

Influencing Factors of Blended Teaching from the Perspective of University Students

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Abstract: The rapid development of educational informationization has put forward new requirements for teaching mode. Blended teaching under the background of information technology has become the focus of higher education teaching reform, and the research on the influencing factors of the implementation effect of blended teaching has attracted more and more researchers' attention. This study aims to investigate students' views on the effect of blended teaching from the perspective of college students who once participated in blended teaching activities. This paper conducts a theoretical study on the influencing factors of blended teaching, and conducts an empirical study on the influencing factors of blended teaching effect by means of questionnaires. The results show that personal interests and attitudes and curriculum design are the main factors affecting the effectiveness of blended teaching. Moreover, teachers' professional image, curriculum design and Teaching Platform Functions all have a significant impact on students' interest and attitude in participating in blended teaching. Finally, this paper puts forward some suggestions to strengthen the "student-centered" teaching consciousness, optimize the "student-centered" teaching design, attach importance to the improvement of teachers' professional image, and select a suitable blended teaching platform.

Keywords: Blended Teaching, Perspective of University Students, Influencing Factors

1. Introduction

Traditional classroom teaching is a typical "teacher-centered, knowledge-based" teaching form. Teachers play a vital role in all learning activities. The lack of learning resources and single learning activities make it difficult for students to effectively develop their creativity and problem-solving skills. With the development of network technology, various online learning platforms continue to emerge, and numerous learners are beginning to learn on the network. In this online learning form, students change from passive acceptance of knowledge to active selection of learning knowledge, which can flexibly arrange learning content and progress. However, learning quality is difficult to guarantee owing to the lack of process supervision and learning effect evaluation in online learning activities. In the Ten-Year Development Plan of Educational Informatization

(2011-2020), the Ministry of Education of China has proposed new requirements for teachers and educators—to promote the deep integration of information technology and higher education, create a talent training model, strengthen the construction of infrastructure and information resources, and promote the modernization of educational content, teaching means, and teaching methods [1]. Blended teaching is the product of the application of information technology in teaching; it overcomes the drawbacks of traditional teaching and online learning and offers students and teachers multiple resources, environment, and learning methods [2]. A majority of foreign researchers believe that blended teaching combines face-to-face teaching of teachers and students with computer-aided teaching, which overcomes limitations of the original teaching modes so that the blended teaching mode exhibits excellent advantages in the field of education [3, 4]. Several experts in the field of educational technology in China, including Prof. Kekang Ho, Prof. Zhiting Zhu, Prof. Kedong

Li, and Prof. Jiahou Li, have elaborated on blended teaching. Prof. Ho Kekang interprets “blended teaching” as “combining the advantages of traditional learning methods with those of E-Learning” [5]. In-depth understanding is not only to give full play to the leading role of teachers in guiding, inspiring, and monitoring the teaching process but also completely reflect the initiative, enthusiasm, and creativity of students as the main body of the learning process. Besides the theoretical study of blended teaching, in recent years, several researchers have investigated the implementation and application of hybrid teaching. Shand and Glassett explored the design and delivery of a blended social studies teaching methods course to assess the elements of the blended design that pre-service teachers found most constructive [6]. Simonova explored whether the blended teaching method could enhance the process of acquiring new knowledge in English grammar; the results differed according to the students’ level of English knowledge [7]. Popovic et al. evaluated the impact of Web-based blended learning in the physiology course at the Faculty of Medicine, University of Montenegro, and the introduction of Moodle in the presented teaching model increased interest of students, attendance of face-to-face lectures, as well as formative and summative scores [8]. These studies reported that blended teaching has changed the traditional “teacher-centered” teaching mode, realized the “student-centered” new teaching mode, and effectively improved the learning effect to a certain extent. After more than 20 years of development, both domestic and foreign researchers, teaching practitioners and government and educational institutions have basically reached a consensus that blended teaching will become the “new normal” of future education [17]. Especially under the background of “Internet +”, blended teaching shows blowout development. The hot Internet plus education has also brought the community to a new focus on blended teaching. However, few empirical studies exist on the impact of blended teaching. The essence of blended teaching in the era of “Internet +” is to create a truly highly participatory individualized learning experience for students. Students need not only standardized knowledge acquisition but also self and creative knowledge [18]. From the students’ perspective, this study combines the questionnaire survey method with the statistical analysis method, investigates the views of students who have participated in the blended teaching practice, expects to determine the factors affecting the blended teaching, and proposes reasonable suggestions for improving the teaching effect.

2. Research Design

2.1. Research Objective

The survey was completed by a sample of 146 students who participated in blended teaching activities in the School of Artificial Intelligence. All the questionnaires were valid. Table 1 presents the distribution of students’ gender, grade, and major.

Table 1. Basic Details of Students in the Survey.

| | Male | Female |
|--------|------------------|--------------------------------|
| Gender | 134 | 12 |
| | 91.78% | 8.22% |
| Grade | Junior | Sophomore |
| | 90 | 56 |
| Major | 61.64% | 38.36% |
| | Computer Network | Mobile Application Development |
| | 90 | 56 |
| | 61.64% | 38.36% |

2.2. Research Method

We adopted the method of a questionnaire survey. Through literature review, consulting experts, and organizing teachers and students to organize seminars. From the perspective of students with blended teaching activities, we designed the questionnaire of influencing factors of blended teaching. The questionnaire contains four dimensions, namely, personal interest and attitude, teachers’ professional image, curriculum design, and teaching platform functions, a total of 17 items. To evaluate the subjective judgment of students on the blended teaching effect, the data were collected using a 5-point Likert Scale (5 = strongly agree, 4 = agree, 3 = average, 2 = disagree, 1 = strongly disagree) for each item [9]. We collected 146 questionnaires, and all were valid, with an effective rate of 100%. In this study, SPSS software was used for data analysis.

3. Analysis of Investigation Results

3.1. Reliability and Validity Analysis of Questionnaire Items

To study whether the collected data were true and reliable, that is, whether the samples answered the questions truthfully, reliability analysis was first applied to the data generated by the questionnaire. Cronbach’s α coefficient is commonly used in reliability analysis, which is usually >0.7 [10]. From Table 2, Cronbach’s α coefficient was 0.949, which is >0.7 , showing that the reliability of the collected data is of high quality and could be used for further analysis.

Table 2. Results of Cronbach α coefficient.

| Questions | Cronbach α |
|-----------|-------------------|
| 17 | 0.949 |

Data validity analysis was used to determine whether the questions effectively expressed the information of research variables or dimensions, that is, whether the design for questions was reasonable. The commonly used analysis method is exploratory factor analysis, and the indices are KMO criterion (>0.7) and Bartlett’s test of sphericity (sig. <0.05).

Table 3. Results of the data validity analysis.

| Questions | Factor | | | |
|-----------|--------|------|-------|-------|
| | 1 | 2 | 3 | 4 |
| Q1 | 0.183 | 0.28 | 0.841 | 0.206 |

| Questions | Factor | | | |
|-----------------|----------|-------|-------|-------|
| | 1 | 2 | 3 | 4 |
| Q2 | 0.181 | 0.333 | 0.821 | 0.282 |
| Q3 | 0.171 | 0.248 | 0.831 | 0.164 |
| Q4 | 0.13 | 0.352 | 0.795 | 0.237 |
| Q5 | 0.903 | 0.051 | 0.158 | 0.238 |
| Q6 | 0.898 | 0.108 | 0.176 | 0.241 |
| Q7 | 0.910 | 0.053 | 0.16 | 0.271 |
| Q8 | 0.792 | 0.172 | 0.107 | 0.33 |
| Q9 | 0.255 | 0.288 | 0.185 | 0.790 |
| Q10 | 0.415 | 0.155 | 0.213 | 0.756 |
| Q11 | 0.316 | 0.29 | 0.229 | 0.741 |
| Q12 | 0.337 | 0.181 | 0.226 | 0.740 |
| Q13 | 0.215 | 0.401 | 0.273 | 0.638 |
| Q14 | 0.164 | 0.783 | 0.398 | 0.261 |
| Q15 | 0.15 | 0.822 | 0.357 | 0.226 |
| Q16 | 0.049 | 0.854 | 0.262 | 0.265 |
| Q17 | 0.059 | 0.895 | 0.245 | 0.223 |
| KMO | 0.902 | | | |
| Bartlett's test | 2710.221 | | | |
| Sig. | 0.0000 | | | |

Bold values show good validity for correspond dimension (factor).

As shown in Table 3, KMO value is 0.902, which is >0.7 , and through the Bartlett's test of sphericity, it implies that the data have good validity. Finally, we extracted four factors, which have a good corresponding relationship with the questions. The load coefficients of factors were all >0.6 , the smallest was 0.638, which corresponded to the four dimensions (factors) in the questionnaire. Overall, these questions had good structural validity, that is, collected information could effectively express the dimensions (factors).

3.2.2. Students' Views on the Efficacy of Blended Teaching

Table 4. Students' Views on the Effectiveness of Blended Teaching.

| Factor | Question | Contents | Score |
|--------------------------------|----------|---|-------|
| Personal Interest and Attitude | Q1 | I like the blended teaching mode of this course. | 3.72 |
| | Q2 | I think it is very necessary to carry out this kind of blended teaching. | 3.71 |
| | Q3 | This blended teaching can make up for some shortcomings of traditional classroom teaching. | 3.73 |
| | Q4 | I will continue to pay attention to and participate other courses which will adopt blended teaching | 3.72 |
| Teachers' Professional Image | Q5 | I am satisfied with the professional ethics of the teacher. | 4.6 |
| | Q6 | I am satisfied with the professional knowledge of the teacher. | 4.57 |
| | Q7 | I am satisfied with the personality image of the teacher. | 4.55 |
| | Q8 | I am satisfied with the teachers' ability to organize and manage teaching activities. | 4.48 |
| | Q9 | I am satisfied with the textbooks selected for this course | 3.98 |
| Curriculum Design | Q10 | I am satisfied with the content of this course. | 4.21 |
| | Q11 | I am satisfied with the online resources of this course. | 4.14 |
| | Q12 | I am satisfied with the teaching organization of this course. | 4.08 |
| | Q13 | The evaluation method of this course is reasonable and can effectively promote my learning. | 4.04 |
| | Q14 | The teaching platform functions are powerful and can stimulate my interest in learning. | 3.6 |
| Teaching Platform Functions | Q15 | Through the teaching platform, my learning attitude is more positive. | 3.57 |
| | Q16 | Through the teaching platform, my learning efficiency has been improved. | 3.6 |
| | Q17 | Through the teaching platform, my active learning ability has been improved. | 3.47 |

As shown in Table 4, statistical results reveal that the score of the dimension of teachers' professional image is the highest, followed by professional ethics, professional

3.2. Analysis of the Influencing Factors of the Efficacy of Blended Teaching

3.2.1. Students' Views on the Influencing Factors of the Efficacy of Blended Teaching

When asked students' views on the influencing factors (personal interest and attitude, teachers' professional image, curriculum design, and teaching platform functions) of the blended teaching effect. Figure 1 shows the results of the survey.

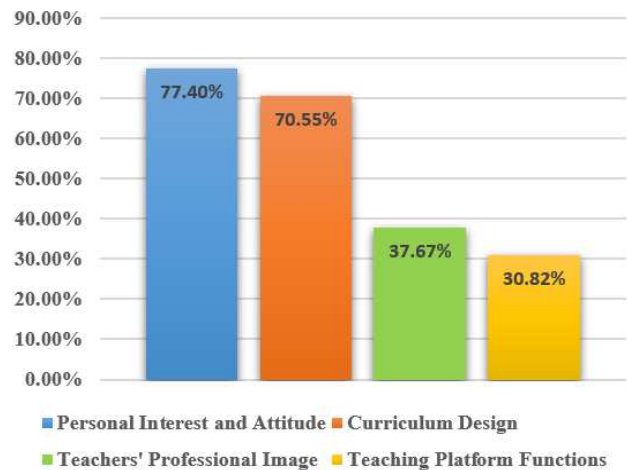


Figure 1. Students' views on the influencing factors of the efficacy of blended teaching.

Most students thought that personal interest and attitude were the most crucial factors, accounting for 77.40%, followed by curriculum design, accounting for 70.55%. However, teachers' professional image and teaching platform functions were not crucial, accounting for 37.67% and 30.82%, respectively.

knowledge, personality image, and teaching organizational ability. The average score of the factors of teachers' professional image was 4.55, which is an interesting finding

of the survey. Although students thought that teachers' professional image is not crucial, if teachers have an excellent professional image, students' satisfaction with the implementation of blended teaching could be improved. Next, the curriculum design factor obtains high score, followed by the teaching content, online resources, teaching organization, curriculum evaluation methods, and textbooks. The average score of curriculum design was 4.09, corroborating previous students' view that curriculum design is a key factor affecting the efficacy of blended teaching. However, the average score of personal interest and attitude factors is no more than 4.0, only 3.72; this is a contradictory result, although most students believed that personal interest and attitude are the major factors. These findings revealed that to enhance the effect of blended teaching, teachers should find ways to improve students' interest and help students correct their learning attitude. Finally, teaching platform obtained the lowest average score, only 3.56. All the questions about the teaching platform did not get >4.0 points. As the previous students agreed, the teaching platform had the least influence on the blended teaching among the four factors.

3.2.3. Correlation Analysis of Influencing Factors of Blended Teaching

As personal interest and attitude are key factors, we analyzed their correlation with the other three factors, as shown in Table 5. Q1-Q4 are the four items of personal interest and attitude, and Q5-Q17 are the other items of Teachers' Professional Image, Curriculum Design, and Teaching Platform Functions.

Table 5. Correlation Analysis of Influencing Factors.

| | Q1 | Q2 | Q3 | Q4 |
|-----|---------|---------|---------|---------|
| Q5 | 0.360** | 0.373** | 0.337** | 0.319** |
| Q6 | 0.405** | 0.405** | 0.371** | 0.338** |
| Q7 | 0.362** | 0.397** | 0.340** | 0.332** |
| Q8 | 0.341** | 0.387** | 0.318** | 0.360** |
| Q9 | 0.463** | 0.508** | 0.412** | 0.462** |
| Q10 | 0.467** | 0.526** | 0.422** | 0.418** |
| Q11 | 0.500** | 0.567** | 0.429** | 0.480** |
| Q12 | 0.429** | 0.500** | 0.433** | 0.468** |
| Q13 | 0.486** | 0.557** | 0.440** | 0.600** |
| Q14 | 0.642** | 0.675** | 0.578** | 0.672** |
| Q15 | 0.614** | 0.656** | 0.545** | 0.634** |
| Q16 | 0.512** | 0.596** | 0.512** | 0.565** |
| Q17 | 0.519** | 0.575** | 0.494** | 0.562** |

* $P < 0.05$; ** $P < 0.01$

Pearson correlation coefficient is used, the greater the value, the stronger the correlation between items. From Table 5, all the correlation coefficients were >0.3, and we observed a significant level of 0.01 between all other questions and the questions about personal interests and attitude. The results suggested a significant positive correlation between teachers' professional image, curriculum design, teaching platform functions, and personal interest and attitude.

4. Suggestions

4.1. Enhancing the Teaching Consciousness of "Student-centered"

Currently, college students are self-assertive, self-confident, and accustomed to thinking from their own point of view, demanding more attention and freedom. The survey data revealed that most students also believe that personal interest and attitude are the primary factors affecting the impact of blended teaching, which requires teachers to strengthen the "student-centered" teaching consciousness. First, teachers should understand students' needs and learning situation to make full preparations for the implementation of blended teaching. Second, in the process of teaching implementation, teachers should flexibly use various teaching strategies and means to guide students to participate in the entire learning process, giving full play to the role of guide and organizer. For example, "Flipped Classroom" is a new student-centered teaching mode rising in recent years, which can realize the purpose of "arousing interest in learning and promoting active learning" [11]. In addition, teachers can also use various information resources to conduct vibrant and colorful teaching activities, enhance the interest of teaching activities, and increase the interaction with students. Finally, in the entire teaching process, teachers should also maintain communication with students, understand students' learning situation, and constantly adjust and optimize the curriculum teaching design to improve the teaching effect.

4.2. Optimizing "Student-centered" Teaching Design

The teaching design of curriculum is the core link of teaching implementation. The instructional design aims to create and develop learning experience and learning environment to promote students to master knowledge and skills. The "student-centered" teaching design requires that teachers should first select appropriate teaching content according to students' cognitive level. In this survey, regarding the dimension of curriculum design, the highest score was the teaching content, which was 4.21. The most important thing for students was the teaching content. Bloom's taxonomy divides the cognitive process from low level to high level into remembering, understanding, applying, analyzing, evaluating, and creating [12]. Owing to the difference in students' cognitive level and cognitive ability, teachers can formulate multilevel teaching objectives. The teaching content should not only fulfill the needs of students at lower cognitive level but also meet the needs of students at higher cognitive level. Then, according to different levels of learning content, teachers should choose different teaching strategies. For example, for the learning content of memory and understanding, teachers can urge and help students understand memory through timely online tests. For the analysis and evaluation of learning content, teachers can use discussion method and brainstorming, for example, to stimulate students' learning motivation. For learning

content that needs to be applied or even innovated, teachers can adopt task-based or project-driven teaching methods, and design several links, such as explanation, demonstration, classroom practice, and after-class development exercises, to help students master relevant skills. Finally, to evaluate students' learning outcomes, teachers should adopt multiple evaluation methods, focusing on both process assessment and knowledge and skills assessment. Besides the assessment from teachers, students can also be actively involved, such as mutual assessment among students, group assessment, and so on.

4.3. Promoting Teachers' Professional Image

Teachers are called engineers of the human soul. Teachers' influence on students may last a lifetime. Compared with other professions, the most significant characteristic of teacher's profession is its responsibility of educating people. Teachers shoulder the educational mission of "making people become talents." From the statistical results of collected data, the score of the dimension of teachers' professional image is the highest, and the results of the correlation analysis revealed that teachers' professional image exerts a significant impact on students' personal interests and attitudes. Teachers should constantly improve their moral behavior and habits, form good moral qualities, respect and care for students, have patience with students, and persevere in their persistence of "teaching and educating people." With the continuous development of new technologies, new knowledge and theories are constantly emerging, and also constantly affecting various disciplines. Thus, college teachers should constantly update their own "subject" professional knowledge per the characteristics of the development of the times. In addition, teachers should follow the law of educational activities in the process of teaching and continue to learn the theoretical system of pedagogy and apply these theories and methods in the actual teaching process. Moreover, teachers should become researchers in their own teaching practice. Owing to students' individual differences, the multidimensional nature of teaching content and the creativity of teaching activities, the teaching effect itself is dynamic. Only by constantly exploring and reflecting on teaching practice, teachers can constantly enhance their teaching level and ability, thus constantly improving the teaching effect.

4.4. Choosing an Appropriate Blended Teaching Platform

In the practice of hybrid teaching, various learning platforms have appeared in recent years, including Moodle [13], Blackboard [14], WeChat Public Platform [15], Mosoteach [16], and so on. From the perspective of students, however, the teaching platform is not the main factor affecting blended teaching. However, from the results of the correlation analysis, as shown in Table 5, "The powerful teaching platform can stimulate my interest in learning" have the highest correlation with students' personal interest and attitude, which is higher than other questions. Thus, choosing

a suitable teaching platform can enhance students' interest in participation to a certain extent. Different teaching platforms have different characteristics. Moodle and Blackboard were developed early and were robust and stable. WeChat Public Platform and Mosoteach were developed by China, have a mobile app, and are more attractive to today's young people. Platform is only the carrier of teaching activities, no matter which one is chosen, only through the careful design of teachers, can it give full play to its functions, thereby enhancing students' learning interest and improving learning effect.

5. Conclusion

This study collects students' views on the impact of the implementation of blended teaching. From the students' point of view, personal interest, attitude, and curriculum design are the main factors affecting the blended teaching effect. In addition, teachers' professional image, curriculum design, and the function of teaching platform exert a significant impact on students' interest and attitude in participating in blended teaching. This study illustrates that teachers should change their roles, actively guide students to participate in the whole learning process, and stimulate their internal driving force of self-conscious learning and self-development. In addition, teachers should attach importance to the teaching design of the course, consider the teaching content, teaching strategies, and teaching evaluation methods from the perspective of students. Moreover, teachers need to constantly improve professional ethics, professional knowledge, and teaching skills, so that they can truly achieve the goal of "learning to be a teacher, behaving like a model of the world." Overall, this study provides reference and demonstration for researchers engaged in blended teaching, as well as provide reference suggestions for improving the effect of blended teaching. In the future, we will collect more data for in-depth analysis. On the other hand, we plan to collect data from the perspective of teachers to analyze teachers' attitudes towards blended teaching and find out the problems in the process of implementing it. We also intend to make an empirical analysis of the factors affecting the quality of blended teaching in Colleges and universities. These studies are helpful to deepen the understanding of the blended teaching activities, to construct and improve the design of blended teaching, to clarify the operating mechanism of the blended teaching, and to find effective strategies to promote the implementation effect of the blended teaching activities. At the same time, it also provides feasible paradigm and practical guidance for the development of blended teaching activities in various courses, which has great meaningful application value.

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