED ON WECHAT SUBSCRIPTION ACCOUNT

### *A. Manpower, material resources, financial resources*

**Manpower:** the construction of WeChat subscription account required two types of manpower: information technician and course teacher. Professional information technicians completed the design and development of system functions. The course teachers were responsible for the resource management and information exchange on the course subscription account. Teachers needed to master one or more micro-class production tools, and could help information technicians to design system menus and functions.

**Material resources:** the effective operation of WeChat subscription account required a good hardware environment for campus Wi-Fi. To watch the video and other digital resources needed network. It was a great effect for the student to achieve knowledge when campus network didn't cover every corner of the campus and network signal strength is different [1].

**Financial resources:** it was difficult to achieve sustainable development that building any teaching platform only depended on the teachers' enthusiasm and dedication spirit. The source of construction funding could be from two ways. One way was school. The school should set up teaching reform projects, which could provide start-up funds for the platform construction. In addition, teachers who actively participated in the construction of mobile teaching platform would be given rewards and preferential treatment in promotion. Another way was to attract business investment. WeChat public platform was not only a self-media platform but also a business platform because it embedded profit model. It is considerable to attract advertisements of education training organizations to obtain operating expenses.

### *B. Mobile teaching platform based on WeChat subscription account was universal or special*

The universal teaching platform integrated the teaching needs of different courses, and provided a unified access interface for different courses, which was suitable for the highly coupled courses. For example, there were three courses in computer science and technology major: Database Principle and Application, Web Front-end Development Technology and Java Web Application Development. The design of platform menus and functions integrated the content of three courses. The special teaching platform only serviced for one course, and different courses independently used different subscription account, which was the most commonly form. For example, WeChat subscription is used for "Database Principles and Application" course teaching [2] and "Archives Management by Computer" [3].

### *C. Which teaching links and teaching content were suitable for WeChat subscription account*

It's necessary to choose seriously the right moment when subscription account was applied in pre-class stage, while-class stage, post-class stage and evaluation. We should avoid exaggerating the role of subscription account, neglecting the face-to-face communication between teachers and students. In addition, not all of subjects' teaching contents were fit for using the subscription account to assist teaching. Only 20M video size was not enough to present a complex experiment process. And the page hadn't online formula editor, which was inconvenient for science and engineering teaching content. For example, the time distribution method and the shear distribution method of "Structural Mechanics" were more suitable for traditional teaching methods [4].

### *D. The title of message and the right time of push*

A subscription account could send out a message every day. The content of message must be closely related to teaching content, that didn't grandstand for the favor. However, you should pay attention to the title and the timing of the news, which had a direct impact on the click rate of the message. The high click rate of the news could be called an effective message transmission. The title of message should stimulate students' curiosity and prompt students to click. The right time of push was the peak period to use the phone for students, such as the first ten minutes before class in the morning or afternoon, and the evening study period.

### *E. Learning process evaluation mechanism and technical support method*

When teaching videos and information were put on WeChat public platform, the process of knowledge spread was transferred from classroom to online. Classroom has become a place where teachers and students could communicate with each other in a direct way, and the students' teaching status is strengthened. This was "flipped classroom", a new teaching mode, which had been widely promoted in recent years. The difficulty in the implementation of "flipped classroom" was the evaluation mechanism of learning process. Students lacked self-control and were not accustomed to pre-class, after-school review, and class questions. How to supervise the students' continuous learning of the platform information is the fundamental problem to ensure the construction of the teaching platform. In general, the objects of learning process evaluation were combined with students' online information or video's learning situation, classroom questions, online or offline testing, homework, WeChat interaction, etc. The evaluators are teachers, classmates and themselves. In the evaluation process, they would consider the students' analytical ability, practical ability, learning attitude and independent learning ability, participation and so on. However, the diversity and complexity of evaluation required teachers to devote a great amount of spare time, which would hinder teachers' enthusiasm for "flipped classroom". Moreover, good evaluation mechanism could avoid the problem that online learning completely depended on learners' autonomous learning, which is aimless, no system and no communication. Therefore, the platform designers should consider the design and development of

evaluation functional modules, reduce the workload of teachers, and improve students' learning efficiency.

## IV. THE METHOD OF BUILDING MOBILE TEACHING PLATFORM BASED ON WECHAT SUBSCRIPTION ACCOUNT

WeChat public platform provided news push, menu design, keyword reply, voting and other functions. They were used to push curriculum content, curriculum platform promotion information release, real-time teaching, group answering questions, one-on-one tutoring, etc. This paper analyzes the method of using WeChat public platform to construct mobile teaching platform from the following four different teaching phases, including pre-class preview stage, while-class stage, post-class stage and evaluation stage.

### *A. Pre-class stage*

Experience showed that the class could organize effective discussion if more than one third of students previewed, who basically mastered more than half content [5]. So before class, teachers should combine their own teaching experience with the students' interest in learning, cognitive level and demand for the development of society, to write teaching syllabus and teaching plan, to design the teaching activities, to give scientifically time distribution proportion of students' autonomous learning and face-to-face teaching, to guide students to learn, to reduce the blindness of students' autonomous learning.

Specific work included teaching content design, knowledge point induction, video recording, task setting and FAQ module construction. In terms of teaching content design, the whole of the course content was divided into several project (work), and then, making graphic and video learning resources and PPT courseware for special micro learning modules [6]. Video recording should pay attention to transform the angle of video to avoid visual fatigue of the viewer. At the same time, we will set up pre-class preview and task list to facilitate learners' purposeful study. In the two or three days before class, the teacher sent the task information to each student in the form of message push. Students get tasks on the public platform by entering a "number code" or "keyword". If there was some confusion in learning, students could communicate with teachers and classmates through subscription account, or check the FAQ module. According to the teaching experience for many years, teachers analyzed some common problems and questions written to FAQ. Students could submit some questions and answers which could be appended to the FAQ after teachers approved them. FAQ module was constructed by teachers and students together, and constantly updated in real time. It means great deal to students' self-study [7]. In addition, teachers could improve the classroom teaching effect by adjusting the contents and activities of classroom teaching in response to students' feedback.

### *B. While-class stage*

The first thing was class check-in. It could be based on scanning WeChat two-dimensional code [7] or using WeChat wall [2] to check in. To check in by the WeChat two-dimensional code needed to develop a website to import the list

of students into the server. When teacher named, the website address and a randomly generated parameters were merged to generate a dynamic QR code. And then students checked in through the WeChat "scanning and scanning" function. At the same time, the system determined the location of the students by calling WeChat GPS positioning function, and the distance threshold was set to avoid students' remote check-in. The first scan will prompt the student to bind WeChat ID to the student name and the student number. Each time the scan succeeded, data was saved in the background for statistics. In order to deal with individual students who signed up unsuccessfully, the check-in system should have manual check-in function.

At the official start of class, teachers used traditional teaching multimedia facilities to play courseware, impart knowledge and organize teaching activities. You could also use WeChat subscription account or WeChat QR code to push the teaching materials in real time, send questions and comments, and synchronize the display on the screen to activate the classroom atmosphere. The voting function of WeChat public platform could be used to take a test. Firstly, Teachers generated QR code about test questions. Then students scan QR code and answer questions. Finally, test results would be instantly presented on platform. It helped teachers get feedback information in time and check the learning status of students. WeChat wall is interactive software based on bullet screen technology. It had a check-in function and on-site interactive function, which could effectively save data and export Excel forms. Teachers could release tasks and problems by using WeChat wall to arouse the enthusiasm of students [8].

### *C. Post-class stage and evaluation*

Setting up after-school development tasks was order to consolidate the knowledge and improve the comprehensive application ability. Task forms could be study report, group project or curriculum design. WeChat public platform could "track" students' autonomous learning and classroom learning process. Learning behavior data were recorded in real time. Teachers evaluated students' learning level on these data. Evaluation content included students' attendance, the quality of individual or group study, achievement exhibition, online interactive, test score, etc. The teacher had a statistical analysis of the students' learning behaviors to understand the students' learning interest, learning attitude and learning data utilization rate. It's helpful to adjust teaching. Student could query each test result conveniently because score was published on the WeChat subscription account. It's possible to identify problems and build knowledge systems for students in accordance with teacher's comments.

## V. SUMMARY

Constructing mobile teaching platform was the main direction of teaching reform. How to guarantee the practical effectiveness of mobile teaching platform is the key point of system design and development. It's possible to build mobile teaching platform based on WeChat subscription account because WeChat had incomparable users among college students, opened user programming interface, and rich interactivity. However, a secondary development was needed. We should design the platform menus and functions for the WeChat subscription account. It could be better used for teaching. When designing system architecture, you could place resources on a cloud platform or on a standalone server. It's affected to address the problem that the size of the upload resources is limited and improve the flexibility of data access. In the case of learning discussions based on WeChat subscription account, the phenomenon deviating from the subject could be degenerated, which resulted in difficulty of meaningful learning. Teachers should monitor the whole discussion process, gave real-time guidance, set the topic of discussion in necessity, and not allow the group to discuss content that was irrelevant to the course.

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