

A Research on Online Teaching Behavior of Chinese Local University Teachers Based on Cluster Analysis

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ABSTRACT

COVID-19 boosted online teaching and yielded a significant amount of valuable data, yet utilizing it for education is a challenge. This study employed the K-means clustering method to analyze the online teaching behavior data of 1147 courses from a local university in East China. As a result, five types of courses with distinct teaching behaviors were identified: resource preparation (4.1%), online classroom interaction (3.6%), task evaluation (9.2%), active interaction (15.5%), and inactive interaction (67.6%). By examining the relationship between these course types and academic performance, the authors discovered no significant difference in the academic performance of students in the three course groups (i.e., resource preparation, online classroom interaction, and task evaluation) and students in the inactive interaction course group. However, there was a significant disparity in academic performance between students in active interaction courses and students in inactive interaction courses. These findings can assist teachers in planning online teaching activities more effectively and improving teaching outcomes.

KEYWORDS

big data, cluster analysis, online teaching behavior, university teachers

INTRODUCTION

The onset of the COVID-19 pandemic in 2020 had far-reaching consequences on public health and the well-being of millions of individuals worldwide. Governments worldwide implemented various measures to mitigate the spread of the virus, leading to significant disruptions in various sectors, including education. In many countries, mandatory lockdowns rendered face-to-face instruction in educational institutions impossible, promoting distance learning as a practical substitute for traditional classroom education, particularly in universities.

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In 2019, the Department of Higher Education of the Ministry of Education of the People's Republic of China approved the implementation of the Double Ten Thousand Plan or the Gold Course Construction Plan in all colleges and universities across the country. This initiative aimed to develop 10,000 national first-class courses and 10,000 provincial first-class courses, with 3,000 online "gold courses" and 7,000 blended "gold courses" (offline and online) (Ministry of Education of the People's Republic of China, 2019). The creation of the third batch of national first-class courses has already begun. The COVID-19 pandemic affected the regular opening of classrooms and traditional in-person teaching in colleges and universities. To address this, the Ministry of Education recommended that institutions make use of massive open online courses (MOOCs) and high-quality online course teaching resources at the provincial and school levels. With the aid of experimental resource platforms and various online course platforms at all levels, as well as on-campus online learning spaces, online learning and teaching must be actively carried out to ensure teaching progress and quality during the epidemic prevention and control period. This helps in achieving the objective of suspending classes without stopping teaching and learning. Additionally, the Ministry of Education of the People's Republic of China (2020) recommended 22 online course platforms that could support online teaching services in colleges and universities during the epidemic prevention and control period, such as Icourse Network, Wisdom Tree, and Superstar Learning. Driven by the Ministry of Education, online courses in higher education have rapidly developed. Different colleges and universities have established online courses with unique features on network platforms, leading to an increase in online curriculum teaching.

In April 2022, EDUCAUSE, which is the U.S. higher education informatization association, released the *2022 Horizon Report: Teaching and Learning Edition* (Pelletier et al., 2022), which identifies hybrid and online learning, learning analytics, and big data as the future of higher education. According to Long and Siemens (2011), big data and its analytics have become the most significant factors influencing the future of higher education. The rapid development of online curriculum teaching in Chinese colleges and universities after the epidemic has also provided an opportunity for big data research on users' education on major online platforms. Statistics show that, in China's colleges and universities at all levels, the number of students reached tens of millions. Online teaching in the teaching platform has left a vast amount of teaching data. In the network teaching environment, mining the big data of teachers' and students' teaching and learning on the platform will help to find the characteristics of teachers' and students' behaviors and their changing rules, providing theoretical support for education administrators in colleges and universities to improve their teaching decisions, optimize resource allocation, and change higher education teaching. The majority of extant studies on online teaching behavior are focused on students and their various online learning behaviors and activities. However, there has been limited research on teaching behavior from the perspective of instructors, specifically through the collection and analysis of substantial amounts of online teaching data (Zhang et al., 2021). In this study, the authors investigated the teaching behavior of teachers in a university in East China, analyzed the data of teachers' generative teaching on the online course teaching platform, and discussed the characteristics of teachers' online teaching behavior, in order to improve the teaching quality of higher education and promote the reform of the higher education model.

Teachers' Online Teaching Behaviors

Behavior refers to externally observable activities that are influenced by an individual's thoughts and intentions. Human behavior is shaped by a range of factors including one's ideological beliefs, values, and living environment (Ding, 2007). When it comes to teaching, the term "teaching behavior" encompasses all actions teachers take to stimulate, maintain, and support their students' learning. They include activities such as providing guidance and services to students (Li, 2005). The advent of online education has produced a growing interest in how teachers' teaching behaviors operate in digital learning environments, as opposed to traditional classroom settings.

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