

# ***The Impact of Blended Learning on Chinese Middle School Students' Interest in Learning During Covid-19***

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**Abstract:** As the covid-19 pandemic forced campus closures, schools were transformed in how they taught and learned. *Blended* learning is the approach chosen by most schools, combining face-to-face learning with online learning to allow students to receive education and meet academic needs. This paper describes the adoption of blended learning in China based on constructivist theory. The purpose was to research the impact of blended learning on Chinese middle school students who developed an interest in learning during the covid-19 pandemic. The paper uses a questionnaire-based research method to study their perceptions of blended learning and changes in achievement, involving 150 Chinese secondary school students. The results show that blended learning positively contributed to Chinese secondary school student's interest in learning, resulting in improved performance during the covid-19 period.

**Keywords:** Blended learning, Chinese middle school, Covid-19

## **1. Introduction**

In the past thousands of years, teaching activities have usually only occurred in classrooms, schools, and various places and are often passive, teacher-centred learning and teaching models for students. Traditional learning has numerous advantages, it is more conducive to the exchange of ideas between students and teachers, and the possibility of misunderstanding is reduced [1]. However, with the rise of education digital transformation, blended teaching, as a new "online-offline integration" teaching way, has gradually attracted increasing attention from educators. Since the World Health Organization declared covid-19 a pandemic, a series of measures have been adopted around the world in response to the spread of covid-19 to limit social interaction [2]. Covid-19 has disrupted normal teaching and learning activities, forcing schools to seek new solutions to keep students' lessons uninterrupted. China is the first country affected by the pandemic, and the integration of technology into teaching and learning is a phenomenon that has only emerged in China in recent years [3]. Therefore, blended teaching is a new method to ensure the normal operation of teaching activities.

The research was motivated for several reasons; first, from a social point of view. Individuals underdeveloped understand that the impact of the covid-19 pandemic on mental health remains. Many middle school students demonstrate a trend of increasing mental health problems and are more sensitive to social risks in China [4]. Thus, mental health problems are one of the factors affecting the achievement of Chinese middle school students. Second, from the perspective of

educators. Challenges associated with transitioning from face-to-face to blended teaching due to the Covid-19 pandemic (flexibility, group work, student exchanges, etc.) [5]. This paper will report students' perceptions and preferences for learning styles, providing helpful information for educators to change teaching strategies to ensure effective teaching.

## 2. Literature Review

The Covid-19 pandemic has dramatically impacted the lives of students and teachers. Firstly, if still practised, traditional education had a more profound negative impact on secondary school students' performance during covid-19. In traditional education, face-to-face teaching is the main form of classroom instruction [6]. The traditional philosophy of education is teacher-centred [7]. This is because traditional education's essential concept and primary task are to transfer knowledge to students from the vast amount of information and skills developed in the past [8]. In other words, the main motive of traditional education is to pass on to the next generation the values, ritual skills and social customs necessary for survival. Students are expected to listen and follow the teacher's steps in completing assessments, so lessons are often task routine [7,9].

### 2.1. Blended Learning

Blended learning was a combination of virtual and physical environments [10]. In other words, blended learning is a learning strategy that incorporates various modes of traditional face-to-face classroom and distance (online) learning and uses various modes of technology [6, 11]. First, many academics are optimistic about the opportunities to enhance virtual learning environments [12]. The enhancement of student learning and encouraging teachers to change their pedagogy through technology and the Internet [13]. Yang and Huang [14] used a case study approach using Tsinghua University in China. They concluded that blended learning is likely to be a new traditional model that can be adapted to different learning styles. Thus, blended learning is an upgrade to the traditional face-to-face model and the entire teaching model [15]. Secondly, blended learning creates a digital and interactive classroom atmosphere for students. Particularly during covid-19, virtual environments will become a more prevalent feature of education. Therefore, research suggests that implementing blended learning can help student performance and improve the quality of teaching and learning [10, 12]. For example, blended learning can reduce social distance, increase interaction between teachers and students, and provide flexible, rich classroom content to ensure classroom engagement and communication. Blended learning will be seen as a student-centred learning approach to improve student achievement [6, 15].

However, blended learning may also negatively affect Chinese secondary school students [5]. Firstly, the change in educational approach negatively affects students' psychological state and academic performance. As blended learning increases teachers' workload and disrupts the original workflow, the boundaries between work and home space become increasingly blurred [16]. For example, Zhang et al. [17] analysed the extent of anxiety and depressive symptoms among Chinese secondary school students compared to pre- and post-COVID-19 through a 31-item cross-sectional study. On the one hand, the prevalence of depression among Chinese secondary school students during the COVID-19 pandemic (22%) was approximately twice as high as the worldwide rate of depression among secondary school students (11.3%) from a global perspective [18]. On the other hand, from a Chinese perspective, the prevalence of depression during the COVID-19 pandemic was slightly lower than that of Chinese secondary school students over the past 30 years [19]. Consequently, ongoing lockdown and seclusion may also result in a deterioration in mental health due to the behavioural restrictions imposed by COVID-19.

## 2.2. Constructivism

To start with, the centrality of the idea of constructivism is that it is student centred. Constructivists believe that teaching and learning should focus on the experiences and environments in which students are willing and able to learn [20]. Next, constructivism emphasises the initiative of the learner. The process by which learners build understanding based on prior knowledge and experience [21]. This process is usually done in the context of social and cultural interaction. Hence, at the root of constructivism is the assumption that knowledge is self-constructed instead of being innately competent or passively absorbed [22, 23].

Initially, constructivism encompasses a variety of theories of thought, three of which are presented here [24]. At first, Piaget's theory of cognitive development suggests that learners develop cognitive structures by gradually constructing their understanding of the external world through a process of interaction with their surroundings, which is active and lifelong [25, 26]. Moreover, Piaget recommended that children progress through four stages of cognitive development (sensorimotor, preoperational, concrete and formal operations). These stages are used to illustrate how human cognition develops [27, 28]. In the second place, Vygotsky's constructive learning theory is based on Piaget's theory of cognitive development and considers social interaction central to the theory [29]. In other words, all knowledge is socially constructed, and learning occurs in interaction with others [30, 31]. Thus, Piaget's theory of cognitive development focuses on children's autonomous exploration and construction of their knowledge, while Vygotsky emphasises that social interaction facilitates cognitive development [21, 32]. In the third place Bruner's theory of cognitive learning. Like Vygotsky, they focus more on the external environment, especially the social environment, than Piaget did. Takaya [33] argue that learners can learn about cultural and social interactions based on their subjectivity by constructing knowledge in their minds, thus fostering the ability to develop their world models.

Primarily, in traditional learning, information transfer is seen as the main course content, ignoring students' assimilation and digestion processes [5]. As traditional learning focuses only on the knowledge imparted by the teacher and is not student-centred [34], Al-Huneidi and Schreurs [1] propose a blended learning based on constructivism. The basic ideas at the heart of constructivism and blended learning are the same. Constructivism argues that learners actively acquire knowledge through constructing meaning with the help of teachers and other learners rather than being directly imparted by teachers [23]. Blended learning is the belief that how much knowledge students acquire depends on their ability to construct the meaning of knowledge based on their own experience with the help of the teacher rather than the learner's ability to reproduce the teacher's thought process [1]. In addition, student-centredness in blended learning increases students' interest in learning and improves learning outcomes [34]. Particularly in China, the central context of teacher-centred education has long been promoted. When students can share and communicate directly with their teachers and peers in the classroom, they gradually transform knowledge into knowledge under their teachers' guidance [1, 6]. Consequently, for Chinese secondary school students, a change in educational approach is not only a change in form but also a way to stimulate interest in learning and improve academic performance.

Overall, the core concepts of constructivism and blended learning are consistent with student-centred and emphasise students' active construction of their knowledge. In a specific Chinese context, blended learning based on constructivism can stimulate students' interest in learning and improve their performance.

### 2.3. Hypothesis Development

There is conflicting evidence in a slice of studies on whether blended learning has a positive impact. First, research demonstrates that blended learning is superior to traditional learning because BL is interactive, offers different teaching styles and has been manifested to improve student motivation and achievement [35, 36]. Second, since blended learning is designed to replace traditional education for Chinese middle school students during covid-19, this should increase the learning outcomes of Chinese middle school students. Therefore, from the perspective of students, to study the impact of blended learning on the performance of Chinese middle school students to measure whether blended learning is considered an upbeat learning style. However, several studies are reporting on the limitations of blended learning due to the Covid-19 pandemic. Therefore, the environment of students in blended learning may be considered an unwelcome and harmful factor [5]. For example, students' learning preferences, students' learning motivation and stress, and students' participation in group activities. Based on the above, the paper makes assumptions:

Hypothesis 1: Blended learning positively impacts Chinese secondary school student's performance during the covid-19 period.

Hypothesis 2: If Chinese middle school students do not consider the covid-19 factor, they prefer traditional face-to-face learning.

### 3. Study Design

The research was motivated for several reasons. First, from a social point of view. The impact of the COVID-19 outbreak on mental health remains underdeveloped understood. Many middle school students manifest a trend of increasing mental health problems and are more sensitive to social risks in China. Hence, psychological problems are one of the factors affecting the achievement of Chinese middle school students. Second, from the perspective of educators. Challenges associated with transitioning from face-to-face to blended teaching due to the Covid-19 pandemic (flexibility, group work, student exchanges, etc.) [5]. As a result, this paper will report students' perceptions and preferences for learning styles, providing helpful information for educators to change teaching strategies to ensure effective teaching. The study was conducted in June-July 2022. To achieve the research goals, the paper uses a questionnaire-based research method aimed at ensuring the reliability and validity of the entire research process [37].

This paper collects qualitative data through questionnaires. First, the study sample included 150 Chinese middle school students. A central aspect of teaching and learning is the student's experience of the process [38]. Thus, Chinese secondary school students are selected. They can report the latest blended learning situation because they are all practitioners. Therefore, research is expected to gain student perspectives and objections regarding blended learning through surveys with these middle school students. Secondly, the form of the questionnaire is simple to ensure that middle school students can clearly understand the content of the questions. Primarily composed of Likert scale questions, participants demonstrated their feedback on various aspects of blended learning and their satisfaction. The questionnaire uses a 5-point Likert scale, such as 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree). Middle school students are all 12-15 years old, their comprehension is limited compared to adults, and their learning tasks are busy and time-critical. Consequently, the questionnaire adopts a simple and convenient answering method so that students can complete the questionnaire quickly and efficiently. In addition, ethical approval was acquired from the participants and written informed agreement was gained from each participant prior to the research being performed.

## 4. Data Analysis and Results

This study released 160 questionnaires to Chinese middle school students, of which 157 were valid questionnaires. There was a slight difference in the participation rates of boys and girls, with 78 boys (49.68%) and 79 girls (50.32%). First of all, in terms of specific grades, 91 students in grade 8 participated in the questionnaire survey, which was the most grade (57.96%), 30 students in grade 7 were the least involved (19.11%) and 36 students in grade 9 (22.93%). Moreover, 157 middle school students (100%) have experienced blended learning. Secondly, regarding weekly online learning of middle school students, 7.01% never study online, and 43.31% study online three times a week at most. In addition, the study calculated the data using a 5-point Likert scale question using frequency, percentage and mean. Table 1 illustrates this by accounting for the mean answer for a particular question in the construction variables and the aggregate mean answer for each construction variable [39]. Finally, the students responded to the questionnaire on an anonymous basis. The researcher communicated the purpose of this questionnaire and assured us that the data would only be used for this study and academic purposes.

Table 1: Likert scale response measures.

Interpretation of responses of the Likert-type scale	
Mean Range	Interpretation
1 to 1.80	Strongly disagree
1.81 to 2.60	Disagree
2.61 to 3.40	Neutral
3.41 to 4.20	Agree
4.21 to 5.00	Strongly agree

As shown in figure 1, students directly expressed their belief that blended learning improved their performance. First, the study performed mean calculations to measure students' perceptions of performance improvement. Overall, the average is 3.78, and the results in Table 1 of the root drama indicate that it is in agreement. In other words, blended learning has dramatically improved students' performance. Secondly, most students (68.15%) reported that their positive attitude towards blended learning stimulated their learning initiative. Few middle school students (62.7%) believed that blended learning increased the communication between teachers and students, activated the classroom atmosphere, and made their studies more focused. Middle students mentioned that the increased interactivity enhanced their interest in learning. This further confirms my second hypothesis. Additionally, due to the variety of courses in blended learning, students (63.7%) argued that optimizing their thinking and problem-solving methods mobilized their enthusiasm for learning. In general, blended learning stimulates students' learning initiative and interest through various methods and interactions, which improves their performance.

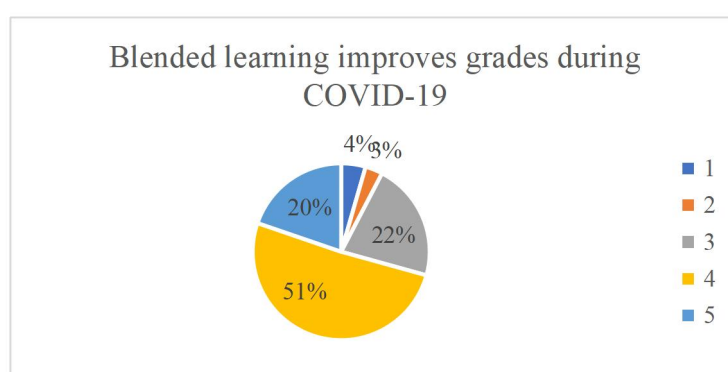


Figure 1: Blended learning improves grades during COVID-19.

Furthermore, figure 2 also demonstrates that more students considered blended learning to be an enjoyable learning method before Covid-19, with an average score of 4.03. However, after considering the situation of covid-19, the average student's classroom enjoyment decreased to 3.86, with a difference of 0.34. However, during covid-19, students with blended learning experienced a reduction in learning stress compared to pre-covid-19, with an average reduction from 3.93 to 3.71. Not only that, but blended learning also stimulated students to have a positive learning attitude, with the average rapidly increasing from 3.54 to 4.04. Therefore, blended learning relieves students' stress but also adjusts students' learning attitudes, especially during the covid-19.

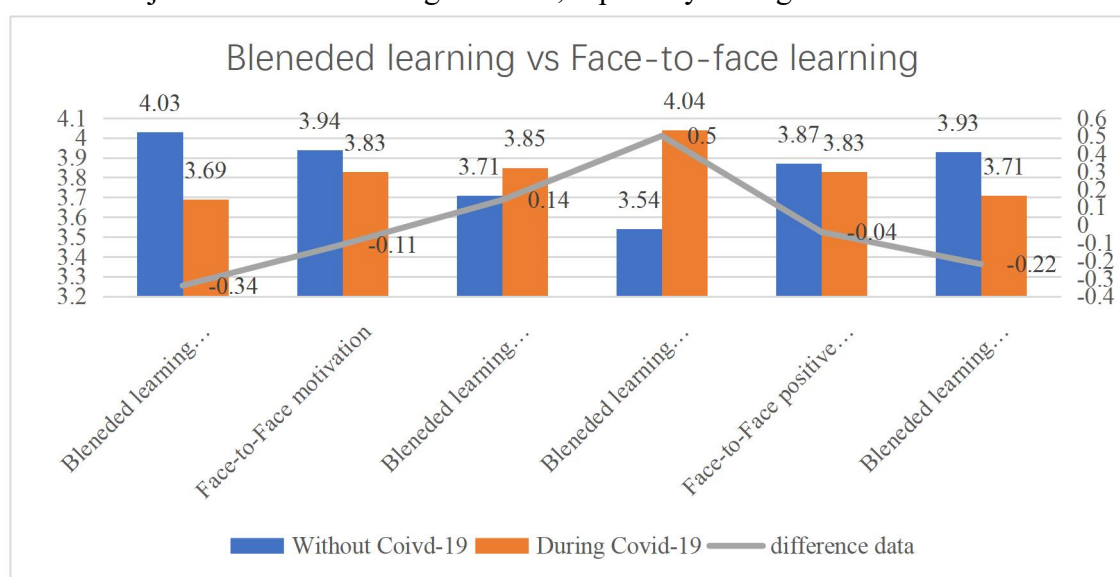


Figure 2: The positive impact of covid-19 on blended and face-to-face learning.

## 5. Discussion

In brief, blended learning stimulated learning appeals to Chinese students during the covid-19 period. According to the questionnaire survey results, students consider blended learning can stimulate learning interest and improve learning performance. To start with, it is recognized by students that blended learning can improve student achievement. Because blended learning promotes communication between students and teachers, the classroom atmosphere is more active and exciting, and students are more focused. Then, the diversity of course content makes students interested in learning. Blended learning combines online and offline learning, where students can experience various courses. Besides, the results indicate that blended learning was not a pleasant



way to go before covid-19. However, students' learning pressure has decreased in the wake of Covid-19. Thus, without covid-19, face-to-face learning is a better way to learn. At last, during the covid-19 period, middle school students in China maintained that blended learning could stimulate their interest in learning and improve their grades.

## 6. Conclusion

In conclusion, whereas traditional face-to-face learning was more suitable for Chinese middle school students' development of performance without covid-19, blended learning positively influenced Chinese middle school students' interest in learning and improved their performance during covid-19. First, blended learning is considered an advantage over traditional learning and will gradually become the “norm” [14]. The apparent improvement in student achievement through questionnaires demonstrates that this educational strategy is an effective way to build the other practice of blended learning. Second, learner satisfaction is one factor that makes educational programs effective and successful [40]. Blended learning is not an enjoyable way of learning during covid-19, but blended learning significantly lowers students' learning stress. Because the results displayed that blended learning increased interaction and thus stimulated positive learning attitudes in students, students gave high marks to blended learning during COVID-19. Finally, it is hoped that the results of this study can be used to improve the educational level of Chinese secondary schools and optimize the effectiveness of educational strategies through blended learning as a new efficient learning method.

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## Appendix (questionnaire)

A questionnaire on the learning achievement of blended teaching for middle school students  
Hello!

Dear Questionnaire Participants: Thank you for participating in this survey on the learning outcomes of blended teaching for middle school students during the COVID-19 pandemic. All middle school students are welcome to participate in the survey. This anonymous questionnaire consists of 20 multiple-choice questions, which will take about 2 minutes of your time. Its content and results are only used for academic research, and your personal information will be kept strictly confidential. The answer only reflects your opinions. There is no right or wrong. When filling out, please follow your actual thoughts and practices, not the thoughts and practices of others or ideals. If you have any questions, please contact the author at any time. Thank you for your support and cooperation.



Question 1

How many times a week do you online learning?

☐0    ☐1    ☐2    ☐3    ☐4    ☐5

Question 2

Blended learning is a new type of online/offline teaching mode (using online course software such as Zoom, DingTalk, Tencent Video, etc.), have you ever had one in your learning experience?

☐Yes    ☐No

Question 3

In the absence of Covid-19, in-person classes are an enjoyable way to learn.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 4

Blended learning is an enjoyable way to learn during Covid-19.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 5

In the absence of Covid-19, you are motivated to learn in a face-to-face environment.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 6

During Covid-19, you are motivated to learn in a face-to-face environment.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 7

In the absence of Covid-19, you are motivated to study in a blended learning environment.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 8

During Covid-19, you are motivated to study in a blended learning environment.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 9

Since you started blended learning, your attitude towards learning has changed positively.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 10

The blended learning can stimulate your learning enthusiasm and initiative.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 11

Blended learning can help you master more knowledge in your studies.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 12

The blended learning helps to increase the frequency of communication and communication between teachers and students.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 13

Blended learning helps to improve your independent problem-solving and problem-solving skills.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 14

Blended learning is flexible.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 15

Face-to-face learning is stressful without Covid-19.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 16

Face to face learning is stressful during Covid-19.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 17

Blended learning can be stressful without Covid-19.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 18

Blended learning is stressful during Covid-19.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 19

Blended learning causes mental health problems.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5

Question 20

Blended learning has improved grades compared to traditional learning during COVID-19.

Strongly Disagree		Neutral		Strongly agree
1	2	3	4	5