# ABAC ODI JOURNAL Vision. Action. Outcome

## Examining Factors Influencing Students' Satisfaction and Engagement with Flipped Classroom in Private Universities in Zhaoqing, Guangdong Province, China

*Yibo Guan*

# Examining Factors Influencing Students' Satisfaction and Engagement with Flipped Classroom in Private Universities in Zhaoqing, Guangdong Province, China

## Yibo Guan[1]

[1]School of computing, Guangdong Business and Technology University, China.
Email: 1325271775@qq.com

## Abstract

This research paper aims to investigate the factors influencing student satisfaction and engagement in the use of flipped classroom in private universities in Zhaoqing, Guangdong Province. The conceptual framework proposes a causal relationship between perceived quality, perceived value, student interactions, teaching process, instructional content, student satisfaction, and student engagement. The researcher used a structured questionnaire distributed to 500 students from Zhaoqing, Guangdong Province, including first-year students, sophomores, and juniors. Structural equation modeling and confirmatory factor analysis were used to analyze the data, including model matching, reliability, and structure validation. The results of the analysis showed that perceived quality, perceived value, teaching process, and student interaction had a significant effect on student satisfaction. Student satisfaction has a very strong positive and significant impact on student engagement, while educational content had little effect on the usage of flipped classroom by the students. Through structural equation model data analysis, it was found that the teaching process has the greatest impact on student satisfaction and involvement in the flipped classroom, as well as subsequent interaction with the students, value, and perceived quality. Six of the seven hypotheses have been accepted. Therefore, it is recommended that the management team and teachers of private universities provide assessments to measure the development plan of the flipped classroom teaching model of the influencers to learn engagement.

## Introduction

In educational development, every technological advancement and change has brought about the growth of education industry. Science and technology are not only the revolutionary force driving history but also the most revolutionary force in the highest sense.

He (2014) pointed out that flipped classroom combines pre-class online learning with offline discussions in the classroom, a Small Private Online Course (SPOC) teaching a form of Massive Open Online Courses (MOOCs) + classroom, and a specific embodiment of using

MOOC videos to implement flipped classroom teaching. From the perspective of contemporary educational development concepts, flipped classrooms reflect democratization and informatization (Zeng, 2014). From the perspective of the theoretical foundation of flipped classroom teaching, it is a learning approach that blends direct explanation with constructivism (Zhang & Zhang, 2012). To the trend of teaching reform, future learning should be a hybrid education that combines online and offline, MOOC, and flipped classrooms (Zhang & Rao, 2014).

Guangdong Province is currently in a period of rapid economic and educational development. Due to the rapid economic growth and continued exploration along the path of innovative development in the area, there is a great demand for high-quality and global talent. Therefore, educational institutions must constantly update teaching methods for better teaching outcomes. However, the teaching development of private universities in Guangdong still faces some obstacles, such as uneven educational resources caused by uneven regional economic development, The ratio of teachers to the teaching environment is unstable, and the impact of many factors e.g., student interaction, satisfaction, and engagement (Chan & Shek, 2021).

Berisha-Shaqiri (2015) pointed out that the role of internet information technology in curriculum teaching is to strengthen teacher-student communication, which makes good teaching better but cannot turn bad teaching into good teaching. Therefore, integrating network information technology and teaching should be based on the characteristics, and the correct methods and techniques should be studied. This study is based on private universities' flipped classroom teaching model in Zhaoqing City, Guangdong Province. It is based on the new teaching and learning methods of information technology. It is guided by modern educational concepts such as information technology and curriculum integration, with students as the center and ability improvement as the guide. Exploring and analyzing the factors that affect students' satisfaction and learning engagement after using the flipped classroom teaching model provides new ideas and methods for managers and teachers of private education institutions to use the flipped classroom teaching model.

## Literature Review

### *Flipped Classroom*

The flipped classroom is an innovative educational approach that has gained popularity in recent years (He, 2014). In a traditional classroom setting, students typically receive direct instruction from the teacher during class time, and then complete homework or assignments outside of class (Adebiyi et al., 2017). However, the flipped classroom reverses this model, where students engage with instructional materials, such as video lectures or readings, before coming to class. Class time is then used for active learning activities, discussions, and problem-solving exercises (Zhang & Zhang, 2012).

### *Student Satisfaction*

Regarding the explanation of student satisfaction, Kanwar and Sanjeeva (2022) proposed that if the participants' attitudes and feelings towards the content of the learning process are happy or positive, it is considered "satisfaction," and disappointed or unhappy attitudes are "dissatisfaction." Therefore, learning satisfaction affects learners' evaluation of

learning through the learning process. Alhazmi (2015) proposed that students should have their feelings during the learning process. If learners are satisfied with their needs during the process, it can be called learning satisfaction, which has strong subjective emotional factors and personal experience (Min et al., 2022).

Banu Kenayathulla and Ikram (2022) concluded that improvements need to be made in the learning environment to increase learning satisfaction. They believe that the suitability of the learning environment will positively and positively affect improving students' learning satisfaction.

### Perceived Quality

Alhaddad (2015) defines perceived quality as consumers' judgments about an entity's overall experience or benefit. Stylidis et al. (2018) proposed conceptualizing perceived quality as an "attitude-like" approach. Perceived quality in the context of education refers to the subjective evaluation and assessment of the overall excellence, effectiveness, and value of an educational experience. It encompasses how individuals, such as students, parents, educators, and stakeholders, perceive the educational institution, program, or service based on various aspects. The perceived quality of the students' services was their assessment of the level of performance of the services provided by the educational institutions relative to their intended level. Customer loyalty, satisfaction, and overall organizational image are all significantly affected by customers' perceived quality (Akoglu & Özbek, 2022; Gallart-Camahort et al., 2022).

Perceived quality is an important driver of learner satisfaction in a substantial body of literature (Djakasaputra et al., 2021; Gallart-Camahort et al., 2022). According to Miremadi (2013), customer-perceived quality and customer satisfaction are independent variables and positively correlated. According to Stylidis et al. (2018), perceived service quality is a critical prerequisite for customer satisfaction.

According to Nguyen (2021) research on the perceived quality of students, which has a positive impact on both the variables of perceived value and student satisfaction. Zhu (2016) identified private, professional education institutions as customers. They validated the hypothesis that students' perceived value plays a mediating role in the relationship between perceived quality and satisfaction through the construction of a model of satisfaction evaluation. From a customer satisfaction perspective, Li et al. (2020) concluded that customer-perceived quality has a positive promotive impact on customer-perceived value and customer satisfaction. The perceived value of high school students is mainly reflected in their subjective assessment of the curriculum, which in turn impacts perceived quality. Hence, two hypotheses are concluded:

Hypothesis 1: Perceived quality has a significant influence on perceived value.

Hypothesis 2: Perceived quality has a significant influence on student satisfaction.

### Perceived Value

Value is the goods or money needed to obtain a certain combination of goods and accompanying services (Hanif et al., 2010). Perceived value is the subjective evaluation of a product or service that consumers perceive when they receive it. Consumers weigh the costs they pay against the perceived benefits and the value of their products or services (Boksberger & Melsen, 2011). According to Sumaedi and Bakti (2011), customers' perceived value is their

evaluation of what they have paid for or sacrificed to receive services from educational institutions.

Two main factors determining customer satisfaction are perceived quality and price (Samudro et al., 2020). Adebiyi et al. (2017) connect the value of education only and the goals that can be achieved through learning. According to Mbango (2019), the perceived value of service is one of the main influencers of customer satisfaction. Samudro et al. (2020) argue that a positive relationship exists between the perception of value and customer satisfaction. Hu (2011), in his research on the service quality model of higher education, believes that the perceived value of the student has a positive impact on student satisfaction. Learners' perceived value has also been shown to correlate positively with their satisfaction (Adhi Nugroho et al., 2019). Therefore, this study assumes a hypothesis:

Hypothesis 3: Perceived value has a significant influence on student satisfaction.

### *Student Interactions*

Sun et al. (2022) view classroom teaching as more than just the delivery of information; it is an interpersonal process that involves interaction between the teacher and students. According to Sahuddin et al. (2022), interaction is a communication activity that can lead to misunderstandings. This highlights the importance of effective communication in the classroom, not only between the teacher and students but also among the students themselves. Xiao et al. (2023) proposes the interaction influence distance theory, categorizing interaction into three types: learning content, student-instructor, and student-student interaction. This theory emphasizes that all three types of interaction are essential for effective learning.

Hollenbeck et al. (2011) found that student-to-student interaction can reduce the perceived threat of poor performance. This indicates that creating opportunities for students to interact can help alleviate anxiety and build confidence. Croxton (2014) suggests that the quality and timeliness of teacher-student communication and student-to-student interaction influence student satisfaction. This highlights the importance of facilitating interaction and ensuring that it is of high quality. Numerous studies have shown the critical role of interaction in shaping the learning experience and student satisfaction (Kuo & Feng, 2013; Parahoo & Tamim, 2012). Therefore, teachers should actively seek to create opportunities for interaction and ensure that it is effective and timely. Accordingly, a proposed hypothesis is scaped:

Hypothesis 4: Student interactions have a significant influence on student satisfaction.

### *Teaching Process*

Sayed Munna and Abul Kalam (2021) defines the teaching process as the concept of teaching and the process of students mastering knowledge. This highlights the importance of delivering information and ensuring that students can understand and apply it. Understanding the essence of the teaching process is crucial for teachers as it affects their perspective, content selection, and teaching methods (Reinstein et al., 2011). Teachers who have a clear understanding of the teaching process are better equipped to design effective lessons and deliver the knowledge in a way that can maximize student learning. Williams and Sheridan (2010) emphasize the importance of teachers developing constructive technologies and using teaching strategies to encourage cognitive student participation in discussions. This highlights the importance of creating a classroom environment that fosters active learning and student engagement.

Hu (2011) found a positive correlation between the quality of higher education services and student satisfaction. This suggests that the quality of the teaching process is a critical factor in determining student satisfaction with their education. Fei and Yu (2021) found that the quality of teaching positively impacts student satisfaction in vocational colleges. This indicates that the quality of the teaching process is important not only in higher education but also in vocational education. Parahoo et al. (2015) found that the teaching process significantly impacts student satisfaction. This highlights the importance of ensuring that the teaching process is effective and meets the needs of students in order to promote their satisfaction with their education. Consequently, a hypothesis is suggested:

Hypothesis 5: Teaching process has a significant influence on student satisfaction.

### Instructional Content

Antes (2014) highlighted that teaching content refers to the knowledge and information that must be taught to students, including facts, concepts, principles, and processes. The chosen content should align with the course objectives and assessment efforts to ensure effective training. Sirelkhatim and Gangi (2015) described instructional content to achieve training goals that define the intended outcomes of the instructional plan.

When the course content is relevant, interesting, and of high quality, students in online courses are more likely to participate and be motivated. This highlights the importance of designing engaging online courses that meet students' needs and interests. Positive feedback on learning has positively impacted student satisfaction (Shen & Wu, 2020). This emphasizes the importance of providing students with feedback that recognizes their efforts and achievements, which can help to foster a positive learning experience. The quality of the content taught and the curriculum's design can also significantly impact learner satisfaction (Chen, 2017; Guo, 2020; Li et al. et al., 2020). This highlights the importance of designing courses that are scientifically sound, practical, and relevant to the needs and goals of the learners. Hence, this research put forwards a hypothesis:

Hypothesis 6: Instructional content has a significant influence on student satisfaction.

### Student Engagement

Gray and DiLoreto (2016) proposed a cognitive investment, active participation, and emotional commitment of students toward learning. Rizfia Fachrudin and Amalia Fachrudin (2016) believes that there are two key factors to investment. First, students are willing to invest a lot of time and effort in studying. When there are gains in academic achievements, it can promote the learning and development process towards successful results; The second factor is the allocation of resources in schools, learning opportunities in schools, and how to motivate students to participate in public activities, which all affect the degree of student engagement.

Student satisfaction is considered a result of learning engagement and an effective tool for monitoring and improving the quality of education. On the one hand, based on a large amount of evidence, student satisfaction results from learning engagement. Ariani (2015) found a correlation between college students' learning engagement and satisfaction. As students' satisfaction with learning engagement increases, their persistence and sense of success in university and major also increase (Holman, 2013; Wolters & Hussain, 2015). Subsequently, this study can hypothesize per following:

Hypothesis 7: Student satisfaction has a significant influence on student engagement.

## Conceptual Framework

Therefore, this study aims to explore the satisfaction and learning engagement of students, using flipped classroom of students in private universities in Zhaoqing City, Guangdong Province. The variables include the perceived quality, perceived value, student interactions, teaching process, instructional content, student satisfaction, and student engagement of first, second, and third-year students at a private university in Zhaoqing City, Guangdong Province, under the flipped classroom teaching mode. In addition, this study also examined the causal relationships between various variables to reveal the factors that affect student satisfaction and engagement.

**Figure 1**

*Conceptual Framework*
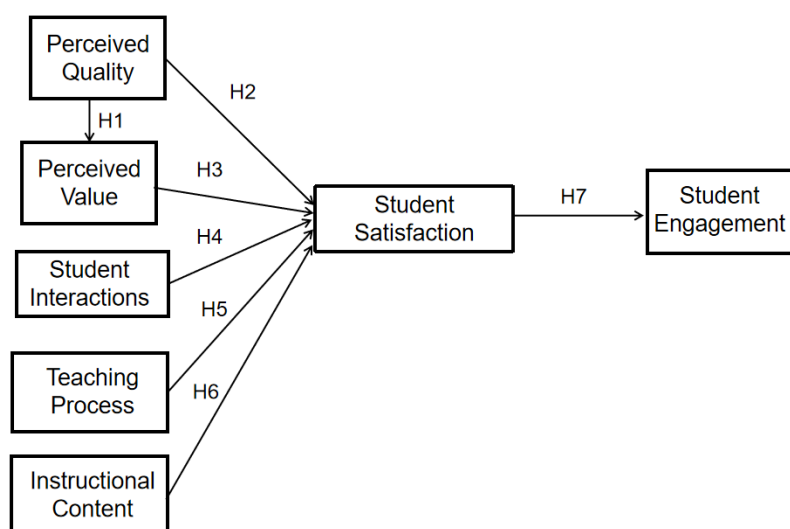


Note: Constructed by author

## Research Methodology

### Research Design

Using a quantitative nonprobability sampling method, the researchers employed structured questionnaire which were distributed online to the target sample. They have been studying in private universities in Zhaoqing and using the flipped classroom model for at least one month and more than six hours a day. This study aimed to identify key influencers that significantly impact student satisfaction.

The quantitative questionnaire consists of three parts; screening questions, measuring items with five-point Likert scale, and demographic questions (gender, age, subject and monthly cost of living). The five variables proposed by the author, from strongly inconsistent (1) to strongly consistent (5), analyzed seven hypotheses.

Overall, the study utilized a rigorous methodology to collect data on the factors that significantly impact student satisfaction in the context of the flipped classroom model. The findings can provide valuable insights into how to enhance student satisfaction and improve the effectiveness of online learning in similar settings. The data collection was made through questionnaire distribution.

**Research Population and Sample**

This study focuses on undergraduate students from the School of Computer Science with at least one semester of flipped classroom learning experience in private universities in Zhaoqing City, Guangdong Province, China. The model structure included seven potential variables and 27 observed variables, with a minimum sample size of 109 required for the model structure and a recommended minimum sample size of 425. Therefore, a sample size of 500 is deemed appropriate for this study and using Structural Equation Modeling (SEM) statistical techniques. The sample comprises of undergraduate students from year 1 to 3, as fourth-year students are excluded due to their additional out-of-school graduation internships.

This study used nonprobability and judgment sampling methods to select computer science majors from private universities in Zhaoqing, Guangdong Province, China. Stratified random sampling was then used to sample computer science majors in their freshman, sophomore, and junior years, with the specific quantities, as shown in Table 1

**Table 1**

*Sample Units and Sample Size*

| Major/Student Year | Population Size | Proportional Sample Size |
|---|---|---|
| Computer Science Majors-freshman | 1665 | 170 |
| Computer Science Majors-sophomores | 1699 | 174 |
| Computer Science Majors-Junior | 1520 | 156 |
| Total | 4884 | 500 |

**Source:** Created by author

**Data Analysis**

Before collecting the data, the items' index-objective congruence (IOC) underwent evaluation by expert ratings, and a pilot test was conducted involving 50 participants. The IOC results received ratings above 0.6 from three experts, indicating the content validity of a questionnaire. Additionally, the pilot test yielded Cronbach's alpha coefficient values for the reliability of questionnaire ,exceeding the acceptable threshold of 0.7, as specified by Nunnally and Bernstein (1994).

To analyze the collected data, SPSS 22.0 and AMOS 26.0 software were utilized. The researcher employed confirmatory factor analysis (CFA) and structural equation modeling (SEM) techniques to assess the theoretical framework and examine the proposed correlations between the variables. Subsequently, the findings were scrutinized and evaluated.

### Demographics of Participants

In this study, 500 surveys were distributed to all target students via stratified random sampling. Screening questions help to screen out unqualified participants. Our final sample consists of 491 students majoring in computer science at a private university in Zhaoqing City. In Table 2, most participants were male, representing 56.6%; Women account for 43.4%. The age range in this study is primarily 21 to 22 years, representing 56%. Investigations revealed that 295 students formerly resided in the area of the Pearl River Delta (cities such as Guangzhou, Foshan, Zhaoqing Shenzhen, Dongguan, Huizhou, Zhuhai, etc.), which made up 60% of the total population. In terms of the target group of college students, the proportion of monthly living expenses is mostly in the range of 1000 to 2000 RMB, with 319 persons making up 65%.

**Table 2**

*The demographic data*

| Demographic and General Data (n=491) | Category | Frequency | Percentage |
|---|---|---|---|
| **Gender** | Male | 278 | 56.6% |
| | Female | 213 | 43.4% |
| | 18-20years old | 212 | 43.2% |
| | 21-22years old | 275 | 56% |
| | 23 above | 4 | 0.8% |
| **Subject** | The Yangtze River Delta Economic Zone | 113 | 23% |
| | The Pearl River Delta | 295 | 60% |
| | The Beijing-tianjin-hebei region | 57 | 11.6% |
| | None of the above | 26 | 5.3% |
| **The monthly cost of living** | 501-1000 | 36 | 7.3% |
| | 1001-2000 | 319 | 65% |
| | 2001 above | 136 | 27.7% |

### Results and Discussion

The present study used Confirmatory Factor Analysis (CFA) to test the discriminant validity. According to Table 3, Cronbach's alpha coefficient values exceed the acceptable threshold of 0.7, as specified by Nunnally and Bernstein (1994).The factor loading values of all terms in each variable were significant and representative, indicating the quality of the fit (Hair et al., 2006). To meet the criteria for a good fit, a factor loading value greater than 0.30 and a p-value less than 0.05 were used as cut-off points. Additionally, all indicators have reliabilities above 0.7 and mean-variance extracted above 0.5, which meets the standard set by Fornell and Larcker (1981).

**Table 3**

*Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)*

| Variables | Source of Questionnaire | No. of Item | CA | Factors Loading | CR | AVE |
|---|---|---|---|---|---|---|
| Perceived Quality (PQ) | Alhaddad (2015) | 5 | 0.895 | 0.727-0.860 | 0.896 | 0.633 |
| Perceived Value (PV) | Sumaedi and Bakti (2011) | 3 | 0.843 | 0.770-0.821 | 0.844 | 0.643 |
| Student Interactions (SI) | Sun et al. (2022) | 3 | 0.854 | 0.798-0.823 | 0.854 | 0.662 |
| Teaching Process (TP) | Reinstein et al. (2011) | 6 | 0.924 | 0.777-0.863 | 0.925 | 0.672 |
| Instructional Content (IC) | Sirelkhatim and Gangi (2015) | 4 | 0.852 | 0.757-0.778 | 0.852 | 0.590 |
| Student Satisfaction (SS) | Alhazmi (2015) | 3 | 0.805 | 0.726-0.817 | 0.806 | 0.581 |
| Student Engagement (SE) | Gray and DiLoreto (2016) | 3 | 0.863 | 0.802-0.847 | 0.863 | 0.677 |

Discriminant validity is established when the square root of the average variance extracted (AVE) exceeds the coefficient of any intercorrelated constructs (Fornell & Larcker, 1981). As presented in Table 4, the square root of AVE for each construct along the diagonal line surpassed the inter-scale correlations. Consequently, the presence of discriminant validity was ensured.

**Table 4**

*Square roots of AVEs and correlation matrix*

|  | PQ | PV | SI | TP | IC | SS | SE |
|---|---|---|---|---|---|---|---|
| **PQ** | **0.796** | | | | | | |
| **PV** | 0.496 | **0.802** | | | | | |
| **SI** | 0.478 | 0.508 | **0.813** | | | | |
| **TP** | 0.285 | 0.337 | 0.272 | **0.820** | | | |
| **IC** | 0.251 | 0.189 | 0.204 | 0.217 | **0.768** | | |
| **SS** | 0.558 | 0.577 | 0.583 | 0.497 | 0.211 | **0.762** | |
| **SE** | 0.558 | 0.58 | 0.544 | 0.427 | 0.312 | 0.636 | **0.823** |

Note: The diagonally listed value is the AVE square roots of the variable

The adequacy of the model fit was demonstrated through the satisfactory values of goodness-of-fit indices, as shown in Table 5. The statistical values of these indices were compared against predetermined acceptance criteria. Specifically, the values obtained were as follows: CMIN/DF = 1.516, GFI = 0.937, AGFI = 0.937, NFI = 0.943, CFI = 0.80, TLI = 0.976, and RMSEA = 0.032.

**Table 5**

*Goodness of Fit for Measurement Model*

| Fit Index | Acceptable Criteria | Statistical Values |
|---|---|---|
| CMIN/DF | < 3.00 (Hair et al., 2006) | 1.516 |
| GFI | ＞0.9 (Hair et al., 2006) | 0.937 |
| AGFI | ＞0.9 (Hair et al., 2006) | 0.937 |
| NFI | ＞0.9 (Arbuckle, 1995) | 0.943 |
| CFI | ＞0.9 (Hair et al., 2006) | 0.980 |
| TLI | ＞0.9 (Hair et al., 2006) | 0.976 |
| RMSEA | < 0.05 (Browne & Cudeck, 1993) | 0.032 |
| 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,

## Structural Equation Modeling (SEM)

Hair et al. (2010) demonstrated the validity of the chance relationship between variables in their proposed model by employing Structural Equation Modeling (SEM), which incorporated measurement error for the structural coefficients. The fit of the structural model to the data was evaluated using the Goodness of Fit Index, which was assessed using several fit indices, including Chi-square statistics (CMIN/df), Goodness of fit index (GFI), adjusted Goodness of fit index (AGFI), norm fitting index (NFI), comparative fitting index (CFI), Tucker Lewis index (TLI), and approximation root mean square error (RMSEA). These indices were utilized to assess seven potential variables: perceived quality, perceived value, student interaction, instructional process, instructional content, student satisfaction, and student engagement.

Table 6 presents the goodness-of-fit index measures for the Structural Equation Modeling (SEM) analysis. The statistical significance of the results was evaluated using the following values: CMIN/DF=1.856, GFI=0.921, AGFI=0.904, NFI=0.928, CFI=0.965, TLI=0.961, RMSEA=0.042.

**Table 6**

*Goodness of Fit for Structural Model*

| Fit Index | Acceptable Criteria | Statistical Values |
|---|---|---|
| CMIN/DF | < 5.00 (Hair et al., 2006) | 1.856 |
| GFI | ＞0.85 (Hair et al., 2006) | 0.921 |
| AGFI | ＞0.8 (Hair et al., 2006) | 0.904 |
| NFI | ＞0.8 (Arbuckle, 1995) | 0.928 |
| CFI | ＞0.8 (Hair et al., 2006) | 0.965 |
| TLI | ＞0.8 (Hair et al., 2006) | 0.961 |
| RMSEA | < 0.08 (Browne & Cudeck, 1993) | 0.042 |
| 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

## Hypothesis Outcomes

The scientific literature typically assesses the relationship between independent and dependent variables using regression coefficients or standardized path coefficients, as outlined in the research hypotheses. Six out of the seven proposed hypotheses are supported. The results indicate that student engagement in flipped classroom teaching mode is strongly influenced by student satisfaction, followed by the teaching process. In turn, students' satisfaction with flipped classrooms is significantly driven by perceived quality, perceived value, student interaction, and the teaching process. The standardized path coefficients shown in Table 7 determine the significance of the hypothesis being supported at p=0.05. As such, the standardized path coefficient for student satisfaction (β=0.719, t-value=12.997) has the greatest impact on student engagement. However, this study found no significant relationship between teaching content and student satisfaction, indicating a standardized path coefficient of β=0.024 and a t-value of 0.582.

**Table 7**

*Summary of hypothesis tests*

| Hypothesis | Standardized path coefficient (β) | t-value | Testing result |
|---|---|---|---|
| H1: Perceived quality has a significant influence on perceived value. | 0.514 | 10.000* | Supported |
| H2: Perceived quality has a significant influence on student satisfaction. | 0.254 | 4.587* | Supported |
| H3: Perceived value has a significant influence on student satisfaction. | 0.275 | 5.573* | Supported |
| H4: Student interactions have a significant influence on student satisfaction. | 0.309 | 6.253* | Supported |
| H5: Teaching process has a significant influence on student satisfaction. | 0.292 | 6.918* | Supported |
| H6: Instructional content has a significant influence on student satisfaction. | 0.024 | 0.582 | Not Supported |
| H7: Student satisfaction has a significant influence on student engagement. | 0.719 | 12.997* | Supported |

Note: *p<0.05

**Discussion**

H1 was tested to examine the impact of perceived quality on perceived value under flipped classroom instruction mode. The standardized coefficient value was 0.514, with a t-value of 10.000, indicating a significant positive effect. H2 confirmed that perceived quality and satisfaction were independent variables and had a positive correlation with each other. Perceived quality was a crucial driver of students' satisfaction with learning, with a standardized coefficient value of 0.254 and a score of 4.587. These findings align with the existing literature on this topic (Alhaddad, 2015). H3 tested the impact of perceived value on students' satisfaction with learning under flipped classroom instruction mode. The results revealed a positive influence, with a standardized coefficient value of 0.275 and a t-value of 5.573. This outcome is consistent with numerous previous studies in the literature (Mohd et al., 2013; Stylidis et al., 2018). H4 findings demonstrated a positive relationship between highly interactive classrooms and students' motivation and satisfaction with learning. The standard coefficient value was 0.309, with a t-value of 6.253. This outcome is in line with previous research in the literature, suggesting that interactive classrooms have a strong impact on student satisfaction and motivation in tertiary education services (Hollenbeck et al., 2011; Parahoo & Tamim, 2012). H5 findings indicated that the quality of teaching processes in higher education positively affects student satisfaction. The standardized coefficient value was 0.292, with a t-value of 6.918. This outcome is consistent with previous research in the literature (Calisir et al., 2014; Chi, 2015; Wang, 2019; Zeng et al., 2021). The teaching process mainly includes the work status of teachers and assistants, homework completion status, teaching time allocation, teaching video quality, etc. The research results show that the satisfaction of the teaching process directly affects students' overall satisfaction with flipped classrooms. The H6 research results show the standard coefficient value=0.024 and t-value=0.582; therefore, H6 is unsupported. This study contradicts the findings of Adebiyi et al. (2017), in the flipped classroom teaching mode, changes in teaching content have a smaller impact on students' learning satisfaction, and the design of teaching processes can more effectively affect students' learning satisfaction (Barbera et al., 2013). The H7 research results show that the standard coefficient value=0.719, t-value=12.997. It has been confirmed that student satisfaction results from learning engagement and is an effective tool for monitoring and improving the quality of education. As students' satisfaction with learning increases, their level of engagement and sense of success in universities and majors also increase (Ariani, 2015; Dayton, 2015; Fiorini et al., 2014; Holman, 2013; Lewis et al., 2011).

**Conclusion**

This research investigates the factors influencing student satisfaction and engagement in the use of flipped classroom in private universities in Zhaoqing, Guangdong Province. To achieve this goal, a conceptual framework is proposed based on the hypothesis that students' perceived quality, value, instructional process, interaction, and content significantly influence student satisfaction and engagement when using flipped instructional models. A survey instrument was developed and distributed to first- to third-year undergraduate computer science majors at a private university in Zhaoqing City to collect data. Confirmatory factor

analysis (CFA) tested the constructed model for validity and reliability. Analyze the factors that affect students' satisfaction and engagement with flipped classroom instructional models.

The research results are as follows. Firstly, the results of the teaching process have the strongest significant impact on student satisfaction and engagement. Chi (2015) Previous studies pointed out that the teaching process refers to conducting flipped classroom teaching, mainly including the work situation of teachers and teaching assistants, homework completion, teaching time allocation, teaching video quality, etc. The research results showed that the satisfaction of the teaching process directly affects students' overall satisfaction with flipped classrooms. Multiple academic studies have found that the quality of the teaching process significantly impacts student satisfaction. Potential users perceive the system to be more useful when the quality of the process is higher (Calisir et al., 2014).

Secondly, student interaction was the second most important influencer of student satisfaction. This supports the notion that highly interactive online courses can enhance student motivation and satisfaction with learning.

Thirdly, the perceived value of using the flipped classroom mode of instruction significantly impacts student satisfaction and engagement. Perceived service value is one of the key influencers of customer satisfaction. Mbango (2019) argue that there is a positive impact relationship between the perception of value and the satisfaction of customers. Research on the service quality model of higher education suggests that students' perceived value positively affects their satisfaction with the service. The perceived worth of learners and satisfaction have a positive correlation (Samudro et al., 2020).

Fourthly, the perceived quality of using the flipped classroom mode of instruction significantly impacts student satisfaction and engagement. Zhu (2016) state that students' perceived quality has a direct positive impact on the students' perceived value and satisfaction variables. Improvements in the quality of service provided by educational institutions will increase student satisfaction. The model also tested whether service quality significantly affects student satisfaction (Li et al., 2020).

Fifthly, in the present study, the impact of content instruction on student satisfaction was insignificant. Previous studies have shown that the teaching content of courses impacts student satisfaction, which has been confirmed by multiple scholars (Alhazmi, 2015). However, under the flipped classroom mode, students have a relatively small experience of teaching content, which has a relatively small impact on their satisfaction and engagement. This viewpoint has also been reflected in the research of other scholars (Barbera et al., 2013). Therefore, the flipped classroom teaching mode significantly impacts teaching processes and student interactions more than teaching content.

In summary, this study underscores the critical relationship between students' satisfaction and their engagement in learning. Specifically, student satisfaction is not only an outcome of engagement in learning but also an effective tool for monitoring and improving the quality of teaching. As evidenced by previous research (Lewis et al., 2011; Wolters & Hussain, 2015), student satisfaction significantly impacts their engagement in learning.

These factors include perceived quality, value, student interaction, and instructional process.

## Recommendations

Researchers found key influencing factors for students' satisfaction and engagement in flipped classroom teaching models in private universities in Zhaoqing City, Guangdong Province, China, including perceived quality, value, student interaction, teaching process, and teaching content. Therefore, the suggestion is to develop and promote these aspects throughout private education institutions to generate better student satisfaction and engagement, thereby improving student learning outcomes. In order to gain the willingness to adopt a flipped classroom teaching model in higher education, in addition to the teaching content generated due to its insignificance, it is crucial to prioritize and promote the key factors identified in this study. Specifically, the instructional process emerged as the most critical predictor of students' satisfaction with using flipped classrooms. This underscores the importance of focusing on teachers' procedures and methods in the teaching process. When undergraduates perceive flipped classrooms as a valuable mode of learning that can enhance their academic performance, they are more likely to use and engage deeply with the material. Therefore, when implementing flipped classrooms, developers, teachers, and senior management at higher education institutions should prioritize aspects such as students' perceived quality, perceived value, instructional process, and interaction with students.

In summary, the key factors influencing college students' satisfaction with and engagement in flipped classrooms. The identified variables can be leveraged by developers of flipped classroom courses and senior managers of higher education institutions to improve service quality and effectiveness. This knowledge can guide investment decisions, leading to fully utilizing the flipped classroom model and, ultimately, improved educational outcomes.

## Limitations and Further Study

A limitation of the present study is its specific focus on first to third-year undergraduate students at private educational institutions in Zhaoqing City, Guangdong Province, China. Therefore, it is important to acknowledge that the results may need to be generalizable to other educational institutions, industries, cultures, or countries. Future research could explore other factors impacting student satisfaction and learning engagement, such as autonomy and team learning. Additionally, future studies could employ experimental methods to control for other variables that confound causal relationships. For instance, researchers may consider defining specific quality factors and observing the behavioral intention of the dependent variable. Qualitative research could be incorporated to gain a deeper understanding of students' satisfaction with learning and engagement in the flipped classroom instruction mode.

**References**

Adebiyi, M. E., Hassan, Y. A., Hansbourgh, C., & Edginton, C. R. (2017). Values attached to educational goals, study processes, and educational motivation. *Journal of Education and Development, 1*(1), 48. https://doi.org/10.20849/jed.v1i1.252

Adhi Nugroho, M., Setyorini, D., & Tiara Novitasari, B. (2019). The role of satisfaction on perceived value and e-learning usage continuity relationship. *Procedia Computer Science, 161,* 82-89. https://doi.org/10.1016/j.procs.2019.11.102

Akoglu, H. E., & Özbek, O. (2022). The effect of brand experiences on brand loyalty through perceived quality and brand trust: a study on sports consumers. *Asia Pacific Journal of Marketing and Logistics, 34*(10), 2130-2148. https://doi.org/10.1108/APJML-05-2021-0333

Alhaddad, A. (2015). Perceived quality, brand image and brand trust as determinants of brand loyalty. *Journal of Research in Business and Management, 3*(4), 1-8.

Alhazmi, A. (2015). Student satisfaction among learners: Illustration by Jazan University students. *Journal of Education and Human Development, 4*(2), 205-212. https://doi.org/10.15640/jehd.v4n2_1a20

Antes, A. L. (2014). A systematic approach to instruction in research ethics. *Accountability in Research, 21*, 50-67. https://doi.org/10.1080/08989621.2013.822269

Arbuckle, J. L. (1995). *AMOS for Windows Analysis of Moment Structures )*3rd ed.). Small Waters Corp

Ariani, D. W. (2015). Relationship model of personality, communication, student engagement, and learning satisfaction. *Business, Management and Education, 13*(2), 175. https://doi.org/10.3846/bme.2015.297

Banu Kenayathulla, H., & Ikram, M. (2022). A systematic literature review of student satisfaction: What is next?. *International Journal of Advanced Research in Education and Society, 4*(4), 50-75.

Barbera, E., Clarà, M., & Linder-Vanberschot, J. A. (2013). Factors influencing student satisfaction and perceived learning in online courses. *E-learning and Digital Media, 10*(3), 226-235. https://doi.org/10.2304/elea.2013.10.3.226

Berisha-Shaqiri, A. (2015). Impact of information technology and internet in businesses. *Academic Journal of Business, Administration, Law and Social Sciences, 1*(1), 73-78.

Boksberger, P. E., & Melsen, L. (2011). Perceived value: a critical examination of definitions, concepts, and measures for the service industry. *Journal of Services Marketing, 25*(3), 229-240. https://doi.org/10.1108/08876041111129209

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen, & J. S. Long (Eds.). *Testing structural equation models* (pp.136-162). SAGE Publication, Inc.

Calisir, F., Bayraktaroglu, A. E., Gumussoy, C. A., & Kaya, B. (2014). Effects of service quality dimensions including usability on perceived overall quality, customer satisfaction, and return intention in different hospital types. *International Journal of Advanced Operations Management, 6*(4), 309-323. https://doi.org/10.1504/ijaom.2014.066829

Chan, C. S., & Shek, K. F. (2021). Are Guangdong-Hong Kong-Macao Bay area cities attractive to university students in Hong Kong? Leading the potential human capital from image perception to locational decisions. *Journal of Place Management and Development, 14*(4), 404-429. https://doi.org/10.1108/jpmd-04-2020-0032

Chen, H. H. (2017). *Analysis on the influencing factors of college students' online course learning satisfaction - based on the survey of several universities in Nanjing* (1st ed.). Nanjing: Nanjing Normal University.

Chi, Y. (2015). A survey on students' satisfaction in flipped classroom. *Exploration of Higher Education, 6,* 85-89.

Croxton, R. A. (2014). The role of interactivity in student satisfaction and persistence in online learning. *Journal of online learning and teaching, 10*(2), 314.

Dayton, A. E. (2015). *Assessing the teaching of writing: Twenty-first century trends and technologies* (1st ed.). University Press of Colorado.

Djakasaputra, A., Pramono, R., & Hulu, E. (2021). Brand image, perceived quality, ease of use, trust, price, service quality on customer satisfaction and purchase intention of blibli website with digital technology as dummy variable in the use of eviews. *Journal of critical reviews, 1*(2), 1-14.

Fei, Q. Y., & Yu, X. Y. (2021). A study on the influencing factors of teaching satisfaction of ideological and political course in colleges and universities from the perspective of intersubjectivity) -an empirical analysis based on structural equation model. *Ideological and political course research, 1*(9), 11-17.

Fiorini, S., Liu, T., Shepard, L., & Ouimet, J. (2014). *Using NSSE to understand student success: a multi-year analysis* (1st ed.). In annual conference of the Indiana Association for Institutional Research, Indianapolis.

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

Gallart-Camahort, V., Fiol, L. C., & Sánchez García, J. (2022). Influence of the internet on retailer's perceived quality in the generation of retailer's brand equity. *The Journal of Business Perspective, 27*(1). 33-47. https://doi.org/10.1177/0972262921992212

Gray, J. A., & DiLoreto, M. (2016). The effects of student engagement, student satisfaction, and perceived learning in online learning environments. *NCPEA International Journal of Educational Leadership Preparation, 11*(1), 1-20.

Guo, J. (2020). An empirical analysis of online teaching satisfaction and its influencing factors during the epidemic: A case study of Anhui Xinhua University. *Journal of Suzhou Institute of Education, 23,* 75-78.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (2010). *Multivariate data analysis* (7th ed.). Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariant Data Analysis* (6th ed.). Pearson International Edition.

Hanif, M., Hafeez, S., & Riaz, A. (2010). Factors affecting customer satisfaction. *International research journal of finance and economics, 60*(1), 44-52.

He, L. K. (2014). From the essence of flipped classroom, look at the future development of flipped classroom in our country. *Research on visual education, 7,* 5-16.

Hollenbeck, C. R., Mason, C. H., & Song, J. H. (2011). Enhancing student learning in marketing courses:An exploration of fundamental principles for website platforms. *Journal of Marketing Education, 33*(2), 171-182. https://doi.org/10.1177/0273475311410850

Holman, D. K. (2013). Evaluation of student engagement assessment in Colorado state university's warner college of natural resources. *Mountain Scholar, 1,* 1-214.

Hu, Z. X. (2011). Construction and empirical Study of the mean structure model of higher education service quality. *Fudan Education Forum, 9*(3), 27-32.

Kanwar, A., & Sanjeeva, M. (2022). Student satisfaction survey: a key for quality improvement in the higher education institution. *Journal of Innovation and Entrepreneurship, 11*(27), 1-10. https://doi.org/10.1186/s13731-022-00196-6

Kuo, Y. F., & Feng, L. H. (2013). Relationships among community interaction characteristics, perceived benefits, community commitment, and oppositional brand loyalty in online brand communities. *International Journal of Information Management, 33,* 948-962. https://doi.org/10.1016/j.ijinfomgt.2013.08.005

Lewis, A. D., Huebner, E. S., Malone, P. S., & Valois, R. F. (2011). Life satisfaction and student engagement in adolescents. *Journal of Youth and Adolescence, 40*(3), 249-262. https://doi.org/10.1007/s10964-010-9517-6

Li, Y. Y., Zhang, H. M., & Zhang, H. Z. (2020). Construction and empirical test of online learning satisfaction model of college students during the epidemic: Based on the survey of 15 universities in Shanghai. *Open Education Research, 26,* 102-111.

Mbango, P. (2019). The role of perceived value in promoting customer satisfaction: Antecedents and consequences. *Cogent Social Sciences, 5*(1), 1684229. https://doi.org/10.1080/23311886.2019.1684229

Min, Y., Huang, J., Varghese, M. M., & Jaruwanakul, T. (2022). Analysis of factors affecting art major students' behavioral intention of online education in public universities in Chengdu. *AU-GSB E-JOURNAL*, *15*(2), 150-158. https://doi.org/10.14456/augsbejr.2022.80

Miremadi, A. (2013). Perceived value, image, customer expectations, customer loyalty, hotel industry. *International Journal of Humanities and Social Science, 3*(9), 245-272.

Mohd, C. K. N. C. K., Shahbodin, F., Pee, A. N. C., & Hanapi, C. (2013). Personalized learning environment (ple) approach: Preliminary analysis in malaysian's secondary school. *International Journal of Computer and Information Technology, 2*(03), 2279-0764. https://doi.org/10.1109/ic3e.2013.6735970

Nguyen, T. T. H. (2021). The effect of brand image, perceived quality and brand experience on customer loyalty: an empirical investigation in the telecommunication industry in Vietnam. *Journal of International Economics and Management*, *20*(3), 60-74. https://doi.org/10.38203/jiem.020.3.0016

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

Parahoo, S. K., & Tamim, R. M. (2012). Determinants of student satisfaction in higher education: an empirical study in Dubai. *International Journal of Services, Economics and Management, 4*(4), 282-297.

Parahoo, S. K., Santally, M. I., Rajabalee, Y., & Harvey, H. L. (2015). Designing a predictive model of student satisfaction in online learning. *Journal of Marketing for Higher Education, 1*(2), 1540-7144.

Reinstein, A., Hasselback, J. R., Riley, M. E., & Sinason, D. H. (2011). Pitfalls of using citation indices for making academic accounting promotion, tenure, teaching load, and merit pay decisions. *Issues in Accounting Education, 26*(1), 99-131. https://doi.org/10.2308/iace.2011.26.1.99

Rizfia Fachrudin, K., & Amalia Fachrudin, K.  (2016). The influence of education and experience toward investment decision with moderated by financial literacy. *Polish Journal of Management Studies, 14*(2), 51-60.

Sahuddin, A., Nurtaat, L., & Fadjri, M. (2022). Student-student interaction in online learning during the covid-19 pandemic: A case study. *Education Quarterly Reviews, 5*(2), 180-191. https://doi.org/10.31014/aior.1993.05.02.479

Samudro, A., Sumarwan, U., Simanjuntak, M., & Yusuf, E. (2020). Assessing the effects of perceived quality and perceived value on customer satisfaction. *Management Science Letters, 10*(5), 1077-1084.

Sayed Munna, A., & Abul Kalam, M. (2021). Teaching and learning process to enhance teaching effectiveness: a literature review. *International Journal of Humanities and Innovation (IJHI), 4*(1), 1-4.

Shen, Z. H., & Wu, D. G. (2020). Study on the influencing factors of college students' online learning effectiveness and satisfaction: An empirical analysis based on structural equation model. *Educational Development Research, 40,* 25-36,

Sirelkhatim, F., & Gangi, Y. (2015). Entrepreneurship education: A systematic literature review of curricula contents and teaching methods. *Cogent Business & Management, 2*(1), 1052034. https://doi.org/10.1080/23311975.2015.1052034

Stylidis, K., Wickman, C., & Soderberg, R. (2018). Perceived quality of products: a framework and attributes ranking method. *Journal of Engineering Design, 31*(1), 37-67.

Sumaedi, S., & Bakti, G. M. Y. (2011). The students perceived quality comparison of ISO 9001 and Non-ISO 9001 certified school: an empirical evaluation. *International journal of engineering & technology IJETIJENS, 11*(1), 104-8.

Sun, H.-L., Sun, T., & Sha, F.-Y. (2022). The influence of teacher–student interaction on the effects of online learning: based on a serial mediating model. *Educational Psychology, 13*(1), 1-10. https://doi.org/10.3389/fpsyg.2022.779217

Wang, X. F. (2019). An empirical study on the relationship between distance education students' perceived service quality and satisfaction. *Chinese Adult Education, 07*, 49-55.

Williams, P., & Sheridan, S. (2010). Conditions for collaborative learning and constructive competition in school. *Educational Research, 52*(4), 335-350. https://doi.org/10.1080/00131881.2010.524748

Wolters, C. A., & Hussain, M. (2015). Investigating grit and its relations with college students' self-regulated learning and academic achievement. *Metacognition and Learning, 10*(3), 293-311. https://doi.org/10.1007/s11409-014-9128-9

Xiao, M., Tian, Z., & Xu, W. (2023). Impact of teacher-student interaction on students' classroom well-being under online education environment. *Education and Information Technologies, 1*(2), 1-23. https://doi.org/10.1007/s10639-023-11681-0

Zeng, S. H. (2014). Theoretical implication and practical exploration of "Flipped Classroom". *Education Review, 10,* 118-120.

Zeng, S. M., Wan, P., Chen, A., & Hu, Z. Y. (2021). Evaluation of experimental teaching process based on modern information technology. *Higher Engineering Education Research, 6,* 62-67.

Zhang, N. X., & Rao, Y. T. (2014). The challenges and opportunities brought to China by MOOCs (MOOCs) Interview with Zhang Jie, President of Shanghai Jiao Tong University. *University (Academic edition)*, *1*, 4-15.

Zhang, Y. G., & Zhang, Y. J. (2012). Perspective on the flipped classroom. *Information technology education in primary and secondary schools, 3*, 9-10.

Zhu, L. (2016). *The Impact of perceived quality and perceived Value on students' satisfaction in Private Vocational training institutions* (1st ed.). Shanxi University of Finance and Economics.