

# Design of Blended Teaching Model of Public English for Medical Students Based on In-depth Learning

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## Abstract

As an effective educational concept and learning method, in-depth learning is very important to promote human development. As an important trend in the development of higher education, blended teaching provides a broad space for students' in-depth learning. This paper theoretically realizes the transformation from "teacher-centered" to "student-centered", understands the learners' learning investment, helps Chinese medical students to invest more actively and efficiently in blended public English learning, and enriches the theoretical research of college Students' English learning investment. Through the analysis of the implementation effect, it is found that the blended teaching mode of promoting in-depth learning can improve students' learning results and improve students' understanding of knowledge. Blended teaching mode can stimulate students' in-depth learning motivation and learning investment, promote students' application of in-depth learning strategies, and achieve the purpose of promoting students' in-depth learning.

**Keywords:** *In-depth learning; Blended teaching; Public English*

## 1. INTRODUCTION

Due to the continuous development of Internet technology, modern information technology is widely used in teaching, and the blended teaching mode of "Internet + education" is becoming more and more diversified, and teaching is no longer confined to the classroom, and blended teaching that combines the advantages of online self-learning and webcast teaching has been generally recognized [1]. However, in this process, whether learners truly engage in learning, that is, participate in teaching activities and pour certain emotions into meaningful learning construction at the same time, remains to be determined. Therefore, this study uses the blended teaching model as the research background, based on the relevant theories of learning input, combined with quantitative and qualitative analysis, to explore the state of medical students' involvement in public English learning activities, and more comprehensively reflect the true learning situation of the learners [2]. The research goal is to solve how teachers promote blended teaching practice and carry out teaching innovations and changes, so as to stimulate students' learning motivation and interest in learning, and provide reference for learners to engage in blended English learning more actively and efficiently [3].

On the one hand, the research in this article can help promote the further development of the reform of public English teaching in medical schools [4]. This paper studies the students' learning investment in the blended teaching environment, and puts forward corresponding suggestions to improve the learning investment of medical students, which is conducive to solve the problems of low learning efficiency of students, realize the integration of online and offline teaching, and truly apply the blended teaching method training to practical teaching [5]. On the other hand, the study is conducive to the cultivation of medical students' comprehensive English ability, which is conducive to the cultivation of applied medical talents, which is also in line with the essential requirements of professional quality training guided by professional ability.

## 2. CONNOTATION OF IN-DEPTH LEARNING

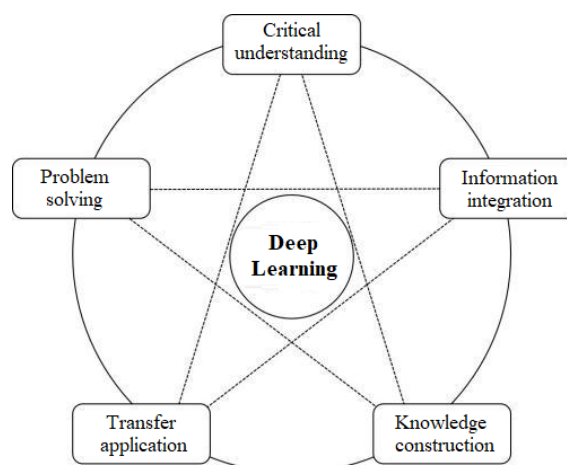
In the field of education in China, Professor Li Jiahou first explained the concept of in-depth learning in the early 20th century [6]. He believes that in-depth learning is based on understanding, through critical learning and thinking, transfer and apply the learned knowledge in new situations, and finally realize the learning of

problem-solving. The high-frequency core keywords related to in-depth learning include "learning", "knowledge", "understanding" and "ability", etc. Although experts have different definitions and research perspectives on in-depth learning, there is a consensus on the essential understanding [7]. Compared with shallow learning, in-depth learning has significant differences in the following aspects as shown in Table 1.

**Table 1.** Differences between in-depth learning and shallow learning

	Shallow learning	In-depth learning
Learning objectives	Memory, understanding, simple application	Analysis, evaluation and creation
Learning motivation	External motivation: test pressure, teacher coercion	Internal motivation: own needs, interests and hobbies
Learning content	Treat knowledge as scattered and isolated units	Emphasize the organic integration of learning content
Learning style	Passive learning, mechanical memory	Active learning, understanding and memory
Learning strategy	Lack of corresponding strategies	Metacognitive strategies such as planning, monitoring and regulation
Learning process	Lack of evaluation and reflection, unable to learn and use flexibly	Actively participate, think critically, learn and use flexibly, and pay attention to evaluation
Learning result	Acquire knowledge, but fail to migrate applications and solve problems	Not only master the core knowledge, but also promote the development of high-level thinking ability

According to the comparison between in-depth learning and shallow learning, it is concluded that in-depth learning has five basic characteristics: paying attention to critical understanding, emphasizing information integration, promoting knowledge construction, intentional transfer and application, and being able to solve problems, as shown in Figure 1.



**Figure 1.** Features of in-depth learning

Critical understanding is to study and think critically on the basis of understanding, and put forward new opinions in questioning and discrimination, so as to lead the problem to depth; information integration can connect the old and new knowledge, and use visual tools such as mind map and concept map to structure the knowledge, so as to deepen the understanding and application of new knowledge[8]; knowledge construction is to construct new understanding on the basis of existing cognitive structure, constantly reflect and adjust their own behavior; transfer application is to transfer the ideas, principles, methods and strategies of the original situation to similar situations to judge the differences, so as to draw inferences from one instance [9]; problem solving is the use of existing knowledge to solve complex problems in real life.

The core feature of in-depth learning is high-order thinking, which is a high-cognition mental activity or cognitive ability, and reflects the requirements for the cultivation of compound talents in the age of knowledge and information. Compared with shallow learning, in-depth learning is the educational pursuit of the information age and the inherent need of each learner's own development.

### 3. BLENDED TEACHING

The "National Medium and Long-term Educational Reform and Development Plan (2010-2020)" puts forward requirements for the optimization of teaching tools, emphasizes the need to promote the deep integration of information technology and higher education, and promote the modernization of educational content and teaching methods [10]. The blended teaching that aims to combine traditional learning methods and networked learning is not only in line with the national policy direction, but also can provide a carrier for the implementation of in-depth learning goals [11].

Blended teaching advocates using the information advantages of the Internet to fully tap the initiative, enthusiasm and creativity of students as the main body of

the learning process while playing the role of teachers in guiding, enlightening and monitoring. The core is to deliver the appropriate ability to the appropriate learners through the combination of appropriate learning techniques and appropriate learning styles at the appropriate time [12]. This method is closely compatible with in-depth learning in the following three aspects. The two rely on each other and help each other, which makes it possible to improve the teaching effect.

First, blended teaching and in-depth learning are in line with the goals. Blended teaching aims to cultivate students' high-level thinking activities, focusing on the cultivation of their communication and coordination skills, collaboration and cooperation skills, critical thinking skills, complex problem solving skills, creative skills, etc., and the above skills are also important contents of in-depth learning.

Second, blended teaching mode provides technical support for in-depth learning [13]. Through the use of information technology and the sharing of Internet resources, blended learning allows teachers to re-plan the course time, provide students with a broader practice space, and ensure that students experience the real situation in the process, which is more conducive to achieving in-depth learning goals.

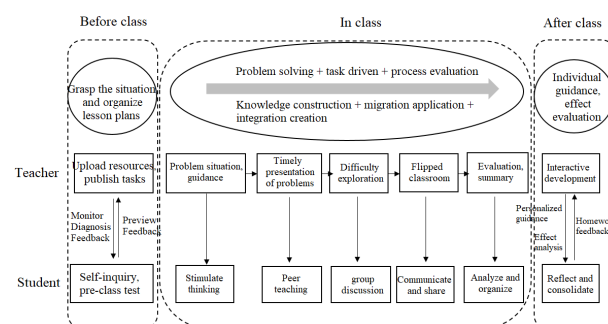
Third, blended teaching mode adapts to the process of in-depth learning. In-depth learning includes three stages of information, methods and cognition, following the life course of knowledge acquisition -- skill development -- in-depth learning. This is basically consistent with the process of blended teaching, that is, to encourage students to obtain basic information about knowledge points through online learning, and then generate reflections on knowledge through communication and consultation with teachers and students in the classroom, and establish an individual knowledge system.

#### 4. CONSTRUCTION OF PUBLIC ENGLISH BLENDED TEACHING MODEL ORIENTED TO IN-DEPTH LEARNING

The combination of the three core elements of the new learning community, in-depth learning tasks, digital tools and resources can effectively promote in-depth learning and help students achieve in-depth learning results. In teaching, emphasize the establishment of new learning partnerships between students and teachers. Purposeful design and development of hierarchical learning tasks, especially in-depth learning tasks for the development of students' higher-order thinking, can reconstruct the learning process of knowledge creation and enable students to experience middle- and higher-order learning. This study explores the construction of a blended teaching model that promotes

in-depth learning of public English students based on the integration of network teaching platforms.

In the designed blended learning model, both online and offline are oriented to promote learners' meaning construction and in-depth learning. Implement teaching strategies that combine problem-based learning, task-based learning, inquiry-based learning, collaborative learning and autonomous inquiry, and combine summative and formative evaluation. The public English blended teaching model oriented to in-depth learning is shown in Figure 2.



**Figure 2.** Public English blended teaching model oriented to in-depth learning

##### 4.1. Preparation Before Class

In the past, the traditional preview mode was often used in public English classroom teaching. The teacher assigns preview tasks such as words and text reading, and then the students complete the preview tasks by themselves. From the actual situation of this preview mode, students' learning effect is not significant, and students still can't maintain their learning interest and attention in the process of classroom teaching. The reason can be found that due to the lack of corresponding incentive and assessment mechanisms in the pre class preview mode, students only listen to the tasks assigned by teachers, but students do not implement them. In addition, in classroom teaching, teachers need a lot of time to explain and translate some words and phrases [14]. At this time, if the network teaching mode is actively adopted and the specific teaching is carried out in the flipped classroom mode, the effect of the corresponding learning tasks of secondary vocational students is not good.

However, in the blended teaching mode, it can combine the advantages of the two teaching modes. The application of some English dictionary software can ensure the authoritative pronunciation, translation and interpretation of English words. While learning, students can divide the proficiency level of words based on their own actual situation, so as to guarantee the circulation and long-term memory of students' words and ensure students' rapid learning. In the teaching process, based on the use of the cloud platform, teachers upload some micro class videos and teaching courseware made in

advance to create favorable conditions for students' preview. On this platform, teachers can also fully grasp the overall students' preview, so as to consolidate the basis of classroom teaching and create favorable conditions for students' in-depth learning.

#### **4.2. Teaching in Class**

In the past, when classroom teaching was carried out, teachers occupied the main position of classroom teaching. The teaching objective is only the teaching of course knowledge content, and the main teaching resource is teaching materials. The knowledge content of teaching materials is often presented to students in the form of blackboard writing. Students are too passive in the process of learning. A single boring teaching form is not conducive to the stimulation of students' learning interest, and students' learning initiative cannot be fully mobilized. With the development and application of network education mode, flipped classroom has been fully realized, and in the classroom, teachers will help and answer the problems existing in students' learning. For medical students, their abilities in autonomous learning and inquiry learning are relatively weak, while in the form of complete flipping in the classroom, they rarely learn some substantive content.

The application of blended teaching mode, through the application of diversified teaching resources and teaching carriers, teachers can scientifically set learning tasks, and then realize the learning of new knowledge through learning modes such as group cooperation and exploration among students, so as to ensure the effective optimization of English classroom teaching. It is worth noting that teachers should ensure that they can fully grasp and monitor the whole process of the classroom, and guide them according to their actual situation on the basis of understanding the progress and situation of each learning group. Changing the central position occupied by teachers in classroom teaching, would help students' learning with the guides, guides and co learners of students' learning, change students' passive learning into active learning, ensure that students' deep desire and desire for learning are stimulated, and lay a solid foundation for the mobilization of students' learning initiative.

#### **4.3. Extension After Class**

Teachers should pay more attention to the promotion after class and help students choose some effective learning apps for intensive learning. The interesting and knowledgeable English knowledge content provides a great degree for students' English learning, which not only reduces the difficulty of students' learning, but also can fully arouse students' interest in learning [15]. In the teaching process, teachers should pay attention to the differentiated characteristics of students. Based on the

principle of hierarchical promotion, teachers should assign non interoperable after-school promotion tasks to students at different levels respectively, so as to help students improve their personalized learning and personalized development, and guarantee the common progress and development of the whole students.

When creating a learning effect evaluation system, teachers can make comprehensive and efficient use of the cloud platform. Based on some data from the cloud platform and the information on students' classroom learning status, it is ensured that the whole process of students' learning can be systematically and scientifically evaluated, and the performance and status of students' learning process can be objectively, comprehensively and reasonably evaluated from three aspects: before class, in class and after class. Comprehensively optimize and improve the disadvantages and irrationality brought by the previous model of evaluating students by examination, so as to mobilize students' subjective initiative in learning and ensure the full play of students' effectiveness of improving tasks after class. On this basis, promote students to actively enter in-depth learning, lay a good foundation for their continuous growth and development, and give full play to the effectiveness of the blended teaching model.

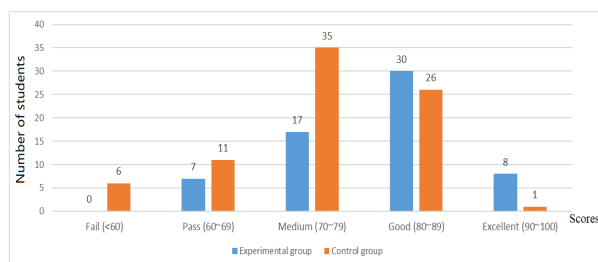
### **5. EVALUATION OF IMPLEMENTATION EFFECT**

In order to compare and analyze the teaching effects of blended teaching and traditional classroom teaching, this study selects students who are in the Grade of 2020 majoring in clinical medicine and medical imaging as the research object to practice the blended teaching of public English. 79 medical students with traditional teaching mode were used as the control group, while 62 students with blended teaching were used as the experimental group. Through data analysis, this study compared the changes in test scores, in-depth learning behavior and in-depth learning cognition between the experimental group and the control group.

#### **5.1. Comparison of Examination Scores**

Both the experimental group and the control group were taught by the same teacher. The amount and difficulty of the two final papers were the same, and the question types of the papers were prepared according to the requirements of the syllabus. The final examination questions cover a wide range of areas and the test papers focus on the key points. It not only examines the students' mastery and understanding of important knowledge points, but also examines the comprehensive application ability of the learned knowledge. The final test results can present the achievement of students' cognitive goals and reflect students' in-depth learning to a certain extent. The statistics of Public English final test

scores of students in the experimental group and the control group are shown in Figure 3.



**Figure 3.** Comparison of examination results

Statistics show that the average final score of the experimental group is 81.06 points, while the control group is 76.56 points. The passing rate of the final grade of the experimental class was 100%, which was 7.5% higher than that of the control class, and the excellent and good performance rate increased 1.8 times. According to the comparison of score distribution, the experimental class is mainly distributed between 80 and 89. Compared with the control class, the overall score of the experimental class has been improved, indicating that the new teaching mode is more conducive to improving students' scores, promoting students' mastery of knowledge, and helping students with medium or lower scores to transform to a higher level.

As a collection of students' process evaluation and summative evaluation, comprehensive achievement can better reflect students' whole learning process and in-depth learning to a certain extent. Therefore, the total scores of the students in the experimental group and the control group were introduced into SPSS for independent sample T-test to compare the average values, as shown in Table 2.

**Table 2.** Statistical test of comprehensive scores

	N	Mean value	Standard deviation	Mean value of standard error	T value	P value
Experimental group	62	81.06	7.823	.992	3.112	.002
Control group	79	76.56	6.697	.876		

From the results of t-test, the average comprehensive score of the experimental group is 4.50 points higher than that of the control group.  $P=0.002<0.05$ , it shows that there is a significant difference between the two groups. It can be seen that the blended teaching aimed at promoting students' in-depth learning plays an obvious role in improving students' performance. The blended teaching has achieved better teaching effect and promoted students' in-depth learning.

## 5.2. Comparison of In-depth Learning Behavior

Before and after the course, questionnaires were distributed to the students in the experimental group and the control group respectively. Students were asked to fill in a questionnaire according to their corresponding performance in public English courses. The obtained pre-test and post-test data are processed and compared through SPSS. The mean independent sample t-test is calculated to obtain the students' in-depth learning status, as shown in Table 3.

**Table 3.** Comparison of in-depth learning behavior

Item	N	Pre test M±SD	Post test M±SD	T value	P value
In-depth learning motivation	62	3.422 ±.598	3.951 ±.594	-4.994	.000
Learning input	62	3.101 ±.616	3.629 ±.652	-4.641	.000
In-depth learning strategy	62	3.120 ±.578	3.649 ±.673	-4.699	.000

It can be seen from the above table that there are significant differences in the dimensions of in-depth learning motivation, learning investment and in-depth learning strategies in the experimental class ( $p<0.05$ ), which shows that there are significant differences in the in-depth learning state of the students in the experimental class before and after. In the preliminary test data, the average value of the three dimensions of the students' in-depth learning status has been improved. Among them, the in-depth learning motivation has the largest increase before and after the implementation of blended teaching, which shows that in the teaching process, students' in-depth learning motivation is improved and they are more inclined to active learning.

## 5.3. Comparison of In-depth Learning Cognition

In the questionnaire, students in the experimental group and the control group were asked to evaluate their in-depth learning cognitive abilities. Through the independent sample t-test of the comparison mean of the pre-test and post-test data, the survey result of in-depth learning cognition is shown in Table 4.

**Table 4.** Comparison of in-depth learning cognition

Item	N	Pre test M±SD	Post test M±SD	T value	P value
High-level cognition	62	3.073 ±.657	3.433±.563	-3.246	.002
Integrated learning	62	3.047 ±.605	3.408±.582	-3.604	.000
Reflective learning	62	3.207 ±.668	3.569±.533	-3.465	.001

The results in the table show that the experimental classes have significant differences in the dimensions of high-level cognition, integrated learning, and reflective learning ( $p < 0.05$ ), which means that there is a significant difference in the in-depth learning level of the experimental group before and after the test. It can be seen that the blended teaching aimed at promoting students' in-depth learning has a significant effect on the improvement of students' in-depth learning level. Through the change of data, it can be seen that the higher-level cognition of students is improved; the changes in the integrated learning dimension data show that the frequency of activities for students to connect and integrate information from different sources has increased. Through exploration, students can reflect and explore their own ideas, and deepen their understanding and transfer of knowledge through learning.

## 6. CONCLUSION

Starting from the actual needs of teaching, this study aims to promote the public English teaching of medical students and carry out a blended teaching design to promote in-depth learning. Based on the concept of in-depth learning, this paper puts forward a blended teaching model to promote in-depth learning, and then makes a specific practical teaching research on blended teaching by taking medical students' public English course as an example. By comparing the changes in test scores, in-depth learning behavior and in-depth learning cognition between the experimental group and the control group, the survey results show that the blended teaching mode of promoting college students' in-depth learning has achieved good results, which verifies the effectiveness and operability of the blended teaching mode of promoting in-depth learning.

In order to promote students' in-depth learning, the design of blended teaching should give full play to the leading role of teachers and students, carry out teaching centered on problems, and establish a blended teaching model through the process of knowledge active construction, knowledge transfer and application, evaluation and reflection. The model makes full use of problem-based learning, task-based learning and process evaluation strategies to guide the formation of an autonomous cooperative inquiry interactive classroom, which is conducive to promoting students' in-depth learning.

## ACKNOWLEDGMENTS

Medical Education Research Project of Medical Education Branch of Chinese Medical Association and Medical Education Professional Committee of Chinese Association of Higher Education in 2020(Project Number:2020B-N02245)

## REFERENCES

- [1] Ramli F, Shafie N, Tarmizi R A. Exploring Student's in-depth Learning Difficulties in Mathematics through Teachers' Perspective[J]. *Procedia - Social and Behavioral Sciences*, 2013, 97(1):339-345.
- [2] Ferguson J E. Inclusive perspectives or in-depth learning? A longitudinal case study of past debates and future directions in knowledge management for development[J]. *Drilling & Production Technology*, 2011, in press(1):1011-1016.
- [3] Jian-Nian L I. Some Ideas about the Application of Visible Cognitive Tools to Teaching——Method to promote students' in-depth learning[J]. *Journal of Guizhou Normal College*, 2010, 57(3):107-122.
- [4] Chai X, Zhang H, Xin X, et al. A Study on Intelligent Image Recognition and Testing for Cargo Inspection based on In-Depth Learning Technology[J]. *Railway Freight Transport*, 2019.
- [5] Okazaki, Yu, Shenze, hero. Strategy of teaching material research in young teachers: In depth learning through dialogue with teaching materials[J]. *Summary of teaching and Vocational College of Wakayama University: Research on school education practice*, 2019, 12(010):57-66.
- [6] Fauteux-Lefebvre C, D Gravelle, Abatzoglou N. In-depth learning and development of experimental and team work skills in laboratory courses[J]. *Proceedings of the Canadian Engineering Education Association*, 2011, 103(5):123-135.
- [7] Lang L Y, Lu J L, Yu N N, et al. In depth learning based method of denoising joint transform correlator optical image encryption system[J]. *Acta Physica Sinica -Chinese Edition-*, 2020, 69(24):244204.
- [8] Wang K, Bae K H. In-Depth Learning Layout and Path Optimization of Energy Service Urban Distribution Sites under e-Commerce Environment[J]. *Complexity*, 2021, 20:97-101.
- [9] Lu R. Research on the Structure of Smart Power Plant Based on In-depth Learning[J]. *IOP Conference Series Earth and Environmental Science*, 2020, 440:032113.
- [10] Av A, Fb B, Ph B, et al. Prompting In-Depth Learning in Immersive Virtual Reality: Impact of an Elaboration Prompt on Developing a Mental Model[J]. *Computers & Education*, 2021,55:77-98.
- [11] Gu H, Huang H, Xie Z, et al. Research on self-driving equation track Control of College students based on in-depth Learning[J]. *Automobile Applied Technology*, 2019,03(2):36-64.



- [12] Xin Y, Huang W, Lu X, et al. Research and Application of Line Loss Prediction Technology Based on In-depth Learning LSTM[J]. *Electrical Automation*, 2019,88(03):63-82.
- [13] Bratland E. Social realism and in-depth learning: Can students build knowledge with an epistemic dimension? [J]. *Cognitive Science – New Media – Education*, 2019, 5(2):9.
- [14] JC Cronjé. Using Hofstede's cultural dimensions to interpret cross-cultural blended teaching and learning[J]. *Elsevier Science Ltd.* 2011, 56(3):0-603.
- [15] Qingdong L. Research on Blended Teaching Reform of "Statistics" Based on "High-Level, Innovation and Challenging"[J]. *Creative Education Studies*, 2021, 09(2):355-360.

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