



# An Empirical Study on Online Learning Experience of “Tencent Meeting” Students

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**Abstract.** The “Tencent Meeting” will be launched at the end of December 2019 along with the demand for online teaching. The use of “Tencent Meeting” in college teaching during the epidemic period has many advantages in terms of other online teaching equipment, which has also been praised by many college teachers and students. Based on the learning situation of college students in “Tencent Meeting”, this paper constructs an evaluation model focusing on learning experience, and analyzes the impact of seven factors on students’ experience, including classroom check-in, student voting, picture in picture, classroom interaction, large student capacity, virtual background and beauty filter, and classroom management. Further explore its operability in teaching, so as to improve its service quality in the field of education [1].

**Keywords:** Tencent Meeting · Student experience · Network teaching · influence factor

## 1 Introduction

Based on the questionnaire survey on online learning experience of 483 students in Shenyang Jianzhu University, this paper focuses on the influencing factors of the “Tencent Meeting” equipment itself, tests the reliability and validity of the questionnaire, analyzes the correlation with students’ background dimensions, and finally conducts multiple linear regression analysis to investigate the factors that need to be improved in the future informatization teaching of the equipment, so as to improve students’ learning experience in “Tencent Meeting”.

## 2 Research Objects and Methods

### 2.1 Research Object

The research object of this paper is the student group of Shenyang Jianzhu University who used the “Tencent Meeting”. After issuing the questionnaire through the questionnaire star, the survey was conducted anonymously. It is mainly distributed in the form of internal confession wall, class group and college official account. A total of 548 questionnaires were sent out. After the invalid questionnaires were screened out, 483 valid questionnaires were received, of which 67.38% were male and 32.62% were female. The questionnaire recovery rate was 100%, and the effective rate was 88.1%.

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**Table 1.** Reliability statistics

Clone Bach Alpha	Number of items
.812	7

**Table 2.** KMO and Bartlett test

	KMO and Bartlett test	
Bartlett sphericity test	KMO value	.844
	Approximate chi square	192.486
	degree of freedom	21
	Significance	.000

### 2.2 Research Method

This paper mainly uses questionnaire survey to collect sample data, and uses SPSS23.0 statistical analysis software for data analysis.

## 3 Data Analysis

### 3.1 Reliability Test of Questionnaire

In order to understand the reliability of the questionnaire data filled in by the surveyed students on the learning experience of “Tencent Meeting”, Cronbach  $\alpha$  The coefficient carries out reliability analysis on seven factors, including classroom check-in, student voting, picture in picture, classroom interaction, large student capacity, virtual background and beauty filter, and classroom management [6]. The results are as follows. According to the results Table 1, Cronbach  $\alpha$  the coefficient is between 0.8 and 0.9, which shows that the overall reliability of the scale is relatively ideal.

### 3.2 Questionnaire Validity Test

In order to test the structural validity of the questionnaire, this paper conducted KMO and Bartlett test Table 2 on the seven related factors in the questionnaire. The data passed Bartlett sphericity test, with a p value of 0.000 ( $p < 0.05$ ), indicating that the questionnaire data is suitable for factor analysis. KMO value is 0.844, greater than 0.8, indicating that the questionnaire data validity is good [2]. According to Table 3, the extracted common factors are all greater than 0.8, indicating that the extracted common factors can better explain the data in the questionnaire.

**Table 3.** Common factor variance

	initial	extract
Class sign in	1.000	.836
Student voting	1.000	.902
Chinese painting, Chinese painting	1.000	.890
Classroom interaction	1.000	.982
Large student capacity	1.000	.906
Virtual background and beauty filter	1.000	.894
Classroom management	1.000	.829

**Table 4.** Student satisfaction analysis

	Very satisfied/%	Satisfied/%	General/%	Dissatisfied/%	Very dissatisfied/%	mean value
Class sign in	6.31	45.05	40.54	6.31	1	3.48
Student voting	13.51	40.54	34.23	9.01	2.7	3.54
Picture in Picture	18.92	45.95	24.32	9.91	0.9	3.72
Classroom interaction	13.51	45.05	30.63	6.31	4.5	3.57
Large student capacity	17.12	35.14	34.23	10.81	2.7	3.54
Virtual background and beautiful filter	21.62	32.43	31.53	10.81	3.6	3.57
Classroom management	23.42	40.54	26.13	8.11	1.8	3.76

### 3.3 Analysis on the Influencing Factors of Online Learning Experience of Students in “Tencent Meeting”

#### 3.3.1 Analysis on the Use Satisfaction of Equipment Functions

Based on the main functions of “Tencent Meeting”: class check-in, student voting, picture in picture, class interaction, large student capacity, virtual background and beautiful filters, and class management, the Likert 5-level scale is used to measure, which are respectively very satisfied, relatively satisfied, uncertain, not very satisfied, and very

dissatisfied [5]. Analyze the satisfaction of the seven factors to the student experience. The analysis results are as follows Table 4.

According to the data, in the evaluation of the experience of the main functions of “Tencent Meeting”, the satisfaction with the picture in picture function and classroom management function is the highest, with the average of 3.72 and 3.76 respectively. The satisfaction with the class sign in function was the lowest, with an average of 3.48. This shows that the picture in picture screen sharing function in the equipment and the convenient management and control of teachers in the classroom can effectively play their roles, while the class check-in function is of little significance to students who need to open video or voice classes.

### **3.3.2 Multivariate Correlation Analysis of Equipment Function and Students’ Background Characteristics**

This paper makes a correlation analysis on the satisfaction of the seven main functions of the “Tencent Meeting” equipment and the background characteristics of the students participating in the survey Table 6 [4]. Pearson correlation coefficient is used to express the strength of correlation Table 5.

The results show that the background characteristics of students: gender, age, grade, major, and the seven main functions of the “Tencent Meeting” equipment: class check-in, student voting, picture in picture, classroom interaction, large student capacity, virtual background, beautiful filters, and the overall classroom management. The correlation coefficient between major and classroom interaction function is  $-0.229$ , and shows a significant level of 0.05, Therefore, there is a significant negative correlation between specialty and classroom interaction function. It can be seen that science and engineering majors have more practical activities in the classroom.

### **3.3.3 Multiple Linear Regression Analysis of Each Factor and the Overall Learning Experience**

In combination with the above investigation and analysis, this paper uses multiple linear regression analysis to integrate the common factors that affect the overall learning experience. There are eight factors in total, namely, student major, class check-in, student voting, picture in picture, classroom interaction, large student capacity, virtual background and beautiful filters, and classroom management. Through the analysis of the data Table 7, the weight of each factor is obtained. The higher the weight, the greater the students think the impact of this item on learning experience. On the contrary, the smaller the impact [7].

The results showed that the regression model of this study was statistically significant,  $F(8101) = 3437$ ,  $P < 0.001$  Table 7, indicating a linear correlation between dependent variable and independent variable. The null hypothesis of this test is that the multiple correlation coefficient  $zR = 0$ . At the same time, it also shows that compared with the empty model, the inclusion of independent variables helps to predict the dependent variables.

**Table 5.** Correlation analysis.

	Gender	Age	grade	major	Class sign in	Student voting	Picture in Picture	Classroom interaction	Large student capacity	Virtual background and beauty filter	Classroom management
Gender	1										
Age	-.079	1									
	.411										
grade	-.077	.321**	1								
	.425	.001									
major	.209*	.099	.127	1							
	.029	.305	.187								
Class sign in	.052	.045	.117	-.065	1						
	.589	.643	.225	.502							
Student voting	.092	.064	.028	-.145	.468**	1					
	.341	.508	.771	.131	.000						
Picture in Picture	.012	.107	-.003	-.178	.506**	.401**	1				
	.900	.268	.974	.063	.000	.000					
Classroom interaction	-.035	.090	-.138	-.229*	.311**	.502**	.381**	1			
	.718	.348	.151	.016	.001	.000	.000				
Large student capacity	.011	.093	.002	-.137	.383**	.468**	.368**	.377**	1		
	.907	.335	.987	.155	.000	.000	.000	.000			
Virtual background and beauty filter	.039	.051	-.016	-.157	.315**	.427**	.345**	.224*	.411**	1	
	.689	.595	.865	.103	.001	.000	.000	.019	.000		
Classroom management	.050	-.015	.013	-.020	.429**	.405**	.368**	.275**	.411**	.321**	1
	.603	.879	.894	.836	.000	.000	.000	.004	.000	.001	

\*At 0.05 level (double tail), the correlation is significant

\*\*At 0.01 level (double tail), the correlation is significant.

The results show that the constant term  $a = 3.941$  Table 8, and the regression coefficients of each item are set as  $X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8$ , and brought into the equation. The regression equation is:

$$y = 3.941 + 0.139X_1 + 0.169X_2 + 0.036X_3 + -0.122X_4 + -0.198X_5 + -0.180X_6 + -0.869X_7 + 0.000X_8 \tag{1}$$

It can be seen that the P value of the partial regression coefficient test of student specialty, class check-in, student voting, picture in picture, classroom interaction, large

**Table 6.** Descriptive Statistics

	average value	standard deviation
Gender	1.60	.492
Age	2.58	.565
grade	2.83	1.116
major	2.48	1.179
Sign in for middle class	3.48	.787
Student voting	3.54	.935
Picture in Picture	3.72	.920
Classroom interaction	3.57	.962
Large student capacity	3.54	.992
Virtual background and beauty filter	3.57	1.062
Classroom management	3.76	.967

**Table 7.** ANOVA<sup>a</sup>

model		Sum of squares	degree of freedom	mean square	F	Significance
1	regression	14.326	8	1.791	3.437	.000 <sup>b</sup>
	residual	52.628	101	.521		
	total	66.955	109			

- a. Dependent variable: do you think Tencent Meeting is helpful to your learning?
- b. Predictive variables: (constant), major, classroom management function, virtual background and beauty filter function, classroom interaction function, classroom check-in function, large student capacity function, picture in picture function, student voting function

student capacity, virtual background, beautiful filter and classroom management is < 0.05. Under the test level of  $\alpha = 0.05$ , it can be considered that the partial regression coefficient is not 0, which is statistically significant, and can be included in the final regression model. Among the equipment functions, the classroom management function contributes the most, with a regression coefficient of 0.869; Among the background characteristics of the students, the contribution of the major is the smallest, and the regression coefficient is 0.000, indicating that the impact of the major on the student experience of “Tencent Meeting” is small and negligible. Among the equipment functions, the contribution of picture in picture is the smallest, with a regression coefficient of 0.036. Therefore, in order to improve students’ learning experience, from the perspective of equipment functions, especially the optimization and improvement of classroom management functions, only through targeted improvement measures can students’ learning experience be improved [4].

**Table 8.** Multiple linear regression analysis

model		Non standardized coefficient		Standardization coefficient	T	Significance
		B	Standard error	Beta		
Equipment function	(Constant)	3.941	.458		8.599	.000
	Class sign in	.139	.112	.143	1.876	.020
	Student voting	.169	.100	.154	3.295	.019
	Picture in Picture	.036	.094	.043	1.387	.042
	Classroom interaction	.122	.088	.149	1.389	.016
	Large student capacity	.198	.086	.174	3.595	.011
	Virtual background and beauty filter	.180	.076	.243	2.350	.021
	Classroom management	.869	.085	.110	4.047	.029
Student Background	Major	.000	.061	.000	.005	.043

## 4 Conclusion

Through the data survey of the questionnaire, this paper draws the following conclusions: according to the data of multiple linear regression analysis Table 8, the classroom management function contributes the most; Secondly, from high to low, students' large capacity, virtual background and beauty filter, student voting, classroom check-in, classroom interaction, picture in picture and students' majors have significant positive effects on students' online learning experience ( $p < 0.05$ ). The classroom management function represents the control point of teachers in the "Tencent Meeting" classroom, which can properly control the process of counting the number of students in the classroom, switching the microphone and video control, course questioning, link switching and other courses. It plays an important role in the teaching activities of the "Tencent Meeting" equipment. It should enrich the control commands of classroom management functions in view of the advantages of information education, so as to better respond to the new needs of contemporary college students for information teaching. As the second outstanding contribution, the large student capacity is one of the characteristics of the "Tencent Meeting" equipment, which can be carried out for large-scale open classes, lectures and conferences. Some students reported that although the capacity is large, the

operation is unstable, and there are frequent flashbacks. Therefore, this problem needs to be strengthened and improved to maximize this feature.

In the data of multiple linear regression analysis, the factor contributing the least is the major of the students. Most of the reasons are that 78.54% of the students surveyed are from science and engineering majors. Therefore, the demand for experimental demonstration, data model and other learning contents is large, which will be reflected in the demand for online learning. Therefore, in view of the learning needs of science and engineering, the “Tencent Meeting” equipment should also be paid attention to in the future rectification, and its functional scope should be expanded.

In order to better serve the teaching activities, in addition to the corresponding optimization of the functions in the “Tencent Meeting” equipment, it also needs the support of government policies, the follow-up guarantee of social enterprises, and the school’s rectification and strengthening of teachers’ teaching concepts, teaching methods and information technology applications. Only in this way can we further improve students’ online learning experience and accelerate the pace of information education in China.

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