Optimization of Blended Learning for Open Education From the Perspective of Instructional Interaction: A Case Study of *English for the Humanities*

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Abstract

One of the advantages of open education is the potential integration of online and offline learning. However, in practice, this integration has not been fully achieved. This study explores attempts to optimize blended learning for open education by promoting instructional interaction, which is essential for successful learning. Using *English for Humanities* as an example, the study found that interaction between learners and learning resources can be promoted by enriching materials and designing tasks with appropriate difficulty levels based on real-life situations. When an open discourse learning environment is established and daily communication is enhanced, students become more active in social interaction. The optimized blended learning approach has been shown to improve students' learning participation and satisfaction. However, the study also revealed that the online interaction between students and resources remains at a relatively low level due to a lack of effective supervision and timely guidance. This practical study provides methods to promote instructional interaction and effective blended learning for open education.

Key words: Blended leaning; Open education; Instructional interaction; English teaching

1. INTRODUCTION

Open education, as an important way for the country to promote education equity and advocate lifelong learning, has become one of the research hotpots in recent years. Compared to distance education, it provides more opportunities for offline learning in the face-to-face classroom, thus combining the advantages of both distance education and traditional offline education (He & He, 2022; Jia, 2022; Kong & Jing, 2019) . However, in the "Internet +" era, it needs further discussion to achieve effective integration of information technology and teaching, in order to meet the learning needs of adult learners.

Blended learning is a teaching method that combines traditional face-to-face classroom teaching and online teaching, incorporating the characteristics of both. Since 2020, it has been widely used around the world (Allen & Seaman, 2010). It integrates the two teaching methods organically through effective teaching design and technological support (Jin & Wang, 2013).

Blended learning has been employed in open education, and researches have made attempts in theoretical exploration and improvements in practice (Jia, Chen, & Li, 2022; Kong & Jing, 2019; Zhang, Wang, & Xie, 2018). Numerous studies have showed that open education, combination of distance learning with offline learning, provides strong policy and technical support for the implementation of blended learning, making it a natural soil for blended learning. Similarly, blended learning provides theoretical support and implementation approaches for the deep integration of online and offline learning in open education. Blended learning can provide more learning opportunities and resources for adult learners (Hu & Zhang, 2018), increase their enthusiasm and interest in learning (Huang, 2020), and provide more practical opportunities and personalized career development supports (Huang & Liu, 2017).

However, studies found that blended learning has not shown the same significant promotion in open education as it has in primary and secondary education (Li, Yu, & Yang, 2022). And problems need to be solved in the implementation of blending learning in open education, such as passive participation in learning activities (Yu, 2017), lack of interactions and limited learning resources (Aghazadeh & Sharifkhani, 2018).

The essence of spatial separation between teaching and learning in open education calls for achieving the reintegration of teaching and learning (Keegan, 1993). The key to this reintegration lies in instructional interaction, mediated by media (Chen, 2004). Instructional interaction is the most important and prominent issue in open and distance education, as the quality of online learning depends on it (Trentin, 2000).

Compared to distance education, which relies exclusively on online learning, open education offers face-to-face classroom learning, providing more opportunities for instructional interaction. Therefore, the quality of instructional interaction is also a key factor in ensuring the success of open education.

The objective of this study is to optimize blended learning by promoting instructional interaction. It primarily addresses two core issues: "how to promote instructional interaction" and "what are students' perceptions of the optimization". Through the optimization and implementation of blended learning in open education, this study offers valuable insights and inspirations for innovative teaching in open education.

2. INSTRUCTIONAL INTERACTION

2.1 The Definition and Types of Instructional Interaction

The quality of distance learning depends on instructional interaction (Trentin, 2000). However, in reviewing the relevant theories regarding the instructional interaction in open and distance education, it was found that the definitions of instructional interaction and related concepts are not unified (Wang & Chen, 2015). In previous studies, researchers have been more inclined to use the term "interaction" rather than "instructional interaction", and often reference Moore and Wagner's definitions. Moore (1993) stated that "interaction is a two-way communication between two or more people to interpret challenging viewpoints." Wagner (1994) pointed out that "interaction is an event that requires at least two objects and two actions, and interaction occurs when the two objects and actions mutually affect each other."

Chen (2004) pointed out that the term "interaction" is used to describe various events of mutual interaction, which can lead to the generalization of research subjects. Therefore, it is necessary to use the term "instructional interaction" to describe interactive phenomena with

educational significance in open and distance education. In Chen's (2004) study, the connotation of instructional interaction was defined as "an event that occurs between students and the learning environment, which includes communication between students and teachers, communication and interaction between students, and communication and interaction between students and various material resources". However, with the development of technology and its application in open and distance education, the connotation of instructional interaction is also constantly expanding.

Therefore, Wang (2016) distinguished and defined the connotation of instructional interaction, indicating that instructional interaction is essentially the process of mutual communication and interaction among the subjects in the learning environment in order to help learners achieve learning objectives. This is a broad definition of instructional interaction. At the same time, due to the emphasis on learner-centered interaction in instructional interaction research, the narrow definition of instructional interaction is: the process of learners' mutual communication and interaction with other subjects in the learning environment in order to achieve learning objectives (Wang, 2016). The definition of instructional interaction by Wang (2016) is adopted in this study.

The type of instructional interaction has also changed with the development and application of technology. Initially, there were three types of interactions (learner-learner, learner-teacher, learner-content), and later three more were added (content-content, teacher-content, and teacher-teacher interaction). Subsequently, new types based on groups and networks emerged, and social interaction has been added recently. However, these classifications overlap and intersect with each other. Therefore, this study adopts the classification proposed by Bates(1990) and Wang (2016), which states that instructional interaction in a narrow sense includes the interaction between learners and learning resources (Learner-Resource Interaction or LRI), as well as social interaction. Social interaction usually refers to the interaction between students and teachers (Learner-Teacher Interaction or LTI), or between students themselves (Learner-Learner Interaction or LLI). It is worth noting that social interaction also includes some daily communication behaviors such as greetings, chatting, expressions of gratitude, etc. , which are also very important in open and distance education in terms of enhancing the emotions between learners and eliminating feelings of loneliness.

2.2 The Developments of Instructional Interaction

The development of instructional interaction theory has gone through three stages. The first stage is the initial stage. During this period, the high drop-out rate in distance education made educators start paying attention to instructional interaction. The proposal of three core

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interaction types by Moore (1993) is considered the most important theoretical contribution of this stage. It established a theoretical framework for the in-depth development of interaction research that followed.

The second stage is the period of rapid development. During this stage, new bi-directional communication media and technologies emerged, and researchers began exploring their potential applications in distance education. Among these technologies, network technology played a significant role in advancing the field. Representative research achievements include the theory of transactional distance proposed by Moore (1993), the Reintegration of Teaching Acts by Keegan (1993), and the interactive online learning model developed by Anderson (2003). These research achievements were instrumental in advancing the field of distance education, offering insights into the nature of student-teacher interaction, the role of teaching acts, and the design of interactive online learning environments.

The third stage is the period of diversified development. With the prevalence of social constructivism learning theory, as well as the development of technology and various social media, the research on teaching interaction has gradually shifted towards exploring how to use these technologies to promote high-quality instructional interaction. Social interaction has become the core issue in the research of instructional interaction in distance education. In social interaction research, the most representative is the Networked Learning Model proposed by Anderson and Dron (2007). With the deepening of understanding and the development of intelligent technology, the types of teaching interaction are also developing. Some researchers have proposed whether interaction can be mutually substitutable or hierarchical. The interaction equivalency theorem (Anderson, 2003), the three-level network learning interaction framework (Hirumi, 2002), and the Instructional Interaction Hierarchical Model (Chen, 2004) were proposed in response to this situation.

In addition to theoretical research, many scholars have conducted research on the function and measurement of instructional interaction. Multiple studies have shown that online teaching interaction plays an important role in improving learners' learning satisfaction, participation, and deep learning (Alqurash, 2019). Various researchers have proposed different ways of measuring online instructional interaction, including scales and online interaction behavior data. Wei, Chen, and Kinshuk (2012) mainly measured online instructional interaction from four aspects: social interaction, procedural interaction, explanatory interaction, and cognitive interaction, which were specifically measured in aspects such as providing encouragement, conveying information, expressing opinions, explaining information, and providing constructive feedback. Yilmaz and Karatas (2018)

developed an online instructional interaction scale from three dimensions: learner-resource interaction, teacher-student interaction, and student-student interaction, which were measured through online interaction behavior data. Hu (2015) believed that the interaction between learners and learning content could be measured from eight indicators such as learning time, the number of course notifications viewed, and the number of course resource views. The interaction between learners and other learners could be measured from five indicators such as posting, replying, and uploading resources. The interaction between learners and teachers could be measured from four indicators such as the number of submitted assignments and the number of completed quizzes, and the interaction between learners and the learning environment can be measured from five indicators such as login times, online time, and the number of help document views.

3. RESEARCH DESIGN

3.1 Research Questions

Employing qualitative methods as the main method, this study aims to optimize the current blending learning design in open education. To be specific, this study tries to find the practice approaches to promote instructional interaction and assess students' perceptions of the effectiveness of the optimization. The research questions are as follows:

Dose the optimized design of blending learning promote instructional interaction?

What are students' perceptions of the effectiveness of the optimization?

3.2 Research Instruments

The questionnaire and semi-structured interview were used to analyze students' perceptions of the optimized blended learning design. The questionnaire was adopted from previous studies by Yue and Sun (2016) and Tan and Fu (2020), and the questions were scored using a Likert five-point scale, ranging from "strongly disagree" to "strongly agree". The questionnaire questions mainly focused on students' learning satisfaction, sense of participation, and sense of accomplishment in learning. The semi-structured interviews, which took approximately 10 to 15 minutes per student, were conducted after students had experienced the optimized blended learning. The interview questions mainly aimed to gather information on students' perceptions and preferences of the optimized blended learning design and its perceived usefulness for learning.

Additionally, Rain Classroom and WeChat apps were introduced into the class. Through the "Live Commenting" feature of Rain Classroom, students were able to freely express themselves during face-to-face classroom sessions. Furthermore, tasks could be assigned to students

via their smartphones and answers could be submitted synchronously. Through WeChat, communication between students and their teacher, as well as between students, was enhanced. In the WeChat social group, students received learning reminders and assignment evaluations from their teacher, and could interact with each other outside of class. Relevant data such as the number and content of students' live comments and task submissions could be collected from the Rain Classroom app's background, and chat records could be collected from WeChat. This data can be used to analyze instructional interactions.

3.3 Data Collection and Analysis

The data were collected from various sources: the records of students' online learning behaviors, the records of students' interactions during the off-line learning in the classroom, the data collected from Rain Classroom and We Chat Apps, the questionnaire and the transcripts of semi-structured interviews. The data were collected under the permission and support of the participants.

The data were analyzed following a case study qualitative data analysis scheme proposed by Miles and Huberman (1994). Furthermore, the data coding process was double-checked by another qualified researcher to ensure the reliability of the data analysis. Only two disagreements arose during the coding process while the author and the other researcher were analyzing the data together, but a further discussion led to a consensus.

3.3.1 Learner-Resource Interaction

The Learner-Resource Interaction (LRI) was measured by analyzing the number of learning behaviors exhibited in online and offline settings. For online learning, the following indicators were used: the number of learning resources viewed, the number of completed tests, and the amount of time spent learning (Hu, 2015). In the offline classroom, LRI was measured by the number of tasks submitted by learners.

3.3.2 Social Interaction

As previous studies have shown, social interaction typically refers to the interaction between students and teachers (LTI), or between students themselves (LLI), as well as certain daily communication behaviors such as greetings, chatting, and expressions of gratitude (Bates, 1990; Wang, 2016). To analyze social interaction, data were collected from both online and offline learning scenarios. Specifically, in online learning, the primary social interaction occurred on the online learning forum and the WeChat social group. Therefore, the number of social interactions in online learning refers to the number of posts and replies on the forum, as well as the number of chats in the WeChat social group. Based on the different themes and contents of the interactions in the WeChat group, social interactions were further classified into learning-related interactions, such as discussions about learning content, requests for assignment help, assignment notifications, task feedback, and performance evaluations, and daily communication, such as greetings, chatting, and expressions of gratitude.

In offline learning, social interactions were indicated by the proportion and frequency of interactions between students and the teacher, as well as between students themselves. To gain a better understanding of social interactions, this study coded face-to-face classroom interactions into two categories: active and passive. Active interactions refer to interactions in which students volunteered to participate, such as answering questions and engaging in peer-to-peer discussions, whereas passive interactions mostly occurred when the teacher asked students to answer questions.

3.3.3 Students' Perception

Students' perceptions of the effectiveness of the optimization were measured from the following aspects: students' learning satisfaction, sense of participation, sense of accomplishment in learning and students' perceptions and preferences of the optimized design of blending learning. Specially, students' satisfaction was measured with the questionnaire adopted from previous studies(Yue & Sun, 2016; Tan & Fu, 2020). The questions are scored using the Likert five-point scale, ranging from "strongly disagree" to "strongly agree". And the semi-structured interview was served as a supplementary in analyzing students' learning satisfaction. To find out students' perceptions and preferences of the optimized design of blending learning, the questionnaire and the transcripts of semi-structured interviews were analyzed in a recursive way by "multi-data cross validation and constantly comparison of one piece of data to another" (Strauss & Corbin, 1990).

4. OPTIMIZATION OF THE BLENDED LEARNING

Taking English for the Humanities as an example, this study optimized the design of blended learning in open education from three aspects: teaching methods, approaches to promote instructional interaction, and teaching procedures. The study lasted for a semester, about three months, as previous research has shown that conducting blended learning for one to three months leads to the most significant improvement in students' learning (Li et al., 2022).

4.1 Analysis of the Course and the Learners

This course is a public English course for students from various majors, such as law, social work, Chinese language, and education, at the Open University of China. It aims to strengthen students' English language foundations and develop their fundamental skills while providing them with basic knowledge related to their

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respective professions and cultivating their practical abilities to use English for communication in various human activities.

However, the teaching materials' content and themes tend to be dispersed, fragmented, and limited. Moreover, extracurricular knowledge is not adequately introduced, and the materials are heavily biased towards Western culture, with insufficient introduction of Chinese culture and regional culture.

The teaching implementation often follows the traditional model of "online self-learning + offline face-to-face teaching and Q&A," with insufficient integration between information technology and offline learning. Furthermore, technology integration is not effective enough to meet students' learning needs (Li & Wang, 2019). As a result, students are often reluctant to participate in face-to-face classroom interactions (Tian, 2018).

The students in this course come from diverse academic backgrounds and have varying social and professional experiences. While most of them are proficient in using internet terminal devices such as computers and mobile phones, they share a common challenge as English as a Foreign Language (EFL) learners: weak English foundations and varying proficiency levels. Furthermore, many students face serious work-study conflicts, and based on past experiences, only about one-third of the students attend face-to-face classes regularly.

4.2 Teaching Methods

The teaching methods employed are problem-based learning (Barrows,1986; Savery,2006), task-based language teaching (Nunan, 2004) and creating social situation(Vygotsky, 1978; Daniels, 2001).

By applying the method of problem-based learning, the teaching process includes four stages: Problem Identification, Exploration, Assessment, and Application. In the "Problem Identification" stage, students are guided to complete online self-study with the help of self-study task sheets and identify problems concerning the current learning. In the "Exploration" stage, the teacher provides targeted explanations for students' problems through online learning platforms and face-to-face classrooms to complete knowledge input. In the "Assessment" stage, students test their self-study and classroom learning outcomes by completing evaluation tasks. Finally, through "Application," students are guided to apply the learned knowledge, methods, and skills to the next stage of learning and real workplace scenarios.

The course adopts task-based language learning, which includes four stages: Task Introduction, Task Completion, Task Evaluation, and Task Extension. During the "Task Introduction," relevant knowledge and backgrounds are explained to help students prepare for the initial stage. In "Task Completion," the teacher breaks down the task into different difficulty levels, and students can choose tasks that match their actual level to ensure participation and completion. During the "Task Evaluation" stage, students consolidate their learning further through peer and self-evaluation, while the teacher conducts personalized value-added evaluations based on students' actual performance to determine their assessment. Finally, in "Task Extension," the teacher assigns post-class extension tasks to consolidate students' learning and improve their application ability.

According to Vygotsky (1978), learning occurs in the social environment where learners interact with others. During this process, learners develop new cognitive abilities through engaging in activities at higher levels. Learning is the process in which learners construct the meaning of knowledge in specific contexts. Learners can only truly understand knowledge through concrete, contextual activities. Since, Learning occurs in the social environment where learners interact with others(Daniels, 2001), this study created social situations during the teaching process, which means to provide learners with a learning environment that encourages social interaction, collaborative problem-solving, and exploration. In such a situation, learners can improve their learning outcomes by interacting with other learners, teachers, and other stakeholders. Specifically, based on the teaching textbook, we reconstructed teaching materials and curriculum through theme-based approach. First, we analyzed the content of the teaching materials, reorganized them and carried out educational activities based on the themes, instead of the traditional approach of following the order of chapters. We have reconstructed the content of the eight units in this course, creating four social situations that connect the eight units together.

4.3 Approaches to Promote Instructional Interaction

4.3.1 Learner-Resource Interaction

Firstly, providing rich and interesting learning resources for students is one of the strategies to promote instructional interaction, as stated by Huang (2023). On the one hand, we enriched teaching resources. Besides the online learning resources of the course, we made full use of online MOOC resources, selected high-quality and relevant resources to cover contents such as historical figures, scenic spots, and urban culture, and emphasized on both Chinese and western cultures. On the other hand, to engage students in learning,we reconstructed teaching materials and curriculum through theme-based approach. We analyzed the content of the teaching materials, reorganized them, and carried out educational activities based on a theme-based approach, instead of the traditional approach of following the order of chapters. We explored the intrinsic connection between the contents of different units to make the learning logical and interesting.

Meanwhile, providing tasks designed based on real-life situations is another strategy for promoting instructional

interaction. We utilized a theme-based approach based on the teaching textbook, creating four social situations that connect the eight units together. All the learning tasks were designed to solve problems related to the social situations.

To further promote instructional interaction, we set interactive tasks with appropriate difficulty levels to adapt to the learner's "zone of proximal development" and achieving effective instructional interaction (Vygotsky, 1978; Huang, 2023). So we set tasks with appropriate difficulty levels for learners to help learners continuously challenge themselves without feeling too frustrated by difficulties, while also enabling them to gain more knowledge and skills. Considering the variations in students' English levels, we set tasks at different levels of difficulty, allowing students to choose according to their actual level and to promote task completion. This type of setting also helps to establish effective interactive relationships, enabling learners to better understand and apply what they have learned.

4.3.2 Social Interactions

Firstly, establishing a classroom environment that encourages open discourse. In traditional face-to-face classrooms, the instructional interaction is the main way for students to gain speaking rights. However, due to the limitations of course format, class size, and teaching time, traditional Q&A interactions are often restricted. Therefore, the teacher remains the organizer and dominator of classroom discourse. The problem could be solved by building an open discourse classroom environment with the help of mobile internet technology and social media applications (Tian, 2018). Research shows that the application of information technology in teaching activities can establish a virtual network discourse environment, in which students will participate more actively in learning activities and discussions (Chang & Sperling, 2014). If a virtual discourse environment similar to the online world is introduced into classroom teaching, more discourse can be shifted from teachers to students, especially to create a more equal and distributed discourse mode, enabling effective and active classroom interactions (Mameli, Mazzoni, & Molinari, 2015).

Since the integration of online and offline learning is considered to be one of the features of open education, it is necessary to apply mobile internet technology into the traditional face-to-face classroom to promote the interactions in the class. And students' ability to use mobile devices provides the foundation for such applications. As a result, Rain Classroom and We Chat Apps were introduced in the class so that students were able to express themselves with the "Live Commenting" function. Additionally, tasks could be assigned to students' smartphones, and students could submit their answers using their smartphones synchronously.

Then, we initiated six topic discussions on the online learning forum in the semester in order to create more opportunities for students to interact with each other and enhance what they had learned. Additionally, online discussion and communication can effectively promote college students to think deeply and actively about what they had learned. The online teaching interactive behaviors, such as mutual consultation, questioning, argumentation, and explanation of personal opinions, have a positive effect on the development of high-level thinking in learners (Galikyan & Admiraal, 2019).

Lastly, we conducted after-class Q&A and targeted evaluations. It can help students understand course content better, discover and solve learning problems, and promote communication and interaction between teachers and students (Huang, 2023). After-class Q&A was conducted through WeChat groups, which allowed students to ask questions and receive timely answers from either other students or teachers, at their own convenience. We also conducted targeted evaluations through WeChat to help students identify their weaknesses and improve their learning strategies and methods accordingly. In addition, we provided individualized guidance and feedback based on students' performance and progress, which was instrumental in helping students improve their learning efficiency.

4.4 Teaching Procedures

The blended learning scenarios consist of online courses and supplementary learning resources, Rain Classroom App, WeChat App, and face-to-face classrooms. In the teaching process, we introduced smartphones as a learning platform, used problem-based learning, and designed differentiated and progressive tasks, based on the varying English proficiency levels of the class. Our aim was to facilitate continuous participation, collaboration, and knowledge acquisition for every learner. The complete teaching process consists of the following three stages: Self-learning, Exploration in class and After-class consolidation.

In Stage One, students were expected to engage in self-learning through the National Open University Learning website before attending face-to-face classes. To help students complete their self-study tasks online, teachers designed unit guides in advance and distributed them through the class group chat. Before the face-to-face class, the teacher divided all students into three levels based on their pre-test results and evenly distributed them into different groups according to their English proficiency level.

During Stage Two, there were four scheduled face-to-face classes per semester. The teaching activities during these sessions consisted of setting the scene, completing learning tasks, presenting learning outcomes, and evaluating outcomes. Each session consisted of a variety of tasks, including explaining concepts, answering questions, self-exploration, and group collaboration. Rain Classroom and WeChat Apps were introduced to allow

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students to provide "Live Commenting" and submit their work synchronously via their smartphones.

In Stage Three, after-class consolidation, the teacher reviewed submitted assignments and provided one-to-one online feedback. Additionally, an online interactive forum was utilized to address individual student questions and further consolidate their learning outcomes..

Furthermore, since the assessment of teaching outcomes in traditional open education is insufficient (Liu, 2018), this study evaluated students' learning outcomes throughout the entire teaching process, including participation in learning, task completion, and task quality. Evaluation methods included peer review, student self-evaluation, and personalized feedback provided by the teacher based on each student's actual learning progress. Through diversified evaluations, students were encouraged to participate in the evaluation process while the teacher provided personalized feedback to enhance their learning outcomes.

5. RESULTS AND DISCUSSIONS

5.1 Learner-Resource Interaction

In this semester, 135 students registered for this course. A total of 152 online learning resources were available, which included 132 course resources (including 8 online tests) and 20 additional learning-related resources. On average, students spent 66.5 hours studying per semester and browsed an average of 225.7 times of resources. More than 20 students browsed resources more than 500 times, while 67 students browsed resources less than 100 times. This suggests that at least half of the students did not browse all of the learning resources. Although some students spent as much as 240 hours studying online, more than half of them spent less than 72 hours in online learning. Additionally, 25.9 percent of students did not complete all 8 online tests, as shown in Table 1 and Figure 1.

Table 1
Online Learner-Resource Interaction

Online Interaction L-R	Average	Minimum	Maximum	Total
Learning resources viewed	225.7	37	684	30463
Learning time (Hour)	66.5	24	240	8976
Tests finished	6.0	0	8	815

Further analysis indicates that more than one-third of the total resource browsing was for the additional learning resources. Overall, there seems to be insufficient interaction between students and course resources in online learning. Students appear to be more interested in the additional learning resources, which is also supported by questionnaire and interview results. This suggests that providing more diverse and rich learning resources may enhance Learner-Resource Interaction.
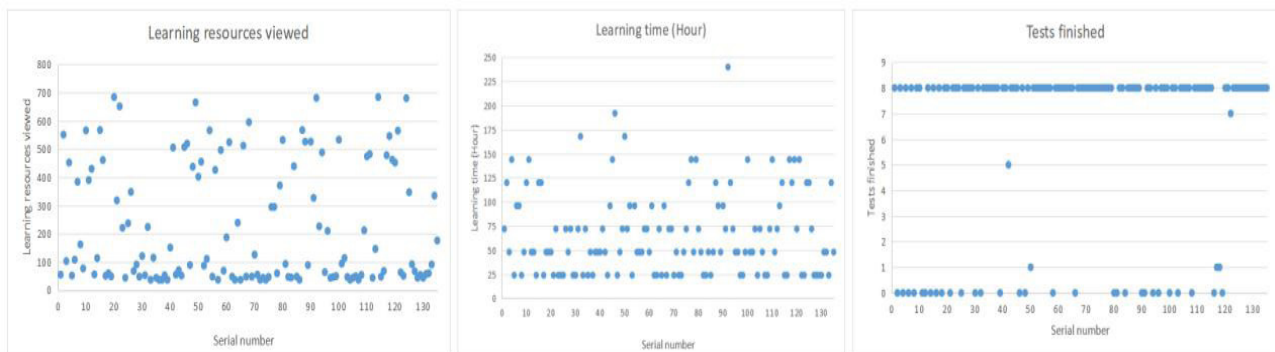

Figure 1
Online Learner-Resource Interaction

Table 2
Offline Learner-Resource Interaction

	The first class	The second class	The third class	The fourth class
Tasks assigned	4	4	5	4
Students attending the class	26	33	32	30
Tasks submitted in total	102	129	159	120

However, in offline classrooms, there is relatively high interaction between students and learning resources, and almost all students completed their classroom tasks, as shown in Table 2. Upon closing analysis, it is found that two students did not complete the task of application (introducing their hometown) during the first face-to-face class, three students did not complete the task of peer evaluation during the second face-to-face class, and one student did not complete the task of peer evaluation during the third face-to-face class. In the feedback evaluation after class, the teacher contacted the relevant students via We Chat and found that the main reason for their failure to complete the tasks was their inability to do so. According to the results of questionnaires and interviews, it could be the lack of the effective supervision and guidance responsible for the differences in institutional interaction between online and offline learning. What's

more, compared to the online tasks and resources which are the same for each student, tasks in the offline class are set at different levels of difficulty, allowing students to choose according to their actual level. As a result, most of students can finish the tasks adapt to their actual English proficiency in the offline class. This suggests that effective and timely supervision and guidance, as well as multiple tasks, are keys to promoting Learner-Resource Interaction.

5.2 Social Interactions

There were six topic discussions based on social situations initiated on the online learning forum where the main social interactions occurred. After one semester of teaching practice, the online social interaction rate of students reaches as high as 56.3 percent, which shows a significant improvement compared to less than one-third in the past. And on the forum, the total posts of online discussion are 1340, with an average of 17.6 posts per person, as shown in Table 3.

Table 3
Social interaction on online forum

Number of participants	Number of posts	Number of relies
76	241	1099
	Total 1340	

There are a total of 186 social interactions in the We Chat group, with the vast majority related to learning. As shown in Table 4, the online communication platform can provide more opportunities for social interaction. It is worth noting that only 12.3% are daily interactions. Although these daily interactions are not related to learning, they can enhance the relationship between learners, establish harmonious interpersonal relationships

and identity recognition, and eliminate feelings of loneliness. Therefore, they are still important in open and distance education (Wang, 2016). Furthermore, most of these daily interactions were initiated by students, so teachers should be more actively involved in daily interaction to enhance the relationship with learners and to promote social interaction.

Table 4
Social interaction in We Chat group

Social interaction in We Chat group		Initiator	Total
Learning-related	Discussions	Students	21
		Teacher	3
	Asking for help	Students	44
	Notification	Teacher	8
	Feedback and Evaluation	Teacher	87
Daily communication teacher		Students	17
		6	

Moreover, in the traditional classroom, most students are unable to grasp the discourse power in the classroom, which results in poor performance in the active interaction (Tian, 2018). Yi (2017) 's research found that if a virtual learning scenario is established in the classroom, students will be more active, and a more equal classroom discourse mode can be formed in classroom interaction, making social interaction more sufficient. By introducing Rain Classroom, student's active interaction rate is above 70%, reaching as high as over 80%, and most of the students participated in the interactions through the Rain classroom App,as shown in Table 5. The results indicate that the introduction of dimensional interaction can effectively improve students' initiative and participation in the classroom interaction.

Table 5
Social interaction in the face-to-face Class

Kinds of social interaction		The first class		The second class		The third class		The fourth class	
		N	P	N	P	N	P	N	P
Active	Volunteering	3	80.8%	3	69.7%	3	78.1%	2	80%
	Through APP	18		20		22		22	
Passive	Teacher asked	2	19.2%	6	30.3%	2	21.9%	5	20%
	Not participate	3		4		5		1	
	Total	26		33		32		30	

*N represents the number of students
*P represents the proportion of the students

5.3 Students' Perception

Through analyzing students' performance during the entire teaching process, questionnaires, and semi-structural interviews with students, it is found that students have a high level of satisfaction and participation and a relatively strong sense of accomplishment in learning. Moreover, the students generally support the teacher's evaluations and comments and feel that they can benefit from them.

Compared to static learning resources for online self-study such as text, video, audio, etc., students have a higher level of enthusiasm towards dynamic online interactive discussions. Meanwhile students generally expressed that they were able to complete learning tasks and had a strong sense of participation and achievement in their studies. as shown in Table 6.

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Table 6
Results of the Questionnaires

Serial Number	Item	Mean
1	I am satisfied with the teaching of this semester's course.	4.59
2	I use online self-study resources frequently.	2.17
3	I actively participate in online interactive discussions.	3.98
4	I actively participate in face-to-face teaching activities.	3.01
6	I am able to complete pre-class self-study tasks independently.	2.84
7	I am able to complete face-to-face classroom learning tasks.	3.93
8	I acknowledge the teacher's evaluation of my learning performance.	4.66
9	I agree that incorporating extracurricular knowledge into the teaching process is beneficial for me.	4.02
10	I hope to learn extracurricular knowledge in future classes as well.	3.95

After interviewing students, it was found that they had less interest and enthusiasm in face-to-face interaction compared to interactions through the Rain classroom app during class. On the one hand, the students had limited contact with each other, which made them feel awkward when communicating face-to-face with classmates whom they perceived to be strangers in their daily lives. This highlights the importance of establishing harmonious relationships among students, which could be achieved through online daily communication, in order to promote social interactions. On the other hand, the students generally had a lower level of English proficiency and were hesitant to participate in classroom interactions due to the fear of making mistakes and losing face. The Rain Classroom app provided a virtual learning environment in which the students felt a layer of "psychological protection" that allowed them to express their views and opinions more freely and comfortably.

Overall, students are satisfied with the blended learning in this semester and believe that their English proficiency has been improved. Moreover, they reported a high level of acceptance and perceived usefulness of the additional learning resources that were integrated into the teaching process. Further interviews were conducted with 18 students across different levels of English proficiency to explore their perceptions of the integration of additional learning resources into teaching. The key words that emerged during the analysis of their responses were "very interesting" (15 times), "broadened horizons" (12 times), "learned a lot of knowledge beyond the textbook" (10 times), and "new thinking and understanding" (9 times). These findings suggest that the additional learning resources in this course effectively expanded the dimensions of learning, enlivened the classroom atmosphere, and improved learning motivation.

However, during the interviews, differences in attitudes towards the additional learning resources are found among students of different levels. More than 80% of high and low-level students expressed agreement. They stated that the integration of extracurricular knowledge made learning "more interesting," "more relevant to society," and "stimulated deeper thinking." However, among the intermediate-level students, nearly half of the interviewed students suggested that although the additional learning resources were "interesting", ttheir English learning may have been more effective if the extracurricular content was not included. This suggests that we should pay attention to the priority of the content during the teaching. The additional learning resources can assist in learning knowledge and promoting instructional interaction, but we need to pay attention to students' needs and feedback, and dynamically adjust teaching design and arrangements to meet the different learning needs of students at different levels.

CONCLUSION

Effective instructional interaction is essential for successful open and distance learning, and this study aims to explore various approaches to promoting instructional interaction in blended learning for open education. Using *English for the Humanities* as a case study, we implemented a semester of teaching practice to examine the effectiveness of these approaches。

This study identifies potential ways to encourage students to participate in the instructional interactions. Firstly, promoting interaction between learners and learning resources can be achieved by enriching learning resources and designing tasks with appropriate difficulty levels based on real-life situations. Meanwhile, students are more active in social interaction when they are provided with an open discourse learning environment and daily communication is encouraged. As a result, students' participation, satisfaction, and overall support for optimized blended learning have increased. Nevertheless, this study also reveals differences in students' attitudes towards extracurricular learning resources depending on their proficiency levels, suggesting a need for further consideration when integrating these resources into the learning process.

However, limitations still exist in the re-design of the blended learning in this study. Firstly, students' completion rate of self-directed learning is not high. What's more, the interactions between students and resources online are not sufficient. On the one hand, students lack strong and effective supervision and guidance. On the other hand, as adult learners, they face the dilemma of work and study, which results in a lack of intrinsic motivation for self-directed learning. The two aforementioned issues need to be addressed as a priority in future teaching. Besides, the

introduction of additional resources into teaching needs to be improved. It is found that some students still have a low level of adaptability to the additional resources. This reminds us that in teaching, we should dynamically adjust teaching design and contents to meet the different learning needs of students at different levels, and further exploration is in demand in the future.

REFERENCES

Aghazadeh, S., & Sharifkhani, M. (2018). Quality management assessment in MOOCs: challenges and implications for adult education. *European Journal of Training and Development*, 42(9), 570-586.

Allen, I.E., & Seaman, J. (2010). class differences : Online edification in the United States . *The Sloan Consortium,* 15-25.

Alqurashi, E. (2019). Predicting student satisfaction and perceived learning within online learning environments. *Distance Education*, 40(1), 133-148.

Anderson, T. (2003). Getting the mix right again:An updated and theoretical rationale for interaction. *The International Review of Research in Open and Distance Learning*, 4(2), 1-14.

Anderson, T., & Dron, J. (2007). *Groups, networks and collectives in social software for e-learning*. Proceedings of European Conference on E-Learning, 15-24.

Bates, A. W. (1990). Interactivity as a Criterion for Media Selection in Distance Education. *never too far,* 9(16):5-9.

Chang, Y., & Sperling, M. (2014). Discourse and Identity Among ESL Learners: A Case Study of a Community. College ESL Classroom[J]. Research in the Teaching of English, 49(1):31-51.

Chen, L. (2004). A Hierarchical Model for Student and Teacher Interaction in Distance Learning. Chinese Journal of Distance Education, (05), 24-28+78.

Daniels, H. (2001). *Vygotsky and Pedagogy*. London, England: Routledge.

Galikyan, I., & Admiraa, W. (2019). Students' engagement in asynchronous online discussion: The relationship between cognitive presence, learner prominence, and academic performance. *The internet and higher education*, 43(10), 1-9.

He, S.Y., & He, G.Q. (2022). On the Development of Adult Education Knowledge and its Core Issues. *Open Education Research*, 28(6), 111-119.

Hirumi, A. (2002). A framework for analyzing, designing, and sequencing planned e-learning interactions. *Quarterly Review of Distance Education,*3(2), 41-60.

Hu, G. B., & Zhang, H.X. (2018). Blended learning model for vocational education based on MOOC. *Journal of Physics: Conference Series*, 1, 12-62.

Hu, M. (2015). Research on Model of Student Engagement and Its Application in Online Learning. (Doctoral dissertation, Central China Normal University, Wuhan). Retrieved from https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDLAST2016&filename=1016038139.nh

Huang, H. H. (2020). The effect of blended learning model on student participation in open education. *Journal of Educational Technology & Society*, 23(1), 207-220.

Huang, Q., & Liu, Y.Y. (2017). Application and effectiveness of blended learning in vocational education. *Journal of Distance Education*, 15(3), 29-35.

Huang, X.J.(2023)Research on the influence of online teaching interaction on learners' critical thinking and its promotion strategies. (Doctoral dissertation, Northeast Normal University, Changchun). Retrieved from https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDTEMP&filename=1023430535.nh

Jia, W. (2022). Promoting the transformation of open university to platform-oriented university. *Open Education Research*, 28(6), 12-19.

Jia, W., Chen, L., & Li, Z.T. (2022). High-quality development of the open universities: Reflections and expectations. *Open Education Research*, 28(2), 4-10.

Jin, Y., & Wang, Y. Z. (2013). Hierarchical instructional design and its practice based on the blended learning theory. *Modern Educational Technology*, 23(1), 37-40.

Keegan, D. (1993). Reintegration of the teaching acts. In D. Keegan (Ed.), *Theoretical principles of distance education* (pp.113-134). London, England: Routledge.

Kong, Y. H., & Jing, Y. J. (2019). Construction of Ideological and Political Education in English Course in Open Education. *Journal of Shanxi radio & TV University*, 2, 12-19.

Li, B., Yu, Q. & Yang, F. (2022). The impact of blended instruction on students' learning performance: a meta-analysis based on 106 empirical studies at home and abroad. *Open Education Research, 28*(1), 76-84.

Liu, S.Y. (2018). A study on the evaluation of blended teaching effectiveness in adult education. *Education Exploration*, 9(3), 70-74.

Mameli, C., Mazzoni, E., & Molinari, L. (2015). Patterns of discursive interactions in primary classrooms: An application of social network analysis. *Research Papers in Education, 30*(5), 546-566.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage.

Moore, M. G. (1993). Three types of interaction. *Distance education new perspectives*, 3(2), 1-7.

Nunan, D. (2004). *Task-based language teaching*. London, England: Cambridge University Press.

Strauss, A. & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Tan, X., & Fu, Y.L. (2020). Factors affecting online English learning satisfaction and continuous learning intention of college students. *Technology Enhanced Foreign Language,* (04), 82-88+13.

Tian, S. (2018). The construction and empirical study of open discourse classroom environment. *Modern Distance Education Research*, 03, 104-118

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Perspective of Instructional Interaction: A Case Study of *English
for the Humanities*

Trentin, G. (2000). The quality－interactivity relationship in distance education. *Educational Technology, 40*(1), 17-27.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Wagner, E. (1994). In support of a functional definition of interaction. *The American Journal of Distance Education, 8*(2), 6-26.

Wang, Z.J. (2016). Further analysis of the essence and concepts of instructional interaction in online distance education. *e-Education Research, 37*(04), 36-41.

Wang, Z.J., & Chen, L. (2015). Research on instructional interaction in distance education and its latest development. *Open Education Research*, *21*(2), 30-39.

Wei, C. W., Chen, N. S., & Kinshuk. (2012). A model for social presence in online classrooms. *Educational Technology Research and Development*, *60*(3), 529-545.

Yi, C. H. (2017). A case study of the dynamics of scaffolding among ESL learners and online resources in collaborative learning. *Computer Assist Language Learning*, *30*(1/2), 115-123.

Yilmaz, A. B., & Karatas, S. (2018). Development and validation of perceptions of online interaction scale. *Interactive Learning Environments, 26*(4), 337-354.

Yu, Y.X. (2017). A Study on the Self-Learning Ability of Adult Learners in Blended Learning Environment. *Research in Teaching*, *11*(4), 6-10.

Yue, J. F., & Sun, D. J. (2016). Research on construction and application of two-dimension scale of distance learners' satisfaction evaluation---Taking online education of Renmin University of China as an example. *China Educational Technology*, (08), 53-60+73.

Zhang, W. Y., Wang, X. X., & Xie, Q. S. (2018). OU operating models and quality assurance mechanisms: An international comparison. *Distance Education in China*, *09*, 22-28+52.