



An Empirical Study on the Effects of Online and Offline Blended Curriculum Practice

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Abstract. To explore the necessity and function of online and offline blended curriculum teaching in universities, this research used the “Social Security Theory” course for postgraduates as an example to carry out blended teaching practice. In the research, the implementation processes of blended curriculum teaching was explored and SPSS and other tools were used to evaluate the teaching effect. Results showed that online and offline blended curriculum teaching significantly promoted the innovation ability of postgraduate students, and the variance analysis of students’ scores showed that there were significant differences between the blended teaching group ($M = 84.8$) and the traditional one ($M = 74.7$) ($F = 31.978$, $P < 0.001$). The blended teaching also reduced teachers’ repetitive teaching stuffs and teachers’ offline teaching hours had been reduced greatly from 36 h to 18 h. Meanwhile, the satisfaction of students also showed that there was a significant difference between the blended teaching group ($M = 4.26$) and the traditional one ($M = 3.58$) ($F = 228.244$, $P < 0.001$).

Keywords: Online and Offline Blended Course Teaching · Postgraduate · Social Security Theory Course · SPSS

1 Introduction

With the development of educational informatization and application of Massive Online Open Course (MOOC), the flipped classroom and online and offline blended teaching has been recognized by more and more researchers, and has become an important direction of teaching reform research [3]. Online and offline blended teaching breaks through the time and space limitation of traditional classroom teaching, integrates the advantages of network information technology and traditional classroom teaching. Curriculum teaching acted as an important part for degree and graduate education system, and is also a necessary tool to ensure the quality of graduate students training, but there are some problems in traditional curriculum teaching, such as narrow teaching ideas [6], teaching content lags behind [10], single teaching methods [2], one-sided teaching evaluation mechanism [8] and heavy teaching tasks [13]. The aim of this study is applying blended teaching concepts and methods to the graduate curriculum teaching, so as to meet the diversified needs of graduate students’ learning and improve the high-level development of graduate education system This study included the four aspects: teaching and education objectives, learning content design, teaching process implementation

and teaching effect evaluation, and improves the training quality and teaching effect of graduate students by improving the learning effect evaluation.

2 The Necessity of Online and Offline Blended Curriculum Teaching for Postgraduates

Online and offline blended teaching is a teaching method that provides resources and activities suitable for the learning environment through the use of relevant media technology, so as to achieve the optimal teaching effect [4]. This teaching method breaks through the time and space constraints of traditional classroom teaching and integrates the advantages of network information technology and traditional classroom teaching. Online teaching links rich learning resources, uses multimedia information technology to present and combine the course content in a high-density, multi-form and diversified way, and can realize online timely and convenient communication and discussion, and the ideological sparks of discussion can be retained in the form of words and pictures. Offline teaching is based on online learning and discussion, which is further guided and organized by teachers to realize the discussion and thought collision between teachers and students, and among students themselves, guiding the knowledge discovery of in-depth learning, stimulating learning enthusiasm and innovative ideas [5].

2.1 Online and Offline Blended Curriculum Teaching is the Practical Need of Teaching Reform Under the Background of New Liberal Arts Construction

The construction of the new liberal arts is based on respecting the existing liberal arts tradition. It is required to respond to the changes of the times in a timely and accurate manner and focus on the prominent problems of reform and development. The purpose is to cultivate applied, compound and international talents who meet the requirements of the new era [9]. Due to the problems existing in China's postgraduate curriculum teaching, the current curriculum teaching is difficult to meet the teaching reform needs of the new liberal arts construction. The innovation and construction of postgraduate curriculum teaching is imperative. In recent years, in a large number of studies on postgraduate curriculum teaching reform, some scholars have proposed that changing teaching methods and providing personalized and multi-dimensional curriculum learning support for students with diverse starting points is the key to the innovation and construction of postgraduate curriculum teaching in China [14]. The advantages of hybrid curriculum teaching, which integrates high-quality learning resources, teaching methods and students' curriculum learning, have natural advantages for the improvement of curriculum teaching quality. Online and offline hybrid curriculum teaching not only has the teaching supported by modern Internet technology, but also forms a new form of curriculum coordinated and expanded by connecting traditional teaching, which is exactly consistent with the innovative concept of classroom teaching that retains the traditional advantages and expands students' learning vision in the construction of new liberal arts [12]. Therefore, using the achievements of educational informatization to vigorously carry out online and offline blended curriculum teaching is the practical need of curriculum teaching reform under the background of new liberal arts construction.

2.2 Online and Offline Blended Course Teaching is an Important Practice to Realize the Integration of Science and Education

As the core concept of high-level talent training, the essence of science education integration is to innovate, impart, spread and inherit knowledge in the process of “scientific research - Teaching - learning”, so that teachers and students can carry out interactive academic exploration in the academic community, learn from each other and forge ahead [1]. However, the traditional one-way teaching method obviously can not fully mobilize the enthusiasm of students to actively acquire knowledge and cultivate their ability [11]. Online and offline blended curriculum teaching absorbs the core ideas of constructivism, humanism and cognitive learning theory, and emphasizes the role orientation of teachers as “coaches” and students as “protagonists”. It can not only give play to the leading role of teachers in organizing, guiding, enlightening and monitoring the teaching process, but also fully reflect the initiative, enthusiasm and creativity of students as learning subjects, it has good consistency and applicability in the practice of realizing the integration of science and education. At the same time, the integration of science and education emphasizes that in the course of teaching content design, we should integrate the latest research results and absorb the advanced development trend of disciplines, highlighting the scientificity, advancement and creativity of the teaching contents [1]. In view of the lack of cutting-edge graduate teaching materials and the high randomness of tutor course teaching, hybrid course teaching makes use of information achievements, combined with the richness and timeliness of online resources, and closely combines the teaching content with the latest scientific research achievements at home and abroad, so that graduate students can understand the discipline development trends, hot research issues and cutting-edge theory development through classroom learning, it is conducive to enrich the knowledge structure of postgraduates and achieve the training goal of forming a broad academic vision.

3 The Exploration of Online and Offline Blended Curriculum Teaching – Taking Social Security Theory Course as an Example

Based on the curriculum teaching practice of *social security theory* for high-quality postgraduate courses in Hunan Province, this study explored the implementation process of online and offline blended curriculum teaching from four aspects: teaching and education objectives, learning content design, teaching process implementation and teaching effect evaluation.

3.1 Teaching and Education Objective

The objectives of the course included knowledge objectives, ability objectives and cultural quality. Students are required to understand the basic concepts, theories and laws of social security, establish the knowledge framework and method system framework of social risk and security, cultivate students to recognize and understand the reform and improvement process of social security policy, clarify the misunderstanding of public cognition, and objectively and rationally analyze the hot spots and difficulties in the reform of social security, and a result to improve their ability to integrate theory with practice.

3.2 Teaching Content Design

The course of “social security theory” relies on the online teaching platform to build online and offline teaching contents. Relying on the online teaching platform, students learn the teaching videos and top journal papers regularly pushed by teachers or teaching assistants, complete online assignments, discuss and interact, and acquire basic knowledge points. The management function of the platform for learning behavior can automatically record students’ learning traces and participation process, so that teachers can understand students’ learning status and existing difficulties at any time. Offline through face-to-face classroom teaching, teachers list the basic theories of online learning and the difficulties and key points to be solved, and set the offline teaching content targeted to realize the internalization and application of students’ knowledge.

3.3 Teaching Process Implementation

According to the design of teaching content, combined with the actual implementation of the course and students’ acceptance ability, the teaching implementation process of “social security theory” course is divided into three links before, during and after class (see Fig. 1 for details).

3.3.1 Before Class: Knowledge Delivery

Teachers arranged online learning tasks before face-to-face teaching, and released learning videos, documents, tests and discussion topics during online classes. Students formed study groups with no more than 6 people in each group, flexibly arranged learning and discussion time, and completed learning tasks within the specified time. In addition, teachers and teaching assistants published discussion topics on the platform, interact with students and complete questions and answers.

By tracking the detailed data of students’ online learning the teaching assistant can timely understand the dynamics, rules and time allocation of students’ learning, and form binding learning evaluation and teaching key feedback for students. On the one hand, the system automatically displayed the number of times each student watches videos and literature reading through the depth of color. The darker the color, the more time and times of learning. On the other hand, through the number of times students watched the same paper or the same video, they could judge the doubts existing in students’ learning. The more times they watched, the more difficult points they may had, so as to provide accurate key teaching information for teachers’ classroom teaching. Teachers can understand the common problems existing in students’ learning process through the content of students’ replies, which can be used as the basis for offline course teaching adjustment.

3.3.2 During Class: Knowledge Consolidation

In class activities can be divided into three parts: the consolidation and application of basic theories, the analysis of key and difficult problems and discussions on hot topics.

The first stage is the consolidation and application of basic theory. In this part, the teachers explained the basic theory of the chapter contents, and elaborated the application

mechanism of the theory in specific research fields in combination with the online course content. Then, by analyzing the degree of students' absorption of knowledge points, the teachers explained in detail about the students' existing problems or ambiguous knowledge points.

The second stage is the analysis of key and difficult problems. After collecting the difficult chapters and knowledge points, the teachers summarized the problems existing in students' actual learning and guided students to think in depth.

The third stage is the discussion on hot topics. Teachers put forward some social cases or hot topics. In order to better stimulate students' enthusiasm and active participation in blended teaching and learning, teachers conducted group discussion for 5–10 min according to the divided learning groups. During this period, teachers would randomly participate in the discussion of a group to guide the group forming some representative points of view. The leader or members of each group reported the results of the discussion and shared with all the classmates. Teachers played the roles of guidance, summary and evaluation in the whole process of students' displays.

3.3.3 After Class: Internalization and Extension

Teachers released after-school learning tasks online, including reflection and evaluation of the learning process and the development of theoretical extension. They guided students to further deepen their thinking through the summary and reflection of learning activities.

The fourth stage is the reflective evaluation of learning process. In the process of participating in blended curriculum teaching, students will be involved in many links, such as raising questions, collecting evidence, drawing conclusions and so on. Reflective evaluation is to focus on each link of curriculum activities, examine what each link has done, how to do it, how each link is connected to form a whole, and finally get what conclusion[[[Y.Feng, Guide students to reflect and evaluation in scientific inquiry activities [J].China Education Journal, 2021 (09): 81–84 + 97.]]. The key for teachers to help students form reflective evaluation lies in how to link the teaching links, including: first, self-evaluation and mutual evaluation of pre class learning tasks. After completing the knowledge consolidation stage, students review their thinking path of analyzing problems before class and make reflection and evaluation. Will other students think more reasonably and make other homework at the same time? What is worth learning from? Second, reflect on the display task in class. The design of collaborative presentation is to cultivate the output ability of graduate students, including cooperative inquiry ability, oral presentation ability and writing ability. After class, the teacher selects 2–3 groups of collaborative achievements and summarizes them into a collection of excellent achievements. By reflecting the differences in display effects between groups, the graduate students can objectively think critically about their comprehensive ability and literacy. At the same time, with the help of a platform for the comprehensive development of graduate students and the formation of relevant information sharing ability.

The fifth stage is the development of theoretical extension. After class, teachers ask students to discuss the feasible direction of future research on this topic, and provide the latest domestic and foreign research literature on this direction on the platform, in order to cultivate students' international vision and sustainable development ability. For

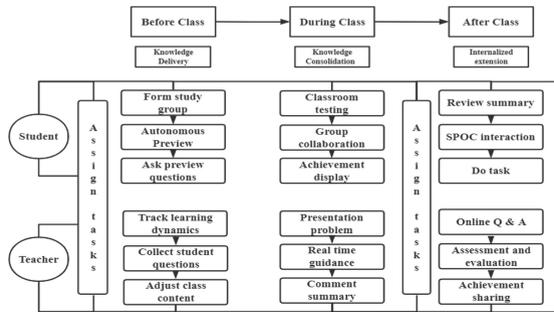


Fig. 1. Implementation process of curriculum teaching activities

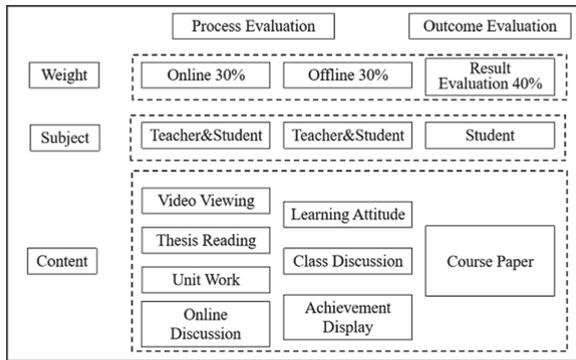


Fig. 2. Learning effectiveness evaluation system

example, in discussing how to break the current dilemma of rural elderly care service supply, in order to help students deeply grasp the context of academic evolution, the first course will guide students to read the classical theory of elderly care service supply, and find out from the classical theory that elderly care service supply involves the main body and mode of supply, After class, let students read a series of research results published by different scholars at home and abroad in the field of elderly care service supply. Through the reading and discussion of classical theories and top journals, students can master the basic theory of elderly care service supply and the changes of research concerns in different periods, form critical thinking in this research field and identify the direction of future research.

3.4 Teaching Effectiveness Evaluation

Corresponding to the teaching method of online and offline blended courses, the course assessment should also be adjusted accordingly, strengthen the whole process evaluation of learning effect, guided students to pay attention to their usual learning and improve their learning initiative. It could be divided into process evaluation and result evaluation (see Fig. 2 for details). Process evaluation consisted of online learning evaluation and offline learning evaluation. Online learning evaluation accounted for 30% of the total

evaluation results. The assessment was based on the learning data provided by the online teaching platform, including the number of sign in times of the platform, the length of online learning, the length of literature reading, the completion of homework, participation in interactive discussion, etc. Offline learning evaluation accounted for 30% of the total evaluation results. The evaluation content was mainly the comprehensive performance of students and learning groups in the process of classroom thematic discussion activities or autonomous learning case collection and reporting. After the course learning, the students were required to select topics on the hot research direction of classroom discussion and write a course paper of about 6000 words. This is not only an examination of students' learning, but also helped students write high-quality papers for publication, which could not only improve students' sense of acquisition and achievement in curriculum learning, but also enhance their confidence in academic research. This part accounted for 40% of the total evaluation score.

4 Effectiveness Test of “Social Security Theory” Blended Curriculum

After three academic years of exploration and trial implementation, this course has achieved remarkable teaching results. Compared with the traditional teaching way, online and offline blended course teaching had achieved remarkable results in students' course achievement, academic achievement and learning satisfaction.

4.1 Course Performance Has Improved Significantly

In order to test the effectiveness of blended teaching, students were selected respectively before and after the blended teaching reformed divided into two groups. Each group had 36 students. In terms of course scores, the average score of students in the blended teaching group was about 10 points higher than that in the traditional teaching group (see Table 1), and there was a significant difference between the two groups ($P < 0.001$) (as shown in Table 2). At the same time, the difference of students' performance in the blended teaching group was small (among them, the performance variance of the blended teaching group is 5.9 and that of the traditional teaching group is 8.9).

Table 1. Comparison of course scores between traditional teaching group and blended teaching group.

	Sample number	Average achievement	Results variance
Traditional teaching group	36	74.7	8.9
blended teaching group	36	84.8	5.9

Table 2. Results of ANOVA in traditional and blended teaching groups.

	quadratic sum	df	mean square	F	conspicuousness
Inter block	1840.222	1	1840.222	31.978	0.000
Within the group	4028.222	70	57.546		
amount to	5868.444	71			

The above results proved that blended teaching methods had generally improved students' understanding and mastery of knowledge and theory, and effectively promoting the improvement of each student's individual academic performance.

4.2 Academic Achievements Have Increased Significantly

Since the teaching team carried out the exploration and practice of online and offline blended curriculum teaching, the output of graduate academic achievements has increased significantly. The students presided over and undertook the school level summer graduate research projects for three consecutive years, and won three first prizes and two second prizes respectively. In the past three years, nearly half of the students had published corresponding course papers, including 5 academic papers in high quality journals. In addition, some students actively participated in national and provincial case competitions and won more than 60 awards. The students' academic ability and output had been significantly improved.

4.3 The Overall Teaching Satisfaction Has Been High

This study also examined students' satisfaction from the following five aspects: Deeply study knowledge and master learning skills; Broaden vision and expand ideas; Improve communication and expression skills; Broaden the depth and breadth of thinking; Bring better academic experience. Through SPSS22.0 and the Likert five subscale, a questionnaire survey was conducted on the students of traditional teaching mode and blended teaching mode. It was found that the improvement of learning satisfaction factors in the above blended teaching mode was significantly better than that in the traditional teaching mode (see Table 3 for details).

The results of variance analysis showed that there were significant differences between the blended teaching group and the traditional teaching group (see Table 4).

Compared with traditional teaching, blended teaching has achieved more remarkable teaching results in students' in-depth learning of knowledge and learning skills, broadening vision and expanding ideas, cooperative communication and expression ability, improving the depth and breadth of thinking and academic experience.

Since the implementation of blended teaching, teachers' offline teaching hours had been reduced from 36 h to 18 h. The teacher team adopted the way of thematic cooperation, carried out curriculum teaching in combination with research interests and professional fields, and effectively combined scientific research projects with teaching contents, which not only effectively realized the renewal of teaching contents, but also

Table 3. Comparison of teaching satisfaction between traditional teaching mode and blended teaching mode

Learning satisfaction elements	model of instruction	Student self-evaluation					
		strongly endorse	disapprobation	same as	Compare the approval	strongly endorse	mean
Can deeply study knowledge and master learning skills	Traditional teaching	1.24%	9.32%	33.54%	36.02%	19.88%	3.63
	Blended teaching	0.61%	2.47%	14.20%	41.36%	41.36%	4.2
Can broaden the vision and expand the idea	Traditional teaching	3.11%	10.56%	37.89%	34.78%	13.66%	3.45
	Blended teaching	1.24%	1.23%	10.49%	34.57%	52.47%	4.36
Can improve the cooperation, communication and expression ability	Traditional teaching	1.86%	11.18%	31.06%	37.27%	18.63%	3.6
	Blended teaching	1.27%	2.47%	17.28%	33.33%	45.68%	4.2
It can improve the depth and breadth of thinking problems	Traditional teaching	1.24%	9.94%	34.16%	34.78%	19.88%	3.62
	Blended teaching	0.62%	2.47%	17.28%	31.48%	48.15%	4.24
Can bring a better academic experience	Traditional teaching	0.62%	9.32%	34.16%	40.99%	14.91%	3.6
	Blended teaching	1.24%	1.85%	12.96%	34.57%	49.28%	4.29

Table 4. Results of ANOVA on Teaching Satisfaction between Traditional and blended Teaching Groups

	quadratic sum	df	mean square	F	conspicuousness
Inter block	1.149	1	1.149	228.244	0.000
Within the group	0.04	8	0.005		
amount to	1.189	9			

stimulated teachers' teaching enthusiasm, realized the in-depth coordination of "teaching and learning" and "teaching and research", and promotes teachers and students, students ideological collision and academic innovation between teachers.

5 Conclusions

The introduction of online and offline blended teaching concepts and methods into graduate course teaching had a significant effect of "integration of science and education" on the goal planning, learning content, teaching process and learning effect evaluation of the course. Under the trend that the social demand for high-level talents tends to be applied, compound and international, graduate education, as a form of national education to cultivate high-level talents in the future, the quality of curriculum teaching has a great impact on graduate training. As one of the course teaching methods for postgraduate talent training, online and offline blended course teaching needed to further strengthen the intelligent processing of data, deepened big data mining, paid attention to the functions of scientific research innovation and knowledge discovery, and highlighted and connect the effect of ideological and political education.

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