

Research Article

Research on College Students' Attitudes Towards Online Learning Platforms and Their Impact on Learning Engagement: A Case Study of the "Cloud Classroom" Teaching Platform

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Abstract

With the continuous advancement of information technology and its deepening integration with educational teaching, online learning has developed rapidly. Online learning platforms have become increasingly sophisticated, and many universities choose Yun Class as the platform to provide diverse teaching interactions for teachers and students. To understand students' attitudes towards using the Yun Class platform for professional courses and its impact on student engagement, a survey was conducted among 80 junior college students majoring in Finance at the College of Applied Sciences, Beijing Union University, from the class of 2022. The collected data were organized and analyzed using software such as SPSS26, Amos22, and Graphpad7.0. Research findings show that students' attitudes towards using Yun Class significantly influence two sub-dimensions of learning engagement—emotional engagement and behavioral engagement. This indicates that students generally support the use of the Yun Class platform for professional courses, and this supportive attitude positively affects their learning engagement. The study concludes that Yun Class, as an aid to teaching, embodies the student-centered teaching philosophy and provides a convenient and powerful learning platform for independent student learning, which is worth promoting. It also points out that the implementation of teaching using the Yun Class platform must highlight the crucial role of teachers, strengthen supervision and guidance, focus on cultivating students' ability for independent learning, and improve the learning outcomes based on the Yun Class platform.

Keywords

Online Learning Platform, Cloud Class, Application Attitude, Learning Engagement, College Students

1. Introduction

The rapid development of information technology and its deep integration with educational teaching have facilitated a shift in the paradigm of undergraduate education from a "teaching paradigm" to a "learning paradigm" [1]. The new paradigm

emphasizes that the purpose of universities is not merely to "teach," but rather to more effectively promote student learning. How to integrate various teaching resources against the backdrop of "Internet Plus," provide students with platforms for au-

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onomous learning and independent thinking, make them responsible for their own learning, and cultivate their abilities to engage in active, autonomous, and lifelong learning has become a hot issue of concern in the educational community [2].

In recent years, against the backdrop of rapid development in mobile internet, multimedia technology, and artificial intelligence, online learning has gained favor among global learners due to its openness, flexibility, lack of restrictions on time and space, and support for personalized learning. It has gradually become one of the important learning methods in the information age. In line with this, online learning platforms have been widely applied globally, offering students unrestricted access to online teaching, resource sharing, and learning services across time and space. Countries such as the USA, the UK, Canada, and Australia have established relatively comprehensive online learning platforms. Domestically, with the continuous improvement of the mobile network environment, various online learning platforms represented by "Cloud Classroom", Xuexitong, and Rain Classroom have begun to be applied in college teaching activities and are rapidly expanding. Among them, "Cloud Classroom" stands out due to its diverse functions, ease of operation, and good interactivity. Especially against the backdrop of the COVID-19 pandemic, an increasing number of university classrooms have chosen "Cloud Classroom" as the online learning platform to provide diverse teaching interactions for teachers and students [3].

"Cloud Classroom" uses smartphones and other mobile communication devices to carry out interactive teaching that is not limited to the classroom. Teachers first create a "class" for the course on the "Cloud Classroom" platform, then they can manage the class using smartphones, computers, or other mobile devices. This includes uploading course resources, organizing teaching activities, and implementing process monitoring. Uploading course resources and organizing teaching activities are relatively easy to understand. Implementing process monitoring mainly refers to using the "Cloud Classroom" platform to assist teaching, where teachers can comment, provide feedback, and answer questions about students' classroom performance and confusion at any time. Teachers can also use the platform's "learning analysis" function to effectively track students' learning activity trajectories and always grasp students' learning dynamics through horizontal and vertical comparative analyses of learning, providing data support for conducting student learning behavior analysis and data-driven personalized, precise teaching reform.

After teachers establish a "class," students join the class for course study using an "invitation code" provided by the teacher [4]. Each time students participate in learning activities, such as class attendance, questionnaire voting, answering questions, participating in discussions, sharing viewpoints, reviewing materials, completing homework, etc., they earn corresponding "experience points." The "experience points" earned by students can serve as an important reference for

objectively evaluating their learning performance [5].

In recent years, there has been a gradual increase in teaching research on the "Cloud Classroom" online learning platform. Wang Zhihong and Zhang Jie (2020) applied a blended learning model based on the "Cloud Classroom" platform to English Linguistics course teaching and proposed that the "experience points" obtained by students are significantly positively correlated with their final assessment results. Ding Qiao et al. (2019) conducted teaching practice on the Engineering [6].

The "Cloud Classroom" platform is a type of educational service product characterized by strong experiential features, and the attitudes of learners significantly impact its effectiveness. Researchers have noted students' attitudes towards the application of the "Cloud Classroom" platform in course instruction, with Wang Lixia (2019) finding that the majority of students approve of using the "Cloud Classroom" to support classroom teaching. However, existing studies primarily focus on the practical application of the "Cloud Classroom" platform in specific courses or types of courses, emphasizing research on "application effects." Studies on the attitudes towards the use of the "Cloud Classroom" platform remain insufficiently systematic and comprehensive [7].

Online learning engagement, as a positive state exhibited by learners participating in online learning activities [8], can predict learners' developmental levels of learning and reflects the quality of online teaching to some extent [9]. In light of this, this study focuses not only on university students' attitudes towards the introduction and application of the "Cloud Classroom" platform in professional courses but also aims to explore how these "attitudes" influence students' learning engagement, with the hope of making constructive explorations to improve the effectiveness of course teaching based on the "Cloud Classroom" platform.

2. Methods

2.1. Subjects of the Survey

The survey selected 80 students from the 2022 class of the Finance program at the College of Applied Science and Technology, Beijing Union University, who were participating in a teaching practice involving two specialized courses (Behavioral Finance and Comprehensive Training in Financial Product Marketing) on the "Cloud Classroom" platform over two semesters.

2.2. Research Hypotheses

This study aims to understand students' attitudes towards the application of the "Cloud Classroom" platform in specialized courses and its impact on their learning engagement. For this purpose, two research hypotheses are proposed:

Hypothesis 1: Students support the introduction and application of the "Cloud Classroom" platform for specialized courses. This hypothesis has two sub-hypotheses:

- 1) Hypothesis 1a: There is a significant difference in students' attitudes towards the introduction and application of the "Cloud Classroom" platform based on gender.
- 2) Hypothesis 1b: There is a significant difference in students' attitudes towards the introduction and application of the "Cloud Classroom" platform based on their admission method.
- 3) Hypothesis 2: Students' attitudes towards the application of the "Cloud Classroom" platform significantly influence their learning engagement. This hypothesis has three sub-hypotheses:
- 4) Hypothesis 2a: Students' attitudes towards the application of the "Cloud Classroom" platform significantly influence their cognitive engagement.
- 5) Hypothesis 2b: Students' attitudes towards the applica-

tion of the "Cloud Classroom" platform significantly influence their emotional engagement.

- 6) Hypothesis 2c: Students' attitudes towards the application of the "Cloud Classroom" platform significantly influence their behavioral engagement.

2.3. Survey Method

This survey employed the questionnaire method. Apart from basic student information, all other questions used a Likert scale with five levels.

Regarding students' attitudes towards the introduction and application of the "Cloud Classroom" platform in specialized courses, a total of 14 questions were designed, as detailed in Table 1.

Table 1. Students' Attitudes Towards the Introduction and Application of "Cloud Classroom" in Professional Courses.

Subjects	
Attitude 1	How much do you support the integration of "Cloud Classroom" into course teaching?
Attitude 2	How much do you support the continued use of "Cloud Classroom" in course teaching?
Attitude 3	How familiar are you with the operational functions of "Cloud Classroom"?
Attitude 4	The experience ranking on "Cloud Classroom" has increased my motivation to learn.
Attitude 5	After integrating "Cloud Classroom" into course teaching, it has helped promote my pre-class preparation.
Attitude 6	After integrating "Cloud Classroom" into course teaching, it has helped create a positive competitive learning environment.
Attitude 7	After integrating "Cloud Classroom" into course teaching, it has helped me understand my learning status better.
Attitude 8	Using "Cloud Classroom" to release activities during class makes me more focused.
Attitude 9	Using "Cloud Classroom" to release activities during class enhances teacher-student interaction.
Attitude 10	Studying with "Cloud Classroom" has increased my enthusiasm for self-directed learning.
Attitude 11	Studying with "Cloud Classroom" has improved my classroom participation.
Attitude 12	Studying with "Cloud Classroom" has enhanced my learning efficiency.
Attitude 13	Studying with "Cloud Classroom" makes me more willing to join groups to complete learning tasks.
Attitude 14	Studying with "Cloud Classroom" has increased my learning load.

Regarding the attitudes of students towards using cloud-based classroom applications and their impact on learning engagement, a total of 15 questions were designed. Students' learning engagement is divided into three sub-dimensions: cognitive engagement, emotional engagement, and behavioral engagement, as detailed in Table 2.

Table 2. The Impact of Students' Attitudes towards Using Cloud Class on Their Learning Commitment.

	Dimensions	Subjects
question 1	Cognitive Engagement	During my course studies, I frequently highlight the difficult and key points in the learning materials.
question 2		I often preview the relevant content beforehand.
question 3		I consistently try to connect new knowledge with what I have already learned.

	Dimensions	Subjects
question 4	Emotional Engagement	I attempt to find suitable examples to help me understand important concepts.
question 5		When studying a course, I am always curious about the content that will be covered.
question 6		I always look forward to the upcoming course activities.
question 7		Participating in course activities brings me joy.
question 8		Engaging with classmates during course studies is enjoyable for me.
question 9		In the context of course studies, I feel that both teachers and peers respect my opinions and suggestions.
question 10	Behavioral Engagement	I regularly study the materials provided by the course as per its requirements.
question 11		In group discussions, I actively express my views.
question 12		If I have any learning ideas, I quickly put them into action.
question 13		I seldom take notes in class.
question 14		Sometimes, societal perceptions about degree completion programs hinder my ability to study effectively.
question 15		I proactively log into the "Cloud Class" platform to check my learning tasks.

3. Result

The survey was conducted anonymously after the completion of two specialized courses. Before the survey, students were informed about its purpose and were requested to fill out the questionnaire objectively and truthfully. The questionnaires were collected immediately after they were completed on-site. A total of 80 questionnaires were distributed in this survey, with 74 valid responses received, resulting in an effectiveness rate of 92.5%. Data collected were organized and analyzed using software such as SPSS26, Amos22,

and Graphpad7.0. The results were then comprehensively presented to reveal students' attitudes towards the application of cloud-based classes in specialized courses and their impact on learning engagement.

Section 3.1 Sample Distribution

Among the 74 sample data participating in this survey, males accounted for 45.9%, while females made up 54.1%; 74.3% of participants were admitted through a degree completion program, and those enrolled under the "Veteran Soldiers Program" constituted 25.7%. Detailed sample data are shown in Table 3.

Table 3. Sample Distribution Table.

		Frequency (n)	Percentage (%)
Gender	Male	34	45.9
	Female	40	54.1
Admission Method	Examination for admission	55	74.3
	Veterans' Education Enrollment Program	19	25.7

3.2. Reliability and Validity Testing of Attitude Scales

Regarding the attitude scales for students' application of cloud-based courses in their major, all 14 items have factor loading higher than 0.5, indicating that these 14 items are

valid. To assess convergent validity, the primary metric is the Average Variance Extracted (AVE). A higher AVE suggests stronger commonality among measurement indicators and a better reflection of issues within the same category. The calculated AVE for this attitude scale is 0.69, which is above the threshold of 0.5, signifying good convergent validity. The Composite Reliability (C.R.) is 0.97, surpassing the 0.6

benchmark. Overall, the reliability and validity of this attitude scale are satisfactory. For detailed test results, see Table 4:

Table 4. Convergent Validity of Attitude Scale.

Item	Loading	Reliability Coefficient	Measurement Error	Composite Reliability C.R)	Average Variance Extracted AVE)
Attitude 1	0.90	0.81	0.19	0.97	0.69
Attitude 2	0.81	0.66	0.34		
Attitude 3	0.82	0.67	0.33		
Attitude 4	0.73	0.53	0.47		
Attitude 5	0.83	0.68	0.32		
Attitude 6	0.82	0.67	0.33		
Attitude 7	0.91	0.83	0.17		
Attitude 8	0.80	0.65	0.35		
Attitude 9	0.91	0.82	0.18		
Attitude 10	0.88	0.77	0.23		
Attitude 11	0.90	0.81	0.19		
Attitude 12	0.77	0.59	0.41		
Attitude 13	0.79	0.62	0.38		
Attitude 14	0.70	0.49	0.51		

3.3. Statistics of Survey Results

3.3.1. Students' Attitudes Towards the Introduction and Application of "Cloud Classroom" in Professional Courses

The survey results indicate that out of 74 students, the average score for their attitudes towards the introduction and application of "Cloud Classroom" in professional courses is 4.14, which is above the medium level. The assumption 1 is confirmed, meaning that students generally support the use of the "Cloud Classroom" platform in professional courses.

For a detailed overview of the overall attitude scores of students, refer to Table 5.

Table 5. Overall Student Attitude Scores.

	N	Minimum	Maximum	Mean	Standard Deviation
Attitude	74	1	5	4.14	0.90

For details on the attitude scores of students for each question item, refer to Table 6.

Table 6. Scores of Students' Attitudes for Each Item.

Item	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14
Mean	4.27	4.20	4.36	4.07	3.96	3.99	4.17	4.07	4.09	4.15	4.20	4.15	3.99	4.33

From the data in Table 6, it is evident that students' support for the introduction of cloud-based classes into course instruction (A1) and their support for the continued use of cloud-based classes in course instruction (A2) are both high, with scores of 4.27 and 4.20 respectively. Students' familiarity with the operational functions of cloud-based classes (A3) scored 4.36, which is considered high. The scores for items 4-13 (A4-A13) range from 3.99 to 4.17, indicating a high level of agreement among most students that cloud-based classes positively enhance learning. Regarding the item "Using cloud-based classes for learning has increased my study

load" (A14), students scored 4.33, suggesting that they do not perceive using cloud-based classes as an additional burden on their studies.

Cloud-Based Class Attitude Score Analysis

Calculations show that there is no significant difference in attitude scores towards the application of cloud-based platforms based on gender, with $P > 0.05$. Hypothesis 1a is not supported, meaning there is no significant difference in attitudes towards the use of cloud-based classes in professional courses based on student gender. The results are presented in Table 7.

Table 7. Differences in Student Gender Attitudes Towards Using "Cloud Classroom" Applications.

	Examination for admission	Veterans' Education Enrollment Program	t	P
Attitude	4.08 ±0.94	4.27 ±0.77	-0.803	0.425

3.3.2. Attitude Scores in "Cloud Classroom"

The calculation reveals no significant difference in attitude towards the use of the "Cloud Classroom" platform across different admission methods, with $P > 0.05$. Hypothesis 1b is

not supported, indicating that students admitted through different methods do not show a significant difference in their attitude toward the introduction or use of the "Cloud Classroom". The results are presented in Table 8.

Table 8. Differences in Student Attitudes Toward "Cloud Classroom" Applications Based on Enrollment Methods.

	Examination for admission	Veterans' Education Enrollment Program	t	P
Attitude	4.08 ±0.94	4.27 ±0.77	-0.803	0.425

The Impact of Student Attitudes on Learning Engagement

Regression models were established based on three sub-dimensions of student learning engagement, namely Model 1a (with cognitive engagement as the dependent variable), Model 2b (with emotional engagement as the dependent variable), and Model 3c (with behavioral engagement as the dependent variable). The results indicate that students' attitudes toward "Cloud Class" significantly influ-

ence their emotional and behavioral engagement, with $P < 0.05$, and both regression coefficients β are greater than 0, suggesting a significant positive impact of students' attitudes toward "Cloud Class" on emotional and behavioral engagement. Therefore, hypotheses 2b and 2c are confirmed. However, students' attitudes toward "Cloud Class" do not significantly affect their cognitive engagement, leading to the rejection of hypothesis 2a. The results are shown in Table 9:

Table 9. The Impact of Attitudes Toward "Cloud Classroom" Applications on Student Learning Engagement.

	Model 1 ^a	Model 2 ^b	Model 3 ^c
	β (95%CI)/T/P	β (95%CI)/T/P	β (95%CI)/T/P
Attitude	0.104(-0.126~0.334)/0.903/0.37	0.262(0.058~0.466)/2.569/0.013	0.24(0.073~0.407)/2.879/0.005
R ² /F/P	0.745/18.438/<0.001	0.833/28.034/<0.001	0.813/27.354/<0.001

4. Conclusion

Statistical data reveals that students are generally positive about the introduction of professional courses on the “Cloud Classroom” platform and its continued use in course instruction. Moreover, factors such as student gender and mode of entry have no significant impact on attitudes towards using “Cloud Classroom” for course applications, indicating that the platform does not significantly target specific learner groups. Additionally, the majority of students are quite familiar with using “Cloud Classroom”, reflecting its convenience to some extent.

Research indicates that students' attitudes toward using “Cloud Classroom” significantly influence two sub-dimensions of learning engagement—emotional and behavioral engagement. That is, higher scores in “Cloud Classroom” Attitude (higher support for “Cloud Classroom”) correlate with higher emotional and behavioral engagement in learning.

In conclusion, this study finds that the “Cloud Classroom” platform not only breaks the traditional classroom's time and space constraints and facilitates efficient sharing of teaching resources but also enhances student motivation, promotes interaction and cooperation during the teaching process, and improves student participation and learning efficiency before, during, and after class. Furthermore, it allows students to promptly understand their learning status, contributing to a healthy competitive learning environment. Overall, “Cloud Classroom” as an aid to teaching embodies the student-centered educational philosophy, offering students a convenient, powerful learning platform that is worth promoting.

5. Discussion

Students are the main body of learning and the core of the teaching process [10]. This survey found that students generally have a positive attitude towards using the “Cloud Classroom” platform. However, during the implementation of teaching, it was observed that some students overly focus on “experience points,” treating them as the priority in course learning; others exhibit insufficient participation, adopting a perfunctory attitude towards activities and tasks before, during, and after class, which deviates from the true purpose of learning. In future teaching, teachers should strengthen supervision and guidance to enhance students' self-awareness and self-discipline in learning.

Despite the numerous advantages of the “Cloud Classroom” platform, it fundamentally remains a supplementary tool for teaching. Therefore, teachers must strive to improve the quality of course teaching, pay attention to course development, enrich online resources, optimize teaching design, innovate teaching methods, focus on fostering students' autonomous learning abilities, to meet students' learning needs and enhance their learning outcomes.

This survey is merely a preliminary investigation involving a portion of our school's students, and many related fac-

tors were not covered or reflected. In the future, it is necessary to enhance the scientific design of questionnaires and the applicability of research methods, to conduct more in-depth studies on learners' attitudes towards online learning platforms and the factors affecting them.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Biography

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