Using Open-Source Learning Platform(Moodle) in University Teachers' Professional Development

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Abstract. With the development of information technology, teachers' professional development based on network has attracted more and more attention due to its ease of use, openness, sharing and knowledge accumulation. This paper studies the importance of teachers' subjective consciousness and self-development needs in the information technology environment in the university teachers' professional development, discusses how to update teachers' professional development attitude and adapt to the new role of teachers in the information technology environment; Moodle(or Magic lamp in China), namely: modular object-oriented dynamic learning environment, is a course management system (CMS) designed and developed by Australian teacher Martin Dougiamas based on the theory of social constructivism. The paper analyzes the internal relationship between Moodle related functional modules and teachers' professional development, and the possibility of realization. After in-depth analysis of characteristics and advantages of Moodle as a technology platform and the support and application value of Moodle platform for university teachers' professional development, this paper constructs a new mode of teachers' professional development with Moodle as the interactive platform, which is "one platform, two footholds, three ways and multi-body participation".

1. Introduction
In the process of popularization and promotion of educational informatization, great changes are taking place from educational concept to teaching means, from teaching mode to teaching environment. Whether teachers can keep up with the development of educational technology and educational resources determines whether teachers can achieve lifelong development. With the continuous development of social software, the application mode of Internet has gradually changed. Through the information collection, sharing and dissemination of different participants, the collection and exchange of knowledge and information become very convenient and fast. Based on this, social software has been rapidly popularized at an unexpected speed, ranging from instant messaging tools such as e-mail, QQ, MSN to educational blogs and wikis. Social software has the characteristics of participation, openness, communication, dialogue, community and connectivity, which is just in line with the prominent practicality, reflection and cooperation in Teachers' professional development. Therefore, in the field of education informatization, how to realize teachers' specialization and how to promote teachers' professional development with social software is an important issue faced by teachers and education researchers.

2. About Moodle
Moodle(or Magic lamp in China), namely: modular object-oriented dynamic learning environment, is a course management system (CMS) designed and developed by Australian teacher Martin Dougiamas based on the theory of social constructivism. It is a free platform for the construction of
open source code of courses and websites based on the Internet. The emergence of Moodle platform adapts to the needs of supporting environment for teachers' professional development. Magic lamp is not only a technical platform, but also an operating platform for experiencing new educational concepts. It is not only an advanced "curriculum management system" (CMS), but also a "learning management system" (LMS) that combines educational theory with practice and supports teachers and students to organize and implement teaching activities. The main features of Moodle platform are as follows:

2.1. Advanced Concept and Comprehensive Functions
Moodle takes "social constructivism theory" as its design basis. Moodle especially emphasizes its educational philosophy. It emphasizes that the basic idea of programming is social constructivism education. For other CMS systems, this is an innovation. Because other CMS systems only provide a bunch of tools, but there is no educational method to integrate them. Therefore, we can think that Moodle is a learning center system, while most CMS is just a collection of commercial tools. The main functions of Moodle can be roughly divided into three parts: website management, learning management and course management. Among them, there are flexible and rich curriculum activities in the course management: Forum, test, resources, voting, questionnaire survey, homework, chat room, blog and kiwi, etc.

2.2. High Compatibility, Low Technical Threshold, Easy to Use
Moodle's online teaching module adopts dynamic modular design which can be freely combined. When teachers build online courses, it is as simple and interesting as building blocks. In other words, it can provide a variety of online learning activities, which can be supported by teachers in the online learning environment, and can be easily edited by teachers.

2.3. Open Source and Free
Moodle, as a free software with open source code, is developed and released in accordance with the CPL agreement, that is, anyone is allowed to use and modify the source code free of charge, but the copyright license notice of the original author must be retained. In addition to developers, there are also a large number of teachers and students in Moodle's community. Their feedback and suggestions are from them. It is the open source nature of Moodle that promotes its continuous improvement and development. Second, unlike the expensive CMS system, Moodle is free software. You can download it freely and install it. You won't be forced to upgrade, you won't be forced to adjust some module functions you don't need. There will be other people who are keen on Moodle. This is the open source and free benefits of Moodle.

3. Teachers' Professional Development Attitude under the Background of Informatization
At present, when we study the professional development of teachers, we should pay attention to the transformation from scale development to connotative development of higher education in China. Teachers' professional development is the only way for teachers' growth. The space for teachers to control professional development is seriously squeezed. Their professional development is in a very inadequate stage. The process of teacher professionalization is dynamic, continuous and even lifelong. It needs a certain carrier and form. A series of measures, such as "people-oriented" education management mode, demand-oriented on-the-job training, learning attitude taking reading as a habit, scientific spirit guided by teaching and scientific research, and information concept based on modern educational technology, are all conducive. In the process of teachers' professional development, teachers should really get rid of the passive situation of "I want to develop". To realize "I want development", we should not only have better knowledge, strong working enthusiasm and passion to face challenges, but also have internal and external considerations, constantly mobilize, maintain, enrich and update the driving force of professional development, and organize and mobilize the "power" distribution.
4. The Application of Moodle in Teachers' Professional Development

4.1. The Framework of Moodle

Moodle is an open source LAMP framework, including Linux (operating system), Apache (web server), MySQL (database), PHP (programming language).

4.2. Main Function and Structure Module of Moodle

Courses, users, roles, groups, grades and other data in Moodle are stored in Moodle database, such as learning resources added by teachers, Posts published by students and settings of system administrators. However, the user's images and uploaded jobs are stored in another Moodle directory called moodledata, and the stored directory is called dataroot.

The main functions of Moodle under the open source environment include: supporting various types of courses, class group functions, various online teaching modules, course resource management, double evaluation mode, test database function, flexible course management, tracking analysis of learning records, etc. Teachers can dynamically increase or decrease the structural modules of Moodle according to their needs, which provides a solid technical support and convenient environment for the design, development and application of curriculum. The design and application of information-based curriculum platform is an important part of teachers' professional development.

4.3. Characteristics and Advantages of Moodle as a Technology Platform

Moodle learning platform is free for teachers to choose to use. Through the learning platform, teachers can easily upload teaching materials in almost all formats. In addition, students and teachers can have a place for communication or discussion after class. Teachers and students can also share articles or feelings with each other through this platform, which is completely free from the restrictions of time and space.

4.3.1. Design your own course page flexibly. Moodle learning platform is learner centered, which is a very flexible and flexible course platform. Each teacher is free to design his own course in the system. Using the concept of jigsaw, we can flexibly adjust and apply the designed areas or functional modules, and establish a personalized course page and atmosphere. Make the course more lively and vivid, completely different from the rigid presentation of traditional digital learning platform.
4.3.2. Quickly integrate different curriculum resources. Teachers can quickly arrange their own syllabus, teaching plans, courseware, teaching plans and other office documents, even pictures, audio, video or web resources in their own courses. They can also be designed to browse, click, link or download according to the needs of the course.

4.3.3. Facilitate course management. Teachers can quickly use the system function to assign course assistants, send email and announcement to the whole class after calling out the course list, calculate the score and set the weight online, and carry out group activities. The subscription function of "discussion area" provides teachers with the function of publishing column: the teacher can set the subscription function of the forum. After the students subscribe, the system will send e-mail to the students when they type in the published items or changes. Whether it is class management or effective guidance of students and record learning process, teachers can master the course more effectively.

4.3.4. Establish diversified curriculum activities. Using the combined functions of the system, we can hand in homework, build discussion area, apply online dictionary, open opinion survey, online test, arrange course calendar, etc. Each function can be adjusted according to different course requirements and can be used repeatedly. Teachers can customize the questionnaire questions and provide students with answers in the course platform. In addition to online browsing results or downloading files, teachers can also set whether to provide students with browsing.

4.3.5. Curriculum reuse. Course backup / restore can be carried out at any time, and the backup items can be selected during the backup: including course design, handouts, course materials, students' learning history etc. can be adjusted as needed.

4.4. Application of Moodle as Technology Platform

4.4.1. Learning resources. On Moodle platform, teachers can avoid using simple information transmission mode, but provide various open related resources in the form of hypermedia, so as to encourage learners to search, select, evaluate and synthesize information, and encourage immersive cooperation and communication. This kind of learning resources include course materials, related knowledge base, original database (content or its hyperlink), etc., and can also link the accumulated works related to the course, personal homepage, reflection diary, etc. to the website.

4.4.2. Interactive tools. In order to support the continuous communication and cooperation activities of the learning community, instructional designers need to provide them with powerful interactive tools, including user-friendly communication tools (such as tags, chat rooms, voice chat tools, controversial forums, etc.), collaboration tools (such as wiki, database, application software sharing, etc.).

4.4.3. Evaluation tools. Moodle system provides assessment tools such as homework display, interactive evaluation and test module, homework display. It is a flexible evaluation support tool for students to upload their learning achievements for other students and teachers to evaluate. The interactive evaluator can make fair evaluation on the sample work document given by the teacher, and the teacher can manage and grade the student's evaluation. "The test module allows the teacher to design and set quizzes, which can include selecting right and wrong questions and filling in the blank. Teachers can choose whether to give the correct answer or other feedback. This module also includes the scoring function.

5. Investigation and Analysis of the Construction of Teachers' Professional Development Platform Based on Moodle

Schools or institutions in many areas of China have built Moodle platforms, and have applied them to different degrees. The author has registered and visited several domestic Moodle websites which are recommended by the official website of Moodle. It is found that the existing Moodle websites can be
basically divided into two categories: one is a pure online course platform, because Moodle platform is an excellent course management software developed based on constructivism learning theory, so most Moodle websites are used to build Moodle based courses. And some websites have achieved good results in the construction of network courses. However, by clicking on these Moodle website links (whether it is the online course platform or the teacher professional development network platform), it is found that many platforms can not be accessed normally. Although some of the platforms can be accessed, they have no substantive content. Although some contents of most platforms have not been updated for a long time, the overall situation is not optimistic, and some of them are prosperous on the surface but actually depressed in reality. It is suggested that schools or educational administrative departments should increase investment and establish effective and substantial incentive mechanism and assessment mechanism to improve teachers' enthusiasm for teachers' professional development by Moodle platform. Any technology or platform is not omnipotent. Technology or platform only supports teachers' professional development, and the key lies in Teachers' self-consciousness and understanding. Only under the premise of teachers' constant attention and pursuit of their own professional development, can technology or platform play their due value. Excellent plug-ins are integrated into Moodle platform for application. And the daily Moodle platform installation, debugging, management and maintenance work also needs professional technical personnel. Due to the lack of professional technical personnel, the existing Moodle platform is only a preliminary set up Moodle platform, without its own characteristics, and has not carried out the development of Moodle platform according to its own needs, and has not played the due value of Moodle.

6. The Construction of a New Model of Teachers' Professional Development on Moodle
The powerful functions and unique characteristics of Moodle platform are exactly what teachers' professional development needs. Moodle can be used to support teachers' professional development, and can adapt to the new requirements of information education for teachers' professional development.

Moodle's support for teachers' professional development is multifaceted and various forms. Therefore, the author tries to construct a new model of teachers' professional development with one platform, two footholds, three ways and multi-body participation".

One platform refers to Moodle as the platform. Because Moodle has strong functions and unique characteristics of easy-to-use, openness, sharing, knowledge accumulation, interaction and practicality, it is a good choice to rely on Moodle to support the long-term and sustainable development of teachers' professional development.

Two footholds: one is based on the principal position of teachers. In the context of social change and education transformation, the people-oriented education concept is gradually deepening. In this profound and arduous educational transformation, a common consensus is that teachers are the key to improve the quality of education. Teachers' professional development is not a simple process of applying ready-made educational knowledge or educational teaching theory to educational teaching practice. It not only requires teachers to actively participate in the learning of common "principle knowledge", but also needs to respect and attach importance to teachers' own educational experience and ideas. Education in the information environment is prone to a misunderstanding that relies too much on technology and ignores the role of teachers. Only teachers themselves can integrate the general "educational theory and professional knowledge" with the teachers' personal "empirical knowledge and practical knowledge". It is the key to highlight the central position of individual teachers in the process of professionalization, mobilize the initiative of teachers to participate in professional development, and let teachers change from "I want development" to "I want development". Second, it should be based on teaching practice. First of all, the demand of teachers' professional development comes from teachers' teaching practice, which is an important driving force for teachers' professional development; secondly, teachers' professional development not only refers to teachers' professional knowledge and skills, but also exists in the whole career of teachers, which is a process of constantly improving educational professional practice and improving their teaching quality; finally, it is a process of constantly improving the professional practice of education and improving their teaching quality The important criteria for the evaluation of teachers' professional development
should be how to meet the needs of students and improve students' academic level, and how teachers have higher teaching practice ability. Only in this way can teachers obtain professional satisfaction and truly realize specialization. Moodle provides us with an ideal platform to promote the further development of curriculum integration research. In Moodle environment, teachers should change their teaching ideas, from presenting teaching content to providing learning resources and learning roadmap for students. The role of teachers is transformed into tutors, collaborators and lifelong learners who guide students to use resources for inquiry learning. It can be said that the process of teachers' teaching practice with Moodle is the process of teachers' in-depth experience of new educational ideas, that is, the process of teachers' professional development. Without teaching practice, teachers' professional development is the water without source and the tree without foundation.

**Three approaches:** three approaches refer to Moodle based teacher autonomous learning, autonomous development, teacher learning community and teaching reflection. These three ways have been discussed in the previous paper, it should be pointed out that these three ways can be used alone or combined with each other. We can use Moodle platform to build a learning community to carry out self-learning, self-development and teaching reflection; using Moodle platform for teaching reflection can also better promote the activities of learning community and the development of autonomous learning and independent development; and autonomous learning and independent development can run through the study of learning community and teaching reflection. With the coordination and unification of the three, teachers can choose and use them according to their own actual situation and needs, give play to the powerful role of Moodle platform, and promote their own professional development of teachers.

**Multi participation** refers to the participation of students, parents, schools, education administrative departments, experts and other participants in the professional development of teachers. It is not enough for teachers' professional development to rely on their own strength. It is also necessary to help teachers realize their professional development with the help of other participants. One of the major problems in Teachers' professional development is the lack of effective cooperation and interaction among teachers. It is the foundation and basic guarantee for teachers' professional development to participate in Moodle platform.

7. References
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