# Finding of the Research on Online Learning Amid Covid-19 Pandemic: Systematic Literature Review

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## Abstract

**Having screened related literature from some databases like China National Knowledge Infrastructure (CNKI) , Springer, etc based on online education in the epidemic situation, we conducted data sampling and analyzed for the following questions and then made further research which includes three content types, that is, one is the popularity of online education on the background of epidemic as well as its application, one is the common points and differences of online education as well as its advantages and disadvantages, another one is the discussion of education mode after the outbreak and feasibility analysis of online education.**

## Keywords

**Epidemic situation; Online teaching; Systematic literature review.**

## 1. Introduction

In 2020, to effectively prevent the further spread of COVID - 19, the Ministry of Education launched the spring extension of school notice, issued by the "Guidance on Online Teaching Organization and Management of Common Colleges and Universities During the Epidemic Prevention", achieved aims of "suspending classes, keeping teaching and learning", and encouraged various colleges and universities to carry out online teaching and online teaching activities such as online learning in virtue of online course platform, online learning space, etc. so as to ensure the teaching progress and quality of high quality teaching.

In fact, online education in China took a slow start in the late 20th century. From the perspective of development, China's online education has gone through three stages, from distance education platform, training institutions to the current Internet companies involved in online education. And in the face of severe weather, such as the 2008 snow disaster in southern China, the Wenchuan earthquake and the typhoon in coastal areas, online education has become the only guarantee and way to learn. The continuous worsening of the epidemic this year has also promoted the popularization of international online teaching.

Through the collection and collation of relevant literature, this paper proposes the advantages and disadvantages of online teaching under the current epidemic situation, aiming to provide effective reference for the application of online teaching in the future, and to promote the implementation of online teaching in domestic and even international education.

## 2. Research Design

### 2.1. Research Problems

Having screened related literature from some databases like China National Knowledge Infrastructure (CNKI), Springer, etc based on online education in the epidemic situation, we conducted data sampling and analyzed for the following questions and then made further research which includes three content types, that is, one is the popularity of online education on the background of epidemic as well as its application, one is the common points and differences of online education as well as its advantages and disadvantages, another one is the discussion of education mode after the outbreak and feasibility analysis of online education.

### 2.2. Research Methods

This paper conducts a keyword search and Systematic Literature Review on online education in Chinese and English in the context of COVID-19 in 2020. Systematic literature review is a new research method in the world. Since the outbreak of the epidemic, there have been numerous literatures in various research fields, especially in education. However, most of the papers were written in the traditional paper format, which also gave the paper a certain innovative angle and readability. In addition, the application of systematic literature review can not only analyze the existing relevant educational literature in detail from various perspectives, but also present and introduce the method to readers. According to the six steps of initial planning, literature retrieval, quality assessment, data extraction, data analysis and literature writing, we conducted comprehensive and comprehensive literature retrieval and evaluation.

### 2.3. The Literature

#### 2.3.1. Literature Retrieval

**Table 1.** Determination and results of key words (subject words) in literature search 1

| Source category | Search keywords | Scope of resources | Retrieval condition | time | Screening of theme | Number of search results |
|---|---|---|---|---|---|---|
| Peking University core journals OR CSSCI OR CSCD OR CAS | Epidemic, teaching, COVID-19, SARS, public health emergencies | Academic journals; English And Chinese extension | (theme = epidemic) AND (theme = teaching) OR (theme = coVID-19) OR (theme = public health emergency) | There is no limit | Teaching, Online teaching | 140 |
| Springer Online Journals | Teaching, COVID-19, Emergency | Springer Online Journals | Teaching AND COVID-19 OR emergency | There is no limit | Education,Educational Philosophy,Educational Technology,Technology and Digital Education | 54 |

Chinese literature retrieval scope of this article covers the source journals of SCI, EI, CSSCI, CSCD and CAS , English literature retrieval originates from Springer Online Journals, according to the research topic of this article, for the sake of the general emergency disposal of education under the education activity and the outbreak of disposal, so the search keywords are used as follows in the first stage of retrieval: 1.Outbreak; 2. Teaching; 3. COVID-19; 4. Major public health events to ensure research on the teaching anytime during the outbreak rather than after that, there are totally 3,681 papers were retrieved from the source journals of EI, SCI, CAS, CSSCI, CSCD and Peking University in terms of titles and keywords, including many articles with low relevance to the topic of this paper, which are more inclined to the topics of medicine, medicine and diseases, etc. Therefore, on the basis of the retrieval results, a total of 140 search results

selected as "teaching" or "online teaching"were obtained from the literature on the subject of online education.

The English literature retrieval source of this paper is from Springer Online Journals. The search terms are 1. Teaching; 2. COVID - 19; 3.Emergency, and finally a total of 508,128 search results are retrieved. Similarly, on the basis of the search results, subjects are screened as Education Philosophy, Educational Technology, Technology and Digital Education, among which 54 search results are selected for literature related to Education and teaching. The final retrieval details of the literature and the results are shown in Table 1.

### 2.3.2. Literature Selection Criteria

The author screened the contents obtained from the initial search based on the core issues studied, and the selection criteria are as follows:

1. The literature should come from the core journals and be cited more often with certain authority.

2. The core theme, keywords, abstractions and conclusions of the literature should be related to the theme of this study.

3. Literature should have specific research methods, such as investigation method, simulation method and observation method.

4. The literature can clearly show the author's views.

5. No less than 3 pages

### 2.3.3. Literature Selection Results

Using the above literature selection criteria, the retrieval results of three authoritative databases were screened twice. In the first selection, according to the literature source, citation frequency, theme, key words, abstract and other criteria, 48 literatures were selected from core journals and highly consistent with the research theme, including 32 literatures in Chinese and 16 literatures in English. And according to the third and fourth article selection criteria for preliminary screening of selected 48 articles secondary screening, ruled out some literature types simply narrate with too short or no clear conclusions of the research content and no specific research methods or the results of the study, finally there are 11 articles conforming to all filters, then the systematic analysis is conducted subsequently.

## 3. Data Statistics and Analysis

In this paper, NVIVO 12 Plus software was used to encode and classify the contents of 11 Chinese and foreign literatures in the form of nine-dimensional literature connotative data extraction. The data results show that all the 11 literatures at home and abroad are related to the research background, which can be divided into four categories:

(1) As of the writing of the literature, the global epidemic trend and the general situation of the author's country, home quarantine is inevitable (it is inevitable to attend classes online);

(2) Measures taken by all sectors of society to cope with the epidemic: the state has introduced policies, schools have switched from offline to online classes, and parents and students actively cooperate in class;

(3) The current feasibility of online classes has the following conditions: technical level (the provision of online courses platform), student equipment (electronic equipment for online courses);

(4) Hidden trouble in current online class mode: lack of experience of teachers. In general, the research background of each paper is incredibly comprehensive, and the analysis of epidemic trend and anti-epidemic measures reflects the timeliness of information.

In addition to the research background, 10 literatures were collected by means of interview, questionnaire survey, observation, literature, etc. The questionnaire survey was the most prominent one. Many literatures had a large questionnaire base and involved a wide range of personnel (teachers, students, parents, education managers, etc.). Among them, the respondents involved educational administrators and teachers from Germany, Switzerland, Austria and Spain. The data are scientific, representative and reliable. Among them, half of the literature does not put forward clear research problems, just stay at the narrative level.

However, the literature only raising research questions is relatively vague, and the research questions are not specific and in-depth enough, which can be summarized into three categories:

(1) How to carry out online teaching;

(2) Features of current online teaching;

(3) Current online teaching problems and how to solve them. For these research problems, literatures are only summarized based on data or facts collected through interviews, observations and literatures.

Under the background of epidemic disease, teaching research is the emerging research topic. The research topic is too novel, and there is not enough quantity and quality of research papers published internationally, which is the reason why the selected literature does not clearly put forward the research question or the question is not profound. Similarly, most of the literatures lack theoretical basis, the 3 articles which only involves the theoretical basis were respectively adopted the fundamental principle of online education and teaching theory. Fishbein and Ajzen (1975) proposed the theory of rational behavior (TRA), Davis (1989) put forward the technology acceptance model (TAM) which is used to analysis the affecting factors of online teaching and Sangra (2002) put forward the teaching process of the five basic factors to improve the quality of online teaching. Lack of rigour and theoretical basis for guiding,most of the literatures have little use for reference.

The research results in the sample literature involve four types of subjects (students, teachers, parents of students, and education managers), two types of institutions (schools, government education departments) and two supports (online teaching platforms and education policies). It covers early childhood, primary and secondary education and higher education, as well as vocational education. The main research problem is the impact of online teaching and the corresponding measures. Almost all the 11 literatures selected in this paper have elaborated the research results of this problem.

## 4. Main Achievements

### 4.1. Research Conclusions of the Teachers

The research on the teachers is the most in-depth and detailed in the selected sample literature. Of the 11 sample references, 6 are mainly aimed at the research of teachers' behavior, so the research conclusion of teachers is more comprehensive and has a certain depth compared with other objects. The conclusion emphasizes the important role of teachers in online teaching. Online teaching has raised the requirements for teachers, and its workload has increased. In addition to full preparation, teachers' personal creative thinking is also needed to solve various new problems in the online process. Most of them are in a state of single-handedness and need to invest more time in designing learning activities that meet learners' cognitive and social needs. Therefore, teacher cooperation plays an important role, such as resource sharing and technical cooperation, which can provide support for individual teachers. In addition, teaching technology and equipment, college measures, teaching methods and teachers' attitudes would also affect the teaching effect. Xu Yilong (2020) used the Technology Acceptance Model (TAM) proposed by Davis (1989) to explain and predict the attitudes and behaviors of teachers in

vocational colleges in China during the COVID-19. It is concluded that the influencing factors of online teaching to teachers are: the creativity of the teachers, the easy operation of the online platform, the teachers' own attitude towards online teaching, and the research conclusions of teachers' self-efficacy. The use of this model makes the research conclusions more rigorous and objective, and also provides a case study for future online teaching related research. The research of Silvia Nuere (2020) is carried out from the perspective of two teachers, which makes a comparative study of the coping styles and differences of online teaching between distance teaching colleges and general offline teaching colleges in response to this emergency. This research perspective is very novel. By comparison, we can find out the lack of online teaching coping measures in general teaching colleges and obtain reference from the daily preparation of distance teaching colleges. However, the research lacks to develop the root causes of the research problems and more feasible measures.

## 4.2. Overall Research Conclusions for the Teaching System

Apart from six studies focused on teachers, the remaining five sample references study the teaching system as a whole, so the research objects involved include all parts of the teaching activities. This kind of research has a relatively equal depth of research on all topics. The research conclusions mainly include the characteristics of each subject, their attitudes towards online teaching, the problems encountered and the solutions.

### 4.2.1. Research on Students

Students are the key subjects in the teaching process, and as the recipients of education, the role played in the online teaching process is relatively passive, and various factors in other processes may affect them. The research conclusions for students mainly involve the following aspects: students' attitude and adaptability to online teaching, their performance in the teaching process and their connection with other subjects, and how to influence and guide students from the teaching process and ideological guidance level. Wang Dongdong (2020) pointed out that students' attitudes towards online teaching vary according to the differences between urban and rural areas and regions, as well as different ages and learning stages. 80% of the students have a positive attitude because they think online teaching is more suitable for their own learning rhythm. However, 16.5% of the students expressed concern about this. The concern mainly comes from the group of students with network and equipment problems due to limited conditions, such as rural areas. Online teaching is extremely difficult and even becomes a burden for students and teachers. Therefore, it has become important research issues on how the society gives effective help, how to improve itself and how to realize the normal operation of online teaching.

### 4.2.2. Conclusions of Relevant Researches for Colleges

The college's decisions and actions have an important impact on online teaching. At the same time, it also depends on the construction of Internet teaching platform and online teaching resources. The college's ability to use online teaching resources would begin to play a role. Wang Dongdong (2020) proposed the important significance of systematic service support for online teaching. Systematic service support includes the preparation of teaching resources carried out by teachers, curriculum developers and other parties in cooperation in the early stage, as well as the maintenance and service support for huge systems in the process of development, and the support system for continuous improvement and improvement of services in practice. It is a direction worthy of in-depth study and attention on how to establish, operate and manage this system.

### 4.2.3. Conclusions of the Research on the Learning Environment of Students

In addition to hardware conditions, the learning attitude of students is also influenced by personal characteristics, family factors, peer support, teacher support and guidance, etc. In the

research on how to support and promote students' motivation and will ability of home-based autonomous learning (Huber-Helm 2020), the cross-border data collection and analysis using school barometer found that students' personal personality traits largely determine their self-consciousness and learning efficiency of home-based autonomous learning during the COVID-19 period. Only about 1/3 of the students can concentrate on studying under such circumstances, but most of the students have less learning time and poor learning status. In addition to personal characteristics, the support given by parents, peers and teachers would also have a positive correlation on their learning effect. In the state of online home learning, the influence of family factors is greatly improved compared with offline teaching. In order to achieve the purpose of improving the quality of online teaching, Song Lingqing (2020) discussed the changes and impacts of students' learning environment and psychological state under the home learning mode, and put forward four stages of "teacher-parent-student" tripartite cooperation as the core development——"connection period, adaptation period, proficiency period, integration period", as well as the characteristics of each stage and the guiding strategies applied in different stages. Following research can conduct in-depth research on how to mobilize relevant influencing factors to play a positive role in students' online learning.

### 4.2.4. Research Conclusion on Online Teaching Methods

The main difference between online teaching and offline teaching should be considered to be the improvement needed in teaching methods. There are many online teaching methods proposed and studied in the sample literature, but perhaps due to the early publication of the existing literature, there is no opportunity to obtain sufficient online teaching data, so the research on this problem cannot be in-depth at many levels. Subsequent research has more opportunities for further research to verify or promote many expectations and assumptions put forward in the previous research. Xie Youru (2020) proposed several different types of online teaching methods. For example, "Online synchronous live teaching, online course asynchronous teaching, online double-qualification collaborative teaching, online multiple mixed teaching". However, the research results of different typical teaching methods only stay in the preliminary application of the proposed teaching methods in case schools, as well as the description of the application guidance and application status quo, which cannot continue to go deep. Following research can focus on the actual effect feedback generated by different teaching methods after application, as well as the differences generated by more applicable scenes and applications of different teaching methods. The case analysis process, thinking and data analysis process of the characteristics of online teaching methods are not listed and presented, but are still a summary of the current situation. Following research can further explain on this.

### 4.3. Recommendations and Initiatives

Half of the measures proposed in the sample literature are slightly vague in terms of initial policies, and a large part only plays the role of appeal and guidance in terms of policies. Although they put forward a good vision and direction, they do not put forward targeted and operable details. The following research should pay attention to avoid being too theoretical when the measures are put forward, and the research should go deeper into practical operation and concretize the measures.

## 5. Conclusion

This research has four study backgrounds, which include individual countries and the global epidemic situation, all walks response measures in epidemic, the feasibility of online teaching, the hidden trouble existing in the online teaching pattern. Using data collection methods such as interview, questionnaire survey, observation and literature, questionnaire survey is majority.

The data base is very large and covers a wide range of regions and countries, so it is representative.

In terms of the research conclusion, the research on the teacher group is most detailed and in-depth, online teaching is a huge challenge to teachers' creative thinking and emergency response.

The analysis of teacher groups also provides reference materials for future research on teacher behavior. After the analysis of the research results, it is not difficult to see that teachers play a leading role in online teaching. Therefore, teachers should pay attention to cultivate the ability of both online and offline teaching methods, so as to be orderly in the face of major emergencies.

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