

# Overview of Blended Learning of Higher Education under the COVID-19 Pandemic

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**Abstract:** COVID-19 has affected and changed all education departments, especially universities, and brought a new stage of "blended learning" education. Through Google academic search, this work has found 47 papers published in the past three years on "blended learning, COVID-19 and higher education", and summarized them in terms of publication time, country, research methods, research conclusions, network platforms used and related majors. This paper will help universities to understand the practice and experience of network teaching and blended learning in different countries and regions from a global perspective, and help teachers to reflect on teaching methods and contents.

**Keywords:** COVID-19, Higher education, Network teaching, Flipped classroom model.

## 1. Introduction

The sudden outbreak of COVID-19 in 2019 has brought great challenges to higher education. Many university campuses have been block, and face-to-face offline teaching has turned to online teaching. Although online teaching lacks some advantages, such as good interaction effect and high students' consciousness, it can be free from time and space constraints, have richer teaching resources, more flexible assessment methods and be able to leave records. After the normalization of the COVID-19 epidemic, more and more universities have tasted the benefits of online teaching, and more teachers have accepted it. Therefore, online and offline blended learning model has been adopt in many universities.

Since 2019, there have been numerous studies on online and offline blended learning during the epidemic, reaching a peak in 2021. We set the following search conditions through Google scholar to find the related paper: (1) it must be peer reviewed magazine (peer reviewed) or graduation thesis, (2) keywords should include blended learning, COVID-19, and higher education in part or in whole, (4) it should be published in 2019-2022, (5) and the experience of different national education systems must be involved.

We find that research on blended learning and higher education has always been popular. Because the COVID-19 broke out at the end of 2019, the number of papers containing those three keywords was 0 in 2019, and 5 and 8 in the following two years. However, the number of papers containing part of them had a great breakthrough in 2020, and reached more than 20000 in 2021 (see Tab. 1).

This paper mainly focuses on the current situation and experience we can learn from the implementation of network teaching, online and offline blending learning and some representative teaching strategies in universities around the world during the epidemic period. In order to make the research scope more extensive and diversified, the scope of literature review is extended to articles related to network teaching strategies. After preliminary screening, we take into account the three key words of "blended learning, COVID-19 and higher education" while considering the diversity of disciplines, and add three articles published before 2019, involving business statistics, management science and health.

Therefore, 47 articles are studied in this paper.

**Table 1.** Statistics of related research papers

Key words	2019	2020	2021
blended learning or COVID-19 or higher education	1640	15900	26100
blended learning, COVID-19 and higher education	0	5	8

## 2. Network Teaching in Universities Around the World During the Epidemic

After detailed literature reading and induction, the 47 representative articles are summarized as follows. Each article includes analysis indicators, such as the author, publication time, country, keywords, research methods, research conclusions, network platform used and related disciplines.

### 2.1. Geographical Distribution of Research Objects

From the perspective of the region where the research object is located, it is relatively scattered. The large regions include the global scope, Europe, America, Asia, etc., involving 31 countries and regions. The United States is the largest research object, followed by the global scope and India (see Tab. 2).

**Table 2.** Main research scope (regions)

Regions	Number of articles	Regions	Number of articles
America	7	China	3
Global	5	Spain	3
India	4	Italy	3
Australia	3	Germany	2
Poland	3	Brazil	2

## 2.2. Research Method

The majority of scholars use the method of questionnaire to collect first-hand data and information, and use some statistical software to analyze the results. The second method is case analysis and literature review. Interviews or expert interviews are also commonly used. By comparing the literature in the past three years, we find that Meta-analysis

method can make up for the shortcomings of the traditional literature review, and has been widely used. It uses the statistics tools to collect, sort out and analyze the numerous empirical studies on a subject made by scholars and experts before, hoping to find out the clear relationship between the variables concerned. Figure 1 shows the commonly used research methods.

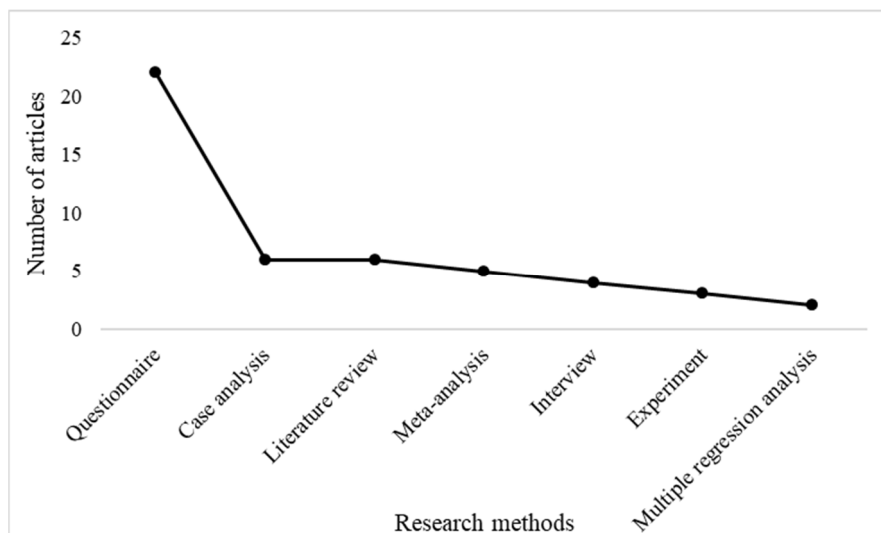


Figure 1. Research methods

## 2.3. Network Platform for Online Teaching

From the perspective of platform or software used in network teaching, most European countries and American adopt Blackboard or Google class system, and use Zoom or Microsoft Teams for network teaching. Some countries in Asia use MOOCs platform more frequently. In addition, many universities also allow students to discuss through social media such as Facebook, WhatsApp, Snapchat, Twitter, Instagram, etc.

## 2.4. Research Major

The literature covers a wide range of disciplines. It includes natural science majors, such as architecture, engineering, civil engineering, chemistry, animal physiology, biology, medicine, and computer. Also, there are social sciences and business majors like management, management science, psychology, journalism and communication, economics, business statistics, and education. Some documents that do not have specific majors or research objects, involving multiple majors and studying the universal network education problems in Higher Education.

## 3. Teaching and Management Experience

### 3.1. University's Attitude Towards Network Teaching

Universities around the world can adjust their teaching strategies in time and actively respond to the challenges brought by the COVID-19 epidemic. Firstly, they invest hardware and software to provide basic conditions for network teaching. Secondly, they actively carry out software and teaching skills training, and pay attention to the physical and mental health of teachers and students. During the epidemic period, most colleges and universities successfully

transitioned from offline teaching to online teaching or online and offline blended learning. After a period of teaching practice, teachers' online teaching skill has been greatly improved, and teachers' acceptance of online teaching has been greatly improved. The effect of online teaching of some courses exceeds that of traditional offline teaching. Various teaching software and online teaching platforms have been developed and utilized unprecedentedly. Moreover, social media has been creatively used for teacher-student interaction and discussion among students, further improving the learning output effect.

### 3.2. Teaching and Learning Strategies

Teaching and learning strategies are still important. The guidance and training of online teaching strategies will help higher education teachers to carry out online teaching. These methods will also help to design successful online learning courses. At the same time, these strategies play an important role in promoting students' learning. Getting feedback from students, providing flexible teaching and evaluation policies will become excellent tools for running online courses.

Most teachers focus on conveying the content of the subject. In addition, teachers often lack sufficient knowledge or resources to provide additional learning strategy training for students. Teachers need to help students further develop the skills of effective learning. The positive role of learning strategy training is not limited to improving the learning process, but also bring more effective learning and lower dropout rate.

### 3.3. Evaluation of Mixed Teaching

Since there are great differences among online teaching, blended teaching and offline teaching, the teaching assessment and evaluation methods should be reformed with the times. Teachers need to adjust the students' academic assessment and evaluation methods to meet the new teaching

requirements.

### 3.4. The Improvement of Blended Learning

Blended learning in higher education needs the collective efforts of administrators, teaching staff, students and parents. Students' satisfaction and participation should also be highly valued, which is the key to learning success. Not all students believe that flipped classroom is conducive to achieve positive learning effects, because this effect may vary according to students' general learning styles and preferences. Therefore, teachers need to invest more patience and time for personalized guidance. In addition, in order to promote a large-scale flipped classroom, a considerable amount of institutional support is required, such as the hardware support of network communication institutions. In the way it can be implemented in practice and provide flexible evaluation.

## 4. Conclusion

Higher education institutions are the battleground for cultivating talents, and the development of computer and network technology has rapidly promoted the progress of the education industry. It makes the education field more and more popular. Although the epidemic has disrupted the fixed mode of higher education institutions, it has also stimulated some innovations and reforms, resulting in online and offline teaching of higher education has reached an unprecedented new height. With the further development of science and technology, the level of educational informatization will be further improved, and the development is unimaginable.

Through literature research, we find that online teaching technology is only a part of the ability of teachers. No matter what kind of teaching software or teaching platform they use, the most fundamental skill requirements are consistent with offline teaching. That is, teachers are required to focus on the design of teaching structure and teaching content, strengthen communication and feedback with students, adhere to the principle of student-centered. They should give students the opportunity to check and correct their mistakes, especially when they have difficulties. It's better to introduce the content of the course through questions or topics, instead of giving them exercises after class. Giving positive and negative feedback to students to support different types of students is important. They need to give detailed feedback to students as much as possible, even if it is a simple wrong question. To improve students' enthusiasm and lasting motivation, teachers should also have the ability to design appropriate teaching activities and tests.

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