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Factors Affecting Satisfaction and Loyalty Toward University Education: A Case Study of Students at Public Universities in Chengdu, China

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Abstract

Purpose: This paper examines the factors influencing educational satisfaction and loyalty toward university education in public universities in Chengdu, China. It presents a case study investigating the perspectives of current students. The research focuses on the causal relationships between Teaching Staff (TS), Curriculum (CC), Infrastructure Facilities (IF), Placement Services (PS), Institutional Image (IM), Student Satisfaction (SS), and Student Loyalty (SL) in higher education. **Research design, data and methodology:** This study employs a quantitative approach (N=503) to survey university students. The questionnaire's reliability and validity were assessed through IOC and pilot testing. A combination of purposive, stratified random, and convenience sampling was used to target students at Sichuan University, China. Data were collected via an online questionnaire, with valid responses analyzed using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). **Results:** Research indicates that teaching staff, curriculum, infrastructure, image, and placement services significantly influence student satisfaction, which in turn affects student loyalty. Among these factors, faculty has the least impact on student satisfaction. **Conclusions:** All seven hypotheses in this study aligned with the research objectives. These findings can help higher education administrators, particularly in public universities in Chengdu, western China, assess and develop strategies to enhance student satisfaction and loyalty, ultimately supporting the growth of public universities in the region.

Keywords: University, Higher Education, Satisfaction, Loyalty

JEL Classification Code: A20, I23, L84, M10

1. Introduction

Higher education is the foundation of social development. The quality and outcomes of the higher education sector determine the caliber of human resources and serve as a barometer of a country's developmental prospects. Higher education plays a pivotal role in shaping human capital, and as the cornerstone of societal advancement, its outputs and standards are particularly critical (Mishra, 2007). With the ongoing expansion of higher education in China, the central and western regions have experienced rapid progress, bolstered by strong national policy support. Amidst these favorable developments, public universities in these regions urgently require evidence-based guidance on policy formulation and institutional strategies. As students are considered the "primary productive force" of university development, their subjective experiences are vital to shaping institutional direction. Thus, understanding the factors that influence student satisfaction and loyalty is key to informing effective policy and strategic decisions.

In alignment with the evolving landscape, the

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development of higher education must keep pace with the times. The measurable value generated through service quality is increasingly significant. Efficient cost control and service improvement can boost competitiveness and institutional reputation in the educational market. To remain responsive to competitive pressures, higher education institutions must draw actionable strategies from academic research as a basis for sustainable development. In marketing literature, customer satisfaction and loyalty are often linked to competitiveness and repurchase behavior. Similarly, when students are conceptualized as customers, research on their satisfaction and loyalty becomes critical. Navarro et al. (2005) emphasized that students express their satisfaction through active educational participation and service evaluation. As providers of educational services, universities function as incubators of talent, while students are both clients and outputs of this system. Higher education institutions must therefore optimize their services to meet student expectations and improve satisfaction through real-time academic experiences (Lin, 2007).

With over 100 institutions of higher learning, Sichuan Province is a significant region in China's central and western education strategy. However, a numerical advantage does not automatically equate to qualitative strength. The overall competitiveness of universities in Sichuan remains an area of concern. Despite regional and economic limitations, the province's large population and favorable policies continue to provide opportunities for development. Sichuan University, located in Chengdu, is renowned for its rich history and academic excellence. As a flagship public university in the province—with over 70,000 students and comprehensive disciplinary coverage—it stands as a benchmark institution for talent cultivation in western China. Its strategic position makes it an ideal case for investigating student satisfaction and loyalty. The findings from this research can provide valuable guidance to other universities in the region seeking to enhance institutional quality and competitiveness.

This study contributes to the literature by developing a comprehensive model linking institutional factors such as teaching staff, curriculum, infrastructure, placement services, and image with student satisfaction and loyalty, particularly in the under-researched context of public universities in western China. Theoretically, it expands the application of service quality and satisfaction-loyalty paradigms in higher education. Practically, the study offers actionable insights for educational administrators and policymakers aiming to improve student-centered strategies and institutional competitiveness in the region.

2. Literature Review

2.1 Teaching Staff

Teachers are an indispensable core component of education, playing a crucial role in bridging different levels of the educational system. Jereb et al. (2018) highlight that teachers not only store and transmit knowledge but also motivate and inspire students. Like students, teachers are both participants and witnesses of the educational process, serving as the most direct link in fostering emotional connections between colleges and students. They play a leading role in education and are integral to institutional operations (Gruber et al., 2010).

Teaching staff have a significant impact on student satisfaction. Research has shown that educators, as mediums of knowledge dissemination, enhance student satisfaction through effective communication and teaching skills (Jereb et al., 2018). In addition to teacher-student interactions, peer discussions and collaborative learning are also crucial (Eom & Ashill, 2016). As facilitators of academic discourse, teachers should integrate communication throughout the learning process, fostering engagement and intellectual exchange. Higher education emphasizes inspiration and dialogue, where interactions between teachers and students, as well as among students, form the foundation for student satisfaction and institutional loyalty.

Gruber et al. (2010) emphasize that teachers help students bridge the gap between theoretical knowledge and real-world applications. By sharing their professional experiences, educators enable students to apply academic learning to practical scenarios. This process is essential for students' holistic development, laying the groundwork for their future success and maintaining a lifelong connection between students and their alma mater. Recognizing teaching staff as a key reference factor in evaluating university services reflects students' perceptions and assessments of institutional quality (Gruber et al., 2010). However, while existing studies confirm the role of teaching staff in influencing satisfaction, few have comparatively evaluated this impact against other institutional factors such as curriculum or infrastructure in the context of Chinese public universities. This study addresses this gap by empirically assessing the relative influence of teaching staff on student satisfaction and positioning it within a broader structural framework of institutional quality. Therefore, the following hypothesis is proposed for the study:

H1: Teaching staff has a significant impact on student satisfaction.

2.2 Curriculum

The curriculum is a fundamental component of university education, as its design determines the hierarchical structure and comprehensiveness of knowledge acquisition. A well-structured curriculum should align with students' academic majors and real-world professional practices, ensuring both coherence and practical applicability. Gruber et al. (2010) highlight that German universities emphasize the connection between course content and professional requirements, ensuring that each course provides tangible learning value by incorporating practice-oriented elements.

For instance, in the field of accounting, integrating real-world job practices into the curriculum allows for retrospective assessments of course design. This process helps educators reflect on teaching effectiveness, refine instructional strategies, bridge the gap between theory and practice, and optimize course content to achieve educational objectives (Liu et al., 2012). Similarly, Eom and Ashill (2016) assert that the quality of curriculum design directly impacts educational effectiveness, serving as a key reference for improving course structures and aligning them with higher education goals.

Farahmandian et al. (2013) emphasize that universities offer a diverse range of courses tailored to students' training objectives, incorporating flexibility and transfer options to enhance learning experiences. The effectiveness of these course configurations is reflected in student satisfaction, which in turn influences their overall educational experience and learning outcomes. The optimization of courses fosters a positive feedback loop, wherein well-structured curricula improve student satisfaction, reinforce academic rigor, and enhance classroom engagement (Gruber et al., 2010). Researchers further highlight that courses designed with logical clarity and well-structured materials significantly enhance learning outcomes and motivation, encouraging students to take an active role in their education (Eom & Ashill, 2016). Nonetheless, much of the prior research has focused on curriculum design in Western contexts or specialized fields. There remains a gap in literature analyzing whether curricula in multidisciplinary public universities in western China are perceived as sufficiently relevant and integrative. This study contributes to filling this gap by examining how curriculum design influences student satisfaction in this distinct setting. Therefore, the following hypothesis is proposed for the study:

H2: Curriculum has a significant impact on student satisfaction.

2.3 Infrastructure Facilities

Infrastructure facilities are tangible assets and a concrete representation of a university's resources (Kaur & Bhalla, 2018). Core educational infrastructure includes laboratories, multimedia classrooms, and libraries, while auxiliary facilities such as accommodations, dining halls, and public restrooms support students' daily needs (Jereb et al., 2018). As fundamental components of the learning environment, infrastructure quality directly reflects the level of services offered by universities.

Studies highlight that well-designed, aesthetically pleasing, and efficiently utilized infrastructure is essential for the sustainable development of higher education (Weerasinghe & Fernando, 2018). High-quality construction enhances campus appeal, fosters creativity, ensures safety, and minimizes long-term maintenance costs. Optimized infrastructure use maximizes educational benefits and facilitates smooth teaching and research activities.

Appuhamilage and Torii (2019) emphasize that infrastructure significantly influences students' choice of higher education institutions. Facilities such as libraries, social spaces, dining areas, and laboratories shape students' academic experiences and personal development. Their quality, practicality, and accessibility directly impact student satisfaction (Weerasinghe & Fernando, 2018). Kaur and Bhalla (2018) found infrastructure to be one of seven key factors affecting student satisfaction, alongside teaching quality, curriculum design, and assessment strategies.

Weerasinghe and Fernando (2018) identify infrastructure as a major driver of student satisfaction, comparable to the impact of learning opportunities. Jereb et al. (2018) further highlight that learning support facilities have a stronger influence on student satisfaction than auxiliary services. High-quality infrastructure fosters a safe, comfortable, and engaging learning environment, enhancing both educational outcomes and students' overall experience. Despite strong evidence linking infrastructure to satisfaction, little research has been conducted to explore how infrastructure perceptions differ across urban versus regional public institutions in China. Moreover, infrastructure's relative impact remains underexplored in integrative models of satisfaction and loyalty. This study fills this research void by systematically evaluating the effect of infrastructure within a structural model including multiple institutional quality dimensions. Therefore, the following hypothesis is proposed for the study:

H3: Infrastructure facilities have a significant impact on student satisfaction.

2.4 Placement Services

Placement services play a crucial role in talent development within higher education institutions, serving as a key bridge between academic learning and professional practice. These services help students leverage their strengths, identify suitable employment opportunities, and take their first steps toward career development (Gruber et al., 2010). Kaur and Bhalla (2018) highlight that placement services not only influence students' career paths but also impact their initial decision to choose a university, as institutions offering strong employment prospects tend to attract more students.

Research has identified eight key components contributing to the overall quality of higher education institutions: placement services, academic standards, teaching resources, extracurricular activities, financial support, learning environment, management control, and student support services (Kaur & Bhalla, 2018). Accordingly, Gruber et al. (2010) emphasize that placement services significantly shape students' future career trajectories and should be a focal point for universities. Senthilkumar and Arulraj (2011) further assert that the perceived quality of higher education is often reflected in the effectiveness of these services. To optimize graduate employability and attract students, institutions must not only provide sustainable continuing education opportunities but also strengthen industry collaborations to secure more resources and enhance employment services (Tsinidou et al., 2010).

Kaur and Bhalla (2018) argue that strong university-provided employment opportunities are key to institutional competitiveness and student attraction. Additionally, Gruber et al. (2010) confirm that placement services are vital to higher education and its industry stakeholders. These services not only enhance student satisfaction but also inform universities' strategic development.

When universities offer diverse job and internship opportunities, students are more likely to secure positions aligned with their majors and career aspirations, reinforcing their connection to the institution. Furthermore, career support services such as resume assistance, interview training, and career counseling help students build confidence in their job search. Južnič and Pymm (2011) emphasize that the effective implementation of placement services significantly enhances students' overall satisfaction with higher education institutions. However, existing studies often generalize placement services without considering regional disparities in labor market integration, particularly in inland provinces like Sichuan. There is also limited empirical research connecting placement services with student loyalty, beyond their impact on satisfaction. This study addresses both gaps by exploring placement service quality and its cascading effect on student satisfaction and loyalty in a specific regional context. Therefore, the following hypothesis is proposed for the study:

H4: Placement services have a significant impact on student satisfaction.

2.5 Image

Chandra et al. (2019) define image as an individual's judgment based on impressions of various entities. In the context of higher education, a university's image is shaped by students' subjective perceptions, which develop into inherent cognitions over time (Weerasinghe & Fernando, 2018). Brown and Mazzarol (2009) describe university image as a blend of strengths and weaknesses, encompassing both visible external attributes and the perceived level of institutional reputation. As centers for fostering innovation and critical thinking, universities cultivate an image of credibility, contribution, strong reputation, and institutional standing (Appuhamilage & Torii, 2019).

Chandra et al. (2019) further characterize institutional image as an intangible asset that represents social recognition and influence—two of the most valued aspects of higher education institutions. Its impact manifests both directly and indirectly: the direct influence affects faculty, students, and administrators, while the indirect impact is seen in the institution's ability to secure resources for teaching quality and placement services (Weerasinghe & Fernando, 2018). Brown and Mazzarol (2009) argue that, although universities are increasingly adapting to market-oriented strategies, their financial profitability remains limited. As a result, building a strong institutional image has become a priority, allowing universities to leverage their competitive identity to attract external resources in a highly competitive academic landscape (Alves & Raposo, 2010).

Institutional image plays a critical role in shaping student satisfaction (Appuhamilage & Torii, 2019). Brown and Mazzarol (2009) highlight the connection between satisfaction levels and institutional image, while Chandra et al. (2019) emphasize that although the quality of teaching services is the primary determinant of student satisfaction, institutional image is equally—if not more—significant. Consequently, cultivating a strong, positive image is essential, as it serves as one of the most influential factors in enhancing student satisfaction (Alves & Raposo, 2010). Despite consensus on the importance of institutional image, prior studies often treat it as a static construct and overlook its mediating role between service quality and satisfaction. Moreover, there is limited research assessing how institutional image perceptions evolve among students in public universities with limited international branding, such as those in western China. This study contributes by

evaluating the impact of image in a regional institutional context and positioning it as a strategic lever for enhancing satisfaction. Therefore, the following hypothesis is proposed for the study:

H5: Image has a significant impact on student satisfaction.

2.6 Student Satisfaction

Satisfaction is defined as a customer's perception of an institution's performance and a direct reflection of their experience (Chandra et al., 2019). Navarro et al. (2005) describe student satisfaction as a concise summary of their comprehensive experience in higher education. Annamdevula and Bellamkonda (2016) argue that satisfaction is a perceptual conclusion shaped by the quality of service provided, where feelings of happiness and fulfillment depend on the institution's ability to meet expectations. Hai (2022) further explains that satisfaction reflects the fulfillment of basic service expectations, influencing brand loyalty, reputation, and the likelihood of repurchase.

Satisfaction encompasses both positive and negative experiences with an institution's services. The balance between customer expectations and the actual value received is a key determinant of satisfaction (Chandra et al., 2019). Annamdevula and Bellamkonda (2016) emphasize that students' subjective evaluations are closely linked to their academic growth and sense of achievement. As competition in higher education intensifies, institutions are shifting from purely non-profit entities to market-driven public service providers. In this context, student satisfaction has become a crucial metric for assessing institutional performance, reflecting the effectiveness of management reforms and future attractiveness (Hai, 2022). Its multidimensional nature makes satisfaction a complex yet essential evaluation criterion in higher education (Navarro et al., 2005).

Latif et al. (2021) identify a strong interrelationship between student satisfaction and loyalty, with clear predictive characteristics. Navarro et al. (2005) further confirm the causal link between satisfaction and loyalty. Chandra et al. (2019) argue that highly loyal students provide strategic guidance for institutional development, helping universities enhance satisfaction levels through feedback and continuous improvement in education quality and services. However, most research aggregates satisfaction into a general construct, lacking exploration of how satisfaction mediates the relationship between institutional factors and loyalty. Additionally, few studies have validated this role in the context of less prestigious public universities where competitive pressure and resource limitations differ significantly. This study advances the field by treating satisfaction as both an outcome and a mediating variable, allowing for a more nuanced understanding of its role in loyalty formation. Therefore, the following hypothesis is proposed for the study:

H6: Student satisfaction has significant impact on student loyalty.

2.7 Student Loyalty

Latif et al. (2021) describe student loyalty as an ongoing cognitive process in which students develop a willingness to positively evaluate their institution and contribute to its reputation. This loyalty is reflected in active discussions about their university and a personal inclination to share information related to it (Alves & Raposo, 2010). Annamdevula and Bellamkonda (2016) compare student loyalty to customer loyalty, where indicators such as repurchase intentions and brand engagement parallel students' interest in institutional culture, creative products, and further studies or employment at the same university. From a behavioral perspective, student loyalty reflects satisfaction with teaching quality and trust in the institution's educational effectiveness (Latif et al., 2021).

Customer loyalty is often measured by acceptance of new products and repeat purchases. Similarly, universities must cultivate student loyalty by maintaining high-quality education and continuously improving services (Annamdevula & Bellamkonda, 2016). Latif et al. (2021) note that students who choose to continue their studies, donate financially, support institutional reputation, or engage in alumni activities demonstrate strong loyalty, which is often most visible after graduation. Alves and Raposo (2010) further highlight that loyal alumni maintain active collaboration with their alma mater.

Teeroovengadum et al. (2019) assert that student loyalty is reflected in continued enrollment, institutional recognition, and recommendations to prospective students. Higher education institutions analyze student loyalty because of its positive impact on institutional growth, including higher enrollment rates and stronger alumni engagement. Therefore, fostering student loyalty is essential for long-term development. By creating a supportive learning environment and enhancing teaching quality, universities can effectively attract and retain students, strengthening their overall competitiveness (Navarro et al., 2005).

Despite growing interest in student loyalty, limited research has explored how loyalty manifests beyond academic metrics in the Chinese context. Moreover, few studies have linked loyalty formation to the combined effects of multiple institutional factors mediated by satisfaction. This study contributes by integrating loyalty into a comprehensive structural model, offering empirical

insights into its antecedents within public universities in western China.

3. Research Methods and Materials

3.1 Research Framework

The conceptual framework of this study is grounded in previous research findings and comprises four theoretical models. The first, proposed by Navarro et al. (2005), examines the relationship between Teaching Staff (TS) and Student Satisfaction (SS). The second framework, developed by Farahmandian et al. (2013), explores the impact of Curriculum (CC) on student satisfaction. Kaur and Bhalla (2018) present the third framework, which highlights the interactions between Placement Services (PS) and Infrastructure Facilities (IF) in relation to student satisfaction. The final framework, introduced by Teeroovengadum et al. (2019), investigates the positive influence of Image (IM) on student satisfaction while also examining the relationship between student satisfaction and Student Loyalty (SY).

This integrated framework is well-suited for examining multidimensional factors in the context of public universities in Chengdu, where policy support, institutional resources, and student perceptions interact. However, a potential limitation lies in the model's focus on linear, one-way relationships, which may overlook dynamic or reciprocal interactions among constructs, such as feedback loops between satisfaction and institutional practices.

As illustrated in Figure 1, the study tests six hypotheses linking institutional factors to satisfaction, and satisfaction to loyalty, to provide strategic insights for higher education development.

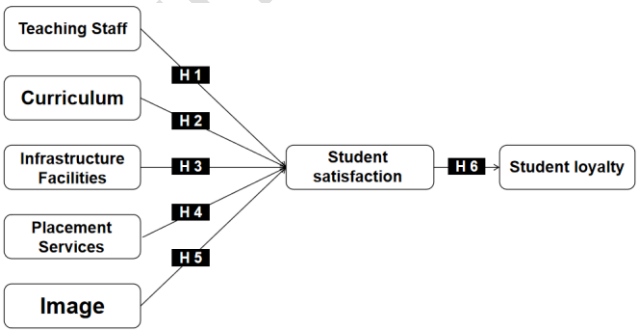

Figure 1: Conceptual Framework

This study aims to identify the factors influencing student satisfaction and loyalty in public higher education institutions. Six hypotheses are tested to examine their causal relationships, including the impact of faculty, curriculum, infrastructure, placement services, and institutional image on student satisfaction, as well as the relationship between student satisfaction and student loyalty.

3.2 Research Methodology

The author collected data based on a quantitative research design using non-probability sampling techniques. An online questionnaire was distributed via Questionnaire Star to the target population—students at Sichuan University, a public university in western China, across all undergraduate year levels. This survey aimed to collect and analyze the factors influencing student satisfaction and loyalty through a structured three-step approach.

First, the questionnaire included demographic screening questions to identify respondent characteristics. Second, the measurement items for each construct were adapted from validated scales in existing literature. Teaching Staff (TS), Curriculum (CC), Infrastructure Facilities (IF), Placement Services (PS), Institutional Image (IM), Student Satisfaction (SS), and Student Loyalty (SL) were each measured using multiple items on a five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). These items were adapted respectively from Navarro et al. (2005), Farahmandian et al. (2013), Kaur and Bhalla (2018), and Teeroovengadum et al. (2019), ensuring conceptual relevance and contextual alignment.

Third, the initial draft of the questionnaire underwent expert validation and pilot testing. A total of 30 students from the target population participated in pilot testing, and three academic experts reviewed the items using the Item Objective Congruence (IOC) technique to ensure content validity. Minor revisions were made based on their feedback to enhance clarity and relevance.

Subsequently, the revised questionnaire was distributed to 503 students, and all valid responses were analyzed using SPSS and AMOS. Confirmatory Factor Analysis (CFA) was conducted to assess the measurement model's construct validity, internal consistency, and convergent and discriminant validity. Structural Equation Modeling (SEM) was then applied to test the six proposed hypotheses and examine causal relationships among the variables.

Given the use of non-probability sampling, specifically purposive and convenience methods, there is a potential for sampling bias. The findings may not be fully generalizable beyond the sample, as participants with higher engagement or access to digital platforms could be overrepresented.

Ethical considerations were addressed by obtaining informed consent from all participants. The questionnaire included a clear explanation of the study's purpose, guaranteed respondent anonymity, and assured that all data would be used solely for academic research. Institutional approval was obtained, and data were stored securely in accordance with ethical research standards.

3.3 Population and Sample Size

The target population for this study comprises students at Sichuan University, a representative public higher education institution in Western China, including both liberal arts and science undergraduates. Kline (2016) suggested that the minimum sample size for Structural Equation Modeling (SEM) should be at least 375. Based on relevant factor parameters and the number of variables, the researchers calculated a minimum required sample size of 425 (Rijnsoever et al., 2009). To enhance data accuracy, the study utilized a sample size of 503. Questionnaires were distributed to all 503 participants in the target population, with a 100% response rate.

The study employed a non-probability sampling approach for data collection. Initially, judgmental (purposive) sampling was used to define the target population as students of Sichuan University, a public university in Western China. Subsequently, stratified random sampling was applied to determine the sampling quota for liberal arts and science students. Finally, convenience sampling was utilized to distribute an online questionnaire for data collection. The distribution ratio of the sample is presented in Table 1.

Table 1: Population and Sample Size by Sichuan university

Subject	Population Size of Undergraduate Students at Sichuan University	Proportional Sample Size
Liberal Arts	11,539	154
Science	26.043	349
Total	**37,582**	**503**

Source: Sichuan University (2019)

The data collection period is concentrated from May to October 2022. The entire screening data process is completed to ensure the accuracy of the target population, all of whom are Chinese undergraduates receiving higher education and participating in the education process. The questionnaire is filled out using Questionnaire Star and distributed to students through the school teacher using social networking tools such as WeChat, email, and QQ.

4. Results and Discussion

4.1 Demographic Profile

The study sample comprised 503 undergraduate students from Sichuan University. In terms of gender distribution, a majority of respondents were female, accounting for 64.4% (n = 324), while male students represented 35.6% (n = 179). This gender imbalance may reflect broader enrollment trends or response behavior patterns among students.

With respect to academic discipline, 69.4% of the participants (n = 349) were enrolled in science-related programs, whereas 30.6% (n = 154) came from liberal arts disciplines. This distribution indicates a stronger representation from students pursuing science fields, which may influence perspectives on institutional services and learning experiences.

In terms of year of study, a substantial proportion of the respondents (70.8%, n = 356) were first- or second-year students, while 29.2% (n = 147) were in their third or fourth year. The predominance of lower-year students suggests a greater responsiveness from those earlier in their academic journey, which may shape perceptions of satisfaction and loyalty based on more recent or developing university experiences.

4.2 Confirmatory Factor Analysis (CFA)

Research has demonstrated that Confirmatory Factor Analysis (CFA) is a reliable and effective tool for establishing measurement models and assessing their validity (Hoyle, 2012). In evaluating conceptual models, factor loadings should exceed 0.5, and P-values should be less than 0.5. Fornell and Larcker (1981) emphasize that structural reliability should surpass the threshold of 0.7, while the Average Variance Extracted (AVE) should be greater than 0.5. The values for convergent and discriminant validity, as presented in Table 2, exceed acceptable thresholds, confirming the reliability of both measures.

To assess model fit, the study applied multiple fit indices, including Chi-square (χ^2/df), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI), Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Root Mean Square Error of Approximation (RMSEA). The evaluation of Goodness of Fit Indices, as shown in Table 3, indicates that the measurement model meets the required fit criteria.

Additionally, discriminant validity was assessed by comparing inter-variable correlations with the square root of AVE values along the diagonal axis. The analysis in Table 4 demonstrates that the square root of AVE values exceeds the inter-variable correlations, thereby confirming discriminant validity (Fornell & Larcker, 1981). The results satisfy the criteria for both discriminant and convergent validity, ensuring the robustness of subsequent structural model evaluations.

Table 2: Confirmatory Factor Analysis (CFA), Composite Reliability (CR), and Average Variance Extracted (AVE) Results

Variable	Source of Questionnaire (Measurement Indicator)	No. of Item	Cronbach's Alpha	Factor Loading	CR	AVE
Teaching Staff (TS)	Navarro et al. (2005)	3	0.823	0.775-0.784	0.823	0.607
Curriculum (CC)	Farahmandian et al. (2013)	5	0.878	0.750-0.816	0.879	0.591
Infrastructure Facilities (IF)	Kaur and Bhalla (2018)	8	0.913	0.719-0.808	0.913	0.567
Placement Services (PS)	Kaur and Bhalla (2018)	5	0.873	0.734-0.790	0.873	0.578
Image (IM)	Teeroovengadum et al. (2019)	5	0.872	0.748-0.780	0.872	0.578
Student Satisfaction (SS)	Teeroovengadum et al. (2019)	6	0.863	0.691-0.732	0.863	0.512
Student Loyalty (SL)	Teeroovengadum et al. (2019)	3	0.758	0.702-0.730	0.758	0.511

Note: CR = Composite Reliability, AVE = Average Variance Extracted

Table 3: Goodness of Fit for Measurement Model

Index	Criterion	Statistical Value
CMIN/DF	< 5.00 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	1.227
GFI	≥ 0.85 (Greenspoon & Saklofske, 1998)	0.931
AGFI	≥ 0.80 (Filippini et al., 1998)	0.919
NFI	≥ 0.80 (Arbuckle, 1995)	0.928
CFI	≥ 0.80 (Hair et al., 2006)	0.984
TLI	≥ 0.80 (Hair et al., 2006)	0.986
RMSEA	< 0.08 (Pedroso et al., 2016)	0.021

Note: 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 = normalized fit index, CFI = comparative fit index, TLI = Tucker Lewis index and RMSEA = root mean square error of approximation

Table 4: Discriminant Validity

Variable	Factor Correlations						
	TS	CC	IF	PS	IM	SS	SL
TS	**0.779**						
CC	0.365	**0.769**					
IF	0.343	0.360	**0.753**				
PS	0.335	0.447	0.307	**0.761**			
IM	0.314	0.279	0.374	0.272	**0.760**		
SS	0.386	0.412	0.415	0.425	0.473	**0.716**	
SL	0.335	0.402	0.324	0.390	0.357	0.555	**0.715**

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

4.3 Structural Equation Model (SEM)

Structural Equation Modeling (SEM) has been established as a reliable and effective tool for theoretical construction, hypothesis testing, and examining the relationships among variables (Hair et al., 2014). As shown in Table 5, the ratio of chi-square to degrees of freedom (CMIN/DF) should be below 3 to ensure a good model fit. Ferguson et al. (2007) propose that the Goodness of Fit Index (GFI) should be at least 0.85, and the Adjusted Goodness of Fit Index (AGFI) should be at least 0.8. Several studies also indicate that the values for the Normed Fit Index (NFI), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) should be equal to or greater than 0.8 (Greenspoon & Saklofske, 1998; Hair et al., 2011). Additionally, the Root Mean Square Error of Approximation (RMSEA) should be maintained at or below 0.08 (Peng & Samah, 2006). In this study, SEM was calculated using AMOS version 26 for model adjustment. The fit index results were as follows: CMIN/DF = 2.001, GFI = 0.876, AGFI = 0.859, NFI = 0.88, CFI = 0.931, TLI = 0.936, and RMSEA = 0.045. All results indicate that the fit indices meet the required standards.

Table 5: Goodness of Fit for Structural Model

Index	Criterion	Statistical Value
CMIN/DF	< 5.00 (Al-Mamary & Shamsuddin, 2015; Awang, 2012)	2.001
GFI	≥ 0.85 (Greenspoon & Saklofske, 1998)	0.876
AGFI	≥ 0.80 (Filippini et al., 1998)	0.859
NFI	≥ 0.80 (Arbuckle, 1995)	0.88
CFI	≥ 0.80 (Hair et al., 2006)	0.931
TLI	≥ 0.80 (Hair et al., 2006)	0.936
RMSEA	< 0.08 (Pedroso et al., 2016)	0.045

Note: 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 = normalized 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 model in this study verifies the significance of all variables through standardized regression weight coefficients and R^2 variance. Using a significance level of $P < 0.05$ as the threshold for acceptance, all six hypotheses in this study show significant effects. The strongest influence is from student satisfaction on student loyalty, with a result of 0.659. The variable with the most significant impact on student satisfaction is image, with a result of 0.377, followed by placement services ($\beta = 0.274$) and curriculum ($\beta = 0.212$). In contrast, the infrastructure facilities and teaching staff on student satisfaction are relatively weak. All results are displayed in Table 6 and Figure 2.

Table 6: Hypothesis Testing Result

Hypothesis	Standardized path coefficients (β)	t-value	Test Result
H1: TS → SS	0.183	3.777*	Supported
H2: CC → SS	0.212	4.476*	Supported
H3: IF → SS	0.197	4.234*	Supported
H4: PS → SS	0.274	5.619*	Supported
H5: IM → SS	0.377	7.291*	Supported
H6: SS → SL	0.659	9.448*	Supported

Note: *=p-value<0.05

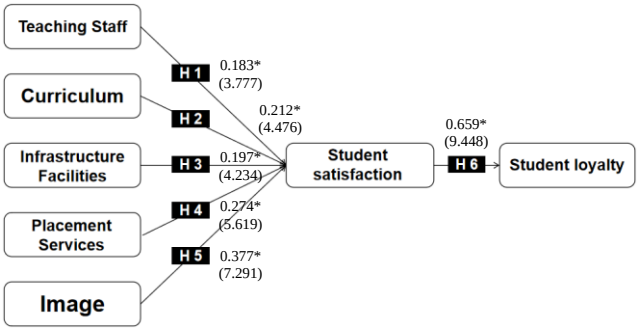

Figure 2: The Results of Research Framework
Note: Solid line reports the Standardized Coefficient with * as p<0.05, and t-value in Parentheses

The results in Table 6 and Figure 2 can be further refined:

H1: The result shows that teaching staff has an impact on student satisfaction. The standardized coefficient value is 0.183. Compared to other hypotheses in this study, the impact on student satisfaction is the smallest. Jereb et al. (2018) also confirmed this influence in their research. For public higher education institutions in China's central and western regions, recognizing the influence of teaching staff in the educational process can enhance student satisfaction. Therefore, the influencing factors of teaching staff can serve as points for the reform and development of universities.

H2: The standardized coefficient of 0.212 indicates the curriculum's significant impact on student satisfaction. Gruber et al. (2010) indicate a positive interactive relationship between the curriculum and student satisfaction. Strengthening curriculum optimization, improving the implementation process, and maintaining a rigorous attitude toward the curriculum will be key directions for enhancing student satisfaction. Higher education administrators should recognize this importance.

H3: Infrastructure facilities have a positive impact on student satisfaction, with a standardized coefficient value of 0.197. Although infrastructure facilities are not one of the most prominent factors influencing student satisfaction, the research by Weerasinghe and Fernando (2018) suggests that they are indeed one of the factors affecting student satisfaction. Therefore, improving infrastructure facilities, including providing convenient living facilities and optimized learning environments, positively impacts student satisfaction.

H4: The result indicates that placement services have a strong influence among the many factors affecting student satisfaction, and its standardized coefficient value in this study is 0.274. The implementation effect of placement services is a prerequisite for improving students' overall satisfaction with higher education institutions (Južnič & Pymm, 2011). Securing a job placement that aligns with students' majors and skill levels is a vital first step in their career development. It reflects the outcomes of the entire higher education process. By prioritizing the development and enhancement of placement services, universities can greatly improve student satisfaction with their institutions.

H5: Image strongly impacts student satisfaction, with a standardized coefficient value of 0.377, making it the factor with the strongest impact on student satisfaction in this study. Alves and Raposo (2010) also clearly mentioned in their study that positive image building can be regarded as the most significant related factor affecting student satisfaction. Image is the most intuitive business card of colleges and universities in the market environment. Its quality affects the customer's willingness to choose, and it is also the part that customers who continue to use the product hope to maintain and improve. Therefore, higher education institutions should spend more effort on maintaining and improving their positive image by building a positive image.

H6: The impact of student satisfaction on student loyalty is highly significant, with a standardized coefficient value of 0.659, making it the strongest influencing factor in this study. Navarro et al. (2005) found that the connection between student satisfaction and student loyalty is causal. Highly loyal students can become promoters and supporters of the school, witness and pay attention to the school's dynamics, and provide help and feedback to the school within their capabilities. There is an obvious predictive feature between student satisfaction and loyalty, providing a strong impetus for colleges and universities to continue strengthening and improving student satisfaction.

The findings confirm the theoretical model and highlight student satisfaction as a key driver of loyalty. Institutional image, placement services, and curriculum were the strongest predictors of satisfaction, offering practical insights for university management. These results underscore the need for targeted improvements in both academic and support services to enhance the overall student experience.

5. Conclusions and Recommendation

5.1 Conclusions

This study focuses on the factors affecting the satisfaction and loyalty of Chinese students in public universities in central and western China. The proposed conceptual framework includes the causal relationship between Teaching Staff (TS), Curriculum (CC), Infrastructure Facilities (IF), Placement Services (PS), Image (IM), Student Satisfaction (SS), and Student Loyalty (SL). Quantitative research is used as the research method of this study. After collecting data from 503 students at Sichuan University, a leading university in western China,

including liberal arts and science students, the key factors affecting the satisfaction and loyalty of this population are analyzed. Confirmatory factor analysis (CFA) is used to evaluate the validity and acceptability of the conceptual model of this paper, and structural equation modeling (SEM) is used to test its adaptability carefully.

The research results are summarized as follows: First, student satisfaction has the most prominent impact on student loyalty. The study by Latif et al. (2021) pointed out that there is not only a significant correlation between the two but also a strong predictive relationship. The sense of belonging and participation brought about by improving satisfaction further consolidates students' loyalty to the school. At the same time, the impact of university image on student satisfaction cannot be ignored. As a manifestation of social recognition and influence (Chandra et al., 2019), students' trust in the school and brand recognition are ultimately reflected through satisfaction. In addition, placement services and course quality also significantly affect student satisfaction, and their improvement can prompt students to have a two-way recognition of teaching results and processes. Finally, the impact of infrastructure and teaching staff on student satisfaction is positive, and both are closely related to students' lives and studies.

These findings are consistent with prior research (e.g., Gruber et al., 2010; Navarro et al., 2005; Teeroovengadum et al., 2019), confirming that service quality dimensions—such as curriculum, placement services, and institutional image—are key drivers of satisfaction. However, this study makes a unique contribution by applying and validating these relationships in the underexplored context of public universities in western China, where institutional development is shaped by regional disparities and policy-driven expansion. Unlike many earlier studies conducted in elite or coastal institutions, this research provides empirical evidence from a more representative and policy-sensitive setting, offering context-specific insights. The findings highlight that while teaching staff and infrastructure are important, institutional image and career-related services have become more central to shaping satisfaction and loyalty in a competitive higher education landscape.

The relationship between student satisfaction and loyalty is an important research area that can help modern public universities break market barriers and seek development paths. The study confirmed the causal relationship between satisfaction and loyalty and identified the key factors to improve student satisfaction. By situating the findings within existing theoretical models and applying them to a strategically important but underrepresented region, this study enhances the broader literature on higher education service quality and student engagement. The data obtained can provide an important basis for public institutions in the region to formulate development strategies.

5.2 Recommendations

Through rigorous analysis, researchers have identified favorable factors conducive to improving student satisfaction: image, placement services, curriculum, infrastructure facilities, and teaching staff. The improvement in student satisfaction has a causal relationship with student loyalty. It is recommended that higher education institutions should emphasize the improvement of these aspects in a planned manner in the development strategy planning and talent training process to promote the competitiveness of colleges and universities, especially those in central and western China, and become a powerful tool for optimizing their development prospects. Image is the business card colleges and universities display to the outside world. It is students' first impression when judging and choosing colleges and universities. A visible image can effectively attract more outstanding students to colleges and universities, forming a virtuous circle of vortex effects, such as the brand effect of Peking University, Tsinghua University, and even world-renowned universities such as Harvard University, Massachusetts Institute of Technology, and Oxford University. This is not a one-day job. It is recommended that colleges and universities accumulate and maintain it for a long time. Placement service is an important bridge for colleges and universities to deliver talent to society. Good output is also the ultimate goal of colleges and universities: cultivating talent. As a top domestic university, Peking University's improvement in student career development is one of the main sources of student satisfaction. Peking University talents have a high degree of recognition in the employment market. The chain reaction generated not only promotes the improvement of student loyalty but also further strengthens the brand influence of the school, forming a win-win situation. As the cornerstone of higher education, curricula are recommended to be continuously reformed and optimized according to their professionalism, student quality, market demand, and other factors. For example, Tongji University has improved student satisfaction by optimizing the curriculum system. In addition, improving infrastructure facilities and teaching staff is the most intuitive improvement of higher education institutions, which is beneficial to improving student satisfaction. In summary, the research results summarize the influencing factors with reference significance and practical value for the development of higher education, and to a certain extent, help educational institutions in central and western China to use research results and open up their development path.

5.3 Limitation and Further Study

It should be noted that the subjects of this study are concentrated on students of Sichuan University in western China, so geographical factors limit its reference value and may not fully represent all student groups in the central and western regions. Although Sichuan University offers a useful case, its institutional characteristics may not reflect the broader diversity of public universities across the region.

Future research should include multiple universities from different provinces to improve generalizability. Comparative studies between institutions of varying size, funding levels, or urban-rural settings would offer more comprehensive insights.

In addition, when constructing the conceptual framework, it is recommended to include assumptions related to student satisfaction and loyalty, such as administration and tuition (financial aid), in the scope of the study. Variables like administrative services, tuition affordability, and digital learning quality could further enrich future models.

This study's cross-sectional design also limits causal interpretation. Future longitudinal or mixed-method studies are recommended to capture changes over time and deepen understanding of student experiences.

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