The Mobile Teaching Platform Based on WeChat Applet and the Moodle System --- Explore the Impact of Teaching Platforms on Learning in a Mobile Learning Environment

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Abstract. With the continuous optimization of mobile technology and network environment in recent years, the new learning platform will become an effective support for future mobile learning. We combine the Moodle platform and WeChat applet to build a mobile teaching platform based on the Moodle and WeChat applet. This article takes the Moodle users and the Moodle WeChat applet users as research objects, use a combination of questionnaire survey, statistics and content analysis, compare and analyze the survey subjects' learning tendency, activity level, and learning period from various aspects. The results of the study indicate that the learner's activity level is affected by different learning platforms, compared with the Moodle platform, the users' activity of the Moodle WeChat applet is significantly higher than the former, moreover, the duration of a single online connection of users on the applet is generally lower than that of the PC, the reasons include the influence of user learning time, place and learning habits. The research conclusion shows that WeChat applet has an important role in enhancing the learning of the Moodle users, WeChat platform takes full advantage of the convenience of mobile learning.

1. Introduction
In general, the concept of mobile learning can be simply understood as learning using mobile devices, such as mobile phones or tablets [1]. In recent years, with the rapid popularization of mobile terminal devices such as high-performance smartphones and tablet computers, people can conduct socialized mobile learning anytime and anywhere [2].

As a product of the era of mobile information technology, WeChat applets have been popularized and developed with the support of the broad user group of WeChat platforms, the Moodle platform is closely watched by learners because of its rich teaching resources. Both of them stand out in practical applications with their unique functional advantages. Therefore, how to organically integrate the Moodle platform and WeChat to build a Moodle mobile terminal based on WeChat, and make comprehensive use of the respective advantages of WeChat and the Moodle, thereby promoting the development of education and teaching, has been a hot spot in online teaching research in recent years [3]. This article analyzes and studies related theories, based on WeChat applet for the secondary development of the Moodle platform, build the mobile terminal of the Moodle platform based on WeChat, in the establishment of their own functional modules and learning resources on the basis of integrating the Moodle's massive learning resources, thereby providing learners with a comprehensive, convenient and personalized learning tool, improving learners' learning initiative and efficiency. Then it conducts research on relevant data to explore the impact of learning platforms on learning under the trend of mobile learning environments.

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2. System Architecture Design
The server adopts WAMP environment, with Windows operating system, Apache server, MySQL database and PHP programming language as the framework, The system adopts B/S three-tier architecture (namely, presentation layer, business logic layer, data access layer), and adopts MVC modular design development to design.

Presentation layer: By adopting Bootstrap + jQuery + HTML + JS and other related technologies, it provides users with a friendly and convenient interactive operation interface [4].

Logic layer: Mainly use PHP language to complete the business logic processing on the server side, and partly use JavaScript technology to process on the WeChat built-in browser side. Respond to business operation requests from the presentation layer, call the components of the data access layer to manipulate the relevant data, and display the returned result data through the presentation layer [2].

Data access layer: This system uses MySQL database to achieve data access.

3. System Functions
According to user needs, the system can be divided into three major modules, namely curriculum module, message processing module and user account module.

Among them, the curriculum module is the core module of the mobile learning platform, mainly display various teaching resources and activities in the system according to the interface of the mobile terminal, and receive the corresponding operations of the processing user. Specifically, it includes four functions: the class I teach, the class I listen to, the course resources, and the class to be added. Teachers can manage the course and student situation in the classes I teach, view learning feedback and answer questions etc; students can manage courses in the classes I attend, complete assignments and exams, and engage in activities such as teacher-student interaction. The course resource module includes the curriculum library, the examination paper library, the assignment library and the community resources, in which assignments can be edited online; adding mainly includes the two functions of creating a course and joining a course, in addition, you can also archive the completed course.

The message processing module mainly includes notifications, private messages and comments, make use of the interface in the message management category of the WeChat public platform, push messages to users through the WeChat terminal, and receive hypermedia messages from users on the WeChat terminal.

The user account module contains WeChat authorized login (binding login), unbind, exit, personal information acquisition, modify my favorites and other functions.

4. Research Design
After the system development was completed, we used questionnaire surveys and statistical methods to collect user usage data and understood user platform usage based on the data. The preliminary questionnaire focused on understanding the basic situation of students using the Moodle platform and WeChat platform. To this end, we selected 500 college students as the research object, the time is limited to the semester, to eliminate the interference of data in the winter and summer vacations. The specific data is shown in the table 1 below.

According to the survey data, all college students use WeChat, and the frequency of use is very high, it follows: WeChat is the mainstream social platform used by people today. The Moodle platform is used more frequently among college students, but horizontal comparison data can be seen that the Moodle is used less frequently, mostly concentrated in the frequency of several times in a semester.

As an excellent teaching management platform, the Moodle has massive teaching resources, college students as the main body of the study, the demand for the Moodle is far less than expected. In response to this situation, we collected data about the background users of the Moodle platform and the Moodle WeChat applet, comparative analysis is conducted from the perspective of user learning period and duration, plot the specific data into the curve statistics as shown in Figure 1 and Figure 2.
Table 1. Survey on the basic situation of students using the Moodle platform and WeChat platform

| Options                  | Category          | Number | Proportion |
|--------------------------|-------------------|--------|------------|
| WeChat usage frequency   | almost every hour | 337    | 67.4%      |
|                          | occasionally every day | 151    | 30.2%      |
|                          | use it for a few days | 8      | 1.6%       |
|                          | rarely use        | 4      | 0.8%       |
|                          | do not use        | 0      | 0%         |
| The Moodle usage frequency | every day         | 1      | 0.2%       |
|                          | several times a week | 57     | 11.4%      |
|                          | several times a semester | 280    | 56%        |
|                          | rarely use        | 120    | 24%        |
|                          | do not use        | 42     | 8.4%       |

![Figure 1. Monthly data for the semester](image1)

![Figure 2. Random data for a semester](image2)
We can intuitively see from Figure 1 and Figure 2, whether in the middle of a semester or a single day of sampling, the user activity of the Moodle small classroom is significantly higher than that of the PC, and the active degree of the Moodle small classroom is affected by time period relatively for low.

To explore the impact of time on user activity, we conducted an online questionnaire survey on users’ single online time. This questionnaire will be distributed in batches, 70 electronic questionnaires will be distributed in the Moodle PC and the Moodle classroom respectively. Among them, 68 were recovered from PC side and 53 from small class. The specific data are shown in the table 2 below.

It can be seen from the figure 3 that the single online time of the Moodle PC users is more concentrated around 1 hour, and there are more users over 1 hour, users barely exist within 10 minutes; the users of the Moodle applet are online for about half an hour once, but few of them are online for more than one hour. The data shows that the single online time of users on the applet side is generally lower than that on the PC side.

**Table 2. Online duration and number distribution**

| Question Options          | The Moodle PC | The Moodle applet |
|---------------------------|---------------|-------------------|
| How long is the single use of the learning platform? | within 10 minutes | 1 | 7 |
|                           | about 30 minutes | 9 | 26 |
|                           | about 1 hour | 37 | 18 |
|                           | More than 1 hour | 21 | 2 |

The pie chart made from the data in the table above is shown in the figure below:

**Figure 3. Proportion of online duration distribution**
We took 200 college students and university teachers as the research objects, and conducted in-depth investigation and analysis from the three directions of learning place, learning time and the biggest concern in learning, to explore the internal reasons for the existence of the data. The survey results can help to further understand the current situation of mobile learning and the real needs of learners for mobile learning, and make full preparations for the next step of the improvement and development of platform modules.

According to the research content, this questionnaire investigates learners' demands for mobile learning, and divides the questionnaire into three main questions: learning place, learning time, and points of most concern in learning. A total of 200 college students and school teachers participated in this survey, from different schools, with random gender and age, making this survey have a relatively complete sample structure. A total of 200 questionnaires were recovered, and the relevant data results are as follows:

**Table 3. Mobile Learning Places**

| Question | Category       | Number | Proportion |
|----------|----------------|--------|------------|
| Where are your mobile learning locations? | on the vehicle | 143 | 71.5% |
| (Multiple choices) | home | 162 | 81% |
| | school | 195 | 97.5% |
| | leisure place | 17 | 8.5% |
| | other | 7 | 3.5% |

According to the survey data on learning places, it shows that the usage rate in schools, homes, and transportation is very high. In other words, the learning locations are widely distributed, users are very happy to conduct learning activities in different places, and there is a strong demand for mobile learning platforms.

**Table 4. Time when mobile learning occurs**

| Question | Category | Number | Proportion |
|----------|----------|--------|------------|
| When does your mobile learning happen often? | while eating | 16 | 8% |
| (Multiple choices) | waiting time | 83 | 41.5% |
| | (waiting for car, people; waiting in line, etc.) | | |
| | when taking a car | 119 | 59.5% |
| | intermission time between classes or meetings | 113 | 56.5% |
| | before noon or at night | 175 | 87.5% |
| | other | 41 | 20.5% |

It is not difficult to see from the above table 4 that nearly 90% of users will choose to carry out mobile learning at noon or at night. Nearly half of the users who are willing to learn while waiting for the car, waiting for people, and waiting in line, and more than half of the users will learn by car and during intermissions between classes or meetings. That is, users will seize piecemeal time and use mobile devices to improve their learning activities.
Table 5. The most concerned points in learning

| Question                                    | Category         | Number | Proportion |
|---------------------------------------------|-------------------|--------|------------|
| What is the most important thing in mobile  | learning resources| 60     | 30%        |
| learning?                                   | learning result   | 54     | 27%        |
|                                             | operational       | 83     | 41.5%      |
|                                             | convenience       |        |            |
|                                             | study cost        | 3      | 1.5%       |

According to the data, users are most concerned about whether the tool is easy to operate in mobile learning, and at the same time have more attention to the learning resources and learning effects they can produce. They do not pay attention to the problem of learning fees, perhaps because most mobile learning is now browsing and downloading through wireless networks, which has little to do with the cost of fees [5]. Therefore, we can say that convenience is the most critical condition for users to carry out mobile learning activities.

To sum up, we can conclude that the time and place of users' learning is unpredictable, which leads to users' higher requirements on the convenience of tools. Not only that, but the learning resources of the platform are also the focus of users. This shows that the mobile learning platform should not only highlight the characteristics of its own convenience, but also provide users with an excellent educational learning tool by combining the massive learning resources on the mature online teaching platform.

Therefore, we can know that the Mood WeChat applet has a better environment for online teaching or online learning due to its convenience and the powerful learning resource library established on the basis of the Moodle. In short, the Mood WeChat applet has an important role in enhancing the learning of the Mood users, the WeChat platform gives full play to the advantages of mobile terminal convenient learning, to meet people's learning needs of fragmentation anytime and anywhere.

5. Conclusion

This system is a mobile terminal micro-classroom system designed and implemented based on the WeChat applet and the Moodle System. The use of the Moodle system in the course management and teaching management of the rich and complete functions and WeChat applet powerful open interface provides users with a more convenient way when carrying out mobile learning.

The biggest feature of mobile learning is the fragmentation of the learning time and the uncertainty of the learning time period. This is because users are limited by time and place, and there will inevitably be a lot of randomness in the mobile learning process. Therefore, we must not only optimize the mobile learning environment, but also provide targeted mobile learning support services, which is also very important. On the one hand, we regularly release some teaching aids on WeChat public platform. In order to make these learning support services based on WeChat applets effective to improve learning effects, we use learning activity reminders, push extended content, knowledge point self-test and other methods to guide and help solve learners may encounter in cognitive aspects problem, with this method, not only can the learner's mobile micro-learning be smoothly carried out, but also the learner's learning experience can be enriched[6].

In addition, WeChat applet is used to design and develop the mobile terminal of the Moodle. On the original Moodle mobile terminal—the Moodle APP, it is more portable, users do not need to download and install, there is no huge installation package and data package, scan or search to use. For developers, the difficulty of developing applet is much lower than that of APP, which makes the later development and maintenance of the platform easier.

However, WeChat mobile learning also has its own limitations, and other existing online education
platforms cannot be completely replaced by it. Because of the powerful interactive system, when the user receives various messages while learning, it may interfere with the learning, and when the user use fragmented time for mobile learning, the surrounding environment also has a certain amount of interference. Therefore, only by using WeChat as an auxiliary form of teaching on the desktop, and making full use of the mobile and convenient features of the mobile terminal, can the learner's learning be provided with the greatest convenience.

6. References
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