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Analysis of Factors Affecting the Satisfaction of Associate Degree Students with The Flipped Classroom in Chengdu, China

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Abstract

Purpose: Flipped classroom is an educational approach that reverses the traditional model of classroom instruction, and is reserved for class discussion and interactive projects. This research paper investigates the key factors that significantly impact the satisfaction of flipped classrooms among students at the Chengdu Vocational University of Art. The framework proposes causal relationships between knowledge, skills, task orientation, behavioral engagement, active learning, and satisfaction. **Research design, data, and methodology:** Researchers distributed questionnaires to 500 associate degree students who had experienced flipped classroom learning using various sampling methods. Data analysis was conducted using structural equation modeling (SEM) and confirmatory factor analysis (CFA), including model fit, reliability, and validity. **Results:** Results indicate that active learning significantly affects satisfaction, behavioral engagement has a significant impact on active learning, and knowledge, skills, and active learning have a significant impact on satisfaction. Task Orientation does not have a significant impact on satisfaction. knowledge, skills, and active learning significantly impact satisfaction, with active learning having the strongest effect. Additionally, knowledge has a significant positive effect on skills, and behavioral engagement has a significant positive effect on active learning. **Conclusions:** We recommend that teachers and academic administrators provide evaluations to enhance the Satisfaction of associate degree students.

Keywords: Flipped Classroom, Satisfaction, Task Orientation, Behavioral Engagement, Active Learning

JEL Classification Code: E44, F31, F37, G15

1. Introduction

In today's information age, the development of information technology in education has gradually become a practical requirement. Compared with traditional teaching methods, information technology in the classroom can quickly and efficiently obtain teaching resources, bringing new teaching experiences to teachers and students. Building a quality assurance system and improving the teaching quality in information technology classroom teaching has become a new focus (Ren, 2017).

Under the development of education information technology, vocational education has extended to the flipped classroom teaching mode, which can fully utilize the advantages of the Internet and traditional teaching (Chen &

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Zhou, 2016). Flipped classroom teaching mode is a specific type of blended learning design that uses technology to move lectures outside the classroom and concepts and practice inside the classroom (Strayer, 2012).

The flipped classroom teaching mode has attracted the attention of educational technology workers and is active in various educational fields (Jin, 2012). Hou (2021) believes that in flipped classroom teaching, teachers can better adapt to the requirements of the new era by using new technologies, student-centered learning, and characteristic teaching.

Flipped classrooms have been proven to affect skills learning positively (Xiao et al., 2018). Emphasizing the application of flipped classrooms, strengthening the information construction of the curriculum, and fully mobilizing the participation and enthusiasm of students can achieve better teaching effects (Zhao, 2015). The results of knowledge learning in the flipped classroom are the same or improved compared to traditional classroom learning, but students in the flipped classroom are more satisfied (Prober & Khan, 2013).

Based on the theory of planned behavior (TPB) model, this article constructs a research framework. It identifies key factors that significantly impact the satisfaction of flipped classrooms at the associate degree level at the Chengdu Vocational University of Art, including knowledge, skills, task orientation, behavioral engagement, and active learning (Ajzen, 1991). Classroom teaching is a major basic teaching organization form in student cultivation, directly related to Satisfaction (Han, 2008). In addition, students' behavioral participation impacts thinking, continuously inspiring and optimizing their knowledge structure in the learning process (Wu, 2007). Therefore, this research framework includes knowledge, skills, task orientation, active learning, behavioral engagement, and satisfaction to explore further the factors that affect the satisfaction of associate degree students with flipped classrooms.

2. Literature Review

2.1 Knowledge

The classic definition of knowledge comes from Plato, who believed that knowledge had been verified, is correct, and is believed by people (Zalta et al., 1995). The famous British historian Peter Burke uses a relatively broad and superficial definition of knowledge, believing that knowledge represents information content that has been deeply thought about, processed, or systematized (Peter, 2016).

Sams and Bergmann (2013) attracted worldwide attention with their more than ten years of practice in flipped classrooms. They proposed in their book "Flipped Learning" that flipped classroom learning uses technological means to improve classroom efficiency and allows students to focus more on learning knowledge content.

Through investigation and research, Liu & Liu (2020) found that the knowledge interaction between students and teachers needs to be more active, leading to the generally low quality of classroom teaching in vocational education. Students engage in knowledge learning and interpersonal interaction on campus, and whether they can complete this process well directly affects their learning effectiveness and overall development (Guo et al., 2022). Through research, Zhai et al. (2015) found that in flipped classrooms, learners' personalized needs and the learning experience of pre-knowledge content are important factors that affect learner satisfaction. Therefore, we propose that:

H1: Knowledge has a significant influence on satisfaction.

H2: Knowledge has a significant influence on skills.

2.2 Skills

In the "Psychology Dictionary," skills are complex systems of intellectual and physical actions that individuals develop by applying existing knowledge and experience through practice (Lin, 2007). Pi (1997) believes that skills are the ability to complete a wise or physical coordination task smoothly according to certain rules or operating procedures based on practice. Moreover, skills refer to lawful cognitive activities acquired through learning.

The primary stage of skills refers to being established on a certain foundation of knowledge (Shi, 1999). Knowledge is fundamental to skills, and skills play a role in developing and extending knowledge (Sun, 2011). In the work of teachers, knowledge, skills, and attitudes are important factors in developing cognitive experience (Webster, 2007).

In students' future employment, the degree of match between skills and positions directly affects the prospects of future career development (Deng & Fu, 2023). In vocational education, the learning, mastery, and application of skills are important factors in evaluating curriculum satisfaction (Mattila et al., 2021). Cultivating skilled personnel has always been a social concern (He, 2014). Hence, a hypothesis is suggested:

H3: Skills have a significant influence on satisfaction.

2.3 Task Orientation

Task orientation refers to using task teachers to inspire, strengthen, and maintain learners' achievement motivation in teaching (Feng et al., 2019). Task orientation means integrating relevant knowledge, skills, and attitudes according to tasks and designing the learning process according to the process (Yang, 2011). The exploration of task-oriented approaches in the curriculum has always been

a concern for vocational education and training teachers (Wan, 2014).

Lemyre et al. (2002) research results show that task orientation is beneficial to learning and related to individuals' mental health. Pérez-Quero et al. (2023) found through investigation and research that task orientation impacts satisfaction in course activities. Borgatta and Ford (1970) believe that in work, both the task and situational factors in task orientation impact satisfaction. Accordingly, this study develops a hypothesis:

H4: Task orientation has a significant influence on satisfaction.

2.4 Behavioral Engagement

Wang (2017) believes that behavioral engagement refers to the series of classroom learning behaviors that students carry out under the guidance of teachers. It is the external manifestation of cognitive engagement, and she has confirmed from different perspectives that behavioral engagement and activity involvement positively affect students' development. Ceng (2016) believes that encouraging students to participate in the teaching process actively has become a concern for teachers.

Liu et al. (2021) found through investigation and research suggested that teachers should play a role in guiding students to actively participate in the classroom by giving them a more active role in the curriculum. Xu (2018) advocates changing the educational model and method based on the student's subjectivity and increasing efforts to cultivate student participation, enhance creativity and initiative, and emphasize active learning to enhance one's abilities. Teachers who can reasonably use student behavioral engagement can guide students to learn actively (Bond et al., 2020). Subsequently, a hypothesis is concluded:

H5: Behavioral engagement has a significant influence on active learning.

2.5 Active Learning

Active learning is a student-centered approach where students can independently regulate and monitor their learning process (Wang et al., 2010). Learning is an ability and the most effective way to enhance one's ability. Active learning can reshape thinking patterns, knowledge structures, and work modes, leading to multidimensional transformations. Active learning has varying degrees of impact on students' learning experience, participation, and learning outcomes (Tang, 2020).

Using video and digital materials to initiate student discussions is a common way to increase active classroom learning (Robles et al., 2019). Ali and Ahmad (2011) found that effective communication between teachers and students, timely updating of course content, and improving teachers' subject expertise can improve students' satisfaction with learning. Liu (2018) conducted a satisfaction survey of 4,808 students, and the results showed that the degree of active learning had a significant positive impact on each factor of learning satisfaction. Therefore, a hypothesis is conducted:

H6: Active learning has a significant influence on satisfaction.

2.6 Satisfaction

Satisfaction is a psychological state (Huang, 2011). Oliver (1999) defines satisfaction as the degree to which a customer's demand is met during the consumption experience as a perceptual state. Learning satisfaction refers to the students' feelings or attitudes towards learning activities, reflecting their experiential feelings and overall evaluation of the learning process at school (Yang, 2016).

Since the 1990s, research on student satisfaction has emerged in North America, and in recent years, there have been some studies on student satisfaction in China. However, most of them are qualitative research from the perspective of psychology or humanities, and quantitative analysis is rare (Lam et al., 2001). Tian and Wang (2007) believe that college students' satisfaction comprehensively reflects the overall level of education in regular universities and students' learning attitudes, which is one of the factors for future university evaluation. Student learning satisfaction is an important content in universities' teaching quality evaluation and guarantee system (Hok et al., 2021). Student satisfaction surveys and research can help schools improve students' satisfaction from weak links, improve quality evaluation, and guarantee a teaching system (Zhang et al., 2016).

3. Research Methods and Materials

3.1 Research Framework

The research framework for this study was developed from previous research frameworks, adapting and combining four theoretical models. The first model, developed by Murillo-Zamorano et al. (2019), examined the impact of knowledge (K) on skills (S1), the impact of knowledge (K) on satisfaction (S2), and the impact of skills (S1) on satisfaction (S2). The second model, developed by Pérez Ruiz et al. (2019), found that task orientation (TO) has an impact on satisfaction (S2). The third model, developed by Jamaludin and Osman (2014), established that behavioral engagement (BE) has an impact on active learning (AL). Finally, the fourth model, developed by Chau and Cheung (2018), demonstrated that active learning (AL) has an impact on satisfaction (S2).

This study's conceptual framework is shown in Figure 1, which combines and adapts these four models to investigate the relationship between these variables in the context of higher education. By building on and refining these existing frameworks, this study aims to contribute a deeper understanding of the factors influencing higher education student satisfaction (see Figure 1).

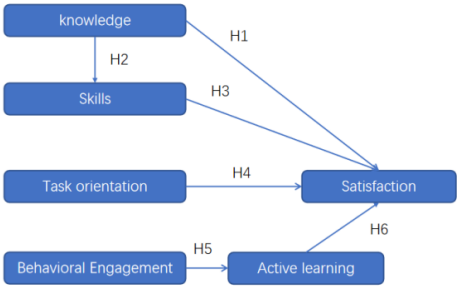

Figure 1: Conceptual Framework

H1: Knowledge has a significant influence on satisfaction.
H2: Knowledge has a significant influence on skills.
H3: Skills have a significant influence on satisfaction.
H4: Task orientation has a significant influence on satisfaction.
H5: Behavioral engagement has a significant influence on active learning.
H6: Active learning has a significant influence on satisfaction.

3.2 Research Methodology

The researchers used a quantitative method with non-probability sampling to investigate the key factors affecting student satisfaction in flipped classrooms at the Chengdu University of Art vocational level. The survey questionnaires were distributed to students who had experienced flipped classrooms via the Internet. Data was collected and analyzed to identify the key factors impacting student satisfaction.

The survey consisted of three parts. The first part involved identifying the characteristics of the respondents through screening questions. The second part used a Likert scale to measure six proposed variables, ranging from strongly disagree to agree strongly. Finally, demographic questions were asked to gather information about the respondents' schools, majors, and educational levels. In addition, a pilot test was conducted to assess the inter-rater reliability of the project's target agreement index (IOC) through expert ratings and testing on 50 respondents.

The researchers conducted validity and reliability tests using Cronbach's Alpha method to ensure validity and reliability. Item Objective Congruence (IOC) Index was used to assess the content validity. The results show that all measuring items were passed at a score of above 0.6. The pilot test and Cronbach's Alpha were used to assess the internal consistency reliability (CA). Consequently, all constructs were approved at a score above 0.7 (Nunnally & Bernstein, 1994).

After the reliability test, the questionnaire was distributed to the target respondents, and 500 responses were collected. The researchers analyzed the collected data using SPSS AMOS 26.0. They then used confirmatory factor analysis (CFA) to test the convergence accuracy of the data and validate the model. They calculated the model fit measurement value through a comprehensive examination of the given data to ensure the validity and reliability of the model. Finally, the researchers applied structural equation modeling (SEM) to test the impact of the variables.

3.3 Population and Sample Size

The target population of this study is associate degree students from three majors at the Chengdu Vocational University of Art. A sample size of at least 403 respondents is recommended for a structural equation model (Kline, 2015). In this study, a total of 500 respondents were collected.

3.4 Sampling Technique

The sampling technique used in this study was non-probability judgmental sampling, which involved selecting the three associate degree programs at Chengdu Vocational University of Art that had implemented flipped classrooms and then using quota sampling to ensure representation from each program (see Table 1).

Table 1: Sample Units and Sample Size

Grade	Population	Proportional Sample Size
Broadcasting and Hosting	200	132
Film and Television Director	60	39
Digital Media Art	500	329

Source: Constructed by author

4. Results and Discussion

4.1 Demographic Information

The demographic information of the 500 participants is presented in Table 2. All respondents were students currently enrolled at the Chengdu Vocational University of Art and had experienced flipped classroom learning mode. There were three majors: Broadcasting and Hosting, Film and Television Director, and Digital Media Art, with 132, 39, and 329 students, respectively, accounting for 26.4%, 7.8%, and 65.8%

of the sample. In addition, there were three grades: first-year, second-year, and junior, with 226, 182, and 92 students, respectively, accounting for 45.2%, 36.4%, and 18.4% of the sample.

Table 2: Demographic Profile

Demographic and General Data (N=500)		Frequency	Percentage
Major	Broadcasting and hosting	132	26.4%
	Film and television director	39	7.8%
	Digital media art	329	65.8%
Grade	1	226	45.2%
	2	182	36.4%
	3	92	18.4%

Source: Constructed by author

4.2 Confirmatory Factor Analysis (CFA)

This study employed confirmatory factor analysis (CFA). All items in each variable were significant, as indicated by the factor loadings, representing the test's convergent validity. all constructs were approved at a score above 0.7 (Nunnally & Bernstein, 1994). Hair et al. (2007) emphasized the importance of factor loadings for each item. Factor loadings require a value of 0.5 and a coefficient P value less than 0.05. Furthermore, according to Fornell and Larcker (1981), the cut-off points for CR are greater than 0.7 and AVE greater than 0.5. As shown in Table 3, the factor loading values were above 0.5, CR was above 0.7, and AVE was above 0.5. The results indicated that the CFA test results were good, and the data analysis results were effective and reliable (see Table 3).

Table 3: Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Variables	Source of Questionnaire (Measurement Indicator)	No. of Item	Cronbach's Alpha	Factors Loading	CR	AVE
Knowledge (K)	Prosser (1987)	5	0.864	0.703-0.805	0.865	0.562
Skills (S1)	Xu et al. (2019)	5	0.872	0.709-0.797	0.872	0.577
Task orientation (TO)	Zandvliet and Fraser (2005)	7	0.921	0.773-0.806	0.921	0.625
Behavioral engagement (BE)	Chau and Cheung (2018)	7	0.898	0.687-0.831	0.898	0.557
Active learning (AL)	Hyun et al. (2017)	8	0.902	0.657-0.776	0.900	0.530
Satisfaction (S2)	Chau and Cheung (2018)	6	0.879	0.691-0.778	0.879	0.547

Table 4 showed that the square root of the AVE of each variable was greater than its correlation coefficient with other variables, indicating that this model had good discriminant validity. In addition, the researchers used CMIN/DF, GFI, AGFI, NFI, CFI, TLI, and RMSEA as model fit indicators for the CFA test.

Table 4: Goodness of Fit for Measurement Model

Fit Index	Acceptable Criteria	Statistical Values
CMIN/DF	≤ 5.0 (Wheaton et al., 1977)	1659.998/ 6502.554
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.869
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.851
NFI	≥ 0.80 (Wu & Wang, 2006)	0.861
CFI	≥ 0.80 (Bentler, 1990)	0.910
TLI	≥ 0.80 (Sharma et al., 2005)	0.903
RMSEA	≤ 0.10 (Hopwood & Donnellan, 2010)	0.056
Model Summary		**In harmony with empirical data**

Remark: CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = Goodness-of-fit index, AGFI = Adjusted goodness-of-fit index, NFI = Normed fit index, CFI = Comparative fit index, TLI = Tucker–Lewis index and RMSEA = Root mean square error of approximation,

As shown in Table 5, the values obtained in this study were greater than the acceptable values, confirming that the model had a good fit. These measurement results also confirmed the validity of discrimination and verified the effectiveness of subsequent structural model estimation.

Table 5: Discriminant Validity

	K	S1	TO	BE	AI	S2
K	**0.749**					
S1	0.493	**0.759**				
TO	0.175	0.215	**0.790**			
BE	0.268	0.346	0.343	**0.746**		
AL	0.294	0.449	0.334	0.554	**0.728**	
S2	0.411	0.549	0.294	0.500	0.678	**0.739**

Note: The diagonally listed value is the AVE square roots of the variables
Source: Created by the author.

4.3 Structural Equation Model (SEM)

The structural equation model (SEM) is a generalization of the regression model, which has many advantages that the regression model does not have: it can deal with multiple independent variables and dependent variables at the same time, meeting the increasingly complex needs of theoretical models in social science research; It can analyze both explicit and latent variables at the same time, which is consistent with the general implicit characteristics of variables in social science research; The measurement error of independent variables is allowed, and the parameter estimation accuracy is higher; It has rich fitting evaluation indexes to evaluate the model, etc. These advantages make SEM an important statistical method in social science research (Wang et al., 2022).

The goodness of fit indices for the Structural Equation Model (SEM) is measured as demonstrated in Table 6. The calculation in SEMs and adjusting the model by using SPSS AMOS, the results of the fit index were presented as a good fit, which are CMIN/DF = 2.099, GFI = 0.877, AGFI = 0.860, NFI = 0.887, CFI = 0.937, TLI = 0.933 and RMSEA = 0.047, according to the acceptable values are mentioned (see Table 6).

Table 6: Goodness of Fit for Structural Model

Index	Acceptable Criteria	Statistical Before Values Adjustment	Statistical Values After Adjustment
CMIN/DF	≤ 5.0 (Wheaton et al., 1977)	2155.887/659 or 3.211	1372.888/654 or 2.099
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.836	0.877
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.816	0.860
NFI	≥ 0.80 (Wu & Wang, 2006)	0.826	0.887
CFI	≥ 0.80 (Bentler, 1990)	0.873	0.937
TLI	≥ 0.80 (Sharma et al., 2005)	0.865	0.933
RMSEA	≤ 0.10 (Hopwood & Donnellan, 2010)	0.067	0.047
Model Summary		**Not in harmony with empirical data**	**In harmony with empirical data**

Remark: CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = Goodness-of-fit index, AGFI = Adjusted goodness-of-fit index, NFI = Normed fit index, CFI = Comparative fit index, TLI = Tucker–Lewis index and RMSEA = Root mean square error of approximation,

4.4 Research Hypothesis Testing Result

The research model judges the significance of the regression path coefficient according to its t-value and calculates the explanatory ability of the independent variable to the dependent variable according to R2. Table 7 reports that at the level of significance p=0.05, **P＜0.01, and ***P＜0.001. The study tested six hypotheses, out of which the data supported five. The coefficient of influence of knowledge on satisfaction is 0.129, that of knowledge on skill is 0.568, that of skill on satisfaction is 0.273, that of task orientation on satisfaction is 0.051, that of behavioral engagement on active learning is 0.614, and finally, that of active learning on satisfaction is 0.696. Based on the outlier information, it is evident that active learning has the most significant impact on satisfaction, while task orientation has the least impact on satisfaction.

Table 7: Hypothesis Results of the Structural Equation Modeling

Hypothesis	(β)	t-Value	Result
H1: K→S2	0.129	2.771**	Supported
H2: K→S1	0.568	10.882***	Supported
H3: S1→S2	0.273	5.656***	Supported
H4: TO→S2	0.051	1.449	Not Supported
H5: BE→AL	0.614	10.951***	Supported
H6: AL→S2	0.696	12.854***	Supported

Note: *** p<0.001, ** p<0.01
Source: Created by the author

H1 showed a significant positive effect of Knowledge on Satisfaction with a standardized path coefficient of 0.129. Among the various factors that affect Satisfaction, learning knowledge is the basic issue in completing courses. University students must master professional skills and knowledge through learning and, more importantly, cultivate communication and coordination abilities through interpersonal interactions to lay a foundation for their future entry into society (Su & Wang, 2022). **H2** showed a significant positive effect of Knowledge on Skills with a standardized path coefficient of 0.568. Among knowledge and skills, knowledge is the basis for skills, and skills are the utilization and development of knowledge (Wei, 2013). **H3** showed a significant positive effect of Skills on Satisfaction with a standardized path coefficient of 0.273. Improving the Satisfaction of skilled personnel is the foundation for creating a good environment for skilled personnel (Zhao, 2002). **H4** showed that Task orientation has no significant effect on Satisfaction, with a standardized path coefficient of 0.051 (t-value=1.449, p=0.147>0.05). This indicates that Task orientation has no significant effect on Satisfaction, so H4 is not supported. **H5** showed a significant positive effect of Behavioral engagement on Active learning with a standardized path coefficient of 0.614. When teachers lead students to participate actively, high-quality classrooms can be created, and appropriate teaching methods can stimulate students' interest in active learning (Bai, 2014). **H6** showed a significant positive effect of Active learning on Satisfaction with a standardized path coefficient of 0.696. Efficient and effective engagement in active learning can enhance students' learning experience and Satisfaction (Liu et al., 2015). Active learning has the largest impact on Satisfaction.

5. Conclusion and Recommendation

5.1 Conclusion and Discussion

Based on the results of this study, the factors influencing the satisfaction of associate degree students with the flipped classroom teaching mode at the Chengdu Vocational

University of Art include knowledge, skills, and active learning. Knowledge is the foundation for completing course learning, and it significantly impacts both satisfaction and skills. In addition, skills also significantly impact satisfaction, indicating that students hope to improve both knowledge and skills through the flipped classroom learning approach.

The study also found that active learning has the greatest impact on satisfaction, suggesting that being proactive and engaged is key to successful participation in flipped classroom learning. Furthermore, behavioral participation significantly influences active learning, indirectly affecting satisfaction. However, task orientation was found to have no significant impact on satisfaction. This indicates that fixed tasks alone cannot ensure student satisfaction with the flipped classroom teaching mode.

In summary, this study suggests that knowledge, skills, and active learning are important factors affecting the satisfaction of associate degree students with the flipped classroom teaching mode at the Chengdu Vocational University of Art. Knowledge significantly impacts skills learning, while behavioral participation has the greatest impact on active learning and indirectly influences satisfaction. Task orientation alone does not significantly affect satisfaction. Based on these findings, it is recommended that educators at the Chengdu Vocational University of Art focus on promoting active learning and behavioral participation in order to enhance student satisfaction with the flipped classroom teaching mode.

5.2 Recommendation

After surveying the satisfaction of flipped classrooms at the Chengdu Vocational University of Art, researchers found that the key factors that affect satisfaction are knowledge, skills, and active learning. The main factor that affects satisfaction with flipped classrooms is active learning. Therefore, it is recommended that teachers encourage students to participate in the learning process during flipped classroom teaching actively. Active participation can help improve the flipped classroom teaching mode's learning effect, and active learning positively impacts satisfaction. Therefore, a student-centered teaching environment should be created, allowing students to feel more freedom and practice and be more motivated and confident in learning activities (Walters et al., 2017).

Firstly, knowledge acquisition is the fundamental purpose of flipped classroom teaching. The absorption situation and degree of knowledge by students are always the focus of educators' attention. It is pointed out that whether students feel their knowledge has been improved, that is, their satisfaction, is the most critical.

Secondly, in flipped classroom teaching, knowledge and skills grow together. Learners can effectively improve their thinking, creativity, and hands-on ability through the experience of flipped classroom teaching, thereby improving the overall satisfaction level of students (Strayer, 2012).

Thirdly, it is recommended that teachers flexibly assign tasks according to the content of the course because fixed tasks cannot satisfy students' learning needs through the flipped classroom teaching mode.

Finally, the new teaching mode can increase students' interest in learning and make learning more enjoyable. In summary, the results of this study will help the Chengdu Vocational University of Art or similar vocational universities obtain reference information and inspiration in the practice of new teaching modes, promote the flipped classroom teaching mode, and promote more possibilities for educational forms in the era of Internet information.

5.3 Limitation and Further Study

The limitations of this study are as follows: First, the research subjects of this study were associate degree students at the Chengdu Vocational University of Art who have experienced the flipped classroom teaching model, so the research results only represent the satisfaction of associate degree students with the flipped classroom teaching model during their time at the Chengdu Vocational University of Art. The population and sample in the study were both from the Chengdu Vocational University of Art, and the flipped classroom model studied was limited to professional courses. Certain differences exist in the difficulty, structure, and content of professional and general education courses. Therefore, the results of this study will only impact the teaching of professional course teachers. The limitations of this study also indicate a need for controlling for other unrelated factors. Considering the complexity of the flipped classroom, there may be other intermediate variables that affect the results. Therefore, the results obtained need to be further verified by future researchers.

In future studies, it is recommended that a larger and more diverse sample be used to investigate the effectiveness of the flipped classroom teaching model. It is also recommended that other factors that may affect the flipped classroom teaching model be considered, such as student learning style, motivation, and prior knowledge. Additionally, it would be useful to explore the effects of the flipped classroom teaching model in different academic fields and levels, as well as in different cultural contexts. Furthermore, it would be valuable to investigate the long-term effects of the flipped classroom teaching model on students' academic performance, critical thinking skills, and overall learning outcomes.

References

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-t

Ali, A., & Ahmad, I. (2011). Key factors for determining student satisfaction in distance learning courses: A study of Allama Iqbal Open University. *Contemporary Educational Technology, 2*(2), 118-134. https://doi.org/10.30935/cedtech/6047

Bai, C. (2014). Creating a Highly Effective High School Language Classroom: A Preliminary Study of the "Learn, Talk, Practice" Teaching Model. *Chinese Loose-leaf Anthology: Teachers 2*(2), 62-64. http://www.cqvip.com/qk/89189x/201402/48500852.html

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*(2), 238. https://doi.org/https://doi.org/10.1037/0033-2909.107.2.238

Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2020). Mapping research in student engagement and educational technology in higher education: A systematic evidence map. *International Journal of Educational Technology in Higher Education, 17*(1), 1-30. https://doi.org/https://doi.org/10.1186/s41239-019-0176-8

Borgatta, E. F., & Ford, R. N. (1970). A note on task and situational factors in work orientation and satisfaction. *The Journal of Psychology, 74*(1), 125-130. https://doi.org/https://doi.org/10.1080/00223980.1970.10545288

Ceng, R. (2016). Exploring the innovation of music teaching in upper elementary school under the new curriculum. *Modernization of Education (electronic version), 9*(8), 179-180.

Chau, S., & Cheung, C. (2018). Academic satisfaction with hospitality and tourism education in Macao: The influence of active learning, academic motivation, and student engagement. *Asia Pacific Journal of Education, 38*(4), 473-487. https://doi.org/https://doi.org/10.1080/02188791.2018.1500350

Chen, B., & Zhou, A. (2016). Teaching design and implementation of flipped classroom for higher vocational application courses under the information network environment: Take "Chinese medicine preparation testing technology" as an example. *Chemical Education, 37*(2), 42-46. https://doi.org/10.26914/c.cnkihy.2022.047542.

Deng, Y., & Fu, Y. (2023). A Study of Factors Influencing Core Employee Satisfaction in Chinese-Funded Manufacturing Firms in Vietnam. *Jiangsu Business Theory, 2*(4), 36-46. https://doi.org/10.13395/j.cnki.issn.1009-0061.2023.04.015

Feng, D., Xu, S., Li, W., & Hu, T. (2019). *Practical exploration of task-oriented teaching mode reform. Technology and Economy Market.* https://www.cnki.com.cn/Article/CJFD Tot al-KJJC201912057.htm

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. *Journal of Marketing Research, 18*(3), 382-388. https://doi.org/10.1177/002224378101800313

Guo, Y., Li, Y., Wu, S., Wang, H., Wang, X., & Liu, X. (2022). Analysis of effective teacher-student interaction based on symbolic interaction theory. *Creative Education Studies, 10,* 187. https://doi.org/10.12677/CES.2022.101034

Hair, J. F., Money, A. H., Samouel, P., & Page, M. (2007). *Research methods for business* (1st ed.). Education+ Training.

Han, X. (2008). *A study on the satisfaction of classroom teaching of master's degree students.* https://cdmd.cnki.com.cn/Artic le/CDMD-10635-2009103958.htm

He, Y. (2014). *Research on the effective cultivation of skilled talents in higher education institutions* [Master's Thesis]. Nanjing Normal University.

Hok, T., Daengdej, J., & Vongurai, R. (2021). Determinants of Student Satisfaction on Continuing Education Intention: A Case Study of Private University in Cambodia. *AU-GSB E-JOURNAL*, *14*(2), 40-50. https://doi.org/10.14456/augsbejr.2021.13

Hopwood, C. J., & Donnellan, M. B. (2010). How should the internal structure of personality inventories be evaluated? *Personality and social psychology review, 14*(3), 332-346. https://doi.org/10.1177/1088868310361240

Hou, Z. (2021). A study on the hybrid teaching model of landscape sketching course based on flipped classroom. Science Education Guide. *Advances in Higher Education, 3*(2), 140.

Huang, W. (2011). *A study of the factors influencing customer commitment and its relationship with positive word-of-mouth behavior* [Master's Thesis]. South China University of Technology. https://cdmd.cnki.com.cn/Article/CDMD-1056 1-1012305173.htm

Hyun, J., Ediger, R., & Lee, D. (2017). Students' Satisfaction on Their Learning Process in Active Learning and Traditional Classrooms. *International Journal of Teaching and Learning in Higher Education, 29*(1), 108-118. https://eric.ed.gov/?id=EJ1135821

Jamaludin, R., & Osman, S. Z. M. (2014). The use of a flipped classroom to enhance engagement and promote active learning. *Journal of education and practice, 5*(2), 124-131.

Jin, L. (2012). What does the "flipped classroom" flip?. *Information Technology Education in China, 9*, 18-18. http://www.cqvip.com/qk/97942c/20129/43122418.html

Kline, R. B. (2015). *Principles and practice of structural equation modeling* (1st ed). Guilford publications.

Lam, T., Zhang, H., & Baum, T. (2001). An investigation of employees' job satisfaction: the case of hotels in Hong Kong. *Tourism management, 22*(2), 157-165. https://doi.org/https://doi.org/10.1016/S0261-5177(00)00039-X

Lemyre, P.-N., Roberts, G. C., & Ommundsen, Y. (2002). Achievement goal orientations, perceived ability, and sportspersonship in youth soccer. *Journal of applied sport psychology, 14*(2), 120-136. https://doi.org/https://doi.org/10.1080/10413200252907789

Lin, S. (2007). *Educational Psychology* (1st ed.). Taiwan Wunan Book Publishing Co.

Liu, S. (2018). A Study of Undergraduate Students' Study Engagement and Satisfaction in Independent Institutions: An Analysis of Data from 8 Independent Institutions in Jiangsu Province. *Teaching Research, 41*(1), 9-13.

Liu, S., Zhen, Y., & Ruan, S. (2015). ARCS model perspective on the design of micro courses. *E-learning in China,* 2, 51-56.

Liu, Y., Shao, W., Yang, Z., Sun, Q., Li, W., & Sun, P. (2021). The Impact of Nonverbal Communication on Learners and Implications for Online Classroom Instruction. *Applied Psychology, 27*(4), 311-324.

Liu, Z., & Liu, Q. (2020). How can online teaching and learning help revolutionize the college classroom? Rational perception of large-scale online teaching and learning initiatives under the epidemic. *Journal of East China Normal University (Education Science Edition), 38*(7), 31. https://doi.org/10.16382/j.cnki.1000-5560.2020.07.002

Mattila, A., Dwyer DeIuliis, E., Martin, R., & Casile, E. (2021). Investigating Student Satisfaction and Perception in Clinical Reasoning Skills with Simulated Case-Based Learning as a Level I Fieldwork Experience. *The American Journal of Occupational Therapy, 75*(2), 1-5. https://doi.org/10.5014/ajot.2021.75s2-rp50

Murillo-Zamorano, L. R., Sánchez, J. Á. L., & Godoy-Caballero, A. L. (2019). How the flipped classroom affects knowledge, skills, and engagement in higher education: Effects on students' satisfaction. *Computers & Education, 141,* 103608. https://doi.org/https://doi.org/10.1016/j.compedu.2019.103608

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill, Inc.

Oliver, R. L. (1999). Whence consumer loyalty? *Journal of marketing, 63*(4), 33-44. https://doi.org/10.1177/00222429990634s105

Pérez Ruiz, A., Collado Agudo, J., García de los Salmones, M. d. M., Herrero Crespo, A., & San Martín Gutiérrez, H. (2019). An Empirical Exploration of the Perceived Effectiveness of a 'Flipped Classroom' in a Business Communication Course. *Journal of the Scholarship of Teaching and Learning, 19*(2), 1-10. https://doi.org/10.14434/josotl.v19i1.22842

Pérez-Quero, F. J., Granero-Gallegos, A., Baena-Extremera, A., & Baños, R. (2023). Goal Orientations of Secondary School Students and Their Intention to Practise Physical Activity in Their Leisure Time: Mediation of Physical Education Importance and Satisfaction. *Healthcare, 11(*4), 568. https://doi.org/10.3390/healthcare11040568

Peter, B. (2016). *Social History of Knowledge.* Zhejiang University Press.

Pi, L. (1997). *The Psychology of Learning and Teaching* (1st ed.). East China Normal University Press.

Prober, C. G., & Khan, S. (2013). Medical education reimagined: a call to action. *Academic Medicine, 88*(10), 1407-1410. https://doi.org/10.1097/ACM.0b013e3182a368bd

Prosser, M. (1987). Is prior knowledge of subject matter more important to the development and use of meaningful learning skills? *PLET: Programmed Learning & Educational Technology, 24*(4), 280-285. https://doi.org/https://doi.org/10.1080/0033039870240403

Ren, Z. (2017). Reflections on the Construction of Teaching Work Diagnosis and Improvement System in Vocational Colleges. *Journal of the National Academy of Educational Administration, 3,* 41-46.

Robles, M. J., Miralles, R., Esperanza, A., & Riera, M. (2019). Different ways to present clinical cases in a classroom: video projection versus live representation of a simulated clinical scene with actors. *BMC Medical Education, 19*(1), 1-6. https://doi.org/https://doi.org/10.1186/s12909-019-1494-1

Sams, A., & Bergmann, J. (2013). Flip your students' learning. *Educational leadership, 70*(6), 16-20.

Sharma, S., Mukherjee, S., Kumar, A., & Dillon, W. R. (2005). A simulation study to investigate the use of cutoff values for assessing model fit in covariance structure models. *Journal of Business Research, 58*(7), 935-943. https://doi.org/10.1016/j.jbusres.2003.10.007

Shi, T. (1999). Reflections on the conceptual system of general psychology. *Nanjing Normal University Journal: Social Science Edition, 1,* 83-89.

Sica, C., & Ghisi, M. (2007). The Italian versions of the Beck Anxiety Inventory and the Beck Depression Inventory-II: Psychometric properties and discriminant power. In M. A. Lange (Ed.), *Leading-edge psychological tests and testing research* (pp. 27-50). Nova Science Publishers.

Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning environments research, 15*(2), 171-193. https://doi.org/https://doi.org/10.1007/s10984-012-9108-4

Su, P., & Wang, Y. (2022). A study on the cultivation of college students' cultural confidence from the perspective of interactive ritual chain. *Creative Education Studies, 10*(12), 3124. https://doi.org/10.12677/CES.2022.1012486

Sun, X. (2011). The use of constructivist learning theory in secondary school geography teaching. *New Curriculum Studies: Basic Education*, *3,* 111-112. http://www.cqvip.com/qk/87941b/201103/37907089.html

Tang, J. (2020). *A study on the impact of active learning classrooms on students' learning experience, learning engagement, and learning outcomes* [Master's Thesis,]. Shanghai Normal University. https://cdmd.cnki.com.cn/Article/CDMD-10270-1020809746.htm

Tian, X., & Wang, X. (2007). Survey and analysis of satisfaction of college students in school. *Exploring Higher Education*, *5,* 126-128. http://www.cqvip.com/qk/82643x/200705/25383770.html

Walters, B., Potetz, J., & Fedesco, H. N. (2017). Simulations in the classroom: an innovative active learning experience. *Clinical Simulation in Nursing, 13*(12), 609-615. https://doi.org/https://doi.org/10.1016/j.ecns.2017.07.009

Wan, S. (2014). Research on the application of task-oriented exploration and cognitive teaching mode in higher vocational practical training--based on the practice of "Innate" platform in the teaching of business administration. *Shaanxi Education: Higher Education Edition*, *3,* 74-75. https://doi.org/10.16773/j.cnki.1002-2058.2014.03.031.

Wang, J. (2017). *A study on the relationship between behavioral participation and activity engagement in extracurricular activities and positive youth development* [Master's Thesis]. Northeast Normal University.

Wang, R., Li, Z., & Zhao, X. (2010). Developing college students' online independent inquiry learning skills. *Electrochemical Education Research*, *10,* 56-60. https://doi.org/10.13811/j.cnki.eer.2010.10.014.

Wang, Y., Wen, Z., Li, W., & Fang, J. (2022). Methodological research and model development on structural equation models in China's mainland from 2001 to 2020. *Advances in Psychological Science, 30*(8), 1715. https://doi.org/10.3724/SP.J.1042.2022.01715

Webster, P. R. (2007). Prelude: Knowledge, Skills, Attitudes, and Values: Technology and its Role in Arts Education. In L. Bresler (Ed.), *International Handbook of Research in Arts Education.* Springer. https://doi.org/10.1007/978-1-4020-3052-9_88

Wei, L. (2013). *Research on knowledge and skills"development strategies in high school geography teaching* [Master's Thesis]. Northwest Normal University.

Wheaton, B., Muthen, B., Alwin, D. F., & Summers, G. F. (1977). Assessing reliability and stability in panel models. *Sociological methodology, 8*, 84-136. https://doi.org/https://doi.org/10.2307/270754

Wu, B. (2007). Reflections on effective teaching. *Education Exploration, 6*(7), 26-27.

Wu, J.-H., & Wang, Y.-M. (2006). Measuring KMS success: A respecification of the DeLone and McLean's model. *Information & management, 43*(6), 728-739. https://doi.org/https://doi.org/10.1016/j.im.2006.05.002

Xiao, N., Thor, D., Zheng, M., Baek, J., & Kim, G. (2018). Flipped classroom narrows the performance gap between low-and high-performing dental students in physiology. *Advances in physiology education, 42*(4), 586-592. https://doi.org/10.1152/advan.00104.2018

Xu, P., Chen, Y., Nie, W., Wang, Y., Song, T., Li, H., Li, J., Yi, J., & Zhao, L. (2019). The effectiveness of a flipped classroom on the development of Chinese nursing students' skill competence: A systematic review and meta-analysis. *Nurse education today, 80*, 67-77. https://doi.org/https://doi.org/10.1016/j.nedt.2019.06.005

Xu, Z. (2018). *A study of student engagement behaviors in middle school classrooms* [Master's Thesis]. Beijing University of Technology. https://cdmd.cnki.com.cn/Article/CDMD-1000 5-1019700469.htm

Yang, J. (2016). Analysis of the current situation and influencing factors of college students' learning satisfaction: a teacher training college in the south as an example. *Chongqing Higher Education Research, 4*(6), 57-65. http://www.cqvip.com/qk/71700x/201606/670855742.html

Yang, R. (2011). The Practice of Developing Job Task-Oriented Professional Teaching Materials. *Private Technology, 3*, 1-10.

Zalta, E. N., Nodelman, U., Allen, C., & Perry, J. (1995). *The Stanford Encyclopedia of Philosophy organizes scholars from around the world in philosophy and related disciplines to create and maintain an up-to-date reference work* (1st ed.). Stanford Encyclopedia of Philosophy.

Zandvliet, D. B., & Fraser, B. J. (2005). Physical and psychosocial environments associated with networked classrooms. *Learning environments research, 8*(1), 1. https://doi.org/10.1007/s10984-005-7951-2

Zhai, X., Ying, J., & Lin, L. (2015). A structural equation perspective on the construction of a satisfaction model of flipped classroom in China. *Exploring Higher Education*, *5,* 65-72.

Zhang, C., Lan, B., & He, Y. (2016). Analysis of Factors Affecting the Quality of Bilingual Teaching in Chinese Universities: Based on Structural Equation Modeling. *China Management Information Technology*, *6,* 238-241. https://doi.org/10.13274/j.cnki.hdzj.2022.11.007

Zhao, H. (2002). Skill Talents and Made in China" High-Level Forum Calls for the "Technology King" in the New Century. *Mechatronics Information*, *23*, 23-24.

Zhao, N. (2015). A Preliminary Study on the Application of Flipped Classroom Model in College English Teaching. *Shandong Social Science*, *2,* 351-352. http://www.cqvip.com/qk/82097x/20150s2/836883755048495 38350495350.html