

Examining the Determinants of High School Students' Satisfaction and Learning Outcomes in Heilongjiang, China

Shi Ji*

Received: February 10, 2025. Revised: March 22, 2025. Accepted: April 2, 2025.

Abstract

Purpose: This study aims to examine the factors influencing the satisfaction of 4th-year high school students in Heilongjiang Province, China. Gaining insights into these factors will help improve the overall quality of education and student experience. **Research design, data and methodology:** A quantitative research design was employed, using survey data collected from a sample of 550 male 4th-year high school students in Heilongjiang Province. The questionnaire assessed variables such as the quality of academic staff, school facilities, curriculum relevance, and student support services. Structural equation modeling (SEM) was used to analyze the relationships between these factors and student satisfaction. **Results:** The analysis has shown that all proposed factors positive influence overall satisfaction, by having student support services, school's reputation, and the quality of programs as the greatest contributors. The research framework demonstrated strong reliability, with factor loadings and goodness-of-fit indices meeting acceptable thresholds. **Conclusions:** The findings suggest that improving access to resources, enhancing academic programs, and building institutional reputation are key strategies for increasing both student satisfaction and learning outcomes in high schools. Educational policymakers should focus on these areas to foster a more engaging and fulfilling learning experience for students.

Keywords: Student Satisfaction, High School Education, Academic Staff Quality, School Facilities, Heilongjiang Province

JEL Classification Code: A21, I20, L80, M10

1. Introduction

This study is grounded in the growing recognition of student satisfaction as a vital indicator of educational quality in higher education. Globally, universities and educational institutions increasingly view student satisfaction not only as a measure of their current performance but also as a critical determinant of long-term success. Satisfied students tend to remain more engaged in their studies, achieve better academic outcomes, and enhance the institution's reputation through positive word-of-mouth and alumni contributions. Over the years, both developed and developing countries have intensified efforts to

understand and improve student satisfaction due to its strong correlation with retention rates, academic performance, and institutional success. In recent years, China's higher education landscape has undergone significant transformation, with the gross enrollment rate increasing from 40% in 2015 to 57.8% in 2021, accommodating over 44.3 million students—the largest higher education system globally. This rapid expansion has shifted the focus from merely increasing enrollment to enhancing educational quality and student satisfaction (Zhang et al., 2022).

In China, particularly in regions like Heilongjiang Province, where this study is focused, the higher education sector has experienced rapid expansion and transformation. This makes the exploration of student satisfaction more

*Shi Ji, School of Graduate School of Business and Advanced Technology Management, Assumption University, Thailand. Email : 970571135@qq.com

© Copyright: The Author(s)

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

relevant and timelier than ever. The Chinese government has made significant investments in higher education, with a clear emphasis on enhancing both access to and the quality of academic programs. Universities across the country have undergone substantial growth in enrollment, infrastructure development, and international collaborations (Li et al., 2019). However, this rapid expansion has presented challenges, especially in maintaining and enhancing the quality of educational services amidst an evolving educational landscape.

In Heilongjiang Province, home to several prominent universities, understanding and improving student satisfaction is crucial. Research indicates that factors such as teaching quality, school environment, organizational management, and logistical support significantly influence student satisfaction in Chinese universities. However, specific data on student satisfaction and learning outcomes in Heilongjiang's higher education institutions remain limited. Addressing this gap, this study aims to investigate these factors within the province, providing insights to enhance educational strategies and policies (Zhang et al., 2022).

The variables investigated in this study, such as the quality of academic staff, university facilities, degree programs, institutional reputation, access to resources, and learning outcome capture the multifaceted nature of student satisfaction. These factors are deeply interconnected and collectively shape students' perceptions of their educational experience. For instance, the quality of academic staff is fundamental, as faculty members play a critical role in delivering knowledge and fostering an engaging learning environment. Similarly, the quality of university facilities and the relevance of degree programs significantly influence students' day-to-day experiences and their broader academic aspirations. Access to resources, including libraries and academic advising, along with the institution's reputation, also plays a critical role in shaping students' overall satisfaction. Furthermore, learning outcomes serve as tangible indicators of the effectiveness of the educational process.

By examining these factors, this study aims to provide a comprehensive understanding of the key determinants of student satisfaction in universities across Heilongjiang Province. Although previous studies have extensively examined student satisfaction and learning outcomes in higher education, most research has been conducted in Western contexts or at elite Chinese universities. Few studies have explored student satisfaction in provincial universities, such as those in Heilongjiang, where rapid educational expansion has presented unique challenges. Additionally, while factors such as faculty quality, institutional reputation, and access to resources are commonly studied, their collective influence on student

learning outcomes in China remains underexplored. By addressing these gaps, this study provides a comprehensive analysis of student satisfaction determinants, offering practical recommendations for policymakers and educational institutions to enhance the student experience in Heilongjiang universities.

2. Literature Review

2.1 Quality of Academic Staff (QAS)

The quality of academic staff is fundamental to the success of higher education institutions. Faculty members' knowledge, teaching skills, and ability to engage with students directly influence the overall educational experience. Effective academic staff can not only convey subject knowledge but also inspire students to think critically and engage deeply with the material. Institutions with high-quality academic staff tend to see improved student satisfaction and better academic outcomes. Research consistently shows that students who perceive their instructors as knowledgeable, approachable, and supportive report higher levels of satisfaction with their educational experience. Studies from the United States and Europe emphasize the role of faculty-student interaction in student satisfaction (Umbach & Wawrzynski, 2005). Meanwhile, research in Southeast Asia suggests that hierarchical educational structures affect student perceptions of faculty quality (Wong et al., 2015). In China, due to the emphasis on examination-based learning, faculty engagement strategies may differ significantly (Li et al., 2019). Given these variations, this study aims to assess how the quality of academic staff influences student satisfaction in Heilongjiang universities within the Chinese cultural context. Therefore, the research hypothesizes as:

Hypothesis 1: The quality of academic staff has a significant influence on student satisfaction in Heilongjiang universities.

2.2 Quality of University Facilities (QUF)

The quality of university facilities, such as classrooms, libraries, and recreational spaces, is essential in fostering a supportive and effective learning environment. Well-maintained and easily accessible facilities significantly enhance students' academic experiences and contribute to their overall satisfaction with the institution. In contemporary higher education, facilities that integrate advanced technology, provide comfortable study areas, and offer thoughtfully designed learning environments are particularly important. In North American institutions, facilities with advanced technological integration are a key

determinant of student satisfaction (Hill & Epps, 2010). However, in developing countries, availability and accessibility of basic infrastructure, such as libraries and classrooms, play a more significant role (Adeyemi & Uko-Aviomoh, 2004). Given the rapid expansion of higher education in China, understanding whether Chinese students prioritize high-tech infrastructure or fundamental facilities is crucial. Therefore, the research hypothesizes as:

Hypothesis 2: The quality of university facilities has a significant influence on student satisfaction in Heilongjiang universities.

2.3 Quality of Degree Programs (QDP)

The quality of degree programs is determined by the rigor, relevance, and comprehensiveness of the curriculum offered. Programs that provide a balanced combination of theoretical and practical knowledge tend to better prepare students for their future careers. Universities that consistently review and update their curricula to reflect industry standards and student needs are more likely to have satisfied students (Biggs & Tang, 2011). Additionally, flexibility within programs, such as elective courses and internship opportunities, can boost student engagement and satisfaction. Therefore, the research hypothesizes as:

Hypothesis 3: The quality of degree programs has a significant influence on student satisfaction in Heilongjiang universities.

2.4 Reputation (RE)

The reputation of a university significantly impacts students' perceptions of their educational experience. A strong reputation can attract students who value the institution's standing in terms of academic excellence, research output, and graduate employability. Marginson (2014) further emphasizes that reputation serves as a signaling mechanism, indicating to students and employers the value and quality of the educational programs. This signaling effect can enhance students' confidence in the education they receive, thereby increasing their satisfaction levels. An institute's reputation not only enhances student recruitment but also boosts student retention by creating a positive and supportive academic culture (Teixeira & Koryakina, 2013). Therefore, the research hypothesizes as:

Hypothesis 4: Reputation has a significant influence on overall student satisfaction in Heilongjiang universities.

2.5 Access (AC)

Access to educational resources and services, such as libraries, technology, academic advising, and extracurricular activities, is crucial for student success. Students who lack

access to resources are less likely to do well in school and more likely to be unhappy with their education (Altbach et al., 2014). Ensuring equitable access to academic resources is crucial for fostering student retention and minimizing educational disparities. Research indicates that access to sufficient resources plays a significant role in shaping students' perceptions of their educational experience and their capacity to achieve academic success (Selwyn, 2014). Institutions that prioritize resource accessibility are better positioned to support diverse student needs and promote a more inclusive learning environment. Therefore, the research hypothesizes as:

Hypothesis 5: Access to educational resources and services has a significant influence on overall student satisfaction in Heilongjiang universities.

2.6 Student Satisfaction (SS)

Student satisfaction is an overarching measure of how well the university meets the academic and personal needs of its students. It is shaped by factors such as the quality of instruction, campus facilities, support services, and social integration. High levels of satisfaction are associated with greater student engagement, academic success, and institutional loyalty (Elliott & Shin, 2002). Understanding and improving student satisfaction is key to fostering a positive academic environment and ensuring student retention. Therefore, the research hypothesizes as:

Hypothesis 6: Student satisfaction has a significant influence on learning outcomes in Heilongjiang universities.

2.7 Learning Outcome (LO)

Learning outcomes reflect the knowledge, skills, and competencies that students are expected to develop throughout their education. Achieving desirable learning outcomes depends on high-quality instruction, thoughtfully designed curricula, and supportive learning environments. Student satisfaction is often closely tied to their perception of how effectively these outcomes are being met. Research indicates that institutions emphasizing well-defined learning objectives, and the continuous refinement of educational strategies are more likely to produce successful and well-prepared graduates (Adam, 2008).

3. Research Methods and Materials

3.1 Research Framework

The variables for this study were identified through an extensive review of existing literature on factors influencing student satisfaction in higher education. Drawing from well-

established models and prior research, key constructs such as the quality of academic staff, university facilities, degree programs, institutional reputation, access to resources, student satisfaction, and learning outcomes were recognized as critical determinants of the student experience (Biggs & Tang, 2011; Hazelkorn, 2015; Umbach & Wawrzynski, 2005). These variables were selected for their relevance to the context of higher education in Heilongjiang Province, China, and their proven impact on student satisfaction and academic success in comparable educational settings. To ensure a comprehensive understanding of the factors influencing student satisfaction, the study incorporated theoretical frameworks and empirical findings from both Western and Asian educational contexts. Each variable was operationalized to align with the study's specific objectives, enabling the generation of measurable insights into the factors shaping the student experience.

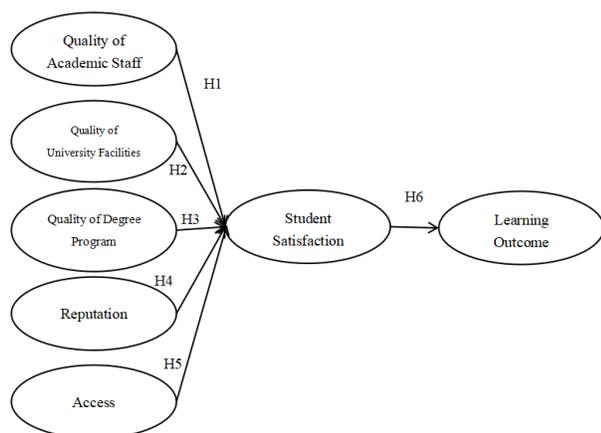


Figure 1: Research Framework

3.2 Research Methodology

This study adopts a quantitative research methodology to examine the factors influencing student satisfaction among fourth-year students in higher education institutions in Heilongjiang Province, China. The quantitative research design was selected for its ability to systematically measure and analyze the relationships between multiple variables affecting student satisfaction. This method allows for objective, numerical data collection that can be statistically tested to identify significant patterns and relationships. Data collection is carried out through a structured online survey administered to students across various universities in the region. The survey aims to gather comprehensive insights into students' perceptions and experiences concerning key factors, including the quality of academic staff, university facilities, degree programs, institutional reputation, access to resources, student satisfaction, and learning outcomes.

The survey instrument consists of demographic information and variable measurement. To enable nuanced responses, each construct is measured using a five-point Likert scale questions ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), ensuring standardized responses for statistical analysis. The survey is rigorously validated using the Item-Objective Congruence (IOC) method to ensure that all items are clear, relevant, and aligned with the study's objectives.

The data analysis employs a combination of statistical techniques, including Structural Equation Modeling (SEM), Multiple Linear Regression (MLR), and Descriptive Analysis. SEM is used to evaluate the direct and indirect effects of the independent variables on student satisfaction, providing a holistic view of the relationships between constructs. MLR is applied to examine the linear relationships between multiple independent variables and the dependent variable, offering insights into the relative importance of each factor. Descriptive Analysis is conducted to summarize the sample characteristics and response distributions, providing contextual insights into the data. This multi-dimensional analytical approach enables a thorough exploration of the factors affecting student satisfaction. The study's methodology prioritizes reliability and validity, supported by a large and representative sample, which enhances the generalizability of the findings. Despite its advantages, the quantitative approach has certain limitations. The reliance on self-reported data may introduce bias, as students' responses can be influenced by subjective perceptions rather than objective conditions. Ultimately, this approach provides a solid basis for data-driven recommendations to improve the quality of education and the student experience in Heilongjiang Province.

3.3 Population and Sample Size

The study's population consists of fourth-year students enrolled in higher education institutions across Heilongjiang Province, China. This group was selected because their completion of a full academic cycle provides them with comprehensive experiences and perspectives on the factors influencing student satisfaction. To ensure a representative sample, stratified random sampling was employed, allowing for proportional representation of various demographic and academic backgrounds. Based on statistical calculations aimed at achieving a high confidence level and a low margin of error, a sample of 550 respondents was determined to be appropriate. According to Kline (2015), SEM analysis typically requires a minimum sample size of 200–400 respondents. Therefore, the sample size is deemed sufficient to yield reliable data for analysis, ensuring the findings are generalizable to the broader population of fourth-year students in the region.

Table 1: Stratified Random Sampling

Strata	Population Size (Male)	Proportional Sample Size
Harbin Institute of Technology	1,661	70
Heilongjiang University	7,126	303
Harbin University of Commerce	4,139	177
Total	12,926	550

Samples were divided proportionately among three institutes of Harbin Institute of Technology at 70 samples, Heilongjiang University at 303 samples, and Harbin University of Commerce at 177 samples as shown in table 1. This proportional representation from various institutions allows for an in-depth exploration of the female student experience across different academic settings, offering insights that are relevant to understanding student satisfaction and educational outcomes in Heilongjiang Province.

4. Results and Discussion

4.1 Demographic Profile

Total respondents can be categorized by demographic characteristics as outlined in table 2. The female high school students were age of 16 years old at 9.1 percent (50), 17 years old at 70.9 percent (390) and 18 years old at 20 percent (110). They lived in urban area at 61.8 percent (340) and rural area at 38.2 percent (210). Their parental education was in college degree or higher at 46.5 percent (256) and high school or below at 53.5 percent (294).

Table 2: Demographic Information

Demographic Characteristic	Category	Frequency (N=550)	Percentage
Age	16	50	9.1
	17	390	70.9
	18	110	20.0
Residential Area	Urban	340	61.8
	Rural	210	38.2
Parental Education	College degree or higher	256	46.5
	High school or below	294	53.5

Table 3: 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
Quality of Academic Staff (QAS)	Biggs and Tang (2011)	5	0.874	0.727–0.859	0.876	0.586
Quality of University Facilities (QUF)	Douglas et al. (2006)	5	0.854	0.679–0.836	0.856	0.545
Quality of Degree Programs (QDP)	Biggs and Tang (2011)	4	0.851	0.725–0.878	0.856	0.599
Reputation (RE)	Hazekorn (2015)	4	0.861	0.706–0.877	0.866	0.618
Access (AC)	Hossler et al. (1999)	4	0.853	0.741–0.835	0.856	0.598
Student Satisfaction (SS)	Elliott and Shin (2002)	3	0.808	0.703–0.840	0.816	0.598
Learning Outcomes (LO)	Kuh et al. (2005)	3	0.822	0.740–0.847	0.829	0.619

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

4.2 Confirmatory Factor Analysis (CFA)

This section validates the measurement model by examining the relationship between observed variables and their respective latent constructs. Data normality has been assessed to ensure the data can be further analyzed. The assessment of normality confirms that all constructs meet the acceptable skewness and kurtosis thresholds of -2 to +2 (Kline, 2015). As well as the internal consistency of the data is verified using Cronbach's Alpha, in which all constructs have values greater than the acceptable threshold of 0.7 (Hair et al., 2006). Confirmatory factor analysis is then used to confirm whether the constructs accurately capture their theoretical dimensions using metrics like factor loadings, Composite Reliability (CR), and Average Variance Extracted (AVE). Table 3 has summarized the results of CFA.

CR value is recommended to exceed 0.70, and values of factor loadings and AVE to exceed 0.5 to indicate good convergent validity (Hair et al., 2010, 2017). CR of QAS is 0.876, and its AVE is 0.586, indicating good internal consistency and convergent validity. Factor loadings for QAS items range from 0.727 to 0.859, with all t-values above the critical value, confirming significant contributions of each item. Similarly, Quality of University Facilities (QUF) exhibits a CR of 0.856 and AVE of 0.545, with factor loadings from 0.679 to 0.836, reflecting a well-fitting model. Quality of Degree Programs (QDP) has a CR of 0.856 and an AVE of 0.599, with particularly strong factor loading for QDP1 at 0.878, suggesting this item strongly explains the construct. Reputation (RE) shows strong reliability (CR = 0.866) and good convergent validity (AVE = 0.618), with high loadings, particularly for RE1 at 0.877. Access (AC) also demonstrates strong reliability and validity (CR = 0.856, AVE = 0.598), with consistent loadings above 0.74. Student Satisfaction (SS) and Learning Outcomes (LO) also show robust metrics, with CRs of 0.816 and 0.829 and AVEs of 0.598 and 0.619, respectively. The overall high t-values and factor loadings across all constructs confirm the strength and relevance of the measurement scales used in this study.

The measurement model fit was analyzed using goodness-of-fit measures. Measurement of indices listed in table 4 were employed for the analysis. The statistical result of all indices was within the acceptable range, CMIN/DF = 1.884, GFI = 0.927, AGFI = 0.910, NFI = 0.921, CFI = 0.961, TLI = 0.955, and RMSEA = 0.040. This confirms the fitness of measurement model.

Table 4: Goodness of Fit for Measurement Model

Index	Criterion	Statistical Value
CMIN/DF	< 5.00 (Awang, 2012)	1.884
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.927
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.910
NFI	≥ 0.80 (Wu & Wang, 2006)	0.921
CFI	≥ 0.80 (Bentler, 1990)	0.961
TLI	≥ 0.80 (Sharma et al., 2005)	0.955
RMSEA	< 0.08 (Pedroso et al., 2016)	0.040

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

Discriminant validity was assessed by comparing the AVE for each construct with the squared correlations between constructs (Hair et al., 2010). Discriminant validity is confirmed if the AVE for each construct is greater than the squared correlation between that construct and any other construct (Voorhees et al., 2016). Table 5 has showed that all the square roots of AVE values exceed other constructs in the correlations, in which proven the discriminant validity of the measurement model.

Table 5: Discriminant Validity

Variable	Factor Correlations						
	QAS	QUF	QDP	RE	AC	SS	LO
QAS	0.766						
QUF	0.369	0.738					
QDP	0.176	0.226	0.774				
RE	0.235	0.268	0.306	0.786			
AC	0.247	0.198	0.327	0.296	0.773		
SS	0.226	0.245	0.375	0.383	0.396	0.773	
LO	0.431	0.436	0.201	0.313	0.243	0.334	0.787

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

4.3 Structural Equation Model (SEM)

The structural model of SEM analysis has been assessed for goodness-of-fit has shown in table 6. The statistical values of fit indices were CMIN/DF = 2.947, GFI = 0.868, AGFI = 0.844, NFI = 0.870, CFI = 0.910, TLI = 0.901, and RMSEA = 0.060. The results have indicated a satisfactory level of model fitness for structural analysis as the values were all within the acceptable criterion.

Table 6: Goodness of Fit for Structural Model

Index	Criterion	Statistical Value
CMIN/DF	< 5.00 (Awang, 2012)	2.947
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.868
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.844
NFI	≥ 0.80 (Wu & Wang, 2006)	0.870
CFI	≥ 0.80 (Bentler, 1990)	0.910
TLI	≥ 0.80 (Sharma et al., 2005)	0.901
RMSEA	< 0.08 (Pedroso et al., 2016)	0.060

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 significance of relationship among the constructs is calculated by using the regression weights and R² variances of standardized path coefficients, t-values. The hypotheses are supported with p<0.05 and t>1.96. The analysis results are shown in table 7 as below. The hypotheses proposed were statistically supported.

Table 7: Hypothesis Testing Result

Hypothesis	Standardized path coefficients (β)	t-value	Test Result
H1: QAS → SS	0.103	2.233*	Supported
H2: QUF → SS	0.115	2.466*	Supported
H3: QDP → SS	0.261	5.527*	Supported
H4: RE → SS	0.271	5.733*	Supported
H5: AC → SS	0.302	6.242*	Supported
H6: SS → LO	0.397	7.582*	Supported

Note: *p-value<0.05

H1: The quality of academic staff has a significant influence on student satisfaction with its standard coefficient at 0.103. High quality academic staff can contribute to a positive educational experience as well as satisfaction level (Pascarella & Terenzini, 2005; Umbach & Wawrzynski, 2005).

H2: The quality of university facilities is the contributor of student satisfaction with standard coefficient at 0.115. This supports the finding of Hill and Epps (2010) modern and up-to-date facilities provide students with the necessary resources to succeed academically and enjoy their time on campus. Technological infrastructure is also one of a facility that enhance the educational experience (Brooks, 2011).

H3: The quality of degree programs has a strong influence on the student satisfaction with standard coefficient at 0.261. This supports the importance of for universities to regularly review and improve their academic programs to ensure they meet students' expectations and support their academic success as it directly impacts student satisfaction (Elliott & Shin, 2002; Kuh et al., 2011).

H4: Reputation is the second largest contributor to satisfaction of the students with standard coefficient at 0.271. The result has proven the outcome of Marginson's (2014) and Wong et al.'s (2015) research that reputation is a signaling mechanism that affect students' confidence and satisfaction. Also, it can subsequently retain the students (Teixeira & Koryakina, 2013).

H5: Access to educational resources and services is the greatest contributor to high school student satisfaction with standard coefficient at 0.302. This aligns with the finding by Altbach et al. (2014) that accessibilities are likely to enhance satisfaction and Thomas and Quinn's (2007) thought that resources is particularly important for fostering success and satisfaction among the students.

H6: Student satisfaction significantly contributes to their learning outcome with standard coefficient at 0.397. The higher level of student satisfaction increases student retention and success, critical indicators of educational quality. This relation is agreed by Adam (2008) and Elliott and Shin (2002).

5. Conclusions and Recommendation

5.1 Conclusions

This study identified key determinants of student satisfaction and learning outcomes in high schools, with Access to Resources (AC) emerging as the most influential factor, exerting both the highest direct effect on student satisfaction (0.302) and a notable indirect effect on learning outcomes (0.120). This underscores the critical role of resource availability—including academic support, learning materials, and technology—in shaping students' educational experiences.

Reputation (RE) (0.271) and Quality of Degree Programs (QDP) (0.261) were also strong predictors of student satisfaction, emphasizing the importance of academic rigor and institutional standing in influencing students' perceptions of their education. Quality of Academic Staff (QAS) (0.103) and Quality of University Facilities (QUF) (0.115) had relatively smaller direct effects on satisfaction but still contributed indirectly to learning outcomes, suggesting that teacher effectiveness and learning environments are vital for academic success. Student Satisfaction (SS) significantly impacted Learning Outcomes (LO) (0.397), reinforcing the need for schools to actively monitor and enhance student experiences to improve academic achievements.

The findings have several implications for educational practice and policy. Schools and policymakers should prioritize equitable access to educational resources as a fundamental strategy to enhance student satisfaction and

academic performance. Strengthening curriculum quality, improving faculty development programs, and fostering institutional reputation are also critical measures to maintain a competitive and effective learning environment. Policymakers should consider targeted investments in under-resourced schools to reduce disparities in access and ensure all students benefit from high-quality education. While this study provides valuable insights, future research should expand to diverse school types and regions to examine potential variations in the determinants of student satisfaction. Additionally, qualitative approaches, such as student interviews and focus groups, could provide deeper insights into the lived experiences behind these statistical trends. Further research should also investigate the long-term effects of student satisfaction on post-secondary education and career outcomes, as well as assess the role of emerging digital learning technologies in enhancing academic engagement and performance.

5.2 Recommendations

To improve student satisfaction and learning outcomes, schools must first enhance access to resources (AC), as this was found to have the strongest direct and indirect effects. Schools should ensure that students have access to up-to-date learning materials, well-equipped libraries, digital resources, and technology-enhanced educational tools. Expanding access to academic advising and mentorship programs, as well as providing financial aid or subsidized educational materials for students from disadvantaged backgrounds, can further bridge the equity gap in resource availability. Additionally, integrating online learning platforms and AI-powered academic support systems can provide students with flexible, on-demand assistance, further improving accessibility.

Improving the Quality of Degree Programs (QDP) is also critical in shaping student satisfaction. Schools should regularly review and update curricula to ensure they remain relevant to industry trends, higher education expectations, and student career aspirations. Incorporating experiential learning opportunities—such as internships, project-based coursework, and interdisciplinary programs—can enhance student engagement and better prepare them for future employment. Establishing mechanisms for student feedback on curriculum effectiveness and instructional quality will ensure programs are continuously refined to meet evolving educational demands.

Institutional Reputation (RE) plays a significant role in student satisfaction and retention, making it essential for schools to actively promote their academic strengths and achievements. Enhancing faculty qualifications through professional development programs, certifications, and research collaborations can improve teaching quality and

institutional credibility. Additionally, schools should foster strategic partnerships with universities, industries, and research institutions to increase opportunities for student engagement, internships, and career placements. Transparent reporting on student success metrics and graduate employability rates can further bolster an institution's reputation and attract prospective students.

While Quality of Academic Staff (QAS) and University Facilities (QUF) had smaller direct impacts on student satisfaction, they remain integral to a positive learning environment. Schools should invest in continuous teacher training programs focused on innovative teaching methods, active learning strategies, and student-centered instruction. Upgrading physical infrastructure, including modernized classrooms, well-equipped science and technology labs, and comfortable study spaces, can improve the overall academic experience. Ensuring small class sizes and fostering interactive, discussion-based learning environments can further enhance student engagement and satisfaction.

Finally, monitoring student satisfaction should be an ongoing institutional priority. Schools should establish regular feedback mechanisms, such as satisfaction surveys, focus groups, and advisory councils, to gather student input and promptly address concerns. A structured action plan with measurable targets and timelines should be implemented to ensure that identified gaps are systematically addressed. Encouraging student participation in institutional decision-making processes can create a more inclusive academic environment and foster a sense of ownership and engagement among students. By implementing these evidence-based strategies, schools can create a more equitable, engaging, and effective learning environment that enhances both student satisfaction and academic outcomes.

5.3 Limitation and Further Study

This study offers valuable insights into the factors affecting student satisfaction and learning outcomes but has several limitations. First, it focuses only on high schools in Heilongjiang Province, China, limiting the applicability of the findings to other regions or countries with different educational systems, cultures, and student demographics. Additionally, the use of self-reported data from students may introduce biases, such as social desirability or recall bias, which could affect the accuracy of the results. The study's cross-sectional design captures data at a single point in time, making it challenging to determine causality or track changes over time.

Future research should address these limitations by including other regions or countries for comparative analysis and conducting longitudinal studies to understand how relationships between satisfaction, academic factors,

and learning outcomes evolve over time. Adding qualitative methods, such as interviews or focus groups, could provide deeper insights into students' experiences. Further studies could also examine additional factors like parental involvement, extracurricular activities, or psychological well-being to provide a more comprehensive understanding of what influences student success.

References

- Adam, S. (2008). Learning outcomes: Current developments in Europe: Update on the issues and applications of learning outcomes associated with the Bologna Process. *European Higher Education Area*.
- Adeyemi, J. K., & Uko-Aviomoh, E. E. (2004). Effective technological delivery in Nigerian polytechnics: Need for academic manpower development policy. *Education Policy Analysis Archives*, 12(24), 1-15. <https://doi.org/10.14507/epaa.v12n24.2004>
- Altbach, P. G., Reisberg, L., & Rumbley, L. E. (2014). *The globalization of higher education: Education and globalization*. Springer.
- Awang, Z. (2012). *Research methodology and data analysis second edition*. UiTM Press.
- Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), 238-246. <https://doi.org/10.1037/0033-2909.107.2.238>
- Biggs, J., & Tang, C. (2011). *Teaching for quality learning at university: What the student does* (4th ed.). McGraw-Hill Education.
- Brooks, D. C. (2011). Space matters: The impact of formal learning environments on student learning. *British Journal of Educational Technology*, 42(5), 719-726. <https://doi.org/10.1111/j.1467-8535.2010.01098.x>
- Douglas, J., Douglas, A., & Barnes, B. (2006). Measuring student satisfaction at a UK university. *Quality Assurance in Education*, 14(3), 251-267. <https://doi.org/10.1108/09684880610678568>
- Elliott, K. M., & Shin, D. (2002). Student satisfaction: An alternative approach to assessing this important concept. *Journal of Higher Education Policy and Management*, 24(2), 197-209. <https://doi.org/10.1080/1360080022000013518>
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Pearson Prentice Hall.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2010). *Multivariate data analysis* (7th ed.). Pearson.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (2nd ed.). SAGE Publications.
- Hazelkorn, E. (2015). *Rankings and the reshaping of higher education: The battle for world-class excellence*. Palgrave Macmillan.
- Hill, M. C., & Epps, K. K. (2010). The impact of physical classroom environment on student satisfaction and student evaluation of teaching in the university environment. *Academy of Educational Leadership Journal*, 14(4), 65-79.

- Hossler, D., Schmit, J., & Vesper, N. (1999). *Going to college: How social, economic, and educational factors influence the decisions students make*. Johns Hopkins University Press.
- Kline, R. B. (2015). *Principles and practice of structural equation modeling* (4th ed.). The Guilford Press.
- Kuh, G. D., Kinzie, J., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2011). Piecing together the student success puzzle: Research, propositions, and recommendations. *ASHE Higher Education Report*, 36(6), 1-144. <https://doi.org/10.1002/aehe.3606>
- Kuh, G. D., Kinzie, J., Schuh, J. H., & Whitt, E. J. (2005). *Student success in college: Creating conditions that matter*. John Wiley & Sons.
- Li, J., Li, S., & Li, X. (2019). Challenges and opportunities in improving student satisfaction in Chinese higher education. *Journal of Higher Education Policy and Management*, 41(6), 570-583. <https://doi.org/10.1080/1360080X.2019.1670938>
- Marginson, S. (2014). University rankings and social science. *European Journal of Education*, 49(1), 45-59. <https://doi.org/10.1111/ejed.12055>
- Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research*. Jossey-Bass.
- Pedroso, B., Pilatti, L. A., Gutierrez, G. L., & Picinin, C. T. (2016). Measurement model for innovation management assessment in the Brazilian automotive industry. *International Journal of Innovation*, 4(2), 71-84. <https://doi.org/10.5585/iji.v4i2.107>
- Selwyn, N. (2014). *Digital technology and the contemporary university: Degrees of digitization*. Routledge.
- Sharma, S., Mukherjee, S., Kumar, A., & Dillon, W. R. (2005). A simulation study to investigate the use of cutoff values for assessing model fit in covariance structure models. *Journal of Business Research*, 58(7), 935-943. <https://doi.org/10.1016/j.jbusres.2003.10.007>
- Sica, C., & Ghisi, M. (2007). The Italian versions of the Beck Anxiety Inventory and the Beck Depression Inventory-II: Psychometric properties and discriminant power. *Psychological Reports*, 101(2), 521-532. <https://doi.org/10.2466/pr0.101.2.521-532>
- Teixeira, P. N., & Koryakina, A. (2013). Improving university reputation through global partnerships, research excellence, and innovative teaching. *Higher Education Review*, 42(3), 157-174. <https://doi.org/10.1007/s11579-013-0248-7>
- Thomas, L., & Quinn, J. (2007). *First generation entry into higher education: An international study*. Open University Press.
- Umbach, P. D., & Wawrzynski, M. R. (2005). Faculty do matter: The role of college faculty in student learning and engagement. *Research in Higher Education*, 46(2), 153-184. <https://doi.org/10.1007/s11162-004-1598-1>
- Voorhees, C. M., Brady, M. K., Calantone, R., & Ramirez, E. (2016). Discriminant validity testing in marketing: an analysis, causes for concern, and proposed remedies. *Journal of the Academy of Marketing Science*, 44(1), 119-134. <https://doi.org/10.1007/s11747-015-0455-4>
- Wong, L. P. W., Leung, P. K. K., & Chan, K. W. C. (2015). The effect of university ranking on graduate starting salary in Hong Kong. *Education + Training*, 57(8/9), 936-951. <https://doi.org/10.1108/ET-02-2015-0011>
- Wu, J.-H., & Wang, Y.-M. (2006). Measuring KMS success: A respecification of the DeLone and McLean's model. *Information & Management*, 43(6), 728-739. <https://doi.org/10.1016/j.im.2006.05.002>
- Zhang, Y., Xiong, W., Yuan, C., & Yu, C. (2022). Analysis of student satisfaction in Chinese universities: Influencing factors and improvement strategies. *Frontiers in Psychology*, 13, 1023420. <https://doi.org/10.3389/fpsyg.2022.1023420>