

Learning Satisfaction and Academic Performance of Students in Higher Vocational Colleges in Xianning, China

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Abstract

China's higher vocational education is undergoing a transition from rapid expansion to quality-oriented development. There are currently 1,486 higher vocational institutions nationwide, enrolling more than 5.5 million students annually. However, persistent societal misconceptions about vocational education and the tendency to prioritize theory over practice continue to undermine students' learning motivation and satisfaction. Learning satisfaction - often considered a "barometer" of educational quality is closely linked to intrinsic motivation when basic psychological needs for autonomy, competence, and relatedness are fulfilled. Existing studies predominantly focus on traditional universities or foreign contexts leaving gaps in localized research on Chinese higher vocational students.

Objective: This study examines the relationship between learning satisfaction and the academic performance in terms of the comprehensive assessment outcome among 300 sophomore students enrolled in a mental health education course at three vocational colleges in Xianning City, China: Xianning Vocational and Technical College, Hubei Health Vocational College, and the Xianning Campus of Hubei University of Commerce.

Methods and Materials:

A quantitative correlational design was employed. Learning satisfaction measured across autonomy, competence, and relatedness was assessed using a structured questionnaire administered to a stratified sample of 300 respondents. Statistical analyses included Pearson's r , Spearman's ρ , t -tests, Mann-Whitney U tests, and ANOVA.

Results:

Students reported overall "*Extremely Satisfied*" ratings, particularly in autonomy and competence. Gender significantly influenced competence and relatedness, while age and institution showed no substantial variation. Academic performance in terms of the comprehensive assessment outcome among students was excellent, with significant differences observed only across institutions. All three dimensions of learning satisfaction were positively correlated with academic performance.

Conclusion:

Findings underscore the critical role of learning satisfaction in fostering engagement and academic success. Practical implications include enhancing pedagogical practices, strengthening student support systems, and optimizing institutional resource allocation within higher vocational education.

Limitations and Future Research:

Several limitations should be considered when interpreting the findings of this study. First, the research was conducted with a small and program-specific sample of mental health students, which may limit the generalizability of the results to other student populations or academic settings. Second, the use of a cross-sectional design restricts the ability to draw causal conclusions regarding the relationship between learning satisfaction and academic performance. Third, learning satisfaction were measured through self-report instruments that may be subject to response biases and variations in individual self-awareness.

Additionally, academic performance was evaluated primarily through comprehensive assessment outcomes, which may not fully capture students' overall academic abilities or practical competencies. The study also did not control for potentially influential factors such as mental health status, motivation, instructional quality, and socio-economic

background, all of which could have shaped students' satisfaction and academic results. Lastly, conducting the study within a single institution introduces contextual limitations related to curriculum design, assessment practices, and institutional culture.

Future research could use longitudinal designs to examine how learning satisfaction and academic performance change over time. Studies with larger and more diverse samples across multiple institutions may improve generalizability. Including additional measures of academic performance and exploring other variables—such as self-efficacy, mental well-being, and instructional factors—may provide deeper insight. Mixed methods approaches and investigations into interventions or learning environments may also help identify strategies to enhance both satisfaction and academic outcomes.

Keywords: learning satisfaction, autonomy, competence, relatedness, academic performance, comprehensive assessment outcome

1. Introduction

Learning satisfaction has emerged as an important indicator of educational quality in higher vocational institutions in China, where the cultivation of technical and skilled talent has become a national priority. As vocational colleges increasingly emphasize students' holistic development, understanding how students perceive their learning experiences and how these perceptions relate to their academic outcomes has become essential for sustaining educational improvement and student success. Recent empirical work in Chinese vocational colleges also highlights that higher engagement is intricately linked with stronger learning outcomes (Cheng & Zhang, 2023).

Student learning satisfaction, rooted in the Self-Determination Theory (SDT) by Deci & Ryan (2000) posits that dimensions of autonomy, competence, and relatedness—is strongly associated with intrinsic motivation, persistence, and achievement. Within higher vocational education, these dimensions are particularly relevant as students navigate practice-oriented coursework, career preparation, and rapidly evolving learning environments.

Despite the importance of learning satisfaction, existing research remains limited in several ways. First, most studies on learning satisfaction and academic performance focus on students in ordinary universities or foreign contexts, leaving a lack of localized evidence from Chinese higher vocational colleges. Second, it is unclear whether the SDT-based satisfaction model—widely validated in general higher education—operates similarly among vocational college students, whose learning needs and motivations differ significantly. Third, few empirical studies in China have examined how satisfaction across autonomy, competence, and relatedness relates specifically to the academic performance in terms of the comprehensive assessment outcome among vocational learners.

Academic performance in terms of comprehensive assessment outcome remains a central measure of student learning, instructional effectiveness, and institutional accountability. Understanding its relationship with learning satisfaction can deepen insights into how psychological and environmental factors contribute to student success in vocational settings.

Therefore, this study investigates the relationship between learning satisfaction and the academic performance in terms of the comprehensive assessment outcome among sophomore students in three higher vocational colleges in Xianning City, China. Specifically, it examines levels of autonomy, competence, and relatedness satisfaction; determines whether satisfaction differs across demographic groups; and analyzes how each dimension correlates with students' academic performance.

The findings aim to provide data-driven insights to inform pedagogical enhancement and institutional development in higher vocational education.

2. Research Methodology

2.1 Study Design

A quantitative correlational design was adopted to examine the relationship between learning satisfaction and academic performance in terms of the comprehensive assessment outcome as well as the moderating effects of demographic variables.

2.2 Population and Sampling

A stratified random sample of 300 sophomore students (100 from each of the three institutions: Xianning Vocational and Technical College, the Xianning Campus of Hubei University of Commerce, and Hubei Health Vocational College) aged 18–23 years participated. Females (61.33%) outnumbered males (38.67%).

2.3 Data Collection

Data were collected through a structured questionnaire assessing autonomy, competence, and relatedness. Academic performance in terms of the comprehensive assessment outcome was measured using comprehensive examination scores. Participation was voluntary, and respondents completed the instrument within 10–15 minutes. The standardized administration process ensured consistency across all three institutions.

2.4 Instrumentation and Measures

The questionnaire was based on SDT and included demographic items, a learning satisfaction scale which assessed the dimensions of autonomy, competence, and relatedness, while academic performance was determined using students' comprehensive examination in terms of the comprehensive assessment outcome in the Mental Health Education course. Expert review and pilot testing confirmed high reliability (Cronbach's $\alpha > 0.89$).

2.5 Data Analysis

Statistical analyses included descriptive statistics, t-tests, ANOVA, Mann–Whitney U tests, Kruskal–Wallis tests, and Pearson correlations. SPSS 26.0 was used for analysis.

2.6 Research Setting and Institutional Context

The three sample institutions represent comprehensive, applied, and industry-specific vocational models, ensuring coverage of diverse educational environments.

2.7 Ethical Considerations

The study adhered strictly to ethical standards. Ethical principles of informed consent, confidentiality, voluntary participation, and data protection were strictly followed. Data were anonymized and stored securely before disposal in accordance with research ethics protocols. The study ensured inclusivity and respect for diversity across participant backgrounds. No physical, psychological, or academic risks were posed to participants.

3. Results

3.1 Demographics

Most of the 300 sophomore student respondents who participated in the study were between 20 and 21 years old, followed by those aged 18 to 19, with a small proportion aged 22 to 23. Female students comprised a larger percentage of the sample than male students. Each of the three institutions contributed an equal number of participants.

Table 1. Demographic Characteristics of the Sample

Variable	Class	Frequency	Percentage (%)
Age	18-19 years old	139	46.33
	20-21 years old	145	48.33
	22-23 years old	16	5.33
Sex	Female	184	61.33
	Male	116	38.67
School	Xianning Vocational and Technical College	100	33.00
	Hubei Institute of Commerce Xianning Campus	100	33.00
	Hubei Health Vocational College	100	33.00

Table 1 presents the distribution of the respondents based on age, sex, and the institution they are enrolled in. Understanding these demographic variables is crucial as they may influence students' learning satisfaction and academic performance. The age distribution of the respondents shows that the majority are between 20–21 years old, comprising 145 students or 48.33% of the sample. This is followed closely by the 18–19-year-old group, with 139 students or 46.33%. Only 16 students or 5.33% are aged 22–23 years old. This distribution reflects the typical age range of sophomore students enrolled in Chinese vocational and technical colleges. The predominance of students in the 18–21 age bracket suggests a relatively homogenous age group, which may influence their levels of satisfaction and academic performance due to similar developmental and educational experiences. According to Eccles (2020), age-related developmental stages can shape motivation, autonomy, and engagement in learning.

In terms of sex, 184 respondents or 61.33% identified as female, while 116 or 38.67% identified as male. The dominance of female participants aligns with current enrollment trends in many health and education-related vocational programs in China, where female students often outnumber male students. This distribution may have implications for interpreting satisfaction and engagement, as research has shown that female students may report higher levels of academic engagement and relational satisfaction in the learning environment (Fredricks et al., 2020; Gao et al., 2022).

The sample was equally drawn from three institutions, with 100 students each from: Xianning Vocational and Technical College, Hubei Institute of Commerce, and Xianning Campus Hubei Health Vocational College. This equal representation ensures balanced institutional input and allows for meaningful comparison between the three schools. Equal distribution also supports the validity of the study's findings across institutions, eliminating potential bias due to unequal sampling. It further indicates that the study can provide generalized insights applicable across similar vocational settings in China.

3.2 Learning Satisfaction

Learning satisfaction scores were generally high across autonomy, competence, and relatedness. Autonomy indicators received high ratings, with slightly lower scores on balancing study and life. Competence scores were consistently high, and leadership-related opportunities received comparatively lower ratings. Relatedness also showed high scores, with marginally lower ratings on feelings of inclusion.

Table 2. Self-Dimension Satisfaction Score (Autonomy)

Title of the Item	Mean	Standard Deviation	Level (1-5)
Complete the task as you wish and submit it on time	4.32	0.51	Very Satisfied
Teachers assign homework that requires critical thinking	4.22	0.48	Very Satisfied
Maintain a balance between study and life	4.13	0.63	Satisfied
Overall dimension score	4.24	0.49	Very Satisfied

The average score of the independent dimension is 4.24 (full score is 5), which belongs to the level of "Very Satisfied". Specifically, items, "Completing tasks according to one's own will and submitting them on time" (4.32) and "Assignments requiring critical thinking from teachers" (4.22) scored the highest, indicating that students' needs for self-managing their learning pace and participating in challenging tasks are well met, consistent with Deci and Ryan (2020)'s finding that "met needs for autonomy can enhance intrinsic motivation".

The lowest score yielded is for item, "Maintaining a balance between study and life" (4.13), reflecting the pressure faced by vocational college students with tight courses and many practical activities, and the need to improve their time management ability.

Table 3. Satisfaction Scores of Competency Dimensions

Title of the Item	Mean	Standard error	Level (1-5)
Campus building cleaning and maintenance	4.32	0.45	Very satisfied
The school attaches great importance to the well-being of students	4.30	0.49	Very satisfied
Take leadership opportunities such as student leaders	4.22	0.58	Very satisfied
Overall Score	4.26	0.47	Very satisfied

The overall score of the competence dimension is 4.26, which is the highest among the three dimensions, indicating that students have a high evaluation of "Very Satisfied" of their own skills and learning environment adaptation. Items, "Campus building cleaning and maintenance" (4.32) and "School attaches importance to students' well-being" (4.30) are outstanding, indicating that hardware facilities and humanistic care are an important basis for the satisfaction of vocational students (Proshansky et al., 2020); while item, "Opportunities to serve as student leaders" (4.22) scored the lowest, which may be related to the fierce competition for leadership positions and high participation threshold of students (Aman & Aziz, 2023).

Table 4. Satisfaction Scores of Belonging /Relatedness Dimension

Title of the Item	Mean	Standard Error	Level (1-5)
Student activities enhance the overall experience.	4.28	0.43	Very Satisfied
Join a club if you can	4.26	0.52	Very Satisfied
I feel included in student activities.	4.19	0.61	Satisfied
Overall Score	4.25	0.48	Very Satisfied

The average score of the belonging /relatedness dimension is 4.25, slightly lower than that of the competence dimension, reflecting the overall positive experience of students on interpersonal relationship and sense of belonging in the learning environment, but there is still room for improvement. Dimensions, "Student activities improve the overall experience" (4.28) and "Have the opportunity to join a club" (4.26) yielded high scores, indicating that rich extracurricular activities are an effective way to enhance a sense of belonging (Noddings, 2020); "Feeling included in student activities" (4.19) scored the lowest.

3.3 Significant Differences by Profile

There were no significant differences in autonomy, competence, or relatedness based on age or institution. Significant gender differences were found in competence and relatedness, with female students reporting higher scores in both dimensions.

Table 5. Test of Differences in Learning Satisfaction by Age Group

Dimension	H value	df	P value	Conclusion
Autonomy	1.087	2	0.702	no significant differences
Competence	2.013	2	0.522	no significant differences
Belonging/relatedness	3.210	2	0.331	no significant differences

Using the Kruskal-Wallis test, it was found that there are no significant differences among different age groups in terms of autonomy ($p=0.702$), competence ($p=0.522$), and belonging ($p=0.331$). The possible reason is that vocational colleges adopt a unified teaching plan, where students of different ages face similar course difficulties and campus environments, which offsets the impact of cognitive development differences (Tinto, 2021).

Table 6. Test of Differences in Learning Satisfaction by Gender Group

Dimension	Mean for Females	Mean for Males	t value	p value	Conclusion
Autonomy	4.26	4.21	1.543	0.123	No significant difference
Competence	4.31	4.18	3.210	0.002	The difference is significant
Belonging/Relatedness	4.32	4.15	3.587	0.002	The difference is significant

$p < 0.01$

The independent sample t-test shows that gender has no significant effect on the autonomy dimension ($p=0.123$), but there are significant differences in competence ($p=0.002$) and belonging dimension ($p=0.002$). For competence dimension, the average value for women (4.31) is significantly higher than that of men (4.18), which may be related to women's greater attention to details in theoretical knowledge learning and higher demand for teaching feedback (Eccles, 2020). For belonging/relatedness dimension, the average value of women (4.32) is significantly higher than that of men (4.15), which is consistent with the theory proposed by Gilligan (2020) that "women pay more attention to interpersonal relationship and emotional connection".

Table 7. Test of Differences in Learning Satisfaction Among Institutions

Dimension	H value	df	p value	Conclusion
Autonomy	1.987	2	0.498	no significant differences
Competence	4.210	2	0.073	no significant differences
Belonging/Relatedness	3.892	2	0.115	no significant differences

The Kruskal-Wallis test shows no significant differences among the three institutions in terms of autonomy ($p=0.498$), competence ($p=0.073$), and belonging ($p=0.115$). This indicates that the quality of teaching and resource allocation at higher vocational colleges in Xianning City tends to be balanced, which may be related to unified supervision by local education authorities (Pascarella & Terenzini, 2023).

3.4 Academic Performance

Students' comprehensive assessment outcome indicated generally high academic performance. Significant differences were found among the three institutions, while no significant differences were observed across age or gender groups.

Table 8. Descriptive Statistics of Academic Performance in terms of the Comprehensive Assessment Outcome

Variable	Mean	Standard Deviation	Least value	Crest value
Overall test scores	90.86	8.23	65	98

The average score of the comprehensive assessment outcome examination of students' mental health education course is 90.86 (full score of 100), which is "Excellent". It reflects the good academic performance in terms of the comprehensive assessment outcome of the sample students, which may be related to the moderate difficulty of the course and effective teaching organization (Wu & Li, 2022).

3.5 Correlation

All three satisfaction dimensions—autonomy, competence, and relatedness—showed significant positive correlations with academic performance.

Table 9. Correlation Matrix of Learning Satisfaction and Academic Achievement

Dimension	Autonomy	Competence	Belonging/ Relatedness	School Achievement
Autonomy	1.00	0.863	0.847	0.193
Competence	0.863	1.00	0.929	0.166
Belonging/Relatedness	0.847	0.929	1.00	0.143
school achievement	0.193	0.166	0.143	1.00
p<0.05, p<0.01				

Pearson correlation analysis shows that the total score of learning satisfaction and each dimension is significantly positively correlated with academic achievement. Autonomous dimension: $r=0.193$ ($p<0.01$), indicating that the improvement of autonomous learning ability can significantly promote academic performance, which is consistent with SDT theory (Ryan & Deci, 2017); Competence dimension: $r=0.166$ ($p<0.01$), indicating that confidence in one's own skills and adaptation to the learning environment are important foundations for academic success; Belonging dimension: $r=0.143$ ($p<0.05$), which confirmed that good interpersonal relationship and belonging can indirectly improve learning engagement.

Table 10. Age and Gender Differences in Academic Performance

Variable	Method of Calibration	P-value	Conclusion
Age	Kuskal-Wallis	0.192	no significant differences
Sex	Independent sample T-test	0.552	no significant differences

The Kruskal-Wallis test and independent sample t-test show that there is no significant difference in the academic performance in terms of the comprehensive assessment outcome among different age groups ($p=0.192$) and gender groups ($p=0.552$), indicating that age and gender are not decisive factors in academic performance, and learning motivation and self-efficacy may play a leading role (Eccles, 2020).

4. Discussion

Students reported high satisfaction across SDT dimensions, confirming SDT's applicability in Chinese vocational contexts. Autonomy satisfaction was strongest when students engaged in self-directed and cognitively challenging tasks. Such findings align with constructivist perspectives that emphasize the importance of active knowledge construction in learner-centered environments (Ertmer & Newby, 2020). Competence satisfaction reflected the importance of physical and psychosocial learning environments. Relatedness satisfaction was enhanced through student activities but limited by feelings of partial inclusion.

Gender differences indicated that female students were more sensitive to competence and relational satisfaction, due to socialized expectations and care-oriented identity development (Eccles, 2020; Gilligan, 2020).

Academic performance in terms of the comprehensive assessment outcome levels was generally strong, with significant variation among institutions but not among gender or age groups. The significant institutional differences highlight the influence of local instructional practices or assessment standards. This is consistent with findings by Wang et al. (2021), who emphasized that pedagogical effectiveness varies across vocational colleges in China due to differences in instructional design and resource allocation.

Positive correlations between satisfaction and academic performance support the SDT framework: fulfilled psychological needs activate intrinsic motivation, which in turn enhances academic engagement and achievement. The positive correlations between all three satisfaction dimensions and academic performance indicate that students who feel more autonomous, competent, and connected tend to achieve higher examination outcomes, reinforcing the relevance of psychological needs in shaping academic success in vocational settings. Similar findings were reported by Hensley et al. (2021), who observed that supporting autonomy, competence, and relatedness enhances learners' engagement and academic performance.

Practical implications include improving competence development pathways, strengthening differentiated student support, and fostering supportive learning environments—those that offer meaningful choices, build confidence, and promote positive peer interaction—may contribute to improved academic engagement and performance among vocational students.

5. Conclusion

This study demonstrates that learning satisfaction among sophomore vocational college students in Xianning is high and significantly associated with academic success. Autonomy, competence, and relatedness each play vital roles in fostering positive academic outcomes. Gender influences satisfaction but not academic performance, while institutional differences affect academic outcomes but not satisfaction.

All three satisfaction dimensions showed significant positive correlations with academic performance. Students who perceived greater autonomy, competence, and relatedness tended to perform better academically, underscoring the importance of addressing students' psychological needs in the learning process.

These findings highlight the value of cultivating learning environments that provide opportunities for self-directed learning, skill development, and meaningful social connection. Addressing these needs can strengthen learners' motivation and engagement, contributing to improved achievement. While satisfaction levels were similar across institutions, variations in academic performance suggest the need for continued review of teaching approaches and assessment practices to promote consistency and support student success.

6. Limitations and Future Directions

This study has several limitations that should be considered. Academic performance was measured using the comprehensive assessment outcome from the Mental Health Education course, which may not fully capture broader academic competencies. Future research may incorporate multiple subjects, practical assessments, or performance-based evaluations to provide a more comprehensive understanding of achievement.

The sample was limited to three vocational colleges within Xianning City, which restricts the generalizability of the

findings. Expanding research to include additional regions or institution types may produce more representative insights.

Self-report data were used to measure learning satisfaction, which may be affected by response bias. Future studies may benefit from mixed-method approaches, including interviews, classroom observations, or triangulated data sources to gain deeper insight into learners' experiences.

Finally, the cross-sectional design limits conclusions about developmental changes or causal relationships between satisfaction and academic performance. Longitudinal or comparative studies involving students across different year levels may provide further insight into how satisfaction evolves and how psychological needs affect sustained engagement and long-term academic outcomes.

References

- Aman, S., & Aziz, N. (2023). Student satisfaction in higher education: A systematic review examining its impact on institutional growth and comparative dimensions. *Journal of Applied Mathematics*, 1(3), 91-108. <https://doi.org/10.59400/jam.v1i3.91>
- Cheng, L., & Zhang, Y. (2023). Student engagement and learning outcomes in Chinese vocational colleges: An empirical study. *Asia Pacific Education Review*, 24(1), 45-59.
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268. https://doi.org/10.1207/S15327965PLI1104_01
- Eccles, J. S. (2020). From expectancy-value theory to situated expectancy-value theory: A developmental, social-cognitive, and sociocultural perspective on motivation. *Contemporary Educational Psychology*, 61, Article 101859. <https://doi.org/10.1016/j.cedpsych.2020.101859>
- Ertmer, P. A., & Newby, T. J. (2020). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance Improvement Quarterly*, 32(3), 77-92.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2020). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59-119. <https://doi.org/10.3102/00346543074001059>
- Gao, L., Li, Y., & Li, J. (2022). Gender differences in academic engagement and motivation among Chinese college students: The role of teacher support. *Journal of Educational Psychology*, 114(1), 115-128.
- Gilligan, C. (2020). *In a different voice: Psychological theory and women's development* (50th anniversary ed.). Harvard University Press.
- Hensley, L., Sayers, R., Brady, A., & Cutshall, J. (2021). Supporting autonomy, competence, and relatedness in a learning-to-learn course: College students' insights into effective instruction. *Teaching of Psychology*, 48(4), 419-436. <https://doi.org/10.1177/0098628320977270>
- Noddings, N. (2020). *The challenge to care in schools: An alternative approach to education* (3rd ed.). Teachers College Press.
- Pascarella, E. T., & Terenzini, P. T. (2023). *How college affects students* (Vol. 3). Jossey-Bass.
- Proshansky, H. M., Fabian, A. K., & Kaminoff, R. (2020). Place-identity: Physical world socialization of the self. In H. M. Proshansky, A. K. Fabian, & R. Kaminoff (Eds.), *Theoretical frameworks for environmental behavior* (pp. 99-130). Springer.
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press. <https://doi.org/10.1521/978.14625/28806>
- Tinto, V. (2021). *Taking student retention seriously: Rethinking the first year of college*. University of Chicago Press.
- Wang, S., Li, J., & He, X. (2021). Evaluating pedagogical effectiveness in Chinese higher vocational education. *Journal of Vocational Education Studies*, 10(2), 89-104.
- Wu, Y., & Li, H. (2022). Learning satisfaction and academic achievement: A structural model among vocational college students. *Chinese Journal of Educational Research*, 29(3), 102-117.

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Authors contributions

Wan Hu managed the manuscript drafting and data collection. Dr. Capacete took charge of methodological matters and made revisions. Dr. Borines was responsible for designing the study. All authors reviewed and approved the definitive version of the manuscript.

All three authors contributed to the conceptualization, research methodology, writing, and revision processes. Each author has read and agreed to the published version of the manuscript.

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Data sharing statement

No additional data are available.

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