SHORT PAPER

A Study on the Influence of Hybrid Teaching on Students' Learning Attitude and Learning Confidence

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ABSTRACT

Intelligent terminal equipment is becoming extremely popular, and online learning has been increasingly accepted by people. In this context, it is particularly important to consider the ways of activating students' interest in learning, improving their learning efficiency, and perception of network learning, as well as whether they can meet the requirements of the curriculum. The participants of this study are university students from China's Fujian Province. According to the findings, it is suggested to improve the hybrid teaching resources, help teachers establish a correct outlook on learning, and improve their online learning management abilities.

KEYWORDS

hybrid teaching, learning attitude, learning confidence, learning management, self-learning strategies

1 INTRODUCTION

With the rapid development of emerging technologies and industries such as cloud computing, big data, artificial intelligence, and the Internet of Things, the Internet continues to integrate with traditional industries. The Internet has penetrated people's daily lives and workplaces, becoming an indispensable support for people. Under the environment of "Internet + Teaching," the wide application of new technologies and tools has brought multi-source, optional, and easy availability of information. Moreover, teachers are no longer the authority or the only source of knowledge. The "ubiquitous" learning environment better meets the needs of students' autonomous and personalized learning; in addition to this, teachers and students can interact in real-time [1]. Hybrid teaching organically integrates traditional classroom teaching and online teaching. It also effectively integrates the advantages of both classroom teaching and online teaching; these two modes interact with each other to provide students with more systematic and improved teaching services. Therefore, in the Internet era, the ways of activating students' interest in learning, improving their learning efficiency, and perception of network learning,

as well as whether they can meet the requirements of the curriculum, are particularly important.

In an effort to fill a critical gap in the relevant literature and contribute to the literature by enriching the research results in the field of online education and providing a reference for the optimization and improvement of hybrid teaching methods, this study uses the survey method to explore the influence of hybrid teaching on students' learning attitude and learning confidence.

2 THEORETICAL BACKGROUND AND HYPOTHESES

2.1 Hybrid teaching and learning attitude

Chen et al. [2] pointed out that the combination of "online and offline" hybrid teaching is of great benefit in terms of improving the quality of teaching and developing students' learning skills, habits, attitudes, and social skills. Liu et al. [3] studied the effectiveness of stem learning for students in H city, Zhejiang Province, using a mixed-methods approach. The results revealed that stem has a positive effect on students' learning attitudes, subject learning, and higher-order ability, as well as an upward trend in the mentioned affective and cognitive aspects. Hsu [4] proposed that hybrid teaching makes Chinese teaching a complete, purposeful, and practical activity so that learners can learn quickly and fully in a natural learning environment and continue to learn in natural life situations. Therefore, their learning attitude improved. As a result, hybrid teaching has become an effective and widely used teaching method. Prescott et al. [5] highlighted the advantages of online learning through massive open online courses (MOOCs) and hybrid teaching, which combines traditional classrooms and MOOCs. It was found that adopting this hybrid teaching method cannot only expand the audience of the course under the current shortage of qualified teachers but also improve interaction with students by enhancing their learning interest and attitude.

2.2 Learning attitude and learning confidence

Hao et al. [6] investigated online learning among university students and used SPSS 22.0 to analyze their attitudes toward online learning. According to their findings, students have a positive perception of and high recognition of online learning. The Internet is the gateway to future life and one of the learning methods that students willingly accept. At the same time, online learning improves students' self-confidence to a certain extent. Liu et al. [7], through a descriptive analysis of college students' SPOC learning attitudes, found that college students overall have a good attitude toward SPOC learning. However, their study revealed relatively low confidence in online learning management. College students should be helped to establish a correct perception of SPOC learning to improve their learning confidence. Sun and Hsieh [8], found that students have significant differences in their English reading performance before and after interactive hybrid teaching. It was found that students made significant progress in English reading comprehension. Most students had positive learning attitudes towards interactive hybrid teaching and interface design. Since hybrid teaching was found to be more complementary than traditional teaching or pure online teaching, it has the potential to improve learning confidence. Alsowayegh et al. [9] mentioned

that combining traditional teaching and online teaching with the hybrid teaching method has several advantages in terms of establishing effective teaching. The most prominent effect of the hybrid teaching method is the improvement of students' learning satisfaction and attitude. Hybrid teaching methods are more complementary than traditional teaching or pure online teaching, which can improve students' learning attitudes and, in turn, enhance their learning confidence. Tarmuji et al. [10] studied the relationship between students' learning attitude, learning confidence, and learning performance. According to their findings, the more experience students have participating in learning activities in terms of thinking and analytical ability, the higher their learning confidence and learning performance will be. In other words, as their attitude toward the relevant courses improves, so will their confidence in learning.

2.3 Hybrid teaching and learning confidence

Wang Kun et al. [11] analyzed the effect of hybrid teaching and its suitability for large classes. The results showed that the hybrid teaching method was suitable for large classes and could improve teaching effectiveness and students' confidence in learning. Dong [12] discovered that Internet plus Program of Alternative Certification for Educators (PACE) teaching cannot only significantly improve pathology students' achievement but also their interest, self-confidence, competition, and cooperation. Zhao et al. [13] used a questionnaire to analyze students' evaluations of hybrid teaching. The results revealed that students' learning discipline and initiative had improved significantly. Additionally, it was found that students' recognition of hybrid teaching was high, which was conducive to their confidence in learning the course well. Joo et al. [14] concluded that there were significant differences in academic performance between hybrid learning and online digital symbol learning, with the academic performance of hybrid learning surpassing that of online digital learning. Similarly, there were also significant differences in learning confidence between blended learning and online digital learning, with the learning confidence of blended learning also higher than that of online digital learning.

Summing up the above literature review, the following hypotheses are therefore proposed in this study:

H1: Hybrid teaching has a significant positive impact on learning attitudes.
H2: Learning attitude has a significant positive impact on learning confidence.
H3: Hybrid teaching has a significant positive impact on learning confidence.

3 METHODOLOGY

3.1 Data collection and analysis methods

This study uses the survey method to collect data from the students at a university in China's Fujian Province through email and a questionnaire linked to the star network. A total of 300 questionnaires were sent out. After deducting the no-availability questionnaires, there were 251 valid questionnaires, with an effective recovery rate of 83.67%. This study used regression analysis to understand the relationship between hybrid teaching, learning attitude, and learning confidence.

3.2 Operational definition

Entrepreneurship. This study cited the general hybrid teaching mechanism of Jin [15], including the following three key items:

1. Plan and objectives: Teachers guide students to set personal goals and plan their time through the self-discipline monitoring form. In the learning process, teachers can understand students' learning status and give specific suggestions by browsing the self-discipline monitoring form.
2. Implementation and monitoring: By examining the strategies selected by students, teachers can understand whether students encounter difficulties or maladjustment in the process of learning. At the same time, it can provide timely evaluation opinions to let students know whether their learning strategies are appropriate.
3. Self-learning strategies: Students review their learning effectiveness to find the most appropriate learning strategies. Teachers can also give feedback based on students' learning processes, and encourage them to try to adjust to more appropriate learning strategies.

Learning attitude. The learning attitude [16] cited in this study consists of three main components:

1. Emotional component: It refers to an individual's feelings about people and things around them including anger, sadness, and joy. Students, for example, may have different preferences regarding teachers, classmates, class atmosphere, school environment, disciplines, and other objects.
2. Cognitive component: Cognition refers to the individual's opinions and views on things. Different personal beliefs are formed from different personal views on things. Whether or not the individual's cognition is correct, it is a part of the individual's attitude.
3. Behavioral component: It refers to an individual's action tendency towards certain stimuli. Action tendency refers to the reaction to specific stimuli determined by the combination of emotional and cognitive factors. This reaction tendency is the behavior produced without prior notice.

Learning confidence. The learning confidence [17] cited in this study should include two items:

1. Learning effect: This includes test results, completion time, semester scores, etc.
2. Learning gains: This includes learning satisfaction, achievements, and preferences.

4 RESULT ANALYSIS

4.1 Reliability and validity analysis

Cronbach's alpha coefficient of each variable in this study and composition reliability (CR) were both greater than 0.9, and Average Variance Extracted (AVE) were found to be greater than 0.6. These scores indicate that the reliability level of each construct in this study was relatively high, as was the measurement scale. At the same time, the square root of AVE for all constructs (the bold data in Table 1) was significantly greater than the Pearson correlation coefficient between the variables in

the corresponding column. Therefore, the differential validity level of each construct in this study can be considered high.

Table 1. Analysis and test of reliability and validity

Constructs	Cronbach's α	CR	AVE	Hybrid Teaching	Learning Attitude	Learning Confidence
Hybrid teaching	0.925	0.916	0.659	0.812		
Learning attitude	0.916	0.911	0.642	0.511**	0.801	
Learning confidence	0.919	0.914	0.617	0.538**	0.507**	0.785

Note: **$p < 0.01$.

4.2 The results of correlation analysis and hypothesis test

Regression analysis is a common method for testing direct and intermediary effects. In this study, SPSS 21.0 software was used to test the above assumptions. In the analysis process, each variable was put into the regression model to test the relationship.

Table 2. Results of regression analysis

Constructs		Learning Attitude		
		Emotional Component	Cognitive Component	Behavioral Component
Hybrid teaching	Plans and objectives	1.978**	2.108**	2.285**
	Implementation and monitoring	1.785*	2.224**	2.218**
	Self-learning strategies	2.256**	2.309**	2.407**
F		25.427***	26.952***	33.014***
R^2		0.223	0.267	0.288
Adj.R^2		0.221	0.254	0.272

Notes: *$p < 0.05$; ** for $p < 0.01$; ***$p < 0.001$.

Table 3. Results of regression analysis

Constructs		Earning Confidence			
		Learning Effect	Learning Gain	Learning Effect	Learning Gain
Hybrid teaching	Plans and objectives	2.145**	2.215**		
	Implementation and monitoring	2.185**	2.401**		
	Self-learning strategies	2.414**	2.489**		
Learning attitude	Emotional component			2.302**	2.124**
	Cognitive component			2.315**	2.106**
	Behavioral component			2.257**	2.396**
F		33.524***	37.985***	31.352***	37.018***
R^2		0.334	0.384	0.334	0.363
Adj.R^2		0.331	0.375	0.321	0.352

Notes: **$p < 0.01$; ***$p < 0.001$.

The influence of hybrid teaching on learning attitude. For regression analysis, the three dimensions of hybrid teaching, namely, plan and goal, implementation and monitoring, and self-learning strategy, were used as independent variables, and the three dimensions of learning attitude, namely, emotional component, cognitive component, and behavioral component, were used as dependent variables. Table 2 shows that the three dimensions of hybrid teaching had a significant positive impact on the emotional components of learning attitude, and they reached significant values of ($\beta = 1.978$, $p < 0.01$, $\beta = 1.785$, $p < 0.05$, $\beta = 2.256$, $p < 0.01$). The three dimensions of hybrid teaching had a significant positive impact on the cognitive component of learning attitude, reaching a significant level ($\beta = 2.108$, $p < 0.01$, $\beta = 2.224$, $p < 0.01$, $\beta = 2.309$, $p < 0.01$). Hybrid teaching had a significant positive influence on the behavioral component of learning attitude, and the three components reached significant values of ($\beta = 2.285$, $p < 0.01$, $\beta = 2.218$, $p < 0.01$, $\beta = 2.407$, $p < 0.01$). Therefore, it can be put forward that hybrid teaching had a significant positive impact on learning attitudes, and hypothesis H1 was supported.

The influence of learning attitude on learning confidence. The three dimensions of learning attitude (affective component, cognitive component, and behavioral component) were taken as independent variables. Besides, for regression analysis, the two dimensions of learning confidence (learning effect and learning gain) were taken as dependent variables. Table 3 shows that, learning attitude had a significant positive effect on learning confidence, with the significant values being $\beta = 2.302$, $p < 0.01$, $\beta = 2.315$, $p < 0.01$, and $\beta = 2.257$, $p < 0.01$. Learning attitude had a significant positive effect on learning gain as well, with the significant values being $\beta = 2.124$, $p < 0.01$, $\beta = 2.106$, $p < 0.01$, and $\beta = 2.396$, $p < 0.01$. Therefore, it can be claimed that H2 was supported and that learning attitude had a significant positive impact on learning confidence.

The influence of hybrid teaching on learning confidence. The three dimensions of hybrid teaching—plan and goal, implementation and monitoring, and self-learning strategy—were used as independent variables. Moreover, for regression analysis, the two dimensions of learning confidence, namely, learning effect and learning gain, were used as dependent variables. Table 3 shows that, hybrid teaching had a significant positive impact on the learning effect of learning confidence, and significant values were produced as $\beta = 2.145$, $p < 0.01$, $\beta = 2.185$, $p < 0.01$, and $\beta = 2.414$, $p < 0.01$; It also had a significant positive impact on learning gain, and the three significant values were $\beta = 2.215$, $p < 0.01$, $\beta = 2.401$, $p < 0.01$, and $\beta = 2.489$, $p < 0.01$; Therefore, H3 can be assumed to be supported.

5   DISCUSSION

Students learning attitude and self-confidence seemed to improve significantly after using hybrid teaching at the university. It was also found in this study that promoting the ability to set goals and plan learning strategies helped self-confidence to some extent. As a result, hybrid teaching was found to be feasible, richer, and more diverse online materials and online activities could be offered in hybrid teaching to facilitate the learning attitude and motivation of students at the university. Simultaneously, it makes sense to integrate several disciplines of student learning rather than a single discipline. Moreover, a university could plan and integrate adaptive materials and learning diagnosis, that is, target different students in the university to provide different learning styles and suggestions

through pre-learning tests, in order to explain the self-regulated learning ability of different types of university students. In terms of learning diagnosis, establishing complete question data in the question database, recording the concept, difficulty, and discrimination covered in each question in the database, and analyzing the response conditions of university students in the exercise or quiz could help in understanding the concept learning conditions and the possible difficulty of university students to reinforce the learning effect with hybrid teaching and improve self-confidence.

6 CONCLUSION

The findings of the research revealed that hybrid learning styles are widely used in university learning and teaching, and the idea of self-regulated learning is gaining momentum. As a result, this study attempted to use the self-regulated learning model in a hybrid learning environment. Therefore, it was aimed at establishing a mechanism of self-regulated learning guidance in the hybrid learning environment through the design of an Internet application. The results showed that after using hybrid teaching for student learning, the university students are relaxed, comfortable, and stress-free. In addition, during exchange, the students can precede learning and have numerous opportunities to practice, interact, and discuss with friends. In this case, hybrid teaching attracts the attention of most of the university students. Teachers' teaching methods can promote the learning attitude of university students. In contrast, it would be boring and lacking in variety if the teachers started students' learning with traditional didactic teaching. Clearly, hybrid teaching attracted the attention of all students in the schools, and teachers' teaching methods promoted students' learning attitude and self-confidence.

7 ACKNOWLEDGMENTS

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