

The Application Effect of New Media Technology in Finance Teaching Courses for Business College Students

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Abstract: To cope with the external impact caused by digital finance after COVID-19, new media technology has been brought into finance teaching courses to increase students' learning performance. This paper used the samples of 329 students from eight classes in two semesters of 2021-2022 to empirically analyze the different effects between offline teaching and online teaching when the new media technology was used to solve the space limitation between teachers and students. We found that online teaching has not achieved better learning performance than offline teaching. Because the students are not adapted to the finance online teaching using new media technology, based on economic knowledge, different grades, and gender of students characteristics as key factors affecting their learning performance. So, the application effect of new media technology in the future finance teaching process should be focused to choose a more suitable way for students, such as the flipped classroom with virtual reality technology arouse the learning interest of freshmen without any economic knowledge foundation; and it's better to increase the practical skills of experimental students in virtual space through new media technology.

1 INTRODUCTION

With the necessary tool of cellphone connectivity, new media becoming more popular among college students. The finance teaching mode has no longer been confined to classroom teaching. New media educational technology is needed to transfer them into online teaching, online-offline integration, flipped classrooms, and immersive classroom programs. As the COVID-19 pandemic has accelerated the change of the traditional face-to-face teaching pattern to online education platforms, making the quality of online classes a concern for tertiary education stakeholders (Chen et al., 2020; Wei et al., 2021). This makes the online teaching pattern become a mainstream learning for business college students. At the same time, many scholars proposed questions like Padnakumari (2022) that every educational institution should face the biggest challenge: how to provide quality education by imparting the skills and knowledge online when neither students nor teachers can meet face to face?

Finance teaching reform led by Internet technology usually includes the following aspects: First of all, moving the finance class to the Internet platform from the face-to-face teaching method, and establishing online teaching, practice, and evaluation system (Chiasson et al., 2015; Yu, 2021); The second is to break through the existing knowledge system from the teaching content, and build a new financial operation mechanism with block-chain, data processing, and information technology as the base frame structure (Li and Wu, 2019; Nie et al., 2020); The third is to increase new media technology to be a parallel learning Metaverse, reproduce the real world currency circulation and market trading so that students can practically simulate the real financial operating system (Salt et al., 2008; Park and Kim, 2022). These finance teaching reforms revolve around online-offline integration, focusing on the new media platform of Internet technology links in the finance teaching course, enhancing students' practical interaction ability, and expanding the financial system of five

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elements integration of residents, enterprises, banks, governments, and foreigners.

Previous studies highlighted the feasibility of Internet links to finance teaching but overestimated the teaching results without recognizing the practical problems. Comparing the actual situation of students learning finance, this paper represents the online-offline teaching method and finds out three aspects of deviation: (i) It overestimated the advantages of economics majors in learning finance more than management majors. The result is that the reserves of basic knowledge of economics promote the performance of finance learning, rather than the reason for the difference between the two majors; (ii) The excellent students in the experimental class will perform more prominently, whether the economics major or the management major, can be better than the students in the ordinary class, because of better learning adaptability for new media technology; (iii) Female students can achieve better results in the finance teaching than male students, no matter what kind of finance teaching methods are used. But the difference in the learning effect of male students under the online teaching mode is relatively low. This study provides an important reference for the online-offline teaching reform of finance courses.

2 LITERATURE ANALYSIS

2.1 Financial Teaching Reform Direction

With the rapid development of the financial industry, the total social demand has changed greatly, so it is imperative to cultivate talents with Internet thinking of new business in the financial industry (He et al., 2021). But the traditional classroom teaching mode for finance learning is relatively simple through a cramming method of face-to-face teaching mainly by teachers according to the content of finance teaching materials. As the finance learning of college students is in the position of passive acceptance, their learning enthusiasm is not high which could easily make an inconsistency result between teaching practice and learning effect for financial cultivation. Although finance teachers tried their best to teach in the classroom, students themselves do not understand as well as expected.

As we know, finance teaching is a strong application subject, which has been becoming a big problem in improving the students' practical learning ability and independent thinking ability from the

finance courses. This request obviously can not realize through the traditional finance teaching method. Thus, financial teaching reform must bring in new media technology, such as Internet technology, artificial intelligence technology, and other high-tech integration was put into finance teaching to form an online-offline integration and virtual reality learning system.

The framework of finance teaching mainly involves five basic elements, including money, credit, interest rate, exchange rate, and financial instruments. Both domestic currency and foreign currency play an important role in economic development, and their forms and values have been changing into E-money or I-money (Mi and Wang, 2022). In particular, Block Chain technology's application makes the digital currency the mainstream form of possible future currency.

Even with the rapid development of internet payment and mobile payment, E-money and I-money make the current teaching mode of finance fall behind the demand of financial practice. The disconnection between theoretical knowledge and practical application has become a key problem that restricts finance teaching by teachers and finance learning by students. Furthermore, in financial markets, whether it is the construction of new digital finance markets or market transactions in new forms of money, not to mention the emergence of new financial instruments, all these factors make the finance teaching method need to carry on the teaching reform direction of the combination of offline teaching and online teaching by a new media platform for business college students.

2.2 New Media for Finance Teaching

It is necessary to apply new media technology in finance teaching courses to change the disadvantages of traditional finance teaching and adapt to the innovative products of new technology in the finance field. Finance educators found that the Internet is easier to access business information, financial databases, statistical tools, and networks for business college students (Shao et al., 1998). With the continuous progress of science and technology, Li et al. (2021) also found that the Internet is deeply combined with education, which is more open, comprehensive, and innovative than the traditional teaching style.

So, the online-offline teaching mode has become a new trend in finance teaching reform. It deeply integrates offline teaching and online learning, enabling students to form strong learning motivation

and significantly improve learning efficiency. To deal with the use of educational technology to overcome the unique challenges in online finance teaching courses, Vatsala and Pissay (2015) found that Bloom's taxonomy, constructivist model, video creation tools, and webinars are the most effective educational technology tools for finance teaching. We can effectively promote the integration of online teaching and offline teaching in finance courses by building an online-based teaching platform with a new media educational technology, thus enabling business college students to achieve better learning results.

Many scholars have been concerned that the new media technology can bring better results to the finance teaching method. Sathye (2004) found that while the content of the unit could be delivered online very efficiently but many operational problems could mar this mode from becoming an effective teaching and learning mode by investigating the challenges in the online teaching of banking and finance. The article of Stephen (2015) reviewed the literature on using videos in the classroom and presents a pedagogical framework for this instructional medium, followed by a discussion on how to effectively integrate online video clips within the finance curriculum. Based on big data technology, the research of Sun (2021) shows that the financial innovation of online teaching systems can effectively expand the scope of assistance and shorten the time of assistance. Lin (2021) thought that it will enrich the teaching design and teaching process of a flipped classroom with the help of the increasingly advanced mobile Internet and information technology.

In the whole financial teaching process, new media technology can provide different support in three stages: Before class, it provides abundant network teaching resources; In class, teachers and students interact by solving problems and group activities; After class, it provides Internet-based teaching resources. All kinds of online platforms answer questions and monitor and test students' online learning at any time, to optimize the process of students' knowledge internalization and ultimately improve students' learning capability.

2.3 Finance Teaching Improving Factors

In the online-offline teaching research for financial students, most scholars think that new media technology can affect the teaching process, and most of them also think that it has achieved good results

for business college students. The factors that affect online-offline teaching can be divided into two types: one is the adaptability of students themselves; the other is the level of teachers' application of information technology.

From the view of students, the research of Smolira (2008) found that the students' feeling toward online homework increased their understanding of the material, which was preferable to traditional homework assignments that are turned in to the instructor based on a survey of students' enthusiasm for doing homework in finance courses. Worthington (2002) indicated that expected grade, ethnic background, gender, and age of student characteristics are a significant influence on student ratings by using an ordered probit model.

From the view of teachers, the study of Marlina et al. (2021) shows that social influence, facility conditions, and effort expectancy significantly influence student behavior and performance. The behavior determinant such as lecturer characteristics, motivation and environment, and organizational structure improve student performance. Mumtaz (2000) revealed that several factors can influence teachers' decisions to use the information and communications technology in the classroom: access to resources, quality of software and hardware, ease of use, support and collegiality in their school, commitment to professional learning, and background in formal computer training. Ali et al. (2022) indicated that system quality, course material, instructor quality, information technology (IT), and support service quality positively impacted student e-learning satisfaction.

In summary, we build an online-offline educational mode in financial knowledge and experiment, as shown in Figure 1. We can see that new media technology plays a key role in the finance teaching and learning process.

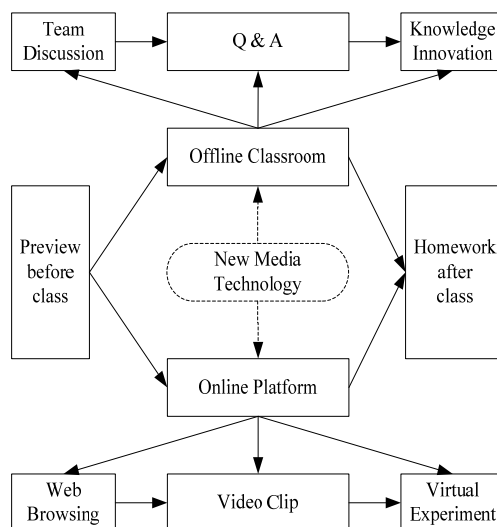


Figure 1: Online-offline educational mode

3 RESEARCH SUBJECTS AND DATA SOURCES

This study takes 2021-2022 as the research interval, which divides into two semesters to test the different impacts between the offline classroom and online platform. The first semester adopts the traditional mode of offline teaching face-to-face completely without any new media technology. The second semester adds an online platform for the COVID-19 epidemic. About half of this time, we used online teaching methods for college students to learn finance knowledge and skills. We also used the Tencent Meeting (TM), where teachers and students could learn about finance courses through online classes. At the same time, we put preview the text before class, practiced exercises in class, did homework, discussion, and shared information, and other basic functions of online teaching with new media technology by Learning Pass APP and WeChat.

In the two semesters, 329 students are participating in the financial teaching research, 182 students in four classes in the first semester, and 147 students in four classes in the second semester. See descriptive statistics in Table 1. The eight classes can be divided into two subjects, one for economics, which was assigned a value of 1 if the major is economics; and the other one for management which was assigned 0; namely variable *Subject*. The *Grade* variable was also used by assigning a value of 1 if the student is a freshman, the sophomore is 2, and the junior is 3. Meanwhile, considering the importance of finance and economics to the student’s major direction, this paper divides the *Major* variable into five dimensions: Management, Accounting, Trade, Business, and Finance, and assigned a value of 1-5 respectively. From Table 1, we can also see that the time of enrollment in each major belongs to the college students affected by the epidemic.

Table 1: Descriptive statistics for the students

Semester	Class Name	Male	Female	Number of students	Subject	Grade	Time of Enrollment
The first semester of 2021-2022	Business Economics	15	23	38	0	3	2019
	Internet Finance	24	33	57	1	2	2020
	Real Estate Management	15	13	28	0	2	2020
	International Trade A	19	40	59	1	2	2020

The second semester of 2021-2022	Excellent Accounting	3	34	37	0	2	2020
	Accounting	19	23	42	0	2	2020
	International Trade B	9	28	37	1	1	2021
	International Trade C	8	23	31	1	1	2021

4 EMPIRICAL ANALYSIS

4.1 Mean-Variance Analysis

We compared the average score of the first semester of offline learning with those of the second semester of online learning, as shown in Table 2. When we divided all the majors into two subjects, the average score of the economics students was 78.10 in the first semester, which was about four points higher than the average score of the management students. Then the obvious economics students' grades

decreased, lower than the first semester about 10 points. Further, we have listed the mean values for the five majors. It is clear that students majoring in Business Economics scored well in the first semester, with the mean values being the highest of all the samples, and students of International Trade have the lowest professional achievement in the second semester. Is this due to major differences? It's not true that economics majors have an advantage over management majors in studying finance.

Table 2: The average score of the students

Variable	Characteristics	Offline learning	Online learning	Mean score
<i>Subject</i>	Economics	78.10	68.70	74.34
	Management	74.00	76.10	75.40
<i>Major</i>	Finance	74.00	--	74.00
	Business	83.00	--	83.00
	Trade	77.30	68.70	73.00
	Accounting	--	76.10	76.10
	Management	74.00	--	74.00
<i>Grade</i>	Freshman	--	68.10	68.10
	Sophomore	75.10	76.10	75.60
	Junior	83.00	--	83.00
<i>Group</i>	Experimental class	83.00	79.20	81.10
	Ordinary class	75.10	70.13	72.62
<i>Gender</i>	Female	79.16	72.40	75.78
	Male	73.51	70.20	71.86

We continued to take grade point average, with Business Economics majors topping out at 83.00 in finance in the first semester of the offline course, with freshmen in International Trade majors having the lowest score of 68.10 in finance. Judging from the results of two classes who are both economics majors, but not in the same grade, the freshman students have achieved lower results in studying finance, which at least shows that it's not that economics majors get good grades in finance but the

foundation in economics knowledge. Similarly, sophomores in management majors who have already studied a foundation in economics knowledge, also did better in finance studies, even though the second semester online was better than the first semester, because the second-semester experimental class was better than the first semester students. In the class column, the performance is more obvious, the first semester of online teaching economics major experimental class than the second

semester of online teaching of management major experimental class had better results. The results of the ordinary classes were the opposite, they were more comfortable with the offline model, and in general, both offline and online, the results of the students in the experimental class are about 10 points higher than those in the ordinary class.

In addition, from the gender point of view, female students are generally getting better performance than male students in finance learning, whether in an online platform or offline classroom. And the differences in the effectiveness of offline teaching are larger with online teaching making up the difference slightly. However, the online teaching model has not improved because of gender, and it is clear that both male and female students perform slightly worse than offline teaching.

Thus, we draw a basic conclusion: business college students with a foundation in economics knowledge learn finance faster than students without a foundation in economics knowledge to achieve better performance results. If a finance course is to be taught online, it is necessary to treat different students differently. We can use the method of dividing classes to teach finance courses online, which will help business college students quickly accept the new media of teaching methods.

4.2 OLS Test Results Analysis

To further verify the above conclusions, we construct an econometric model with teaching achievement as the dependent variable, and then add the variables of major, subject, semester, grade, and gender into the model respectively, as shown in the following formula.

$$E = \beta_0 + \beta_1 Major + \beta_2 Subject + \beta_3 Semester + \beta_4 Gender + \beta_5 Grade + \varepsilon \quad (1)$$

Where the dependent variable E represents the students' final score. The independent variables, $Major$ denotes that students major in five sample majors, namely Management, Accounting, Trade Business, and Finance, which are assigned values of 1-5 respectively; $Subject$ stands for the major category, which is divided into two major types economics and management; $Semester$, the first semester using offline teaching and the second-semester using online teaching; $Gender$ means 1 for the female students and 0 for the male students; $Grade$ represents that 1 of freshman, 2 of sophomore, and 3 of junior. ε represents the residual variable. Then, the OLS test is performed and the results are shown in Table 3.

In the case of no distinction between grades, the division of majors will have a positive role in promoting the learning effect, obviously having a major in economics or finance obtain a better learning effect, economics does not seem to be dominant, on the contrary, management majors dominate. That's because, in the second semester, sophomores in management do better than freshmen in economics majors. Thus, after the grade division, this analysis is valid, model (3) shows that higher grades help to improve higher teaching effectiveness, and economics majors significantly improve teaching performance. In addition, divided by gender, the female students can achieve better results, this is significantly supported, in the (2)-(4) model, we can see those female students show a positive role in promoting the teaching effect.

Table 3: OLS test results

Variable	(1)	(2)	(3)	(4)
<i>lnMajor</i>	0.071*** (0.025)	0.070*** (0.024)	-0.064** (0.028)	
<i>Subject</i>	-0.092*** (0.025)	-0.097*** (0.025)	0.101*** (0.035)	
<i>Semester</i>	-0.077*** (0.013)	-0.089*** (0.013)	0.051** (0.024)	-0.005 (0.017)
<i>Gender</i>		0.073*** (0.013)	0.069*** (0.012)	0.071*** (0.012)
<i>lnGrade</i>			0.246*** (0.035)	0.161*** (0.024)
<i>_cons</i>	4.332*** (0.020)	4.294*** (0.020)	4.091*** (0.034)	4.168*** (0.022)
<i>N</i>	329	329	329	329

Note: t value in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; similarly hereinafter.

4.3 DID Test Results Analysis

To compare the results of two semesters and analyze the difference in learning effect between online and offline teaching, we constructed a Differences-in-Differences (DID) model, as shown in Formula 2.

$$E = \beta_0 + \beta_1 did + \beta_2 time + \beta_3 treated + \beta_4 controls + \varepsilon \quad (2)$$

Where, if the class is an economics major, the variable $treated$ will be set to 1, otherwise, set to a value of 0; if the class is used online educational technology in the second semester, the variable $time$ is set to 1, or it will be set to 0 if that is in the first semester. Then, we set up another variable $did = time * treated$. This variable did represent the

economics major students who have adopted online educational technology in the second semester. The controls variable is including *Homework*, *Grade*, and *Gender* for business college students.

Table 4: DID test results

Variable	(1)	(2)	(3)	(4)
<i>did</i>	- 0.147*** (0.029)	- 0.129*** (0.028)	0.098** (0.045)	0.099** (0.043)
<i>time</i>	0.028 (0.025)	0.010 (0.023)	0.001 (0.023)	-0.010 (0.023)
<i>treated</i>	0.053** (0.022)	0.044** (0.021)	0.014 (0.021)	0.006 (0.020)
<i>lnHomework</i>		0.319*** (0.073)	0.398*** (0.069)	0.346*** (0.067)
<i>lnGrade</i>			0.276*** (0.042)	0.273*** (0.040)
<i>Gender</i>				0.063*** (0.011)
<i>_cons</i>	4.291*** (0.020)	2.875*** (0.321)	2.332*** (0.307)	2.537*** (0.297)
<i>N</i>	329	326	326	326

In models (1) and (2), we can see that the economic students do not achieve good performance results in the use of e-learning technology, but significantly inhibit the teaching effect. Even after the addition of some learning homework on the Internet, it did not change the teaching effect on students. Why is that? We added a grade variable to model (3), where we see that it can change the teaching effect so that economics students get better results after online educational technology, because of the economic foundation, and there has been a certain basis for finance online learning, the basis of economics will have a better role in promoting finance. From model (4), after controlling the gender variables, it is obvious that the improvement of the teaching effect will be promoted, further reinforcing the conclusion that female students are more adaptable to this teaching model.

4.4 Discussion

From the above research, we can see that the application of new media technology has not brought effective results, and need to reconsider the internal characteristics of students, and the external environment of teachers (See Figure 2). The main performance for the following aspects.

(i) In the first semester, management students

scored the lowest in both the highest and average scores, generally lower than the other three economics majors. It seems that the management major has influenced the learning effect of finance. But in the second semester, the two management classes outperformed the two economics classes. In this way, the study of finance should not be attributed to the effect of a management major and economics major. A freshman in economics major without economics background is no better than a sophomore in management major with an economics background. But the junior in economics major has a higher achievement, also further explained that it is a good economics foundation for an essential condition to study the finance courses.

(ii) In each one of the eight classes, there is a high percentage of female students in every class, and there is a large imbalance between the proportion of male and female students. There is also a general phenomenon of higher academic performance of female students than that of male students, and the highest scores are also mostly for female students. That is to say, the current teaching and evaluation of finance learning are in favor of female students but the online teaching method is in favor of male students. Whether this is due to nature or nurture needs to be further studied.

(iii) The students of the experimental class have good grades. Their average score is nearly 10 points higher than the students of the same period. All of them are selected to have a good economic foundation for students in learning methods. However, most of the students do not respond to the effect of the online teaching method well.

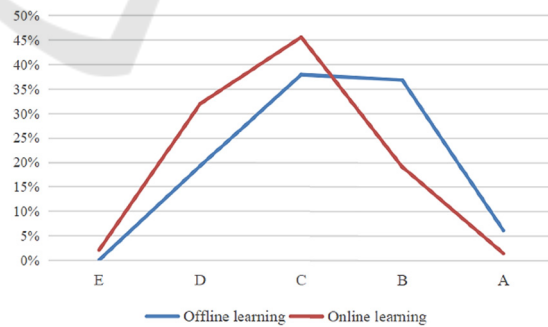


Figure 2: Score distribution curve

5 CONCLUSIONS

Under the situation that the current finance teaching method urgently needs to carry on the teaching reform, we discussed the learning effect of the

online-offline blended teaching mode added to the new media technology. After analyzing the teaching situation of eight classes of economics major and management major students in two semesters of 2021-2022, we found that: the current use of the blended teaching model has indeed caused some burden to business college students and has not fully met the requirements of expectations. The main reasons are as follows: Firstly, there is no good learning foundation, especially for freshmen, more lack of effective learning methods and self-learning ability; Secondly, having a certain economic foundation is a necessary condition for business college students to study finance knowledge and skills, which can promote the improvement of financial performance; Thirdly, female students are more likely to obtain high financial performance than male students, whether this is caused by congenital factors, acquired learning factors, or system design factors need to be further studied. In other words, the main reason for the deviation of online finance teaching is adaptability where has a big deviation between the mean of blended teaching and the law of student learning.

Therefore, we put forward the following solutions for the online-offline teaching and learning of finance knowledge and skills: (i) We should recognize that the online-offline teaching model will inevitably become the mainstream form of the future, and the key factor of study performance is to enhance students' ability to adapt to the finance online teaching using new media technology. (ii) We can change the evaluation method of financial teaching which emphasizes the result to the evaluation method which emphasizes the process, making use of online-based teaching platforms and teaching resources. (iii) Adjusting the sequence of finance programs should be at least put after the basic teaching of economics knowledge, let students have a good understanding of micro-economics and macro-economics before they proceed to study finance courses. (iv) Making full use of the experimental class teaching model, which can also be to accounting experimental class or economics experimental class, separate fast and slow learning in financial knowledge and skills. So, finance educators must improve the new media technology adapted to the law of students' learning and make them resonate with each other to meet the requirements of mutual adaptation.

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