

# ***Adaptation and Optimization of Teaching: A Systematic Review on Online Courses from a Sociocultural Perspective***

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**Abstract.** With the rapid development of science and technology and the far-reaching impact of the COVID-19 epidemic, online courses have grown significantly and expanded their coverage in various educational environments. This transformation has not only reshaped the traditional teaching and learning model but also brought new opportunities and challenges to educators and learners. Given the increasing importance of online education, this study systematically explored the existing literature on the impact of online education on Chinese students and teachers, hoping not only to provide valuable insights for teaching reform and help improve educational practice but also to provide a helpful reference for future research in this area. The researcher classified and screened 260 articles and finally explored 28 articles in detail. The research results showed that more articles were used to study the impact of online courses on students while neglecting their impact on teachers. This imbalance highlights an important research gap that deserves attention. The results of this study may contribute to a deeper understanding and provide some favorable information for the future development and research direction of online education.

**Keywords:** China, Online course, Higher education

## **1. Introduction**

The 4-year COVID-19 in China has made the education industry suffer a huge impact. Schools around China had to change the traditional education model constantly, guiding students and teachers to conduct education through various online teaching platforms [1]. However, online courses are a huge educational change for both students and teachers, and this transformation in learning and teaching methods is full of advantages and challenges [2]. This requires us to grasp the impact of online courses to provide guidance and suggestions to help students improve learning efficiency, classroom participation, and learning initiative, and provide more accurate references for teachers to improve teaching design and methods [3].

Based on the sociocultural theory that emphasizes social interaction, during the transition from traditional teaching models to online education, the forms of interaction between students and teachers have also undergone significant changes. The physical space of traditional classrooms no longer limits students, and the ways they interact with teachers and their surrounding environment have become more diverse and flexible. At the same time, online education emphasizes students' active participation, and teachers have shifted from lecturers to guides [4]. This change of role has

posed challenges for some teachers and also put them to the test of technological application. Therefore, in the process of transforming educational behavior from offline to online, both students and teachers have been affected to some extent.

Meanwhile, compared to primary and secondary school students, the learning environment of higher education students is more influenced by social, cultural, and other complicated factors [5]. Therefore, this study selects higher education students and teachers as the research subjects and explores the impact of online courses by reviewing existing literature. The research asks:

In the China context, what are trends and patterns in contemporary research on the impact of online courses on students and teachers engaging in higher education?

## 2. Theoretical framework

The analysis draws on sociocultural theory proposed by Soviet psychologist Vygotsky [6]. This theory emphasizes that individual cognitive development is formed through interactions with others within a specific sociocultural context [7]. One of the core concepts, the Zone of Proximal Development, also believes that learners can achieve a level of learning beyond their current abilities with the help of others [8]. In addition, the application of cultural tools is also an important element of socioculturalism. With the popularization of information and communication technology in education and daily environments, scholars are striving to expand concepts such as distributed cognition from a socio-cultural perspective, including not only humans and artifacts but also digital technology [9]. Therefore, the systematical review aims to examine whether there are trends and patterns in how online courses affect students and teachers in higher education in existing research, particularly in terms of social interaction and the use of cultural tools.

On the one hand, as Vygotsky said, individual cognition develops because of interactions with others. Therefore, the interaction between a student and a student and that between teacher and student is particularly important in the process of online education. In the context of rapid technological development, teachers play a scaffolding role, meaning teachers only make the appropriate control and intervention during students' learning process [10], which makes the effectiveness of interaction increasingly important. Therefore, the significant transformation of their identity has made the impact of online courses on students and teachers more apparent. How the power of the Internet can be used reasonably has gradually become a new research topic. So, this article aims to understand the extent of research on this part in the context of online education, such as whether it is comprehensive and whether it simultaneously focuses on both students and teachers. In this way, we can analyze the existing research on teacher-student interaction. On the other hand, sociocultural theorists recognize that cognition is not an individual action but rather dispersed among individuals when they participate in cultural activities. Therefore, the construction of thinking is closely related to specific contexts, guided by others, and influenced by specific cultural tools [11]. In the current social context of "Internet plus", cultural tools, namely technological tools, play a key role in knowledge dissemination and learning [12]. Various media, such as video games and analysis tools, not only enable students to form new attention distribution patterns but also create new thinking habits [13]. Therefore, this article aims to summarize the research extent of existing literature on cultural tools in this context by analyzing the platforms used in online courses.

In summary, the two important viewpoints of social interaction and the use of cultural tools proposed by sociocultural theory are highly relevant to the research question of this article. The main challenge faced by online teachers is not only the issue of social interaction but also the effective use of technology [14]. And these two parts play a crucial role in shaping students' thinking, helping them learn, and so on. Therefore, this article will use sociocultural theory as a

theoretical guide to study the impact of online courses on students and teachers, especially in terms of interaction and tool use.

### 3. Method and data sources

#### 3.1. Literature search

Our method was a systematic literature review. To systematically identify relevant studies for this review, a comprehensive literature search was conducted using the EBSCO database on August 27, 2024, thereby providing a thorough review of both recent and past literature, and the search results show there are a total of 260 relevant articles published. The search terms utilized for this review are detailed in Table 1. These terms appearing in the abstract were selected based on their relevance to the research question and were applied to various fields and subject areas covered by EBSCO. The search was executed with appropriate Boolean operators “AND” to combine various classifications and “OR” was used to connect keywords and refine the results. These articles were then imported into Covidence for further management and screening.

Table 1: Examples of search terms used in EBSCO database

Search Term Category (Joined with AND)	Search Terms in Abstract (Joined with OR)
China	China
Online course	“online course*” OR “open online course*” OR “online class*” OR “online education” OR “online instruction*” OR “online platform*” OR “virtual course*” OR “virtual class*” OR “virtual instruction*” OR “virtual teaching” OR “Internet course*” OR “course on the Internet” OR “Internet-based class*” OR “digital class*” OR “digital education” OR “remote education” OR “distance learning”
Higher education	“postsecondary education” OR “tertiary education” OR “advanced education” OR “advanced course*” OR “further education” OR “further course*” OR “high education” OR “senior education” OR “higher teaching” OR “higher instruction*”

#### 3.2. Literature screening

In the further screening process, Covidence automatically removed 50 duplicate items, and then the researcher screened the remaining 210 articles by examining the titles and abstracts using the following exclusion criteria:

Must be about education in China.

Must focus on higher education (elementary, middle, and high education studies are excluded).

Must be focused on the experience of teachers and students (treating schools or parents as subjects are excluded).

The impact of MOOCs or online distance learning on students or teachers must be a topic of the study.

Must be written in English and Chinese.

All articles have undergone careful consideration by the researcher to determine whether they are relevant to the research question. In the preliminary screening, it was determined that 122 articles were not related to the research topic. Remaining 88 articles were for further full-text assessment.

The full texts will be searched from various databases such as EBSCO for further detailed screening. Additional 60 articles were excluded due to inconsistency with the criteria. For example, it's not about students and teachers, but about schools or policies; The wrong focus, which focuses on the technology itself; Wrong content, which focuses on the factors that have an impact, rather than the impact itself, as shown in PRISMA flow diagram (see Figure 1). Ultimately, we identified 28 studies suitable for in-depth analysis and further exploration.

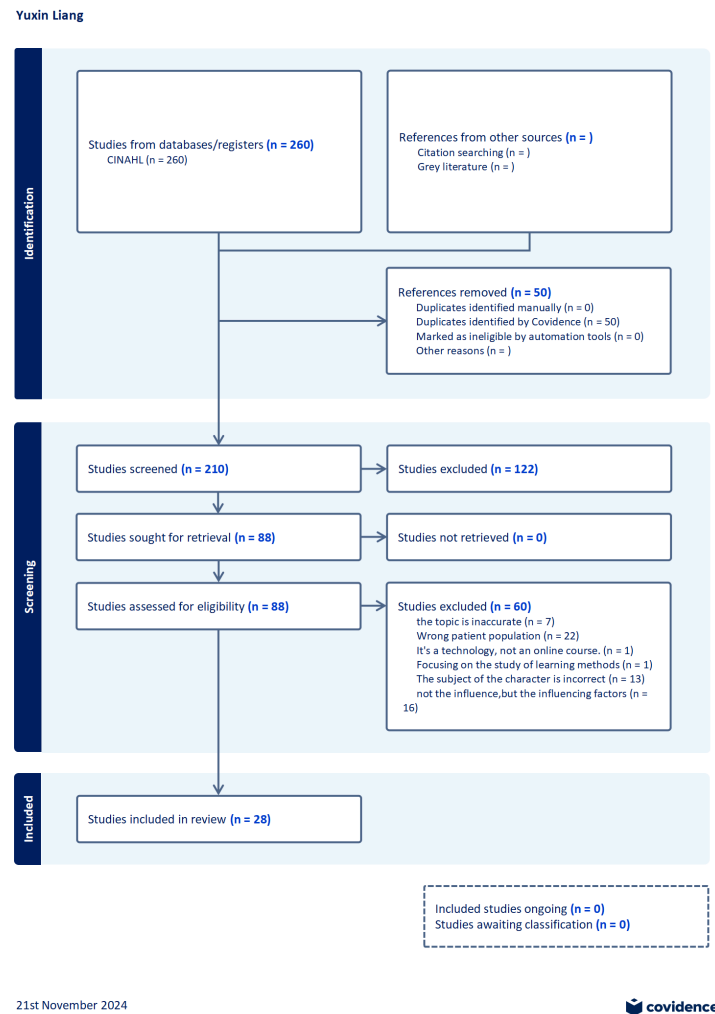


Figure 1: PRISMA flow diagram of the research process

### 3.3. Literature analysis

After the screening process for the studies, the researcher proceeds to the extraction of analysis. At this stage, based on the main research question, the researcher designed several key extraction questions to code the data to analyze how relevant literature discusses the impact of online courses on students and teachers of higher education. Firstly, is the research subject of the article only for students, teachers, or both? In this way, we can distinguish the research bias of existing literature. What's more, the research results, namely the impact on students or teachers and whether it is beneficial to the education industry, can help researchers obtain more detailed information from existing literature and explore whether their research dimensions are in line with the theoretical

framework. In addition, the researcher also summarized specific online course platforms and learning subjects to assist in the review and draw more accurate conclusions.

Following the full-text screening, we quantified the number of articles related to each discussed category, and counted number of articles were additionally converted into percentages. Finally, we were able to produce relevant graphs based on these data as shown in figure 2 and table 2 and described below.

#### 4. Findings

This article aims to investigate the impact of online courses on students and teachers in higher education, particularly exploring the interaction between the two or the application of online course technology based on socioculturalism. So the first step, the researchers classified the research objectives and found that in about three-fourths of the literature (71.43%) online course impacts were studied but focused on students only. Another significant proportion (25%) of studies mentioned the impact of online courses on students and teachers, involving topics like interaction between teachers and students. While only one article wrote about the impact of online courses on teachers, accounting for only 3.57% (see Table 2). This makes the research results more one-sided and ignores the joint role of students and teachers in educational behavior. In addition, even in a small portion of studies that simultaneously focus on students and teachers as research targets, most studies only discuss the current phenomenon of online education or inquire about their subjective views on online courses through questionnaires. They rarely apply explicit educational theories for analysis, and such subjective research often lacks strong theoretical support for educational issues in this field, resulting in a lack of objectivity in research results.

Table 2: Induction of research objectives

Category of analysis	Distribution of articles	Example
From the perspective of students	71.43% of articles	An example of this perspective is from an article by Yan Dai and other researchers [15], which investigated the self-regulated learning, academic rights, and academic achievements of Chinese university students during the epidemic period. This study only focuses on the impact of online courses on students after the change in learning environment.
From the perspective of teachers	3.57% of articles	An example of this perspective comes from an article by Xuan Guo [16], which explores how teachers use science and technology to guide students' writing, which can help teachers to establish educational concepts. This study only involves the impact of online courses on teachers and is conducted from the perspective of teachers.
From the perspective of both students and teachers	25% of articles	An example of this perspective is from an article by Jie Huang [17], which illustrates that teachers must be familiar with new online teaching tools, adjust teaching strategies and methods to improve teacher-student interaction. And students need to be more proactive and self-disciplined. This study involves the impact of online courses on students and teachers, and is conducted from both perspectives.

Table 2 Secondly, as research and sociocultural studies have clearly shown that the influence of cultural tools is also crucial in the educational process, therefore, the use of technology and platforms in online courses should also be taken into account. The results show that in the literature that needs to be classified and extracted, most of them are not based on a specific platform but

analyzed from the broad level of online courses, accounting for 57.14% of the articles (see Figure 2). The results highlight important aspects that future researchers need to supplement, which will inspire Chinese higher education to adjust teacher-centered teaching, enabling online teachers to better utilize technology and receive fully diversified technical training [18].

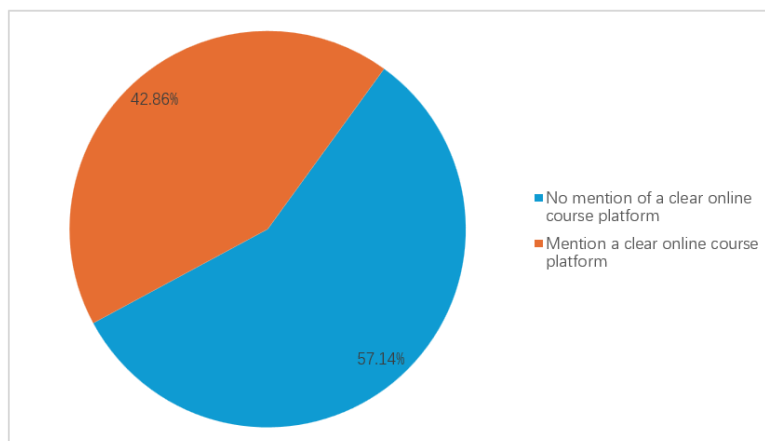


Figure 2: Induction of research objectives

In addition, the researcher found that less than half of the articles focused on a particular discipline, and most did not concentrate on a single field. Tools can not only help people adapt to the environment but also shape individual thinking patterns [19]. The logic of each subject and the thinking patterns of students and teachers engaged in this subject are different. This means that future researchers should explore the effectiveness of online courses as a cultural tool in different subjects to help teachers in various subjects better adapt to new technologies, and adjust teaching strategies and styles as well. It is also significant to make online courses a powerful aid for student learning and teacher-student interaction.

## 5. Conclusion

Our findings on the impact of online courses on higher education teachers and students highlighted some research gaps in the existing literature. Current research tends to focus on the perspective of students, neglecting the important role of teachers. Students need to actively participate in learning and interact with others to make rapid progress. Teachers also need to change their roles from traditional teaching methods of lecturing to guides, providing scaffolding for students to help them improve. In addition, diversified and targeted research should be conducted on online course platforms to help teachers better improve their teaching design and adapt to the current social environment. We hope that this article can provide a comprehensive summary of the insufficient research on online courses, which can serve as a reference and lay a foundation for future scholars' in-depth research.

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