An Empirical Research on the Application of Blended Learning Model in Higher Vocational Education in the Age of Internet

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***Abstract*—Blended learning which combined the advantages of traditional learning and digital teaching, provides a new way to improve the teaching level of colleges. Based on Internet thinking, this study explores the teaching effect of blended learning in higher vocational courses by teaching experimental research. The participants of the study are students majoring in marketing. Students in the experimental group received blended learning, while students in the control group received traditional learning. This research evaluates instructional effects by using the students' learning achievements, learning interests, subject perceived value and course satisfaction. It is found that blended learning mode can significantly improve students' academic performance and course satisfaction, enhance students' learning initiative and participation, and meet the diversified teaching needs of vocational college students.**

***Index Terms*—blended learning, traditional learning, higher vocational education, internet**

I. Introduction

With the rapid development of computer network technology, Educational informatization has promoted the profound transformation of educational concept, educational method, learning environment and learning mode all over the world.

In recent years, higher vocational education in China has shifted from the stage of scale expansion to the stage of paying attention to quality and connotation of development. How to meet students' diversified needs through diversified teaching methods and improve teaching effectiveness by using Internet + thinking is an urgent problem to be solved.

Internet + thinking is a way to re-examine the market, users, products, enterprise value chain and even the whole business ecology in the context of (mobile) Internet +, big data, cloud computing and other technologies. The essence of Internet + thinking is "Customer first". Teaching reform in higher vocational colleges should take "students as the center" and start from teaching philosophy, teaching methods, teaching content, teaching implementation, teaching evaluation and other aspects to improve students' learning experience, improve teaching results, and realize the sharing of teaching resources.

At present, students in higher vocational colleges generally have problems such as low enthusiasm for learning, weak awareness and ability of independent learning, and differences in ability [1], which pose severe challenges to traditional learning. From the perspective of the development of higher vocational education, the traditional learning mode of teachers' one-way teaching is gradually replaced by the digital teaching mode and MOOC (Massive Open Online Course) teaching mode. Although the network teaching mode can make up for the deficiency of the traditional learning mode to some extent, it is still difficult to meet the diversified teaching needs of vocational college students in the current environment of constant update and iteration of Internet technology.

After more than 20 years of development at home and abroad, researchers, teaching practitioners, governments and educational institutions have basically reached a consensus on blended learning: blended learning will become the "new normal" of future education (Porter *et al*., 2014; Norberg *et al*., 2011) [2], [3]. Especially in the current "Internet +" background, "COVID-19" epidemic, blended learning presents a spurt of development. The popularity of "Internet + education" has also refocused all sectors of society on blended learning. In the Internet age, it is imperative to optimize and reform blended learning mode in higher vocational colleges.

II. Literature Review

A. Background of Blending Learning

Although the generally accepted and broad definition of blended learning is "a mixture of online learning and face-to-face instruction", the concept of blended learning has been evolving with increasing clarity since its development in the late 1990s. The concept of blended learning should include two dimensions: physical characteristics and teaching characteristics. Therefore, we divide the concept evolution into three stages [4]. Details are shown in the following Table I.

TABLE I. The Evolution of Blended Learning Concepts

Technology application	Technology integration	The "Internet plus" phase

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	stage	stage	
Physical dimension	Combination of online and face-to-face teaching	Identify online proportions	The combination of mobile technology, online and face-to-face teaching
Teaching dimension	Application of technology	A mixture of teaching strategies and methods	Learning experience
Focus on the key point	Information technology	Interaction	Student centered
Pay attention to point	Technological perspective	Teacher's perspective	Student's perspective

1) Technology application stage (late 1990s -2006) -- Technology perspective

Since 2000, blended learning has attracted the attention of scholars and practitioners at home and abroad. At this stage, the definition of blended learning mainly emphasizes its physical characteristics, and the most representative one is defined by the Sloan Consortium: "Blended learning is a combination of face-to-face teaching and online teaching, combining two historically independent teaching modes: traditional face-to-face teaching and online learning. In other words, a certain proportion of online teaching and face-to-face teaching are combined in the teaching content" [5], [6].

In terms of teaching characteristics, blended learning at this stage is mainly understood as a new learning method, with emphasis on the core role of technology in teaching and learning.

2) Technology integration stage (2007-2013) -- Teachers' perspective

Since 2007, with the development of research and practice, the definition of blended learning has become clearer. At this stage, the definition of blended learning in the dimension of teaching characteristics has developed significantly. Scholars begin to define and pay more attention to blended learning from the perspective of teaching strategies and teaching methods, and pay more attention to teaching design under blended learning environment combining online and face-to-face teaching. Therefore, in this stage, the concept of blended learning focuses on "interaction", the changes brought by blended learning environment to the interaction, and the corresponding changes in teaching design. The most representative is the definition of Bliuc *et al.*: blended learning describes a new learning style that combines face-to-face (on-site) and online interactions between students and students, students and teachers, and students and resources [7].

Blended learning design should give full play to the advantages of online and offline education, take improving students' learning motivation as the guiding principle of the whole design, and commit to realizing independent and personalized learning [8].

First, it is student-centered. Through the interaction between teachers and students, teachers should identify and define learning needs, formulate learning plans, develop learning contents and select evaluation strategies according to learners' characteristics. Second, focus on ability. Blended curriculum design not only helps students master the course content, but also puts the course content into a broader context relevant to life, enabling students to apply what they have learned to solve real-world problems in the future. Third, take evaluation as the center. Provide valuable feedback to teachers and students through real-time evaluation to help teachers change teaching methods and help students solve learning problems. Fourth, it is community-centered. In a community-centered learning environment, learners need to express their own views to each other, discuss with each other under equal, relaxed and lively conditions, and cultivate students' ability to adapt to the society through community construction.

3) "Internet +" stage (from 2013 to now) -- from the perspective of students

With the rapid development of Internet and mobile technology, especially the arrival of "Internet plus" era, the concept of blended learning has also made new development after 2013. In the dimension of physical characteristics, the application of mobile technology is formally incorporated into the concept of hybrid teaching. The concept of blended learning has officially evolved from "the mixture of online teaching and face-to-face teaching" to "the teaching situation based on mobile communication devices, network learning environment and classroom discussion" [9]. It not only gives play to the leading role of teachers in guiding, inspiring and monitoring the teaching process [10], but also fully reflects the initiative, enthusiasm and creativity of students as the subject of the learning process [11].

In the teaching dimension, blended learning is re-understood as a new "learning experience". After experiencing the technical perspective and teacher perspective of the first two stages, people's understanding of blended learning finally falls to the perspective of students, and they begin to pay attention to the changes brought by blended learning to students and their support for learning. More and more scholars have pointed out that blended learning is not a simple mix of technologies, but to create a truly highly participatory and personalized learning experience for students [12], [13]. The emphasis of the blended learning concept at this stage is "student-centered". Goodyear emphasizes that the so-called blended is not only the hybrid of face-to-face teaching and online teaching, but also the hybrid of teaching and tutoring methods in a "student-centered" learning environment [14].

B. The Purpose and Function of Blended Learning

The purpose and function of blended learning is no longer a partial replacement of face-to-face teaching or an auxiliary of online teaching, but to promote and improve classroom teaching and improve learning effect. On the one hand, blended learning can not only take advantage of the advantages of online teaching and face-to-face teaching, but also avoid the disadvantages of them. On the other hand, blended learning can promote the reform of teaching mode, organically integrate mobile terminals, Internet and other information technologies

into learning activities and courses, and create a student-centered learning environment. It can design and choose the right teaching mode and learning support according to the needs of courses, students and teachers, and provide students with truly personalized and targeted learning experience. Combining the advantages of the traditional learning mode with the advantages of the digital teaching mode, blended learning can improve students' learning interest and learning commitment [15], contribute to the improvement of teaching quality, and benefit both students and teachers.

Blended learning has been widely used in vocational education in foreign countries. Blended learning has a positive effect on improving students' practical skills and solving problems based on real problems or situations. Especially in the field of medical education, blended learning is often regarded as one of the main ways of physician skill training. Compared with traditional training, blended learning has a significant effect in improving students' sense of self-efficacy, stimulating their interest in learning, and improving their autonomous learning ability in clinical practice [16]. Studies in the field of vocational education in Taiwan have also found that students who participate in blended courses gain the ability to solve real problems in real situations, and can significantly improve the passing rate of examinations and learning enthusiasm [17].

C. Background of Customer Relationship Management Course in Higher Vocational Colleges

At present, the practice of blended learning in China has been developing vigorously, and the related researches, especially the empirical researches based on practical cases, are relatively few, so the research on blended learning is obviously lagging behind the pace of practical application. Therefore, under the background of "Internet plus", how to use blended learning to create truly participatory and personalized learning experience for learners? Therefore, it is urgent to explore the new model and practice of "Internet plus" blended learning.

This study relies on the teaching of "Customer Relationship Management "course, which is the core course for students majoring in marketing in higher vocational colleges. This course aims at cultivating students' abilities to engage in customer service management and support positions, and preparing them for corresponding skills to engage in such positions. It is a course with strong practical operation and technical skills. Based on the actual situation of vocational college students and the characteristics of vocational college teaching, this study adopts Internet thinking, and attempts to carry out blended learning reform in the course of customer relationship management, through quantitative and qualitative research methods such as group control experiment, questionnaire survey and in-depth interview. This study takes students' academic performance, learning interest, subject perceived value and course satisfaction [18] as the measurement criteria, tests the teaching effect of the blended learning model in this course, and proposes solutions for higher vocational colleges to carry out teaching reform.

The research questions are as follows:

- Is there any difference between the knowledge of students generated by the blended learning and the traditional learning?
- Is there any difference between the students' interest in learning before and after blended learning?
- Is there any difference between the students' interest in learning before and after traditional learning?
- Is there any difference between the students' perceived value of the subject with the customer relationship management course before and after blended learning?
- Is there any difference between the students' perceived value of the subject with the customer relationship management course before and after traditional learning?
- Is there any difference between the students' satisfaction with the customer relationship management course before and after blended learning?
- Is there any difference between the students' satisfaction with the customer relationship management course before and after traditional learning?

III. Materials and Methods

A. Research Objectives

In this study, experimental methods were used to compare and analyze the differences between traditional learning and blended learning in the control group and the experimental group respectively, and the three dimensions of students' academic performance, learning interest, subject perceived value and course satisfaction were used as evaluation indicators [19].

The study participants were sophomore majoring in marketing of Guangdong Vocational College of Posts and Telecom. There were 108 students in 2 classes, including 51 in class A and 57 in class B. The students who participated in the experiment were divided into classes according to the principle of uniform distribution of college entrance examination results. All students took the same courses before participating in the study, and the learning ability started at the same level.

B. Experimental Variables

Firstly, the irrelevant variables of the experiment were controlled, and the teaching time, progress and content of the teaching were completely consistent with the same teacher. Then, considering the characteristics of the course "advertising planning practice", the teaching content is modularized, knowledge points and skill points are decomposed, and 4-7 knowledge points or skill points are selected for each teaching task. Students are required to understand not only the principles and concepts, but also the application situations and methods of theories in teaching. Finally, the model of classroom teaching is

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taken as the experimental variable. Class A is the experimental group and adopts blended learning mode. Class B is the control group and adopts the traditional learning mode. The study design was shown in Table II.

TABLE II. DESIGN OF THE EXPERIMENTAL CONTROL GROUP IN THIS STUDY

Pre-test	Group	Post-test
Student achievement, Interest in learning, Subject perceived value, Course satisfaction	Experimental group(blended learning)	Student achievement, Interest in learning, Subject perceived value , Course satisfaction
	Control group (traditional learning)	

C. Course Activities

Combined with the concept of blended learning and based on the inherent characteristics of customer relationship management courses, the specific teaching process adopts the 4C method, namely connection, construction, reflection and continuation. The experimental group adopted blended learning, and the specific teaching design was as follows:

1) Connection

The teaching goal of this stage is to let students complete the preliminary understanding and understanding of knowledge points before class, and establish connections. With the help of the MOOC platform, teachers carefully produce micro courses (within 10 minutes) to provide resources, stimulate interest, present problems and determine tasks. The specific implementation includes three parts: first, students can log on the MOOC platform to watch micro courses and electronic documents; second, finish the pre-class test; third, write walk-through scripts for customer complaint situations in groups; fourth, students give timely feedback on their questions so that teachers can prepare lessons more effectively [20].

2) Construction

The class is mainly used for group discussion, hands-on operation, interaction between teachers and students, and results display. Roughly divided into the following links:

Knowledge summary: teachers use 15 minutes to summarize and sort out the knowledge framework, carry out pre-class test review and analysis, and focus on answering questions. The teacher's role is to help students better grasp the knowledge.

Task practice: the teacher shall make the task and competition rules in advance according to the characteristics of the teaching purpose and teaching content, and organize each group to perfect the drill script written before class, and give suggestions for modification according to the script. And then, each group carries on the scene simulation on stage.

3) Reflection

After students have finished their presentation, teacher should encourage students to evaluate each other, and then make comments on the performance of the simulation. And then, teacher will invite enterprise expert to watch and comment on the drill online.

Through the multiple evaluation methods of self-evaluation, mutual evaluation, teacher evaluation and enterprise expert evaluation, students are assessed in a more comprehensive and objective way, which is oriented by learning results and ultimately helps students realize internalization and sublimation of knowledge and improve their learning results [21].

4) Continuation

Teachers should pay attention to the interaction between online and students, make online learning mainstream, and make offline practical activities supplement and expand. At the same time, extended exercises are provided after class, such as learning materials, extracurricular books and relevant external links for students to study independently [22]. The teacher guides the students to explore the derivative problems, and to carry out self-reflection, transfer and sublimation. The implementation process based on the blended learning model can be learned from Table III.

TABLE III. BASED ON THE IMPLEMENTATION PROCESS OF BLENDED LEARNING MODEL

Implementation stage	Main task	Teacher	Student
Connection	Assign tasks and complete self-study	Work: assign tasks, track the learning process, extract key and difficult points, and analyze the test before class Ways: online learning platform, learning group	Work: accept the task, study independently, complete the pre-class knowledge test, and submit the task Ways: online learning platform, mobile terminal, computer
Construction and Reflection	Internalize in class, discuss and rehearse	Work: summarize knowledge points, focus on answering questions, inspection guidance, comments Ways: teaching place	Work: implementation, demonstration, drill and summary Ways: teaching place
Continuation	Extend after class, transfer sublimation	Work: interactive guidance, answer questions	Extension after class

D. Research Methods

The collected data included pre-test, post-test, student's midterm homework, the mid-term test, interest in learning, course satisfaction, discipline perceived value, after-class interview and so on.

1) Subject test questionnaire was used in the pre-test and post-test of the study, and the test was conducted in combination with knowledge points and skill points in the teaching unit. Mixed choice questions were used in the questionnaire, and the total score was 100 points.

2) The scale of students' interest in learning was based on the Taiwan PISA 2006 student questionnaire using

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Likert's four-point scale, which had good reliability and validity. The author revised it according to the situation of this course. Likert 4 scoring scale was adopted, and the specific questions of the questionnaire can be found in Table IV:

TABLE IV. STUDENT LEARNING INTEREST SCALE

How much do you agree with the statements below? (Please tick only one box in each row)

	Strongly agree	Agree	Disagree	Strongly disagree
a) I generally have fun when I am learning < customer relationship management> topics				
b) I like reading about < customer relationship management >				
c) I am happy doing <customer relationship management> problems				
d) I enjoy acquiring new knowledge in < customer relationship management >				
e) I am interested in learning about <customer relationship management >				

3) Subject perceived value was modified according to the status of this course by referring to the Taiwan PISA 2006 student questionnaire and adopting Likert 4 scoring scale. Specific questions of the questionnaire are as follows: can be found in Table V:

TABLE V. SUBJECT PERCEIVED VALUE SCALE

How much do you agree with the statements below? (Please tick only one box in each row)

	Strongly agree	Agree	Disagree	Strongly disagree
a) < customer relationship management > is important for helping us				
b) to understand social and economic development				
c) < customer relationship management > is very relevant to me				
d) < customer relationship management > is valuable to society				

4) The course satisfaction questionnaire adopted the Likert's five-point scale, which mainly evaluated the overall impression of the course and the teacher, the content of the course and the effect of teaching.

5) After class in-depth interview. The experimental group was selected. 30% of the students in the control group were surveyed mainly from the aspects of their interest in the curriculum, their attitude towards the blended learning method and the traditional learning method, and their teaching opinions and suggestions. Here are some questions from the interview outline.

- Do you like the blended learning method of online self-study and offline discussion practice
- Do you think blended learning can help you master knowledge and skills better?
- Which do you find more interesting, blended learning or traditional learning? Why?
- Do you think blended learning can make you and teachers interact and communicate better in class?
- Are you willing to continue with the blended approach to learning?

IV. RESULTS

A. Quantitative Results

1) Differences in subject knowledge and skills

Table 6 shown that students in the experimental group and the control group had the same academic achievement before the implementation of blended learning, with no significant difference (t=-0.142, p=0.325), which met the conditions of the control experiment.

Through Mycos teaching quality management platform, students in the experimental and control groups were tested for their knowledge and skills after teaching. As can be seen from Table VI, the average score of the experimental group was 86.5, significantly higher than the control group's 79.4. This shown that students can master the knowledge of the subject well in a short time through the learning content and interactive learning set in the blended learning. This conclusion was consistent with the research findings of Chen jian & Zhou Junhai (2020) [23].

TABLE VI. INDEPENDENT SAMPLE T TEST BEFORE AND AFTER SUBJECT KNOWLEDGE AND SKILLS

Achievements in knowledge and skills	experimental group (N=51)		control group (N=57)		t	p
	M	SD	M	SD		
Admission results	307.7	91.5	304.1	92.6	-0.204	0.838
Pre-test scores	68.4	19.6	67.8	22.2	-0.142	0.325
Post-test scores	86.5	10.4	79.4	19.6	-2.636	<0.030

2) Differences in interest in learning

As can be seen from Table VII, the paired sample T test found that after blended learning, the learning interest of students in the experimental group was significantly improved (P =0.019). The students in the control group showed no significant difference in learning interest before and after receiving the traditional learning mode.

TABLE VII. PAIRED T-TEST OF LEARNING INTEREST, SUBJECT PERCEIVED VALUE AND COURSE SATISFACTION

	group	Pre-test		Post-test		p
		M	SD	M	SD	
Interest in learning	experimental group (N=51)	15.9	2.72	17.6	2.73	0.019
	control group (N=57)	16.2	2.25	16.1	2.27	0.843
Subject perceived value	experimental group (N=51)	13.2	1.85	14.1	2.02	0.046
	control group (N=57)	13.2	1.87	13.4	2.00	0.748
Course satisfaction	experimental group (N=51)	44.8	4.92	41.8	5.94	0.003
	control group (N=57)	41.8	6.65	43.8	5.94	0.081

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3) Differences in subject perceived value

Table VII paired sample T test shown that students in the experimental group significantly improve their satisfaction with the course after receiving blended learning (P =0.003). Students in the control group experienced a increase in course satisfaction after receiving traditional learning, but the difference was not significant.

Based on the one-to-one interview with students, it is found that through blended learning, students can arrange their learning schedule according to their own needs, acquire more extended knowledge, and have more in-depth communication and interaction with teachers. They could better understand the value and importance of advertising planning practice, and found that customer relationship management was closely related to social and economic.

4) Differences in course satisfaction

As can be seen from the paired sample T test in Table VII, students in the experimental group significantly improved their satisfaction with the course after blended learning (P=0.003). Students in the control group experienced a decrease in course satisfaction after traditional learning, but not significantly.

Combined with the one-to-one interview of students, it is found that after traditional learning, students' evaluation on course satisfaction, teachers' guidance of positive thinking, encouragement of discussion decreased. This reflects from the side that in blended learning, internalization and interaction of the classroom have better effects on improving students' participation and guiding positive thinking [18].

B. Qualitative Results

After class, 30% of the students in the experimental group and the control group were selected for in-depth interviews, including 30 students with good/poor performance and large differences between before and after tests. The survey is mainly carried out from the aspects of learning interest, attitude towards blended learning method and traditional learning method, teaching opinions and Suggestions.

Through in-depth interviews, it is learned that compared with traditional learning method, students prefer blended learning method. They believe that with the help of Internet technology, online learning can be realized more autonomously, and fragmented time can be effectively utilized. Teachers have more time to conduct offline guidance, so that they can better master their subject knowledge and skills, learn more extracurricular knowledge extension, and change the passive learning under the traditional learning mode. In addition, blended learning makes the class more interesting, more interaction in the classroom communication, enhance the feelings and to enhance the team cooperation ability, greatly improving the classroom enthusiasm and participation. This conclusion was consistent with the research findings of Keržič Damijana *et al*. (2019) [24]. However, they believe that with blended learning, teachers need to spend more time on the design and implementation of classroom activities, and effective measures should be taken to avoid the "free-riding" situation of group members.

V. Conclusion

Through quantitative and qualitative research methods such as group control experiment, questionnaire survey and in-depth interview, the teaching effect of blended learning mode in practical courses of customer relationship management was tested. It is found that compared with traditional learning, blended learning can to some extent solve the problems of students' diversified learning needs, weak independent learning ability and low learning enthusiasm, and significantly improve their academic performance in a short time. Blended learning method can better improve students' learning initiative and enthusiasm, enhance the interaction between teachers and students, enhance students' ability of teamwork and problem solving, and improve their course satisfaction. This conclusion was consistent with the research findings of Chen Jian & Zhou Junhai (2020) [23].

To sum up, compared with traditional learning, blended learning is of great significance to reform higher vocational teaching and improve teaching effect in many aspects, but it also puts forward higher requirements for higher vocational teaching.

First, the hardware condition of blended learning should be perfected. Blended learning relies on network platform and mobile phone terminal, and pays attention to the online and offline interaction between teachers and students. Therefore, it puts forward higher requirements on the stability of campus network platform and the functional completeness of hardware facilities. Schools need to further increase the investment in smart classrooms and network upgrading to provide hardware support for the effective implementation of blended learning.

Second, teachers need to improve their teaching level and quality [25]. Teachers should identify and define learning needs through teacher-student interaction, make learning plans according to students' characteristics, develop learning content, apply appropriate teaching methods and means, and select evaluation strategies. The blended curriculum design not only helps students master the course content, but also puts the course content into a broader environment related to life, so that students can use what they have learned to solve real-world problems in the future.

Third, build a comprehensive and perfect evaluation system. The assessment of courses is the driving force for students to study independently, so the improvement of the assessment system can better achieve the effect of curriculum reform. The ultimate purpose of establishing the evaluation system is to verify whether the teaching plan achieves the teaching objectives [26]. In the process of teaching in higher vocational colleges, the single evaluation method which used to be based only on academic performance should be changed. In the context of Internet thinking, the evaluation subjects and evaluation methods of higher vocational courses should

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be diversified and systematic [27], which should be combined with self-evaluation, group evaluation, enterprise expert evaluation and teacher evaluation. Some researchers try to apply different conceptual frameworks to evaluate blended learning from different perspectives, such as: classroom community awareness [28], [29], student engagement and interaction [30], problem-based learning framework [31], activity theory, and so on. No matter what kind of evaluation method is adopted, students should be prompted to change from the traditional passive learning to independent inquiry learning, pay more attention to the improvement of students' comprehensive ability and quality, cultivate the awareness of lifelong learning, and finally develop the good habit of lifelong learning.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

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REFERENCES

[1] R. Liang, "Application of blended learning mode in marketing major," *China Journal of Multimedia and Network Teaching*, no. 1, pp. 81-82, 2019.

[2] W. W. Porter, C. R. Graham, K. A. Spring, *et al*., "Blended learning in higher education: Institutional adoption and implementation," *Computers & Education*, vol. 3, pp. 185-195, 2014.

[3] A. Norberg, C. D. Dziuban, and P. D. Moskal, "A time -based blended learning model," *On the Horizon*, vol. 3, pp. 207-208, 2011.

[4] F. Xiaoying, W. Ruixue, and W. Yijun, "A literature review on blended learning: Based on analytical framework of blended learning," *Journal of Distance Education*, no. 5, pp. 13-24, 2018.

[5] C. J. Bonk, C. R. Graham, J. Cross, *et al*., "The handbook of blended learn ing: Global perspectives, local designs," *Turkish Online Journal of Distance Education*, no 4, pp. 181-181, 2009.

[6] I. E. Allen and J. Seaman, "Sizing the opportunity: The quality and extent of online education in the united states, 2002 and 2003," *Sloan Consortiumi*, vol. 23, pp. 659-673, 2003.

[7] A. M. Bliuc, P. Goodyear, and R. A. Ellis, "Research focus and methodological choices in studies into students' experiences of blended learning in higher education," *Internet & Higher Education*, vol. 4, pp. 231-244, 2007.

[8] C. Lei, L. Fenglan, and W. Fan, "Research on blended learning model based on MOOC and flipped classroom under the background of Internet +," *Science and Technology Economic GUide*, vol. 26, pp. 130-131, 2018.

[9] F. Wasoh. Exploring the Roles of Blended Learning as an Approach to Improve Teaching and Learning English. [Online]. Available: http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=27144a22-f991-47c4-a39e-94160e6ce0a9%40sessionmgr4007&vid=0&hid=4214.

[10] Q. wendi, "The unification of blended learning Dao and Technique—blended teaching innovation practice of single-chip computer course in secondary vocational school," *China Education Informatization*, no. 5, pp. 55-57, 2016.

[11] T. Cheng and W. Cui, "Analysis of factors influencing the independent learning of college students' specialized courses in blended learning," *Modern horticulture*, no. 12, pp. 177-178, 2018.

[12] P. Smith. Blended learning, It's Not the Tech, It's How the Tech is Used. [Online]. Available: https://www.huffingtonpost.com/entry/blended-learning-its-not-b_6165398.html.

[13] Michael Horn and Heather Stark, *Blended Learning: Revolutionize Education with Disruptive Innovation*, Mechanical Industry Press, 2015, pp. 37-39.

[14] V. Goodyear and D. Dudley, "I'm a facilitator of learning! understanding what teachers and students do within student-centered physical education models," *Quest*, vol. 3, pp. 274-289, 2015.

[15] X. Dan and D. Tianwei, "Cultivation of independent learning ability of language learners in blended learning mode," *Education and Teaching Forum*, no. 4, pp. 45-46, 2016.

[16] D. Ilic, R. B. Nordin, P. Glasziou, *et al.*, "A randomised controlled trial of a blended learning education intervention for teaching evidence-based medicine," *Bmc Medical Education*, vol. 1, pp. 1-10, 2015.

[17] P. D. Shen, T. H. Lee, and C. W. Tsai, "Applying blended learning with web-mediated self-regulated learning to enhance vocational students," *International Journal of Technology and Human Interaction*, vol. 2, pp. 3-8, 2010.

[18] A. Ali and I. Ahmad, "Key factors for determining students' satisfaction in distance learning courses: A study of allama iqbal open university," *Contemporary Educational Technology*, no. 2, vo. l2, pp. 118-134, 2011.

[19] P. Bingchao, "Experimental research on the application of flipped classroom model to college teaching," *Research on Electrochemical Education*, no. 3, pp. 83-88, 2015.

[20] C. Ning and L. Xiangyang, "An analysis on the blended learning mode of MCU application based on flipped classroom," *Education and Occupation*, no. 2, pp. 88-92, 2019.

[21] S. Xiang, F. Qingge, and H. Huacun, "Construction and application effect analysis of hybrid three-dimensional teaching evaluation system of MOOC and flipped classroom," *China Education Informatization*, no. 12, pp. 69-76, 2018.

[22] L. Jia-ye, "The practice of blended learning mode in marketing teaching in higher vocational colleges under the background of informatization," *Research and Practice of Innovation and Entrepreneurship Theory*, no. 15, pp. 81-82, 2018.

[23] C. Jian, Z. Junhai, W. Yong, Q. Guangying, X. Chunbo, M. Gang, and Z. Zhiyong, "Blended learning in basic medical laboratory courses improves medical students' abilities in self-learning, understanding, and problem solving," *Advances in Physiology Education*, 2020.

[24] K. Damijana, T. Nina, A. Aleksander, and U. L. P. One, "Exploring critical factors of the perceived usefulness of blended learning for higher education students," 2019.

[25] L. Yanbing, "Empirical research on flipped classroom in the teaching of advertising planning practice in higher vocational colleges," *Chinese Character Culture*, no. 9, pp. 105-107, 2018.

[26] J. li, "Research on the optimization of blended learning mode in universities in the Internet era," *Business Economy*, no. 1, pp. 180-184, 2019.

[27] L. Fengqing and H. Xiaoling, "Construction and practice of hybrid teaching quality evaluation system," *China Electrochemical Education*, no. 11, pp. 108-113, 2017.

[28] M. Graff, "Individual differences in sense of classroom community in a blended learning environment," *Journal of Educational Media*, vol. 2, pp. 203-210, 2003.

[29] E. Ayden and S. Gums, "Sense of classroom community and team development process in online learning," *Turkish Online Journal of Distance Education*, vol. 1, 2016.

[30] L. Aspden and P. Helm, "Making the connection in a blended learning environment," *Educational Media International*, vol. 3, pp. 245-252, 2004.

[31] M. Oliver and K. Trigwell, "Can Blended Learning Be Redeemed?" *E-Learning*, vol. 1, pp. 17-26, 2005.

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3. Third prize of micro course in 2018 Guangdong computer education software review activity
4. First prize in the second teachers' teaching ability contest of Guangdong Vocational College of Posts and Telecom
5. Outstanding individual of "teaching improvement and teacher development workshop" project of Guangdong Vocational College of Posts and Telecom
6. Teaching and research experts of Guangdong Vocational College of Posts and Telecom