

Chapter 2

Interactive and Collaborative E-Learning Platform with Integrated Social Software and Learning Management System

Zhao Du, Xiaolong Fu, Can Zhao, Qifeng Liu and Ting Liu

Abstract E-learning featured by active participation, interaction and collaboration of learners and educators is becoming more and more important in education both for learners and educators. While learning management system (LMS) is the traditional approach to e-learning which is organized as courses; social software including blogs, wikis, social networking sites, and social bookmarking sites etc. are adopted by many educators to meet their emerging needs in educations. In order to satisfy the needs for participation, interaction, and collaboration of learners and educators in the cognition, construction, and socialization process of learning; we propose an interactive and collaborative e-learning platform which combines the advantages of LMS and social software by integrating social software with LMS. The platform connects course network of users with his/her social network and knowledge network. As a result, it's helpful to users in building their personalized social network and knowledge network during the process of learning.

Keywords E-learning · Learning management system · Social software · Social bookmarking sites · Social network sites · Knowledge management · Learning management system

2.1 Introduction

Web 2.0, social web, or read/write web has gained increasing popularity in education and brought profound impact to education since the beginning of the new millennium [1, 2]. On one hand, students nowadays are digital natives who

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are accustomed to learn in an active learning environment. On the other hand, the world is changing more rapidly than any other period in human history and people are facing an era of knowledge explosion and globalization. As a result, e-learning featured by active participation, interaction and collaboration of learners and educators is becoming more and more important in education both for learners to get better learning experience and for educators to achieve better education effect.

Learning management system is the traditional approach to e-learning. Learning in LMS is organized as courses. It usually serves as the online platform for course syllabus releasing, handouts distribution, assignments management, and course discussion to students, teachers, TAs who are the member of the same course. Although LMS such as Blackboard, Moodle, and Sakai has been used by numerous universities all over the world to support and improve learning of their students [3]; it is primarily designed for course management purpose and has limited impact on pedagogy. The primary limitations of LMS include lack of personalized control for learners over learning process, limited interaction channel and collaboration manner between learners and educators, restricted interaction and collaboration scope within courses. These limitations make LMS not competent for supporting e-learning in the new era which views learning as a self-governed, problem-based and collaborative social process [4].

Recently, social software including blogs, wikis, social networking sites, and social bookmarking sites etc. are gradually adopted by more and more educators to meet their emerging needs in educations. Although there is no common agreed definition for social software, the core features of social software are to facilitate interaction and collaboration among users. Social software represents a shift to more social, personalized, open, dynamic, emergent, and knowledge-pull model for e-learning [5]. It provides learners with the abilities to direct their own problem-solving process, build connections with a wide variety of people and knowledge, and interact and collaborate with other users [6].

Currently, LMS and social software are mostly provided independently by universities and Internet companies to learners and educators. The advantages of this way lie in flexibility and openness. In addition, it's also economic for universities because there is no need for additional investment. These advantages take social software into the sight of learners and educators. Some of them will become loyal users of social software gradually and begin to incorporate social software into their daily activities including learning. The disadvantages of this way are isolation of information and connections in different systems, lack of specific design in function and UI for educational purposes, and unsustainability of service providing for social software provided by Internet companies. These disadvantages will bring barrier to users especially for students and teachers to whose primary activities are learning and teaching. Based on the considerations above, it's helpful and significant for universities to provide an integrated e-learning platform for students, teachers, alumni and even the public which can support their interaction and collaboration in learning and teaching both on campus and out of campus.

Based on the considerations above, we propose an interactive and collaborative e-learning platform which integrates social software with LMS. The platform provides personalized space for users where they can interact and collaborate with others. The personalized space of users contains their course network, social network and knowledge network. One of the key features of the platform is that it connects course network of users with his/her social network and knowledge network. Therefore, users are able to build their personalized social network and knowledge network during the process of learning. Moreover, it also facilitates interaction and collaboration between users by providing news feed service, recommendation service, and search service.

2.2 Interactions and Collaboration in LMS and Social Software

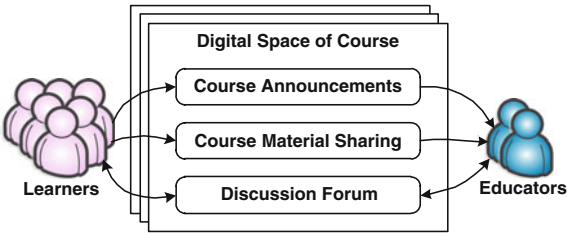
Interactions and collaboration in LMS and social software are different in many aspects. Firstly, the scope and during of interactions and collaboration in LMS are limited to a single course, but there is no limitation for the scope and during of interactions and collaboration in social software. Secondly, interactions and collaboration in LMS are group-oriented, and that in social software are the combination of individual-oriented and group-oriented. Thirdly, the form of interactions and collaboration is relatively simple which is mostly based on text and photos, while the form of interactions and collaboration in social software is much richer which also includes audios and videos. Finally, users can accumulate personalized social network and knowledge network during the process of using social software which is impossible in LMS.

2.2.1 Interaction and Collaboration in LMS

The functions of LMS can be viewed from two aspects. The first aspect is to provide online course management service to educators and administrators within the university that hosts the platform. The second aspect is to provide course-based interaction and collaboration service to educators and learners within the hosting university. In the following paragraph, we are going to focus on the features of the interaction and collaboration services that LMS provides to educators and learners.

Interaction and collaboration in LMS is course-based and the relationship between users in a course is temporal and unequal, as described as Fig. 2.1. Learners and educators of the same course can interact and collaborate within the scope of digital space of a common course. Specifically, educators can post course announcement and course material to learners, learners and educators can discuss in the discussion form. Since interaction and collaboration in discussion forum is oriented at all members of a

Fig. 2.1 Interaction and collaboration in LMS



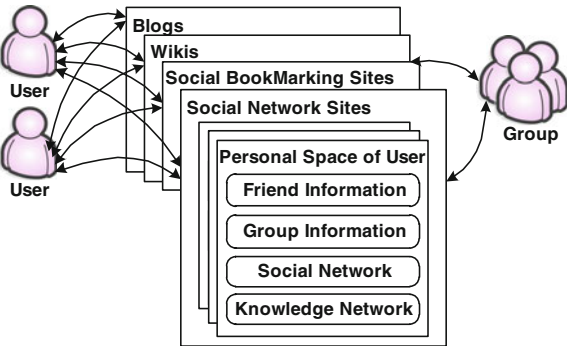
course and mostly based on text and photos, the form and effect of interaction and collaboration is relatively simple and limited. It's noteworthy that the duration of interaction and communication is the same as the corresponding course which is usually one semester. As a result, everything in digital space of a course will be of no use after the end of the course, and there is no opportunity for users to accumulate personalized social network and knowledge network.

2.2.2 Interaction and Collaboration in Social Software

The key aspects of social software are that it involves shared wider participation in the creation of information, encourage more active learning, and supports better group interaction. Therefore, social software can stimulate learner-educator interaction, increase learners' motivation, and fosters a greater sense of community [7]. Social software which is often used in e-learning includes blogs, wikis, social networking sites, and social bookmarking sites [4].

Difference social software provides different forms of interaction and collaboration service to users, the relationship between users is permanent and equal. Social software doesn't have any limitations on duration of group-oriented interaction and collaboration. Different from LMS, all social software provides individual-oriented interaction and collaboration; some of them also provide group-oriented interaction and collaboration, as described as Fig. 2.2. Users can choose to use individual-oriented or group-oriented interaction and collaboration

Fig. 2.2 Interaction and collaboration in social software



according to their wishes freely. Interactions and collaboration in social software can not only based on text and photos as LMS, but also based on audios and videos as well. During the process of using software, users can build and expand their personalized social network and knowledge network. There is personal space for every user where he/she can read various kinds of information from his/her friends and groups as well as his/her own social network and knowledge network.

2.3 Interactions and Collaboration in E-Learning Platform with Integrated Social Software and LMS

Some researchers view the key issue in learning is the support of learning as a cognitive and constructive process [8]. Others view learning as a social process, they stress that the challenge today is not what you know but who you know [9]. The former groups of researcher follow learning theory of behaviourism which focuses on externally observable change, cognitivism which focuses on computational models of the individual mind, or constructivism which presents learners create knowledge as they attempt to understand their experiences; the latter groups of researchers introduce constructivism as a new learning theory which presents learning as a connection/network-forming process [5]. From our point of view, we think learning is a combination of cognitive and constructive process with social process. On one hand, cognitive and constructive are about the aspect of learning process of individual learners; on other hand, social is about the aspects of learning resource and environment of many learners. Therefore, participation, interaction and collaboration in learning are important and helpful in the cognition, construction, and socialization process of learning.

Interactions and collaboration in e-learning platform with integrated social software and LMS can be described as Fig. 2.3. The platform not only combines functions of LMS and social software, but also provides personalized space for each user. The personal space is the place where users can interact and collaborate with others. There are three categories of information and three types of network in personal space of each user. As they can do in LMS, users can participate, interact and collaborate in his/her courses which are organized as course groups in the platform. Besides, users can also read various kinds of information from his/her friends and groups as well as of his/her own within his/her personal space as they can do in social software. The information is flowed to users through the filtering of his/her social network and knowledge network.

The key feature of the platform lies in the connections built between the course network of users and his/her social network and knowledge network, as shown by the dotted line in Fig. 2.3. When users participate in a course, he/she has built permanent group connections with other users who participate in the same course. Furthermore, he/she is also possible to build permanent personal connections with all members of the group. By this way, he/she can build and expand his/her social

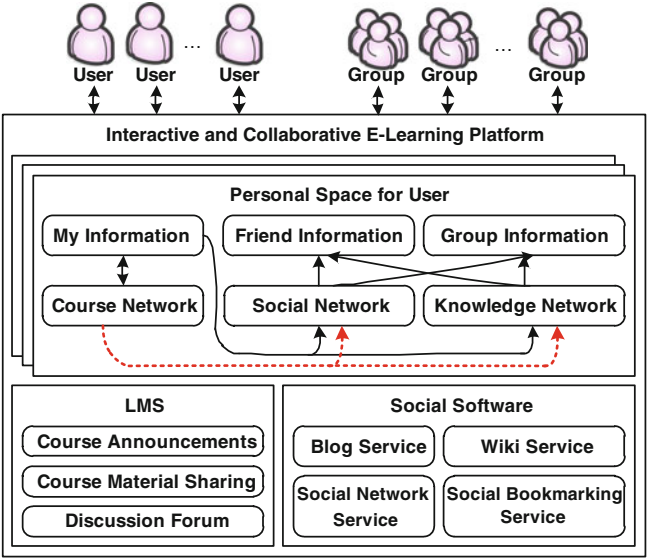


Fig. 2.3 Interaction and collaboration in e-learning platform

network. At the same time, he/she can create or get useful digital resources. He/she can also make comments on them, add tags to them, share them to other users, and save them as his/her favorite. All additional information of digital resources mentioned above forms the value-added information of original digital resources. The set of original digital resources and their value-added information ultimately constitute knowledge network of users. Social network and knowledge network will provide continuous support for users' learning both inside and outside courses.

2.4 Interactive and Collaborative E-Learning Platform

Interactive and collaborative e-learning platform consists of eight parts; these parts can be divided into four layers, as shown in Fig. 2.4. The first and bottom layer is data layer which keeps all data in the platform. Data layer keeps course data, social network data, and knowledge data. The second layer is core services layer which provides all core services in the platform including course services, social software services, and search services. The third layer is information delivery layer which provides various forms of information services to users. Information delivery layer consists of news feed service, relation recommendation service, knowledge recommendation service, and search service. The last and top layer is user interface layer which is the layer users interact with. The platform offers multiple interfaces to its users including web-based interface, mobile-based web interface, and mobile-based app interface.

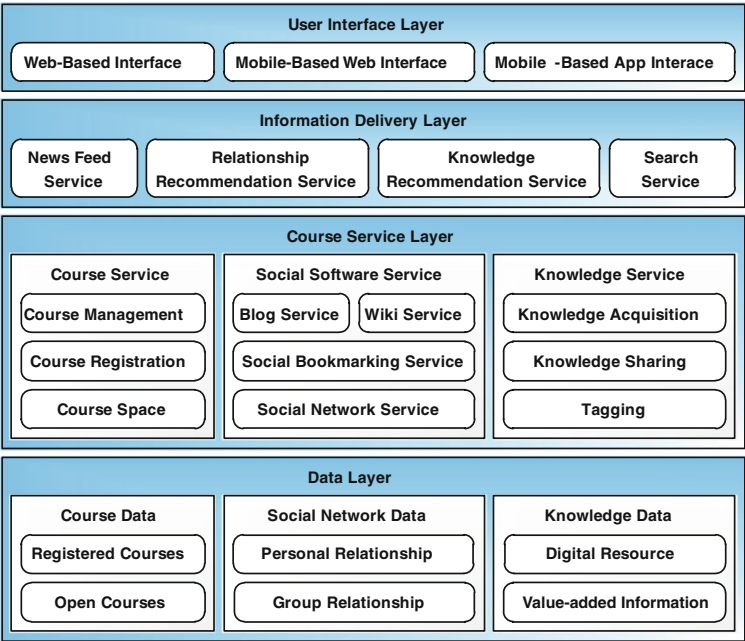


Fig. 2.4 Design of interactive and collaborative e-learning platform

The most important layer to facilitate interaction and collaboration between users is information delivery layer. Services in this layer disseminate different types of information to their target users or possible target users. As a result, users will find it's much easier to build their social network and knowledge network. News feed service push information to users using their social network data. Relation recommendation service and knowledge recommendation service provide users with the information of users, groups, and knowledge that they may possibly interested through intelligent analysis of their behaviors. Search service provides a variety of search services to users including course search, user search, and knowledge search. Moreover, users can search in the scope of the whole platform as well as a specific data set.

2.5 Conclusions

Since students nowadays are digital natives who are accustomed to learn in an active learning environment, interactive and collaborative e-learning environment beyond traditional LMS is needed by both learners and educators. Under this circumstance, learning is a combination of cognitive and constructive process with social process. Social software involves shared wider participation in the creation

of information, encourage more active learning, and supports better group interaction. Therefore, we combine the advantages of LMS and social software to build an interactive and collaborative e-learning platform. The platform not only helps users to build their personalized social network and knowledge network during the process of learning, but also connects course network of users with his/her social network and knowledge network. It also provides news feed service, recommendation service, and search service to facilitate interaction and collaboration between users.

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