Practice and Enlightenment of Blended learning from the perspective of "Internet +" smart mobile Take the course of Computer Foundation as an example

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Abstract—With the continuous development of blended learning in the field of educational technology, colleges and universities pay more and more attention to the research on the frontier, hot spot and development trend of blended learning teaching. The application of "Internet +" smart mobile devices provides a new learning mode for the intelligent mobile terminal of blended learning with its excellent computing performance and powerful network access ability. Based on the systematic analysis of blended learning model at home and abroad, combined with the theory and practice of blended learning model, this paper determines the basic idea of solving problems based on intelligent mobile technology, and puts forward countermeasures and suggestions from the aspects of role design, teaching objectives, teaching content and form, teaching environment, teaching methods and teaching evaluation. In addition, taking the computer foundation course as an example, the integrated construction of mixed learning model, the teaching process of mixed learning is designed. This mode not only arouses students' enthusiasm and initiative in learning, provides timely feedback of learning situation, realizes real-time interaction between teachers and students, and achieves objective evaluation of students, but also enables teachers to better grasp and control the overall classroom, and significantly improves the teaching effect, which also provides reference and reference for future information technology teaching.

Keywords-Internet+; Smart mobile; Blended learning;

1 THE CURRENT SITUATION OF BLENDED LEARNING RESEARCH AT HOME AND ABROAD

Blended learning is a way to overcome the physical boundaries of time and space, make use of the advantages of network learning, make the interaction between professors and learners, and improve the effect of offline learning. Blended learning is not simply divided into offline teaching environment and online teaching environment, but defines teaching as a circular process, that is, blended learning is the general name of curriculum teaching in the form of face-to-face in offline space and teaching and learning activities in the form of online learning in cyberspace.

With the continuous development of blended learning in the field of education technology, colleges and universities pay more and more attention to the research of frontiers, hot spots and

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development trends in blended learning teaching. From the analysis of blended learning techniques and applications at home and abroad, Arbaugh and others reviewed the multidisciplinary blended learning literature and found that the current researchers pay more attention to the performance comparison between face-to-face learning and blended learning, as well as the potential predictors of learning performance [1]. Ma Wei and Zhou Wei's analysis of the relevant literature shows that the international blended learning research focuses on academic achievement, mathematical thinking, undergraduate study, self-reflection and so on [2]. Xiao Wan and Zhang Shu Yu have found that scholars pay more attention to the comparative study of blended learning and traditional learning and online learning, and the application of online open resources in blended learning [3]. Tian Xin Fang and other analysis of blended learning literature found that blended learning evaluation research pays more attention to teaching and learning attitude, learning motivation, learning interaction and so on [4].

From the perspective of blended learning process, foreign studies are more evenly distributed in the application of different types of methods, and the exploration of blended learning is more in-depth and detailed. Domestic research is carried out in the mode of "teacher-led and student self-study", with emphasis on the application of the "teaching-centered" approach, and the relative weakness in integrating "learning-centered" approaches, especially problem-oriented learning, project-based learning, and design-based learning, which are relatively weak for deep learning [5]. In addition, there are still shortcomings in curriculum design, learning resources and content, learning evaluation and learning support in the blended teaching mode, especially in today's continuous development of information technology, the matching of mobile technical support and learning of blended learning wisdom also needs to be improved.

2 BLENDED LEARNING ELEMENTS

In the process of blended learning teaching, the educational design and implementation of the early stage of learning objectives, learning methods, learning time, learning space and other learning elements to be comprehensive consideration, learning objectives, time and "Internet plus" intelligent movement and other interactive ways of effective combination of learning elements, in order to find the most effective solution for blended learning and teaching system. Therefore, in order to be efficient blended learning, it is necessary to focus on smart mobile learning and offline face-to-face learning blended operation mode essentially system teaching design, "Internet plus" learning environment, infrastructure construction and technical support, so that the learning process efficiency and learning results are greatly maximized. At present, blended learning is centered on learners, and in a variety of forms to learner elements, professor elements, learning system elements interaction to achieve interconnected learning effect, to achieve learning satisfaction. At present, the elements that play a major role in blended learning are shown in Table 1.

Table 1 Table Type Styles

Classification	**Constituent elements**
learner	Ability, motivation, cognition, convenience of use, self -satisfaction

Learning materials	Picture composition and function design
Learning content	Mix of structured and unstructured learning content
Study time	Real time and non real time hybrid
Learning form	A mixture of individual learning, collaborative learning (grouping) and normal learning
Learning media	Media mix based on audio, video, multimedia and computer network
Interaction type	Learner - learning content, learner - Professor, learner - learner, learner - group interaction
Evaluation method	Self-evaluation, reflection and completion of evaluation
Professor learning strategy	Teaching, discussion, problem centered learning, project-based learning, etc
Characteristics of professors	Lecture content, lecture style, professor's credit
Professor - learning methods	Direct teaching method, classroom teaching method, discussion method, problem solving method and team guidance
Professor learning strategy	Learning form, feedback, note taking, motivation, blackboard writing, textbook application, etc

3 BLENDED LEARNING TEACHING MODE AND DESIGN

Along with the rapid growth and widespread application of mobile Internet technology, the deep integration of Internet and education has made the characteristics of the mixed learning mode, such as universality, freedom and individuation, become particularly prominent, bringing the vast number of learners unique learning mode experience. At the same time, it also faces the challenges of new information technology. It can make "Internet +" intelligent mobile education targeted to the mixed learning mode. By constructing a smart mobile hybrid learning model based on "Internet +", it can provide reference and guidance for educators to carry out differential teaching, so as to provide students with teaching more in line with their characteristics and promote the process of education and teaching reform. Mixed learning mode does not have the best mode in terms of educational effect, but most of them are divided into pre-class, in-class and after-class stages. In order to better integrate learning resources and bring different mobile learning experiences to students, needs analysis should be done in the whole learning process to obtain accurate data such as learning content, learning needs, students' emotional goals and psychological experiences, so as to lay an objective foundation for the subsequent adjustment of mixed learning before, during and after class. In the before class stage, students can watch personalized video materials according to their own wishes, or take study notes, answer questions and so on. During the class, they can check learning, guide learning activities, implement activities, publish and feedback lessons. After class, on the basis of learning activities, follow-up learning activities guidance, Q&A, evaluation of learning activities, etc. In the whole learning process, a closed hybrid learning mode of "online + offline" + "autonomous collaborative learning" has been formed with the support of Internet + smart mobile technology.

4 THE ENLIGHTENMENT OF THE CHANGE OF BLENDED LEARNING TEACHING MODEL

4.1 Role and interactive designs

A truly effective blended learning teaching model design needs to re-position the relationship between the professor and the learner. At present, teachers in colleges and universities have high demand for blended learning teaching theory, but there are still problems in the cognitive and application level of blended learning teaching mode, whether their teaching ideas are bound by traditional thinking, and do not really understand and carry out blended teaching advantages and meanings, especially the low participation. Through the results of the korean blended learning teaching theory research, it can be seen that the modern blended learning teaching model needs to highlight the situational establishment, skill demonstration, evaluation of student learning activities and feedback of results. From the student's point of view, we should liberate from the passive learning consciousness and strengthen the improvement of students' autonomy and thinking ability, especially to enhance the whole process of students, the whole open learning consciousness. In addition, the blended teaching process also needs learner-learning content, learner-professor, learner-learner, learner-group interaction mixing to achieve the optimal design of role mixing.

4.2 Teaching content and form

At present, China's online courses more use disciplines as a framework, teaching materials as the basis, the use of structured standard curriculum development model, from the traditional syllabus, teaching objectives, curriculum and teaching materials introduction, to the construction of online courses and chapter testing and after-school homework, all without exception to continue the offline classroom model, and did not play a blended learning teaching model advantages, therefore, in the teaching content and form design, to break through the traditional teaching form constraints, according to the subject and professional characteristics, The theoretical view of cognitive education can be considered from the content design and arrangement, and the incentive content of imitation and active participation in learning can be increased. From the perspective of constructiveness, make learning as the center, take the initiative to construct the learner's own knowledge system; From the interdisciplinary theoretical framework, it is necessary to add some chapters to supplement and expand, to achieve interdisciplinary integration, in order to better understand the integration and innovation of knowledge in various disciplines, at the same time, can increase the selection and application of network-based outdoor activities, help to focus on knowledge and difficult content, in an unstructured form to achieve the decomposition and organization of blended learning units.

4.3 Teaching environment

At present, the offline teaching environment of higher education is still dominated by multimedia classrooms, online implementation of students in the after-school time free curriculum activities, from the teaching process, students do not get information receptors to actively dominate their learning behavior, become the master of participating in the construction of learning content, therefore, in the design of the teaching environment, need to

increase the virtual simulation, virtual integration and other practical content of the environment, applicable to the course's work process-oriented environment, online network teaching space and offline physical teaching space, The combination of indoor and outdoor organic environment can meet the needs of students to personalize learning anytime, anywhere. In addition, in the resource environment, it is necessary to establish a dynamic and static combination of diversified resources, to build a teacher and students to participate in the sub-theme, sub-units, sub-modules, systematic and dynamic situational creation of the curriculum environment, with real-time updates, targeted, practical and interactive and other multi-dimensional environmental characteristics.

4.4 Teaching method

At present, in the practice of blended learning teaching mode, teaching method is generally chosen as the main teaching method, the teaching process still embodies the teacher as the center, and does not play the advantage that blended teaching can free students from passive learning process. In addition, there are still shortcomings in the part composition of students and the specific teaching techniques and reflections of each classroom stage, and the way of flipping teaching, so according to the results of Korean practice, the blended teaching methods should focus on teaching using blended teaching strategies and the study of the learning effect of students through the application of teaching strategies. It is necessary to take students' learning as the center and action-oriented in the teaching curriculum, to focus on teaching and learning reflection and learning methods and teaching behaviors, and to fully reflect the comprehensive application of various teaching methods supported by blended teaching.

4.5 Teaching evaluation

The research object in the domestic teaching evaluation is basically limited to similar majors, for the general research results are limited, although the domestic has formed in the blended teaching process of online and offline evaluation means, but in tracking students' learning behavior, timely feedback of the teaching evaluation concept, resulting in the evaluation of learners still use offline summary evaluation, and can not fully reflect the actual comprehensive ability of students, therefore, The development and practice of blended teaching design needs to be carried out through different blended learning environments of various majors and series, and it is necessary to verify the learning effect of teaching platform in more ways. From the design aspect of teaching evaluation, it is necessary to take different judgments for different learners to effectively learn the evaluation mechanism, establish graded, phased multi-dimensional evaluation standards, and can reflect the blended teaching theory knowledge, promote students' independent learning, timely inspection and feedback, practical skills and professional attitude and other assessment requirements, so as to optimize the design.

5 RESEARCH ON THE APPLICATION OF COMPUTER FOUNDATION

The course of Fundamentals of Computer is based on the school's "Learning Pass" and "FanYa" mobile platforms, and adopts a mixed teaching mode. The class hours of basic courses include 16 online and 32 offline. 16 class hours Online class hours, students watch high-definition

videos and complete the chapter test. 24 class hours offline computer operation, providing unified explanation for students' computer operation, or answering questions. The 8 class hours offline are for students to watch the theoretical knowledge points of the video, conduct online testing, explain the difficulties, and answer questions.

5.1 Mobile platform functions

The basic computer courses rely on the "Learning Pass" and "FanYa" mobile platforms to establish online courses, which provide a guarantee for the feasibility of students' independent learning and personalized learning. Students can participate in online discussions, view FAQs, online exercises, preview materials, exercise solutions, exams, and submit assignments. The school has imported the student information into the class database of Learning Connect in advance, so that students can log in to the network learning space through their own accounts and passwords to carry out mobile hybrid teaching, so that students can learn with mobile phones under the guidance of teachers at any time and anywhere. In case of difficulties, they can communicate and discuss with teachers and students in the class group, so that the boundaries of time and space can be broken between students, teachers and students. The main functions are shown in the table 2.

Table 2 Table Type Styles

Functions	***Fundamentals of Computer*** **Mobile network platform**
activity	Sign in, vote, rush answer, theme discussion In class contact, questionnaire, group task
statistics	Learning times, homework statistics, examination statistics Release task points, discussions and classroom activities
materials	Course materials, question bank, assignment bank, examination paper bank
notice	Message publishing
job	Practice operation
test	Create test papers、Publish the exam
discuss	Topic management
management	Class management
Live class meeting class	Course live broadcast and replay

During the mobile learning process, whether the students have completed the before class online test, participated in the discussion, raised questions, and completed the homework after class; In group learning, whether to actively participate in group learning, and feed back the results to the teachers through the automatic statistics of the teaching platform. Teachers and students get accurate and objective learning evaluation, teachers understand the problems of students, and targeted explanations in the classroom can improve the effectiveness of classroom teaching.

Effective teaching requires teachers to carry out teaching activities in a targeted way according to the students' mastery of knowledge. Through “learning pass”, teachers can push various types of teaching resources such as video, animation, voice, and ppt text to students in advance, so that students can independently complete the task "statistics" to view the students' learning, obtain detailed reports of students' learning, and carry out more targeted teaching activities.

5.2 Teaching model

When constructing the mixed learning mode, the teaching mode of "learning as the main body and teachers as the leading role" is adopted to fully mobilize students' learning enthusiasm and give play to their conscious initiative. In the before class, in class and after class teaching links, intelligent mobile Internet terminals are reasonably used to realize the effective supplement of mobile learning to classroom teaching. Students can choose to learn digital resources according to their own needs, and can also use interactive teaching platforms to interact with teachers online.

In the mixed teaching mode, teachers, according to the teaching design, have successively built curriculum resources for the learning content, carried out online and offline teaching, completed teaching tasks such as theoretical teaching, practice, interactive question answering, case study and examination, and integrated fragmented knowledge to form a knowledge structure system. Students need to conduct online learning and offline learning in each learning task. After completing all learning tasks, they will be assessed and get learning results. The mixed teaching method decomposes the tasks suitable for the mixed teaching, applies them to teaching practice, improves teaching management, and promotes the teaching reform of the Computer Foundation course from many aspects, such as teaching form, teaching technology, teaching means, teaching objectives and teaching evaluation. Its teaching mode is shown in table 3.

Table 3 Teaching Model

Teaching Model.		
	Students	***Teacher***
before class	View study guide	Record teaching videos, teaching materials, and study guides to upload to the mobile platform
	Learning related teaching materials	Publish learning tasks
	Learn micro lessons	Organize discussion and Q&A
	Participate in discussion and Q&A	Diagnostic evaluation of students' knowledge, skills and emotional status is carried out on their participation in video and non video resources learning, discussion and question answering before class and on the learning tasks submitted by students.
	Complete learning tasks selectively	According to the diagnostic evaluation results, optimize the teaching design
in class	Understand the learning situation before class	Analysis of before class learning
	Participation in interaction	Optimize teaching design
	Independent thinking	Organize and guide students to participate in discussions and classroom exercises
	cooperative learning	Completeness evaluation
	Self evaluation and mutual evaluation within the group	Assign homework after class
after class	After class expansion	Making and uploading expansion materials

	Participate in the discussion	Organize discussion
	Knowledge consolidation	Online help
	Job submission	Online homework correction
		Completeness evaluation and reflection

The course of Fundamentals of Computer takes undergraduates as the teaching object, combines the mixed learning theory, considers the actual learning situation and training direction of students, selects the teaching content, presents it with appropriate teaching media, designs the teaching tasks of students before, during and after class, explores the application methods and steps of mixed learning theory in teaching practice, constructs a new learning model framework, and applies it to practical teaching. The mixed teaching method decomposes the tasks suitable for the mixed teaching, applies them to teaching practice, improves teaching management, and promotes the teaching reform of the Computer Foundation course from many aspects, such as teaching form, teaching technology, teaching means, teaching objectives and teaching evaluation.

5.3 Teaching design cases

The course of Fundamentals of Computer Application dissects and analyzes all chapters, knowledge points and other contents. It not only analyzes the key and difficult knowledge of the whole course, but also analyzes the correlation between knowledge. It is necessary to study and determine which content is suitable for video teaching, which content must be taught in the classroom, how assignments should be arranged, and how to test students' learning effects. In view of the relatively weak discipline foundation of students, teachers can guide students to make their own learning plans, arrange their own learning progress, and choose their own learning methods and learning strategies for autonomous learning. In class, teachers watch videos for students' preview before class to answer questions. Complete the test after class, and these scores will be included in the students' usual scores. Take the lesson "Use of Word Objects" as an example to display the teacher's teaching design, as shown in table 4.

Table 4 "Use of word objects" teaching design

WORD Object Using		
classification	***teaching design***	
Drawing objects	Guidance	Insert tab settings
	Teaching material	Network video: Drawing object use cases Teaching PPT: Settings for various drawing objects
	Discussion area	How to Use WORD Documents Decorated by Graphic Objects
	Self test	Operation question
Smart Art graphics	Guidance	Insert tab settings
	Teaching material	Network video: Preparation of organization chart Teaching PPT: Smart Art graphics settings
	Discussion area	How to set different layouts and special effects in Smart Art graphics
	Self test	Operation question
Text boxes and	Guidance	Insert tab settings

hyperlinks	Teaching material	Network video:How to use text boxes and hyperlinks Teaching PPT: Insertion of text boxes and settings of hyperlinks
	Discussion area	What is the difference between a text box link and a hyperlink?
	Self test	Operation question

5.4 The evaluation of blended learning

The evaluation of blended learning is a process of collecting objective materials, information and data of learners in the process of blended learning according to teaching objectives, making quantitative analysis of learners' learning behaviors, attitudes and results, and making value judgments accordingly. Because blended learning is a learning program that comprehensively uses different learning theories, technologies and means, its learning environment, learning methods and learning contents have changed, and higher requirements have been put forward for evaluation methods and access to evaluation information. Combined with the characteristics of the course "Computer Foundation", the evaluation of face-to-face classroom teaching activities should enable students to self test the knowledge and principles they have learned. The evaluation of computer room operation practice should enable learners to clearly understand the key points of training and have a deeper understanding of skill operation. For the group cooperation based on the comprehensive application of knowledge, the evaluation should reflect the attention to the task completion process, so that learners can reflect on the experimental process and have a further understanding of knowledge. Therefore, the evaluation of the Computer Foundation hybrid learning curriculum should include formative evaluation and summarizing evaluation.

The summary evaluation aims to understand the final learning effect of learners, evaluate the degree of the learners' goals after a series of teaching activities, and pay attention to the overall mastery of the knowledge of the course. The knowledge points are of high level and the scope of the course content is relatively wide. The summary evaluation of this course consists of the evaluation of theoretical knowledge and the evaluation of operational skills. The evaluation of theoretical knowledge mainly refers to the evaluation of basic knowledge and principles of the course, which is conducted in the way of network answering questions. The evaluation of operational skills mainly refers to the random selection of experimental items by students within a certain time range and the online practical operation according to the experimental requirements. The teachers evaluate the students according to their performance and operation results in the whole practical operation process.

Formative evaluation is an evaluation in the teaching process, focusing on the guidance of learners in the learning process, mainly including the following aspects.

5.4.1 Online knowledge evaluation: Select the corresponding knowledge evaluation to conduct online knowledge evaluation. After the evaluation, the system will give the evaluation results by itself, and learners can also view the detailed evaluation records. The online knowledge evaluation system breaks through the time and space constraints, and learners can conduct self testing at any time and anywhere according to their own learning progress to understand the degree of mastery of their own knowledge and the consolidation of knowledge.

5.4.2 Completion degree of ordinary work: This part is mainly to evaluate the quality of learners' daily homework. According to the current curriculum teaching arrangement, learners need to complete the assignments assigned by teachers, and after submission, students and teachers will evaluate the quality of their assignments, so as to detect and consolidate the knowledge content required by learners.

5.4.3 Group mutual evaluation: Group mutual evaluation refers to the mutual evaluation among team members. The evaluation of learners' participation, learning attitude and task completion in the process of completing a learning task together with other learners. Through group mutual evaluation, learners' enthusiasm for learning can be mobilized, and the role of mutual supervision among members of the group can also be fully played, which improves learners' active participation, improves learners' ability to cooperate and communicate, and promotes better completion of learning tasks.

5.4.4 Self assessment: Self assessment mainly refers to learners' self summary and reflection on their own completion of learning activities and learning tasks. Self assessment is of special significance to learners' self realization, self-development and self-improvement. In the learning activities, self assessment is carried out according to their own conditions, and learning reflection is carried out according to the results of self assessment, so as to improve their learning behavior to improve the learning effect.

5.5 Learn data result analysis

At present, the resources of the course learning platform include course videos, exam questions over the years, courseware, test bank, computer homework, online tests, chapter tests, discussion topics, etc. Teachers can export the quantitative data of students' learning process from the system platform at any time, and then conduct assessment (as shown in Figure 1). From the students submit homework on the computer, watch videos, chapter tests, chapter learning, check-in, discussion, can calculate the students' usual comprehensive results. At the same time, by tracking the changes in the overall grades of the class and the individual grades of students, and observing the classroom learning behavior (as shown in Figure 2), teachers and students can obtain accurate and objective learning evaluation, teachers understand the problems of students, constantly revise the teaching plan, and make targeted explanations in class, which can improve the effectiveness of classroom teaching. Truly establish the hybrid learning effect evaluation index system, comprehensively evaluate the students' learning results and teachers' work performance.

Course videos (20%)	Section quizzes (30%)	Section study times (5%)	Discussion (5%)	Homework (30%)	check-ins (10%)	Regular grades
20	27.23	5	0	18.92	10	81.15
20	27.87	5	2.3	26.27	10	91.44
20	27	5	0	27.28	10	89.28
20	29.11	5	0.9	27.56	10	92.57
20	26.84	5	0.9	24.45	10	87.19
20	25.66	5	4.7	25.6	10	90.96
20	22.61	5	0.65	20.9	10	79.16
20	28.94	5	0.5	27.7	10	92.14
20	26.2	5	0	18.05	10	79.25
20	29.62	5	0.5	27.32	10	92.44
20	25.92	5	5	26.61	10	92.53
20	26.83	5	0	7.24	10	69.07

Figure 1. Learning data and results.

Online Duration (minutes))	The number of topics posted in the course discussion area	The number of palindromes in the course discussion area	Number of course assignments	Number of readings of course teaching materials
1062	3	0	55	2
2296	2	0	29	0
728	1	13	28	0
944	2	7	27	0
1293	1	6	25	1
1553	0	4	22	0
1379	0	4	21	6
1908	0	4	21	4
883	1	3	20	28
1155	1	2	20	4
1097	0	1	19	24
669	0	2	18	0
795	2	1	18	7
1790	0	0	18	1
1467	0	0	18	1
344	0	0	18	0
1071	6	1	17	4
1341	1	1	17	3
1146	3	0	17	2

Figure 2. Learning behavior data.

6 CONCLUSION

Based on the era of rapid development of information technology, in the context of "Internet +" smart education, colleges and universities are actively expanding blended learning mode, adjusting teaching structure and optimizing teaching methods. Based on the theory of blended learning, this paper summarizes the elements and general process of blended learning design, providing a basis for the application of blended learning to the teaching practice of Computer Foundation. According to the mixed learning curriculum design mode proposed in this paper, it not only further enriched the course content of Computer Foundation, realized the diversified course evaluation methods, but also enriched the course teaching activities. The new learning method strengthens students' enthusiasm and initiative in learning, provides timely feedback of learning situation, realizes real-time interaction between teachers and students, and achieves objective evaluation of students. It also enables teachers to better grasp and control the overall classroom, and significantly improves the teaching effect, which also provides reference and reference for the future information technology teaching.

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REFERENCES

[1] M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989Arbaugh, J. B., Godfrey, M., Johnson, M., et al. “Research in Online and Blended Learning in the Business Disciplines: Key Findings and Possible Future Directions,” Internet and Higher Education, 2009,12(2) pp.71-87.

[2] Ma Jing, Zhou Qian, “Research on hot topics and cutting-edge trends in the field of International Mixed Learning -- An Empirical Analysis Based on the method of scientific knowledge atlas,” Journal of East China Normal University (EDUCATIONAL SCIENCE EDITION), 2019,37 (04) pp. 116-128.

[3] Xiao Wan, Zhang Shuyu, “Frontier, hotspot and trend of blended learning research -- quantitative research based on CiteSpace knowledge map software,” Audio visual education research, 2016,37 (7)pp. 27-33 + 57.

[4] Tian Xinfang, Yang Xiaozhen, Wang Xiuyan, “Comparative study of blended learning at home and abroad -- visual analysis of literature based on CiteSpace,” Journal of Guangzhou Radio and Television University, 2019,19 (01) pp. 17-24 + 93 + 108.

[5] Zhu long, “The trend of Blended Learning: an analysis based on 60 highly cited journals of SSCI and CSSCI,” China education informatization, 2021 (10) pp. 11-16.

[6] Cui Bingzhu et al, “Analysis on the effect of H-type mixed learning to promote university classroom teaching,” Korean Society of computer education, 2013.16 (3) pp.49-60.

[7] Jin Xizhen et al, “Cost analysis of online and offline hybrid learning,” Proceedings of Korea computer information society, 2013.18 (8)pp. 141-148.

[8] Alemran M, Mezhuyev V, Kamaludin A, et al, “Technology Acceptance Model in M-learning context: A systematic review,” Computers in Education,2018,125(10) pp.389-412.

[9] Boelens R, De Wever B, Voet M, et al, “Four key Challenges to the Design of Blended learning: A systematic literature review,” Educational Research Review,2017pp.1-18.

[10] AI Xianming, Chen shipin, “Research status and problem analysis of blended learning in China -- bibliometric and visual analysis based on CNKI core journals ,” Education and culture forum, 2019,11 (02)pp. 13-19 + 134.

[11] Jin Daoyi, “Research on beauty course model based on mixed learning form,” Doctoral thesis of Chengxin women's University, 2015.