Study on Online Learning in Universities in the Epidemic-control Context in China

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Abstract: In December 2019, an outbreak of COVID-19 occurred in Wuhan. The State Council of China required all universities, secondary schools and primary schools to carry out online learning in an orderly manner. In order to better understand the learning effect, teaching effect, satisfaction and anxiety of teachers and students in colleges and universities during this period, this study uses questionnaires, correlation analysis and regression analysis of data to understand the current situation of online teaching and provide reference for the further integration of informatization and education and teaching.

Keywords: online learning, learning effect, teaching effect, learning anxiety

1. The Question

In December 2019, an outbreak of COVID-19 broke out in Wuhan.In order to effectively reduce the number of people gathered and prevent the further spread of the epidemic, the State Council held a press conference on January 26, 2020, requiring all universities, secondary schools and primary schools to postpone the start of the spring semester in 2020. This research through the questionnaire, correlation analysis and regression analysis of data, to understand the current situation of network teaching, provide a reference for further integration of information technology and education teaching.

2. Investigation Content

This research makes the undergraduates as the study object. A total of 12,274 valid questionnaires were received from students and 565 valid questionnaires from teachers, which were conducted anonymously.

The questionnaires of students were based on their familiarity with using the Internet platform, teachers' pre-class preparation, students' pre-class preparation and teachers' q&A guidance.Students' online learning satisfaction were investigated as dependent variables.Teachers' questionnaires took the use of the Internet platform, teachers' teaching requirements, students' re-class preparation and students' participation in interaction as independent variables, and the effect of online teaching as dependent variables to conduct the survey.

2.1 Students' Satisfaction of Online Learning

The survey shows that students approve of the current online learning methods and arrangements. Pearson correlation test is used to test the correlation between proficiency in online platform, teachers' pre-class preparation, students' pre-class preparation, teachers' Q&A tutoring and online learning satisfaction. (See Table 1)

Table : *Correlation Analysis*

		Skillful Use of Online Platform	Teachers' Pre-class Preparation	Students' Pre-class Preparation	Teachers' Q&A Tutoring	Online Learning Satisfaction
Skillful Use of Online Platform	Pearson Correlation	1				
	Significance (bilateral)					
Teachers' Pre-class Preparation	Pearson Correlation	.415**	1			
	Significance (bilateral)	.000				
Students' Pre-class Preparation	Pearson Correlation	.456**	.578**	1		
	Significance (bilateral)	.000	.000			
Teachers' Q&A Tutoring	Pearson Correlation	.450**	.677**	.671**	1	
	Significance (bilateral)	.000	.000	.000		
Online Learning Satisfaction	Pearson Correlation	.531**	.552**	.570**	.575**	1
	Significance (bilateral)	.000	.000	.000	.000	

**. there is a significant correlation at the 0.1 level (bilateral)

Therefore, network learning satisfaction with other items has significant positive correlation. The correlation analysis shows that there is significant correlation, and the results are shown in the following table (Table 2). Therefore, the data means that in online learning, in addition to the factors of using the online environment of the online platform, whether students fully prepare before class affects students' satisfaction with online learning, whether teachers make adequate preparation before class and whether teachers answer questions timely also significantly affect students' satisfaction with online learning.

Table 2 *Regression Analysis*

Model	Nonstandardized Coefficient		Standard Coefficient			Collinear Statistics	
	B	Standard Error	Trial Version	t	Sig.	Tolerance	VIF
(constant)	-.529	.038		-13.991	.000		
Skillful Use of Online Platform	.299	.008	.273	35.841	.000	.743	1.345
Teachers' Pre-class Preparation	.246	.012	.196	21.212	.000	.506	1.976
Students' Pre-class Preparation	.250	.011	.214	23.058	.000	.500	1.998
Teachers' Q&A Tutoring	.208	.012	.176	17.301	.000	.416	2.406
R2=0.476, adjustment R2=0.476, F=2761.429(P<0.05)							

2.3 Teachers' Self-evaluation of Online Teaching Effect

All of data indicate that teachers are more willing and familiar with teaching in the same classroom with students. Pearson correlation test is used to test the correlation between the use of the network platform, teachers' teaching requirements, students' preview before class, students' participation in interaction and the effect of network teaching. (See Table 3)

Table 3 *Correlation Analysis*

		The Use of the Network Platform	Teachers' Teaching Requirements	Students' Preview	Students' Interaction	The Effect of Networking Teaching	The Motive of Network Teaching
The Use of the Network Platform	Pearson Correlation	1					
	Significance (bilateral)						
Teachers' Teaching Requirements	Pearson Correlation	.164**	1				
	Significance (bilateral)	.000					
Students' Preview	Pearson Correlation	.075	.178**	1			
	Significance (bilateral)	.075	.000				
Students' Interaction	Pearson Correlation	.195**	.203**	.481**	1		
	Significance (bilateral)	.000	.000	.000			
The Effect of Networking Teaching	Pearson Correlation	.107*	.231**	.401**	.305**	1	
	Significance (bilateral)	.011	.000	.000	.000		

**. there is a significant correlation at the 0.1 level (bilateral)

*. there is a significant correlation at the 0.05 level (bilateral)

The coefficients have passed a significant level of 5% significance test, thus the effect of teaching has significant positive correlation with the use of platform, teacher's teaching requirements, and students' interact. The correlation analysis shows that there is significant correlation. After the regression analysis, the results are shown in the following table (Table 4). The survey showed that teachers think that whether the network platform is skillfully used has little influence on the teaching effect.

Table 4 *Regression Analysis*

Model	Nonstandardized coefficient		Standard coefficient			Collinear statistics	
	B	Standard error	Trial version	t	Sig.	Tolerance	VIF
(constant)	.529	.203		2.608	.009		
The use of the network platform	.021	.022	.037	.945	.345	.944	1.059
Teachers' teaching requirements	.124	.033	.145	3.708	.000	.934	1.071
Students' preview	.304	.042	.316	7.283	.000	.761	1.314
Students' interaction	.130	.049	.117	2.640	.009	.734	1.362
R2=0.200, adjustment R2=0.194, F=34.846(P<0.05)							

3. Discussion

3.1 The Inspection of Early Informatization Results

Although affected by the epidemic, the current online teaching and learning is a necessity. Up to now, although a variety of problems have appeared in the process, it is generally stable, which is a good test for the early informatization promotion.

3.2 The Good Use of Data for Teacher-student Interaction

During the epidemic prevention and control period, the core keywords of the relevant documents issued by the Ministry of Education are interaction + data.The interaction between teachers and students should be strengthened in the network teaching process.

4. Conclusion

The epidemic-control period has brought information-based teaching reform to educators in an all-round way.

4.1 The Interaction and Teaching Methods

Online teaching breaks the time and space of teacher-student interaction. Strengthening teacher-student interaction can significantly improve the teaching quality and students' learning motivation. Teachers take tasks and problems as traction to guide students to effectively use the time after class for active learning. Online teachers and students carry out high-quality discussion and communication, and feedback the learning results.

4.2 The Strengthening of Students' Preview

The effect of students' previewing before class has a significant influence on the quality of online learning.Guide students to continue to carry forward the spirit of active learning, arrange their time reasonably, complete the preview content of the course in advance according to the teacher's

requirements, actively conduct remote interaction and communication, and feedback the learning results.

4.3 The Acceleration of Schools to Carry Out Information Management

The questionnaire shows that a common cause of online learning anxiety among teachers and students is the online teaching platform.In the later stage, the school should speed up the construction of the course platform, ensure the stable operation of online teaching, improve the platform function, and enhance the operability, simplicity and affinity of the system.In addition, the smooth development of school network teaching is inseparable from the efficient work of the management staff.

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