

Practice and Research of Blended Learning Reform in Higher Education

Xiaotao Ye ^a, Aili Lv ^b

School of Henan Polytechnic University, Jiaozuo 454000, China.

^ayetao0380@sina.com, ^blvaili0210@hpu.edu.cn

Abstract

Education innovation has been promoted by development of information technology (IT). Blended learning which based on IT has been a popular teaching model to deepen higher education teaching reform, which serves as the important channel to effectively improve teachers' status in teaching and facilitate student a simultaneous independent and collaborative learning experience. Blended learning reform has been implemented in Henan Polytechnic University (HPU) of China. Reform has been practice from three aspects: Education IT environment design, instructional design and teaching management and evaluation. And remarkable results in innovating teaching philosophy, reforming teaching methods and means, consummating teaching evaluation have been achieved.

Keywords

Education innovation, teaching reform, Blended Learning.

1. Introduction

In recent years, information technology is effectively integrated with the curriculum, creating an ideal learning environment and a new learning style. Especially, the rise of Massive Open Online Course (MOOC), changed the traditional teaching structure and teaching mode, deepened the teaching reform, and achieved the goal of cultivating innovative talents[1,2]. Blended Learning is a new education model, which deeps integrated information technology and traditional teaching; and it combines online digital media with traditional classroom methods, played the leading role of teachers to guide, inspire and monitor the teaching process, but also, fully mobilized the students' initiative, enthusiasm and creativity[3].

On the one hand, blended learning promoted teachers change in the teaching mode, teaching strategies, roles and other aspects; on the other hand, from the learners' perspective, learning has become rights of their own[4,5]. However, at present, the practice of blended learning reform is limited to the individual aspects of curriculum or course design, and permits limited participation in small-scale teachers and students. For the above-mentioned facts, since 2013, HPU had carried out a lot of practice in blended learning reform, which includes three key links: informatization supporting environment design, instructional design and teaching management and evaluation. As a result, remarkable results in innovating teaching philosophy, reforming teaching methods and means, consummating teaching evaluation have been achieved.

2. Education Information Environment Design

Design for Blended Learning on information environment includes four aspects at Henan Polytechnic University (HPU): e-Learning platform, network environment, teaching-video resources and various application systems.

2.1 Construction and Improvement of E-Learning Platform

E-Learning platform is the foundation of implementing blended learning. Now the popular e-Learning platforms include commercial products (e.g., BlackBoard) , open-source software (e.g., Moodle, Sakai) and applications developed by university independently[6]. Sakai is an open, flexible, feature-rich platform for learning, teaching and collaboration that develops organically from within

higher education to address dynamic needs of a global community. Sakai is an open source software suite developed by its diverse and global adopter community.

The HPU's Sakai platform was successfully deployed and used on trial since January 2013. In order to effectively cooperate with blended learning, many new functions were developed on the basis of its fundamental features. For instance, the interface between Sakai and school's educational administration system, video conferencing capabilities, rollcall function and course site evaluation tool.

2.2 Construction of Network Environment

At the school level, the design of blended learning need to construct the campus network to ensure that all the teachers and students can seamlessly access to blended learning environment in anytime and at anywhere. After two phases of construction, campus network has become the one of the main injunctions of CERNET2. It has 10G export bandwidth in total, over 90% bandwidth utilization and 4000 information points covering all public area, which can fully meet the teaching and learning online requirements. Furthermore in order to meet the needs of mobile learning, school constructed a campus wireless network, which adopted 802.11n standard, and using a dedicated DHCP server to assign addresses. Certification accounts synchronized information platform database automatically, so that all teachers and students can access network freely.

2.3 Create Teaching-Video Resources

The design of blended learning requires a wealth of online video resources, in this respect, the school had built a true three-dimensional high-definition virtual studio, 2 recorded broadcast rooms, and one set of portable HD video recording system. Those devices provide good conditions for recording high-definition video teaching resources. Each year, more than 400 courses provided online teaching video resources based on Sakai, which accounts for more than 70% of the excellent sites. These courses included 5 National Resource-sharing Courses, 11 provincial-level ones, 6 provincial-level video-open courses, 3 National Bilingual Language Teaching Course and 8 provincial-level ones.

2.4 Application System Construction

In order to facilitate the unified evaluation and management of teaching results, blended learning environment also needs to be integrated with information portal and other application systems. Now, school has built a campus information portal platform, the uniform identity authentication system, data exchange and integration platform, school conditions display platform and so on. The information portal platform has integrated undergraduate teaching management system, undergraduate educational assistance system, Sakai, postgraduate management system, students' management system, financial system, campus card system, college library borrow system, personal management system, scientific research system, asset management system, OA, E-mail etc.

3. Design and Practice

In the implementation of blended learning reform, HPU not only designed the IT supporting environment, but also designed and practiced on the other main process, such as instructional design, teaching management and evaluation.

3.1 Instructional Design

The instructional design of blended learning involves 3 levels: At the school level, HPU established the personnel training of "moral education first, focus on ability and knowledge". New model full played to the leading role of teachers and the principal role of students, which promoted students personalized development and diversified growth. At the specialty level, surrounding the talent training mode established by school and according to the needs of students' comprehensive development and individual development, HPU established the curriculum system which integrating comprehensive and professional education, combining theory and practice. Meanwhile, HPU set reasonable credit online and offline hours for courses to play the teacher's leading and student's principal role. At the course level, HPU implemented the concept of quality education, which taking

students learning and development effectiveness as the core. Respect and inspire students' academic interests to promote the education and teaching work change from “teacher-mainly” to “learner-mainly”.

Changes in the teaching model also brought about changes in course design. Applying the learning process like MOOC, such as watching course video, participating in discussion, submitting assignments, taking quizzes and exams. Those means combined with traditional classroom to achieve a variety of innovation in blended learning. Below C language programming course will be used to as an example to depict our teaching design for blended learning.

(1)Mixing in and out of class: We not only took full advantage of teacher’s guiding and personality influence using the traditional classroom, but also conducted discussion-based teaching with chat room and forum on Sakai to strengthen the interaction between teachers and students ([Fig. 1](#)).

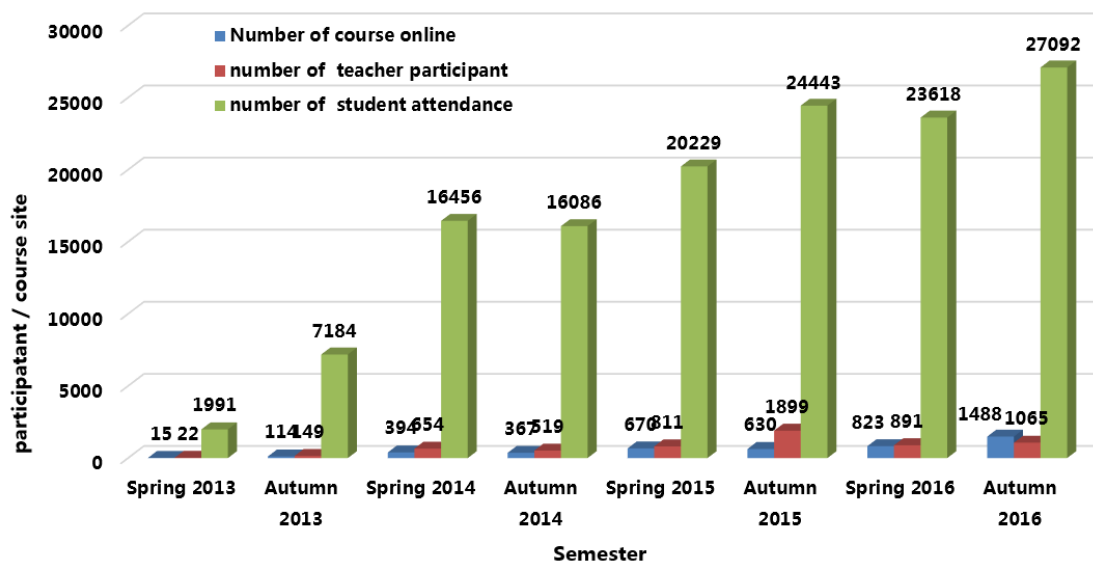
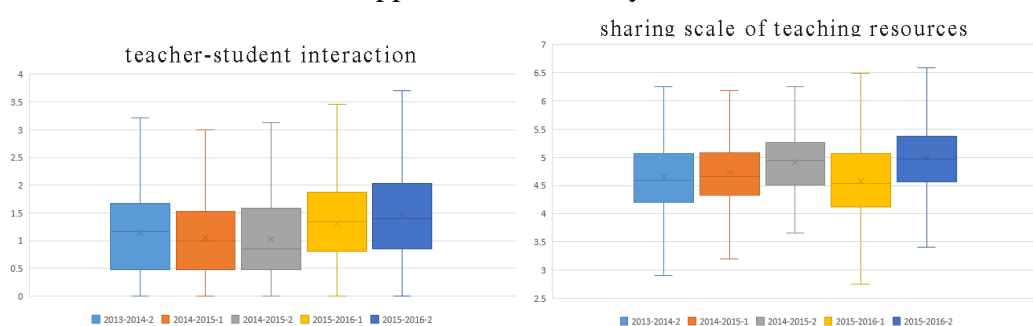


Fig.1 Participation Situation of Blended Learning in HPU

(2)Mixing offline and online: Offline, to participate in classroom teaching, final examinations etc. Online, to achieve resource-sharing online, and to enhance formative assessment using assignment and quiz on Sakai ([Fig.2](#)).

(3)Flipped classroom: To carry out independent advanced learning on Sakai. Pre-class, forming problems during the process of viewing knowledge points, watching video lectures, participating in the discussion and completing the corresponding homework and quizzes. And then ask these questions in class. So that, achieved flipped classroom truly.



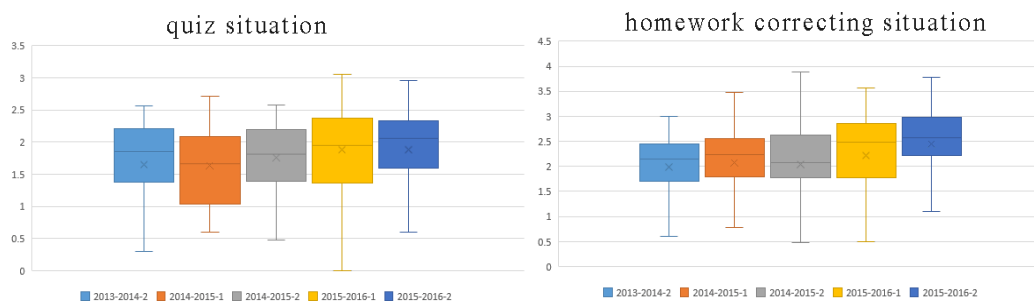


Fig.2 Related Index of Blended Learning Model Practice

3.2 Quantitative Assessment, Evaluation and Management

HPU explored the scientific and rational teaching evaluation system in the practice of blended learning, established an effective teaching assessment and management mechanism. Those measures ensured the effective development of reform.

Firstly, using e-Learning platform, teachers make up for the lack formative assessment of traditional classroom. Using a variety of tools online to record learners' different kind of activities, such as login frequency, duration of study, assignment fulfillment, online quizzes scores, number of forum posts and chat room discussions etc. These records can generate statistical data automatically. Based on these data, we can systematically, synthetically and comprehensive evaluate student's learning process.

Secondly, dean's office can also use e-Learning platform to evaluate teaching process. Quantitative assessment can be made from the following aspects: amount of resources uploaded, number and result of assignment, test times, number of questions answered. After several semesters practice, HPU drew up policies for course assessment and each semester assessed the teaching quality which carries out teaching with e-Learning platform.

4. Management and Promotion

HPU began to implement blended learning reforms in 2013. After more than 4 years, it has accumulated rich experience through actual applications. Moreover, the remarkable results were achieved in following respects: innovating teaching philosophy, reforming teaching methods and means, improving the teaching evaluation etc.

4.1 Promotion Measures

The following measures were taken to promote blended learning:

Firstly, a variety of methods were used to improve the teacher-student's interest in the new model. Take for instance, seminars and trainings were held regularly to establish new philosophy and to share experience of curriculum reform.

Secondly, the mechanisms of the vice-principal accountability and related departments linkage were formed. All units work together, cooperate actively and clear-up division of labor. Dean's Office is responsible for drawing blended learning policies and related measures, managing and evaluating course, organizing the relevant education reform project, review, acceptance and so on; The Modern Educational Technology Center is responsible for the construction and maintenance of informatization. Each college is responsible for guiding, supervising and examining the specific implementation of carrying out blended learning activities, organizing teaching and research activities and academic exchanges.

Lastly, each year, a series of documents were drawn up to encourage teachers to participate in the reform. Teachers and students who join in the reform were rewarded to raise their enthusiasm.

4.2 Result

The implementation of new model not only facilitated the deep integration of IT and higher education, promoted the sharing of quality education resources, but also innovated talent training mode and improved the quality of teaching. It has got a good result in application.

(1) Teachers' enthusiasm to participate in educational reform were promoted. Since its beginning, 3009 courses have used or are using it, 2308 teachers and 40 thousand students have taken part in. New model has been widely acclaimed by teachers and students, which promoted teachers' enthusiasm to participate in educational reform. Only in 2015, 22 related reform projects was supported, funded up to 160,000 yuan inside school.

(2) Renew teachers and students' education concepts: teacher's leading role and student's dominant position in teaching and studying have been given full play. Blended learning cultivate students' initiative and thinking, meanwhile, students' learning efficiency and studying effect have been significantly improved. As shown in Figure 5, after developing new model reform, the indicators, such as sharing scale of high-quality teaching resources, degree of interaction, the number of quiz questions and correcting homework trips, has the following characteristics: ① Many reference indicators were generally increased each semester. ② Some courses, a small number of teachers and students are very active, such as: Spring semester 2016, Teacher Hu Chunyan's "Contemporary World Economy and Politics" course, its interactive chat messages and post number over 3000. Spring semester 2015, Teacher Zhang Lina's "C language programming", its corrected homework number over 7000 times. (In order to facilitate display, the vertical axis of the graph uses log₁₀ logarithmic coordinates).

(3) Promoted the reform of curriculum examination: further innovated teaching methods, ways and means. Blended learning improved curriculum quality assessment system, which combined the process evaluation and summative evaluation. It explored the course examination method of implementing process check, emphasizing ability and innovation. Guide students to learn independently, effectively improved the quality of personnel training.

(4) Deepen the exchange of teaching reform among universities: Actively participate in education informatization and online learning space construction of Henan, and is selected as one of the experimental universities in 2014. In recent years, some college leaders and teachers, such as Henan University of Technology, Zhengzhou University of Light Industry, Jiaozuo University and Sias International University etc., have come to the school for visits and academic exchanges.

5. Conclusion

HPU's blended learning tightly coupled practices and theory study. It mainly studied for three major factors, such as design of supporting platform on informatization, design of teaching and teaching quality management and evaluation. It created application model promotion after establishing experiment site, pushed forward the deep integration of IT and higher education, improved the quality of education and teaching. This paper has a high theoretical reference and practical application value, but it also needs to be improved in the following two components :(1) Implement strategy research. Blended learning still at the stage of exploratory practice, so it needs more practice and research in guiding teachers and students to actively participate in the implementation of new teaching model.(2) Big data mining. Blended learning concept has been highly recognized, but the specific implementations of the results also need more detailed data to support, it requires deep data mining which generated during the process of practice.

Acknowledgements

The authors gratefully acknowledge the subsidy provided by the Educational technology equipment and practice of educational research project in Henan Educational Committee (project number: GZS036, GZS290); Teaching and Research Reform Project of Henan Polytechnic University (2015JG100).

References

- [1] Lv Aili, Ye Xiaotao. Research and Design of Blended learning Based on Sakai's -- Take He'nan Polytechnic University as an example[J]. The Guide of Science & Education 2016,5:85-86.
- [2] Li Kedong, Zhao Jianhua. Principle and application model of Blended Learning[J]. E-education Research. 2004,7:1-6.
- [3] He Kekang. The new development of the technical theory of education at Blended Learning[J]. Journal of National Academy of Education Administrative,2005,9:37-48.
- [4] Shen Jiquan, Research of Blended learning Based on Sakai[J]. Henan Education Information, 2015,1:32-34.
- [5] Yang Xiaodong, The Research of Blended Learning for Computer Basic Course on Moodle Platform[D]. Jinan Shandong: Shandong Normal University,2010.
- [6] Ye xiaotao, Lv Aili. Promotion of College Network Teaching Platform Based on Sakai's -- Take He'nan Polytechnic University as an example[J]. The Guide of Science & Education 2015, 1:37-38.