Semantic Analysis and Model Construction of Hybrid Teaching

Zejiang He[1,#], Yanfan Yuan[2,#], Yingyu Cui[2,*]

[1]*Tongji University School of software Engineering, Shanghai, China*
[2]*Department of Cell Biology, Tongji University School of Medicine, 200092, Shanghai, China*
[#]*These authors contributed equally to this work and share first authorship*
[*]*Corresponding author. Email: yycui@tongji.edu.cn*

ABSTRACT

Purpose: To review the history of the mixed teaching mode, especially the related milestones. **Procedures:** Retrieving, classifying, reading, analyzing the domestic and international literatures in the field of hybrid education, and then trying to summarize the relevant semantics and construct the more perfect model of hybrid teaching through research-based learning. **Methods:** CNKI, Wan-Fang, and VIP *etc*. databases were used to retrieve the related literatures, ProcessOn online drawing software was used to draw the relevant flow charts or frame charts. **Results:** The semantic concept of hybrid teaching was clarified, the research status of hybrid teaching model was summarized, the corresponding research blanks were picked out, the novel hybrid teaching frameworks were constructed and finally the concrete implementation methods were put forward. **Conclusion:** The present study summarized the history of hybrid teaching and the corresponding research methods, further laid a solid foundation for the further research on Empirical Study of Research-based Learning.

Keywords: Hybrid teaching, Research-based learning, Critical and creative thinking, Higher education.

1. OVERVIEW

Hybrid teaching is a novel teaching model based on "Internet + education", aimed at making up for the shortcomings of traditional teaching with information technology. It is student-centred and performed with the Internet tools, online teaching, and offline teaching in a certain proportion, the former as the main, the later the assistance, during which efficient interaction occurs between teachers and students, and among students as well. Integrated the advantages of traditional teaching into online teaching, it can provide students with abundant teaching resources, support individualized learning, and greatly improve teaching efficiency. [1]

2. BACKGROUND

With the advancement of Internet technology and the promulgation of related policies, the concept of "Internet + education" was put forward, which has enhanced the development of hybrid teaching. [2]

3. THE ESSENCE

Traditional teaching and online teaching have their respective advantages and disadvantages. The hybrid teaching integrates their advantages. The purpose of hybrid teaching is to stimulate students' interest in learning and to guide their rational behaviour of innovation, exploration, introspection, and careful reflection in the process of learning.

4. RESEARCH STATUS

4.1. Abroad

Many researches were focused on different modes and related application scenarios of hybrid learning and teaching, and fruitful research results have seen the world. Thereby a variety of teaching modes have been put forward, such as skill-driven, attitude-driven and ability-driven mode, *etc*.

Still a few scholars explored the internal mechanism and influence of hybrid teaching on students' learning. The former mainly refers to the internal correlation mechanism between the implementation of hybrid

teaching and students' learning behaviours, such as the influence on students' learning habits and learning efficiency, therefore more in-depth than the study of hybrid teaching itself. For example, Patni *et al*. showed that content quality and online discussion strategies play an important role in improving the effect of students' mathematics learning. [3]

4.2. Domestic

According to China national knowledge infrastructure (CNKI) database, the domestic researches on hybrid teaching shows a steady growth trend (Figure 1). According to (VIP) Chinese database, relevant research results emerged in 2004. From 2004 to 2008, the growth is slow and stable. The research topics in this stage mainly involve the theoretical research and application exploration of hybrid teaching. From 2009 to 2014, with the emergence of e-learning environment, digital resource construction, mobile learning, universal learning and distributed learning, the growth of literatures accelerated. [4] Since 2015, the number of literatures has reached a climax, peaking in 2019 (Figure 2). The research direction gradually involves the construction of teaching model, application practice and reflection, and diversified application scenarios, *etc*.

Present literatures mainly focus on a specific course, and makes in-depth research on various methods of hybrid teaching and makes discussion on their application effect, e.g. Zuo *et al*. took "University Computer Foundation" course as an example, through the comparison of students' experience of traditional teaching and online & offline hybrid teaching, found that students have higher satisfaction and learning intention under hybrid teaching.[5] According to the existing literature, China has not established a hybrid teaching theory and scheme generally applicable to most courses, and lacks a systematic theoretical system.
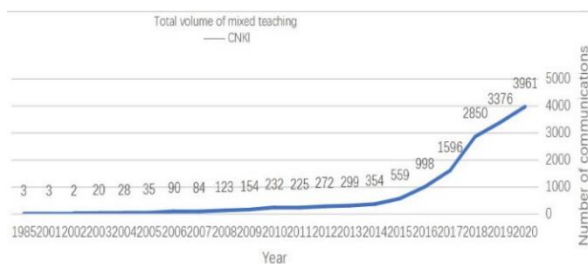

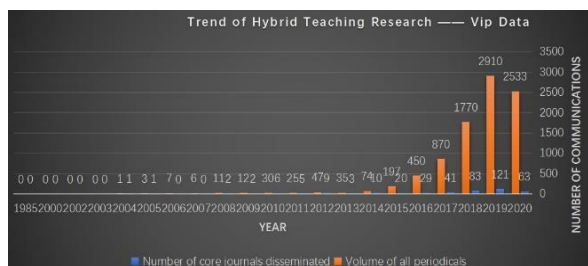**Figure 1** Literatures' Trends from CNKI

Figure 2 Literatures' Distribution from VIP

These papers demonstrated a variety of teaching modes, strategies and implementation plans for hybrid teaching. For example, Guo *et al*. achieved the goal of scientifically adjusting teachers' teaching decisions and accurately recommending students' personalized learning content through the analysis of online teaching data, providing data support for teachers' decision-making optimization under the hybrid teaching. [6] Wang *et al*. analysed the characteristics and learning effects of hybrid teaching under different modes, as well as the teaching strategies of hybrid teaching during the epidemic period [7]. However, the data of research are not enough. In our country, most of the hybrid teaching focuses on the teaching mode itself, while there is less research on the internal correlation mechanism between the teaching mode and students' ability and accomplishment. If we can find the positive influence of hybrid teaching on students' thinking capability, as well as the relevant paradigms and mechanisms, it will play an important role in promoting the development of hybrid teaching and further enrich the theory of higher education.

4.3. Summary

Summarily, scholars are more concentrated on the specific practice of hybrid teaching in some course, carried out a lot of research, achieved fruitful theoretical results, and further reached a certain height. However, a universal theoretical teaching system for all courses has not yet established. Most of them only put forward the teaching steps, teaching methods and evaluation system of specific courses.

On the other hand, as for the research content, there is the problem of insufficient research depth. Most scholars only study hybrid teaching itself, or the specific application and teaching practice in different situations, or the role of hybrid teaching in improving classroom mode and teaching efficiency, but the research on the effects of hybrid teaching on students' thinking capability and the corresponding internal mechanism is obviously insufficient.

5. CONNECTION

Our project collects the relevant data of hybrid teaching, expecting to compensate the blank of hybrid teaching research and enrich the theory of higher education. Further, explore the influence of research-based learning on students' thinking capability under the hybrid teaching. Only by hybrid teaching activities, can we collect and analyse a lot of experimental data and finally discover the internal mechanism. In addition, study the effects of hybrid teaching on students' thinking capability has profound significance, which also conforms to the development of education and teaching and the common expectations of education from all walks of life.

6. MODEL CONSTRUCTION

In the traditional teaching, all students' learning progress is consistent, which to a certain extent curbs the personalized learning. In the hybrid teaching, teachers rely on the online teaching platform, record teaching videos, focus on basic knowledge points, and students can carry out personalized learning according to their own learning habits and time-table rules.

In physical classroom, teachers focus on the key and difficult points, and guide the students to perform open thinking, thereby help them find, think and solve problems, and exercise their critical and innovative thinking during hybrid teaching (Figure 3). Teachers share learning materials and other teaching resources with students to achieve a reasonable allocation of resources for students' hybrid learning (Figure 4).
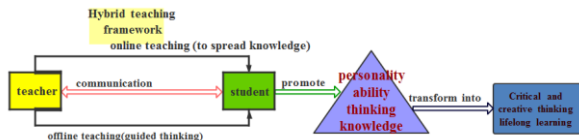

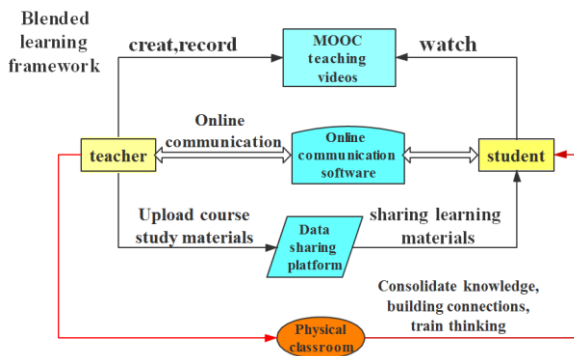**Figure 3** Hybrid Teaching Framework

Figure 4 Hybrid Learning Framework

6.1. Interdisciplinary, Cross-cutting Learning

Interdisciplinary learning can make students connect the knowledge of different subjects in the process of learning, and form open, divergent, and connected thinking, which is conducive to cultivate students' critical and creative thinking. Authors suggest carrying out hybrid learning among different disciplines, constructing hybrid learning courses and implementing hybrid learning projects (Figure 5).
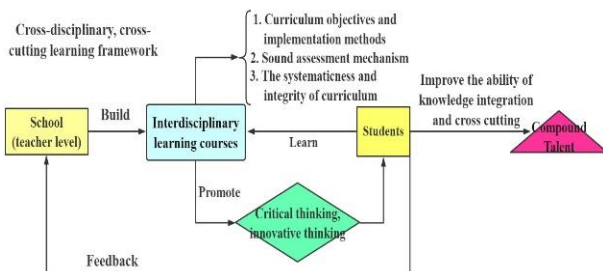

Figure 5 Disciplinary Cross-cutting learning framework

6.2. Curriculum Architecture Establishment

Curriculum framework includes curriculum objectives, teaching tasks and implementation plans, resource allocation and integration, assessment methods, evaluation indicators, teaching feedback, *etc*.

6.3. Aptitude for Personalized Learning

Hybrid teaching helps students carry out personalized learning. With the help of Internet technologies such as big data and cloud intelligence analysis, we can analyse students' learning data, finds out the loopholes of students' knowledge, recommends personalized learning resources, and formulates respectively personalized learning strategies.

6.4. Endow Habits for Continuous Learning

The development of hybrid teaching is conducive to students' sense of achievement and satisfaction in the process of learning, so as to encourage students to carry out continuous learning.

7. CONCLUSION

Summarily, the history of hybrid teaching and the corresponding research methods were summarized and comparisons among them were also performed in the present study. Furthermore, hybrid teaching frameworks at different levels were put forward for the sequent research aiming to endow students with capabilities of continuous learning and lifelong learning *via* online & offline hybrid research-based teaching & learning.

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