Transactions on Comparative Education (2025)
Clausius Scientific Press, Canada

DOI: 10.23977/trance.2025.070203
ISSN 2523-5818 Vol. 7 Num. 2

Exploration and Practice of Blended Teaching Reform in the Course of Internet Data Analysis and Application

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Keywords: Blended Teaching, Data Analysis Course, Teaching Effectiveness, Reform Issues & Directions

Abstract: With the advent of the big data era, the course "Internet Data Analysis and Application" is crucial for cultivating data analysis talents to meet market demands. This paper focuses on the current teaching situation of this course, explores the necessity of carrying out blended teaching reform, and elaborates in detail on the design and implementation process of the blended teaching model based on the combination of online and offline teaching, including aspects such as the selection of teaching platforms, the reconstruction of teaching content, and the organization of teaching activities. Through the evaluation and analysis of teaching effectiveness, it verifies the positive achievements of the blended teaching reform in enhancing students' learning outcomes, cultivating their self-learning ability and practical data analysis ability. Meanwhile, it also points out the problems and improvement directions in the reform process, providing a reference for the teaching reform of similar courses.

1. Introduction

In today's digital age, Internet data is growing explosively, and data analysis ability has become one of the essential skills for professionals in numerous fields. The course "Internet Data Analysis and Application" aims to enable students to master the abilities of collecting, organizing, analyzing, and applying Internet data, so as to meet the market's demand for data analysis talents. However, the traditional teaching model mainly based on teacher-centered lectures has gradually revealed some drawbacks in the teaching of this course, such as low student participation and insufficient cultivation of practical abilities.

With the advancement of information technology, blended teaching has gradually become an important direction for the teaching reform of data analysis courses. The blended teaching model organically combines online teaching resources with offline classroom teaching, providing new ideas for solving these problems. Through blended teaching reform, the flexibility of online teaching and the interactivity of offline teaching can be fully exploited to stimulate students' learning interest and improve teaching quality. Li Zhina et al. introduced the blended teaching model into the programming courses for non-computer majors. By setting clear teaching objectives

and evaluation criteria, students' practical abilities and self-learning abilities were improved [1]. Similarly, Zhang Xiaoming et al. proposed an OBE-guided teaching design scheme for the big data technology development course. They believed that an effective evaluation mechanism is one of the key factors in ensuring teaching quality [2]. In addition, Junli Zhangand Dejun Zhu pointed out that adopting the online-offline blended teaching method in the business statistical data analysis course can not only enhance students' learning experience but also more effectively achieve the learning outcomes [3].

Facing the needs of emerging liberal arts, Lingfei Qian et al. studied the construction of big data-related courses for the information management and information system major, advocating breaking disciplinary boundaries and integrating more interdisciplinary content [4]. Hua Zhang, on the other hand, focused on the e-commerce data analysis course in the e-commerce major and explored the path of curriculum reform in the context of digital transformation [5]. These studies indicate that, under the trend of multi-disciplinary integration, data analysis courses need to pay more attention to practicality and forward-lookingness to meet the special requirements of different industries.

2. Current Teaching Situation of the Course "Internet Data Analysis and Application"

2.1 Single Teaching Model

In the traditional teaching process, it mainly involves teachers' theoretical explanations in the classroom, with students passively receiving knowledge. This single teaching model deprives students of opportunities for active thinking and exploration, making it difficult to arouse students' learning enthusiasm. As a result, students' understanding and mastery of the course content are not in-depth enough. Especially when facing actual data analysis problems, they often feel at a loss.

2.2 Insufficient Practical Teaching

Internet data analysis and application is a highly practical course. Students need to consolidate the theoretical knowledge they have learned and improve their data analysis skills through a large number of practical operations. However, in actual teaching, due to limited experimental class hours and the complexity of setting up the experimental environment, the practical teaching part often fails to meet students' needs. Students cannot obtain sufficient practical training, and the cultivation of their practical abilities is restricted.

2.3 Lagging Update of Teaching Content

Internet technology is developing rapidly, and data analysis methods and tools are constantly being updated. Nevertheless, the teaching content of the course sometimes fails to keep up with the pace of industry development in a timely manner, resulting in a certain disconnection between the knowledge learned by students and practical applications. After graduation, students have difficulty quickly adapting to the requirements of their jobs.

3. Necessity of Blended Teaching Reform

3.1 Meeting Students' Individualized Learning Needs

Students vary in their learning foundations, learning styles, and learning paces. With the help of the online teaching platform in the blended teaching model, students can independently choose

learning time, learning content, and learning pace according to their actual situations for personalized learning. For knowledge points that are difficult to understand, students can repeatedly watch online teaching videos until they master them, thus better meeting their individualized learning needs.

3.2 Improving Students' Self-learning Ability

Blended teaching emphasizes students' self-learning. During the online learning process, students need to independently plan their learning plans, search for learning resources, and solve problems encountered in learning. This helps cultivate students' self-learning awareness and ability. At the same time, interactive communication links in online learning, such as forum discussions and online Q&A, also encourage students to actively participate in learning and improve learning outcomes.

3.3 Strengthening the Effect of Practical Teaching

Through resources such as online virtual laboratories and data analysis case libraries, students can conduct more practical operation exercises after class, making up for the shortage of experimental class hours. Moreover, the online platform can record students' practical operation processes and results, enabling teachers to timely understand students' practical situations and provide targeted guidance and feedback, further strengthening the effect of practical teaching.

3.4 Enhancing the Timeliness of Teaching Content

Online teaching resources are updated rapidly. Teachers can promptly introduce the latest Internet data analysis cases, methods, and tools to supplement and update the knowledge system in offline textbooks, enabling students to keep up with the cutting-edge trends of the industry and closely integrate the knowledge they learn with practical applications.

4. Design and Implementation of the Blended Teaching Model

4.1 Selection of Teaching Platform

Choosing a teaching platform with complete functions and convenient operation is the foundation for the successful implementation of blended teaching. After investigation and trial use, we selected the Rain Classroom intelligent teaching platform. This platform has multiple functions, including course resource release, online learning, assignment arrangement and grading, examination and assessment, and interactive communication, which can meet the diverse needs of blended teaching. At the same time, the platform also provides rich data analysis functions, allowing teachers to understand students' learning situations in real-time and providing data support for teaching adjustments.

4.2 Reconstruction of Teaching Content

4.2.1 Online Teaching Content

Based on the course teaching syllabus, the theoretical knowledge is fragmented and made into a series of concise teaching videos. Each video focuses on one knowledge point or skill point, facilitating students to learn in fragmented time. Meanwhile, relevant e-textbooks, extended reading materials, case analyses, and other learning resources are uploaded for students' independent learning and in-depth exploration. For example, when explaining data analysis methods, in addition

to theoretical explanation videos, analysis documents and operation demonstration videos of actual cases are also provided to help students better understand and apply data analysis methods.

4.2.2 Offline Teaching Content

Offline classroom teaching is no longer a simple repetition of knowledge. Instead, it deeply analyzes and answers the common and difficult problems that students encounter during online learning. At the same time, practical operation guidance, group project discussion, and reporting sessions are added to strengthen students' practical ability and teamwork skills. For example, in each offline class, a certain amount of time is allocated for students to present the progress of data analysis projects in groups. Other group students and teachers can then ask questions and provide comments to jointly improve students' practical level of data analysis.

4.3 Organization of Teaching Activities

4.3.1 Online Learning Activities

(1) Release of learning tasks: Teachers release weekly learning tasks on the teaching platform, clarifying learning objectives, learning content, and learning requirements, and guiding students to learn in a planned manner.

(2) Independent learning: Students follow the learning task arrangements, watch teaching videos online, read learning materials, and complete online exercises and assignments. During the learning process, students can communicate with classmates about their learning experiences through the platform's discussion area and ask teachers questions whenever they encounter problems.

(3) Online testing: Regular online tests are carried out on the teaching platform to examine students' mastery of knowledge points. The test results are promptly feedback to students, enabling them to understand their learning progress and areas for improvement, so as to adjust their learning strategies.

4.3.2 Offline Learning Activities

(1) Question-answering: Teachers centrally answer the questions raised by students during online learning to help them overcome learning difficulties. For some key and difficult issues, in-depth explanations are given through actual cases to deepen students' understanding.

(2) Practical operation guidance: Teachers guide students to carry out practical operations in the classroom. For problems encountered by students during the practical process, timely technical support and method guidance are provided to ensure that students can proficiently master the application of data analysis tools and methods.

(3) Group project discussion and reporting: Students are divided into several groups, and data analysis project tasks are assigned. Group members cooperate to complete the data analysis process of the project. In the classroom, each group reports and discusses the project progress, shares experiences and results, and teachers provide comments and summaries to cultivate students' teamwork and communication skills.

5. Evaluation and Analysis of Teaching Effectiveness

5.1 Analysis of Learning Achievements

By comparing the final-exam scores of students before and after the reform, it was found that after adopting the blended teaching model, students' average scores significantly increased, and the

excellent rate also rose. This indicates that the blended teaching model helps students better master the course knowledge and improve their learning outcomes.

5.2 Analysis of Questionnaire Survey

After the course ended, a questionnaire survey was conducted among students, and 50 valid questionnaires were collected. The survey results show that most students recognized and were satisfied with the blended teaching model. Over 90% of the students believed that the blended teaching model enhanced their learning interest and self-learning ability, enabling them to participate in learning more actively. Approximately 95% of the students thought that the combination of online and offline teaching helped them better understand and master the course content, especially that their practical operation ability was significantly improved. At the same time, students also put forward some valuable suggestions for the teaching reform, such as further optimizing the quality of online teaching resources and increasing the time for offline interactive communication.

5.3 Evaluation of Students' Practical Ability

By observing students' performance in data analysis projects and the project reports they submitted, it was found that students' practical ability was greatly improved. Students could more proficiently use the learned data analysis methods and tools to deeply analyze practical problems and propose reasonable solutions. This shows that the blended teaching reform achieved good results in strengthening the cultivation of students' practical ability.

6. Problems in the Reform and Improvement Directions

6.1 Insufficient Self-learning Ability of Some Students

Although the blended teaching model emphasizes students' self-learning, some students still lack the awareness and ability for self-learning and cannot complete online learning tasks on time. To address this issue, teachers need to strengthen the supervision and guidance of students' learning process, establish a reasonable learning assessment mechanism, and improve students' enthusiasm and initiative for self-learning. For example, colleges and universities increase the proportion of the completion rate of online learning tasks in the total course grade, regularly check students' learning progress, and provide individual tutoring for students with learning difficulties.

6.2 Inadequate Connection between Online and Offline Teaching

During the teaching process, there are sometimes situations where the online and offline teaching content is repetitive or not closely connected, affecting the teaching effect. Teachers need to further optimize the teaching design, carefully plan the online and offline teaching content to ensure that they complement each other and are organically combined. Meanwhile, colleges and universities should strengthen the management and coordination of the teaching process, adjust teaching strategies in a timely manner based on students' learning feedback, and ensure the continuity and smoothness of online and offline teaching.

6.3 Need to Improve the Quality of Teaching Resources

With the in-depth development of blended teaching, the requirements for the quality of teaching resources are getting higher. Currently, the production level of some online teaching videos needs to

be improved, and the update speed of case resources needs to be accelerated. Schools and teachers should increase investment in the construction of teaching resources, organize teachers to participate in relevant training, and improve teachers' ability to produce teaching resources. Meanwhile, colleges and universities encourage teachers to cooperate with enterprises, introduce more practical and latest data analysis cases, and enrich the teaching resource library.

7. Conclusion

The blended teaching reform of the course "Internet Data Analysis and Application" is a beneficial attempt to meet the talent-cultivation needs of the big data era. Through the teaching model of combining online and offline, it effectively stimulates students' learning interest, improves their self-learning ability and practical operation ability, and achieves good teaching results. However, some problems have also emerged during the reform process, which need to be continuously explored and improved in future teaching practice. We believe that with the continuous development of educational technology and the in-depth progress of teaching reform, the blended teaching model will be continuously improved, providing strong support for cultivating high-quality Internet data analysis talents.

Acknowledgements

“Research on Innovative Practice of Blended Teaching Based on OBE + BOPPPS Model: Taking the Course "Internet Data Analysis and Application" as an Example” Project No.: 2024JG056

Research on Internship and Practical Training Empowered by AI Project No.:2024JG007

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