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Determinants of Student Engagement in Nursing Vocational Education in Shanghai, China

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Abstract

Purpose: The study investigates the influence of seven independent variables (Analytical Skills Experience Quality and Supportive Study Climate) on one dependent variable (Student Engagement). Additionally, it aims to identify significant differences between variables. **Research design, data, and methodology:** The research employed the Index of Item-Objective Congruence (IOC) for validity and a Cronbach's Alpha in a pilot test (n=100) for reliability. 100 valid responses from Shanghai Urban Construction Vocational College students were analyzed by multiple linear regression to verify the significant relationship between variables. Following this, 30 students underwent a 16-week Strategic Plan (SP). Afterward, the quantitative results from the post-strategic and pre-strategic plans were analyzed in the paired-sample t-test for comparison. **Results:** In multiple linear regression, the study revealed that analytical skills, interpersonal skills, learning assessments, positive emotions, student experience quality, and supportive study climate impacted student engagement, while interdisciplinary learning had no significant impact on student engagement. Finally, the results from the paired-sample t-test for comparison demonstrated a significant difference in student engagement between the post-strategic Plan and pre-strategic Plan stages. **Conclusions:** This research fosters student engagement by cultivating engagement skills in Shanghai, China.

Keywords: Student Engagement, Vocational Education, Nursing, Strategic Plan

JEL Classification Code: I23, J28, L2

1. Introduction

Shanghai Urban Construction Vocational College (SUCC) is based on the national strategic goal of "Healthy China," adheres to the concept of "urban service," and focuses on

Whole-life cycle services. It conducts in-depth integration of vocational and general education, industry and education, science, and education. It strives to cultivate high-skilled and versatile health professionals with "multi-dimensional services and personalized support," providing guarantees for the scientific implementation of people's health needs. During the Fourteenth Five-Year Plan period, the aging trend in Shanghai will also become increasingly obvious. The increase in the proportion of cerebrovascular diseases and tumors and the number of disabled and intelligent people in this group has added a heavy burden to the family and society, and the demand for old-age insurance, medical security, elderly care services, and health services has continued to increase.

The Fourteenth Five-Year Plan for the Development of the Cause of Aging in Shanghai proposes to improve the quality and increase the number of elderly service teams. It encourages several medical and nursing personnel to practice in medical and nursing institutions (Chen et al., 2022). With nursing (elderly direction) as the core major in SUCC, a professional group of elderly care majors is formed, integrating smart healthcare service and management, social

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work, and other majors to create a "1+N" smart healthcare industry chain service talent cultivation model.

The urgency of action in this research is paramount. Firstly, nursing students must embrace rigorous and focused learning given the rapidly evolving medical knowledge and the need to continuously acquire skills essential for their profession. Secondly, the current talent cultivation and student engagement practices at SUCC fall short of effectively enhancing student engagement, leading to a misplaced perception of progress and an illusion that skills are developing solely through work experience. This underscores the critical need for practical methods to enhance student engagement, demanding careful consideration from both SUCC's management team and educators.

2. Literature Review

2.1 Student Engagement

Fuller et al. (2018) describe student engagement as four dimensions: skill engagement, participation engagement, emotional engagement, and performance engagement. Student engagement is a powerful element that can be used to examine the degrees or standards of learning and teaching process. Teachers could use some methods to promote students' engagement, such as the case analysis method, which can stimulate students to absorb knowledge actively. During the period of students' studying, student engagement is constantly regarded as an essential measurement for educating, instructing, and managing (Fuller et al., 2018).

2.2 Supportive Study Climate

Miklikowska et al. (2021) contend that positive classroom climates can help students learn and adapt socially and emotionally. Much research has emphasized the classroom climate construct, but there needs to be a consensus regarding operationalizing it. A classroom climate can, however, be described by three basic components: instruction support, social/emotional support, and classroom organization and management (Miklikowska et al., 2021). Consequently, the following hypothesis is formulated:

H1: Supportive study climate has a significant impact on student engagement.

2.3 Positive Emotions

Positive emotions are, therefore, released as a result of an input or antecedent. Students' perceptions of a supportive study climate at their university are the inputs to positive emotions in this study. According to this theory, positive emotions broaden the mind and make you pay more attention (Gupta, 2019). The learning process depends on attention and cognition. As a result of the discussions above, it is presumed that when students experience positive emotions, they will perform better at university. Positive emotions are supposed to be influenced by positive emotions. Hence, the following hypothesis is proposed:

H2: Positive emotions have a significant impact on student engagement.

2.4 Student Experience Quality

Burford and von Guionneau (2018) have specifically shown that student perception is directly related to what they get from the education institute. It encourages them to invest more time and effort into academics when they feel positive about their overall learning experience, including academics and non-academics (Burford & von Guionneau, 2018). The more meaningful learning experiences students have, the happier they are. Getting more involved in academic activities makes them happier and more successful, which makes them want to spend more time and effort on them (O'Carroll et al., 2012). This means it can empirically prove that student engagement and experience quality make a difference. The preceding discussion brings us to this hypothesis:

H3: Student experience quality has a significant impact on student engagement.

2.5 Learning Assessments

Getting learning activities and assessments aligned is crucial in educational coaching and problem-based learning. Whether students are learning the core course objectives or understanding the assessments, it helps them synthesize complex analytical exam questions related to real-world issues related to business topics by applying the case method (Watling & Ginsburg, 2019).

Students can apply theory to real-life case scenarios using the case method, which results in more useful marketing recommendations in their assessments. As a result of his study, students were more engaged with the task and achieved better grades due to the case method (Weller & Henning, 2011).

When it comes to identifying gaps and achieving learning goals, the case method outshines other pedagogical approaches like role-playing and simulations, as per Laverty et al. (2016). This superiority will be further tested in the following hypothesis:

H4: Learning assessments has a significant impact on student engagement.

2.6 Analytical Skills

Analytical skills are developed through case method coaching. According to Farel and Paliulis (2004), students can synthesize complex analytical questions that relate to real-life scenarios (Farel & Paliulis, 2004). An authentic learning experience is provided by the case method for problem-based learning by integrating real-world experiences in the classroom. Case method learning could improve students' problem-solving and critical-thinking skills (Trullàs et al., 2022). When it comes to learning theory and applying theory and its policy implications, the case method works better than other pedagogical approaches. To improve cognitive processes in learning, Ivanchei et al. (2019) said educators need to study techniques to engage all students effectively in critical thinking skills (Ivanchei et al., 2019).

It helps you learn more problem-based skills like analysis, evaluation, and application of Bloom's taxonomy of cognitive learning. Students gained tacit and explicit knowledge and higher-order skills through the case method. Through case method coaching, students can apply their analytical skills to challenging business situations (Adams, 2015). Students are more engaged in learning when they have analytical skills in the context of critical thinking skills, according to Cheng et al. (2021). Therefore, the following hypothesis is formed:

H5: Analytical skills have a significant impact on student engagement.

2.7 Interpersonal Skills

Interpersonal skills are what you need to get along with other people. A person's interpersonal skills are categorized according to dominance versus submission, love versus hatred, affiliation versus aggression, and control versus autonomy (Dimopoulos, 2021). One of the most important interpersonal skills is persuasion. Other skills include active listening, delegation, and stewardship. Researchers in social psychology study how attitudes, thinking, and behaviors are changed by societal factors to develop interpersonal skills (Henry et al., 2022).

According to Kang et al. (2021), a case method enhances written and oral communication better than classroom discussions and textbook reading. Previous literature has shown that students were more engaged with case study tasks when they participated in group discussion activities. This helped students interact and form stronger relationships with teachers and each other and resulted in more engagement (Al-Azri & Ratnapalan, 2014).

Wolfer et al. (2021) found that undergrad students in a similar course were more emotionally engaged when they discussed cases with peers and lecturers in class. This emotional engagement led to better group interactions and improved learning outcomes. The collaborative nature of the case method was instrumental in helping students work together and enhance their communication skills (Wolfer et al., 2021). This leads us to the following hypothesis:

H6: Interpersonal Skills have a significant impact on student engagement.

2.8 Interdisciplinary Learning

Education and training pedagogies use the term interdisciplinary to describe studies incorporating methods and insights from several established disciplines (Anderson et al., 2022). Interdisciplinarity is about connecting and integrating ideas, practices, and technologies from many schools of thought, professions, and technologies to address a common problem.

Students' critical thinking skills improved through interdisciplinary learning. As Lent et al. (2021) found, case study methodologies foster interdisciplinary learning, which improves learners' engagement. Additionally, they pointed out that interdisciplinary learning involves collaboration, motivation, participation, and interdisciplinary thinking. An interdisciplinary setting allows case methods to advance deeper learning and have a broader impact (Lent et al., 2021). Therefore, the following hypothesis is developed:

H7: Interdisciplinary learning has a significant impact on student engagement.

3. Research Methods and Materials

3.1 Research Framework

The researcher applied three model theories from Dassanayake and Senevirathne (2018), Slatten et al. (2021), and the Conceptual framework of the theory of relationships among learning assessments, analytical skills, interpersonal skills, and interdisciplinary learning towards student engagement conducted by Song et al.(2022). All three theoretical frameworks mentioned above supported and developed a conceptual framework in Figure 1.

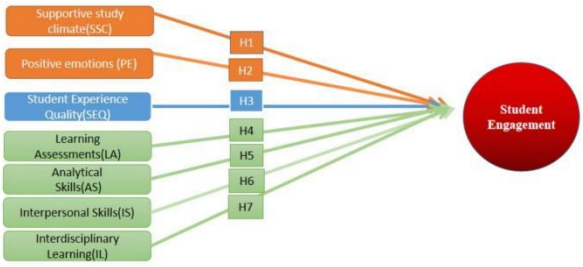

Figure 1: Conceptual Framework

H1: Supportive study climate has a significant impact on student engagement.
H2: Positive emotions have a significant impact on student engagement.
H3: Student experience quality has a significant impact on student engagement.
H4: Learning assessments has a significant impact on student engagement.
H5: Analytical skills have a significant impact on student engagement.
H6: Interpersonal skills have a significant impact on student engagement.
H7: Interdisciplinary learning has a significant impact on student engagement.

3.2 Research Methodology

The research process encompasses three distinct stages. Firstly, a comprehensive survey was conducted among the entire research population (n=100) to gather data for the proposed conceptual framework. Subsequently, all hypotheses underwent rigorous testing using multiple linear regression, with a significance threshold of $p<0.05$. Hypotheses that received support were retained, while those that did not meet the criteria were discarded.

In the second stage, pre-strategic Plan surveys were administered to the remaining population of 100 students within the supported hypotheses. The third stage introduced the Strategic Plan (SP), specifically implemented with 30 participants.

During the final stage, 30 SP participants completed a survey, providing the necessary data for a paired-sample t-test analysis. This analysis compared the pre-strategic Plan and post-strategic Plan results. This comprehensive process enabled a thorough examination of the research objectives and hypotheses.

3.3 Research Population, Sample Size, and Sampling Procedures

3.3.1 Research Population

The researcher chose 100 students from the SUCC program as the research population for the pre-survey. Within the overall student population of approximately 11,000 students, this represented a sampling proportion of 0.91%. The participants were drawn from different academic years, including first-year class 1 students, second-year class 2 and class 3 students, and third-year class 5 and class 6 students. Altogether, 100 SUCC students completed the questionnaire either online or offline. Afterward, researcher

After completing the survey, the researcher carefully reviewed all responses and confirmed the validity of 100 responses.

3.3.2 Sample size

The researcher conducted a pilot survey on 100 students randomly to assess the reliability of the survey instrument. Following the pilot test, the researcher identified 100 SUCC students as the research population and successfully obtained 100 valid responses. The researcher utilized multiple linear regression to investigate the relationship between the independent and dependent variables. Finally, 30 willing students were chosen to participate in the Strategic Plan stage of the research.

3.3.3 Sampling Procedures

The researcher conducted multiple sampling procedures throughout the research process.

The first sampling occurred for the pilot survey and pilot test, where 15 students were randomly chosen to complete the survey questionnaire and provide feedback.

For the pre-survey, the researcher sampled 100 SUCC students from different academic years, ensuring inclusivity. The survey questionnaire was distributed online or offline, and all responses were reviewed, with 100 valid responses confirmed, providing a comprehensive view of the student body.

Finally, for the Strategic Plan stage, 30 willing students were randomly selected to participate in implementing the Strategic Plan.

3.4 Research Instruments

3.4.1 Design of Questionnaire

The researcher followed a three-step process in designing the survey questionnaire:

Step 1: Identifying questionnaire sources was achieved by referencing three openly published articles: Dassanayake and Senevirathne (2018), Slatten et al. (2021), and Song et al. (2022).

Step 2: Adjusting and adapting the survey questionnaires to fit the context of Chinese university students was crucial in ensuring relevance and cultural appropriateness.

Step 3: Implementing the Item Objective Congruence (IOC) was essential to ensuring the questionnaire's validity and reliability.

3.4.2 Components of Questionnaire

Survey questionnaire items were composed of the following three parts:

Part 1: Screening Questions. There were screening questions to filter out the non-research population.

Part 2: Basic info Questions. Questions were asked to gather basic information about the research population, including gender, age, birthplace, and so on.

Part 3: Pre-survey Questions. These questions are not just for pre-survey, but for the crucial task of understanding the current level of IV and DV, a task that your contribution will make possible.

3.4.3 IOC Results

The researcher invited three independent experts, scholars, or doctors to implement IOC (Index of item-objective congruence). Two of the three experts in this study (experts 1 and 2) came from outside the school, with questionnaire design experience; the other teacher (Expert 3) came from SUCC with research design experience. In this IOC process, independent experts, scholars, or doctors are marked +1 for Congruent, 0 for Questionable, and - 1 for Incongruent. In this research, all questionnaire items were greater than 0.67, so the researcher retained all questionnaire items.

3.4.4 Pilot survey and Pilot test results

The researcher randomly implemented a pilot survey of 100 students by asking them to fill out the survey questionnaire and give feedback. Afterward, the researcher implemented Cronbach's Alpha's internal consistency reliability test, in which values should equal or greater than 0.6(Setia, 2016). Therefore, the table below demonstrates that all the items of this research instrument have passed the reliability test with a 0.6 or above score.

Table 1: Pilot Test Result

Variables	No. of Items	Sources	Cronbac h's Alpha	Strength of Association
Supportive Study Climate (SSC)	2	Terje et al. (2021)	0.647	Questionable
Positive Emotions (PE)	4	Terje et al. (2021)	0.640	Questionable
Student Experience Quality (SEQ)	3	Dassanayake and Senevirathne (2018)	0.723	Acceptable
Learning Assessments (LA)	3	Song et al. (2022)	0.794	Acceptable
Analytical Skills (AS)	4	Song et al. (2022)	0.695	Questionable
Interpersonal Skills (IS)	4	Song et al. (2022)	0.828	Good
Interdisciplinary learning (IL)	4	Song et al. (2022)	0.622	Questionable
Student engagement (SE)	5	Terje et al. (2021)	0.799	Acceptable

4. Results and Discussion

4.1 Results

4.1.1 Demographic Profile

The researcher demonstrated the demographic profile of the entire research population (n=100), followed by the selected students' group (n=30), who participated in the Strategic Plan, as shown in Table 2.

Table 2: Demographic Profile

Entire Research Population (n=259)		Frequency	Percent
Gender	Male	63	63.00%
	Female	37	37.00%
Year	First Year	16	16.00%
	Second Year	50	50.00%
	Third Year	34	34.00%
Age	20	29	29.00%
	21	31	31.00%
	22	28	28.00%
	23	12	12.00%
Birthplace	AH	17	17.00%
	HN	12	12.00%
	JS	16	16.00%
	JX	5	5.00%
	SH	28	28.00%
	XJ	5	5.00%
	YN	5	5.00%
	ZJ	12	12.00%
Total		100	**100%**
Strategic Plan Participants (n=30)		**Frequency**	**Percent**
Gender	Male	14	46.70%

Entire Research Population (n=259)		Frequency	Percent
	Female	16	53.30%
Year	First Year	8	26.70%
	Second Year	15	50.00%
	Third Year	7	23.33%
Age	19	9	30.00%
	20	14	46.67%
	21	7	23.33%
Birthplace	AH	4	13.33%
	HN	6	20.00%
	JS	3	10.00%
	JX	2	6.67%
	SH	8	26.66%
	XJ	2	6.67%
	YN	2	6.67%
	ZJ	3	10.00%
Total		**30**	**100%**

4.1.2 Results of multiple linear regression

Multiple Linear Regression on 100 survey questionnaire results to determine whether each hypothesis was supported. Seven research hypotheses were related to the Dependent Variable, Student Engagement (SE). Based on the variance inflation factor (VIF) analysis, it can be concluded that multicollinearity is not a concern since the VIF value is below 5 (Hair et al., 1995). The R-squared (R^2) in a multiple linear regression model with seven independent variables can account for 94.9% of the variability in creativity, indicating its ability to explain the variance in Student Engagement (SE).

Table 3: The multiple linear regression of five independent variables on student engagement

Variables	Standardized Coefficients Beta value	t-value	p-value	VIF	R^2
Supportive study climate (SSC)	0.1667	4.10**	0 .001	3.48	0.949
Positive emotions (PE)	0.1110	2.06*	0.041	4.54	
Student experience quality (SEQ)	0.4356	11.13**	0 .001	3.83	
Learning assessments (LA)	0.4053	9.90**	0 .001	4.36	
Analytical skills (AS)	0.4400	7.87**	0.001	4.84	
Interpersonal skills (IS)	0.2530	5.54**	0 .001	2.07	
Interdisciplinary learning (IL)	0.0673	1.61	0.111	2.51	

Note: p-value <0.05*, p-value <0.001**

In sum, for the seven hypotheses, H1, H2, H3, H4, H5 and H6 were supported, while H7 was not. Interdisciplinary Learning (IL) had no significant impact on Student Engagement (SE). In this circumstance, the researcher removed Interdisciplinary Learning (IL) and made related adjustments. Therefore, the hypotheses were developed in stages based on results from multiple linear regression analyses. Afterwards, was conducted to following below hypotheses:

H8: There is a significant difference in Supportive study climate (SSC) between pre-strategic Plan and post-strategic Plan stages.

H9: There is a significant difference in Positive emotions (PE) between pre-strategic Plan and post-strategic Plan stages.

H10: There is a significant mean difference in Student Experience Quality (SEQ) between the pre-strategic Plan and post-strategic Plan stages.

H11: There is a significant mean difference in Analytical Skills (AS) between pre-strategic Plan and post-strategic Plan stages.

H12: There is a significant mean difference in Interpersonal Skills (IS) between the post-strategic Plan stages.

H13: There is a significant mean difference in learning assessments (LA) between the pre-strategic and post-strategic planning stages.

H14: There is a significant mean difference in Student Engagement between pre-strategic Plan and post-strategic Plan stages.

4.2 Strategic Plan Process

The Strategic Plan lasted for 16 weeks and was based on quantitative data collected at the pre-strategic Plan stage to achieve the purpose of this research, which was developing Student Engagement. The researcher illustrated the Strategic Plan chronologically, as in Table 4.

Table 4: Implementation time and activities as Strategic Plan

No.	Time and Duration	Implementation keywords
1	Week 1	Team establishment
		Goal setting
		SWOT diagnostic analytic tool
2	Week2-4	Group mentoring
3	Week 5-8	Practical courses

No.	Time and Duration	Implementation keywords
4	Week 9-12	Adjust and improve the goal
5	Week 13-16	Summarize experience and share improvements

4.3 Results Comparison between Pre-IDI and Post-IDI

The researcher implemented a paired-sample t-test analysis on all six variables to identify whether there were any differences between Students' Engagement during the pre-strategic Plan and post-strategic Plan stages. The below tables to illustrates paired-sample t-test analysis on six variables as follows:

Table 5: Paired-Sample T-Test Results

Variables	Mean	SD	SE	p-value
Supportive study climate (SSC)				
Pre-Strategic Plan	2.14	0.430	0.0727	p<0.001
Post-Strategic Plan	4.51	0.712	0.1204	
Positive emotions (PE)				
Pre-Strategic Plan	1.69	0.333	0.0562	p<0.001
Post-Strategic Plan	4.44	0.695	0.1175	
Student experience quality (SEQ)				
Pre-Strategic Plan	1.90	0.510	0.0862	p<0.001
Post-Strategic Plan	4.41	0.801	0.1353	
Learning assessments (LA)				
Pre-Strategic Plan	1.67	0.858	0.0868	p<0.001
Post-Strategic Plan	5.00	0.629	0.1353	
Analytical skills (AS)				
Pre-Strategic Plan	1.74	0.496	0.0839	p<0.001
Post-Strategic Plan	4.39	0.814	0.1376	
Interpersonal skills (IS)				
Pre-Strategic Plan	1.91	0.433	0.0732	p<0.001
Post-Strategic Plan	4.41	0.790	0.1336	
Student Engagement (SE)				
Pre-Strategic Plan	2.10	0.319	0.0540	p<0.001
Post-Strategic Plan	4.38	0.778	0.1315	

Table 5 illustrates the results of paired-sample t-test analysis of the pre-strategic Plan and post-strategic Plan comparison as follows: there was a significant difference in Supportive study climate (SSC) between current (M=2.14, SD=0.430)and expected (M=4.51, SD=0.712) condition; t (29) =-16.8, p =0.001(<0.05) and the mean difference was -2.37. Therefore, H8 supported the idea that there is a significant mean difference in the supportive study climate between pre-SP and post-SP.

There was a significant difference in Positive Emotions (PE) between current (M=1.69, SD=0.333) and expect (M=4.44, SD=0.695) condition; t (29) =-23.1, p =0.001(<0.05) and the mean difference was -2.74.

Therefore, H9 confirms the significant mean difference in positive emotions (PE)between pre-SP and post-SP, validating our expectations.

Our findings support the significant mean difference in Student Experience Quality (SEQ) between pre-SP and post-SP, reinforcing our beliefs. The difference in conditions, with a mean difference of -2.51, is significant, as indicated by H10.

There was a significant difference in Analytical Skills (AS) between current (M=1.74, SD=0.496)and expect (M=4.39, SD=0.814) condition; t (29) =-18.0, p =0.001(<0.05) and the mean difference was -2.65. Therefore, H11 supported the idea that there is a significant mean difference in analytical skills (AS) between pre-SP and post-SP.

There was a significant difference in Interpersonal Skills (IS) between current (M=1.91, SD=0.433) and expect (M=4.41, SD=0.790) condition; t (29) =-15.8, p =0.001(<0.05) and the mean difference was -2.50. Therefore, H12 supported the idea that there is a significant mean difference in interpersonal skills (IS)between pre-SP and post-SP.

There was a significant difference in Learning Assessments (LA)between current (M=1.67, SD=0.514) and expect (M=5.00, SD=0.757) condition; t (29) =-16.0, p =0.001(<0.05) and the mean difference was -2.74. Therefore, H13 supported the idea that there is a significant mean difference in learning assessments between pre-SP and post-SP.

There was a significant difference in Study engagement (SE) between the current (M=2.10, SD=0.319) and expected (M=4.38, SD=0.778) condition; t (29) =-14.9, p =0.001(<0.05) and the mean difference was -2.29. Therefore, H14 supported the idea that there is a significant mean difference in Student Engagement (SE) between pre-SP and post-SP.

According to the paired-sample t-test results demonstrated above, the researcher has come up with the following conclusions. First, all seven variables showed a

significant mean difference between the post-SP stage and the pre-SP stage, underscoring the importance of the Strategic Plan in shaping these aspects. Second, the researcher found a significant increase in Student Engagement (SE) between the pre-SP and post-SP phases, highlighting the importance of student involvement in the success of the Plan.

5. Conclusions, Recommendations and Limitations

5.1 Conclusions & Discussions

The study investigated the influence of seven independent variables, namely analytical skills, interpersonal skills, learning assessments, positive emotions, student experience quality and supportive study climate, interdisciplinary learning, and student engagement, on dependent variables and student engagement. The research employed a comprehensive research design, data collection, and methodology to draw meaningful conclusions.

The research design incorporated the use of the Index of Item-Objective Congruence (IOC) for validity and Cronbach's Alpha in a pilot test to ensure the reliability of the measurement instruments. This rigorous approach to measurement strengthened the credibility of the research. Data were collected from 100 valid responses from Shanghai Urban Construction Vocational College (SUCC)students. They were subjected to multiple linear regression analyses to verify the significant relationships between the independent and dependent variables. Moreover, a 16-week Strategic Plan (SP) was carried out with 30 selected student groups. Post-SP data were collected and compared with pre-SP data using paired-sample t-tests.

The results of the study demonstrated that certain factors significantly impacted student engagement. Specifically, analytical skills, interpersonal skills, learning assessments, positive emotions, quality of student experience, and supportive study climate significantly influenced student engagement. On the other hand, interdisciplinary learning did not significantly impact student engagement. This suggests that focusing on analytical skills, interpersonal skills, learning assessments, positive emotions, student experience quality, and a supportive study climate can enhance student engagement.

The findings from the paired-sample t-test for comparison showed a significant difference in student engagement between the post-SP and pre-SP stages. This suggests that the 16-week Strategic Plan (SP) Implementation positively and statistically significantly impacted student engagement.

In conclusion, this research has made a valuable contribution by demonstrating the potential to foster student engagement by cultivating their analytical skills, interpersonal skills, learning assessments, positive emotions, student experience quality, and supportive study climate in Shanghai, China. The study's robust methodology, comprehensive analysis, and practical implications offer insights into the factors that can enhance student engagement. These findings can inform educational strategies to develop these vital skills in students, ultimately preparing them for success in an increasingly competitive and innovative world.

5.2 Recommendations

Strategic plans can play a crucial role in enhancing nursing students' engagement in learning. These plans set clear learning objectives for improving nursing students' knowledge, skills, and attitudes. Such objectives provide students with a well-defined learning direction, stimulate their interest and motivation, and ultimately boost their participation in learning.

Strategic plans that involve analytical skills, interpersonal skills, learning assessments, positive emotions, student experience quality, and a supportive study climate can maximize student engagement. By optimizing these skills, students can be more actively involved in learning, leading to improved learning outcomes.

Furthermore, strategic plans focus on the supportive study climate of students, considering factors such as classroom facilities, learning resources, and the overall learning atmosphere. Creating a supportive study climate encourages students to engage more actively in learning and enhances their learning effectiveness.

Strategic plans also emphasize interpersonal skills, promoting communication and collaboration. Strengthening teacher-student interaction helps students better understand and grasp course content, increasing their engagement.

Additionally, strategic plans establish positive emotions, including reward systems and evaluation criteria. These mechanisms stimulate students' enthusiasm and creativity, further elevating their participation in learning.

In summary, strategic plans play a significant role in enhancing nursing students' engagement in learning. Student engagement and learning outcomes can be maximized by optimizing analytical skills, interpersonal skills, learning assessments, positive emotions, student experience quality, and a supportive study climate.

One of the primary recommendations is that using analytical skills can enhance student engagement and make learning more interactive and meaningful (Grijpma et al., 2022). By setting analytical tasks (Kassab et al., 2023), conducting case studies, training critical thinking, data-driven decision-making, group discussions, reflection and

summarization, and providing feedback, we can effectively use analytical skills to enhance student engagement (Yang et al., 2020).

Interpersonal skills (Bhana, 2014) are crucial in enhancing student engagement, as they facilitate effective communication and collaboration between teachers and students. By building trust, communicating clearly, actively listening, promoting collaborative learning, providing positive feedback, resolving conflicts, and creating an inclusive classroom, teachers can effectively use their interpersonal skills to improve student engagement and foster a positive learning environment (Henry et al., 2022).

Learning assessments (Carney et al., 2018) are crucial tools for enhancing student engagement by providing feedback, identifying areas of improvement, and motivating students to participate actively in the learning process(Taylor et al., 2023). By providing frequent and timely assessments, making them meaningful and relevant, encouraging collaboration, involving students in the assessment process, giving constructive feedback, linking assessments to learning outcomes, and leveraging technology, teachers can effectively use assessments to engage students more actively in the learning process.

Positive emotions (Gupta, 2019) play a significant role in improving student engagement. When students feel happy, excited, or motivated, they are likelier to be engaged in learning, pay attention, and perform better academically (Schubert & Bode, 2023). Here are some ways positive emotions can be leveraged to enhance student engagement. Teachers can create a positive learning environment (Ma et al., 2020), use engaging teaching methods, recognize and celebrate student achievements, foster positive peer interactions, link learning to students' interests, provide opportunities for success, and encourage self-reflection and growth to foster positive emotions and engagement in students.

Improving student experience quality by creating an inclusive and supportive learning environment, personalizing the learning experience, encouraging active learning, providing timely feedback and support, and encouraging student voice and agency can significantly promote student engagement (Katulis et al., 2023). By fostering a positive and engaging learning environment, teachers can inspire students to actively participate, engage deeply with the material, and achieve their full potential.

To promote student engagement by enhancing the supportive study climate (Cho et al., 2023), it is essential to create an environment that fosters a sense of belonging, encourages active participation (Kurt et al., 2022), and provides opportunities for student voice and agency (Margas, 2023). This can be achieved by fostering positive relationships between teachers and students, ensuring an inclusive and safe learning environment (Miklikowska et al., 2021) providing personalized and engaging learning experiences, encouraging collaborative learning and peer support (Qin, 2022), offering timely feedback and recognition (Wachs et al., 2023), and promoting professional development and study skills. By implementing these strategies, students will feel more valued, motivated, and engaged in their learning, leading to improved academic performance and overall well-being.

In conclusion, the study's findings provide valuable insights for educational institutions seeking to cultivate student engagement. By implementing these recommendations, institutions can create a holistic and supportive learning environment that empowers students to take charge of their development and enhances their creative thinking. The analytical skills, interpersonal skills, learning assessments, positive emotions, student experience quality, and supportive study climate can collectively prepare students to thrive in a competitive and innovative world. It is incumbent upon educational institutions to embrace these recommendations and equip their students with the skills necessary for success and personal growth.

5.3 Limitations for Future Research

While the study on the influence of independent variables on student engagement offers valuable insights, it's essential to acknowledge its limitations to guide future research in this area. These limitations not only suggest potential avenues for further investigation and research refinement but also pave the way for exciting new discoveries in the field.

Sample Size and Demographics: The study focused on a specific group of students from Shanghai Urban Construction Vocational College (SUCC). Future research should diversify the sample by including students from various educational backgrounds, age groups, and cultural contexts to assess the generalizability of the findings.

Variables and Relationships: The study focused on seven specific independent variables and one dependent variable. Future research could explore additional independent variables and their potential interactions, offering a more holistic view of the factors influencing student engagement.

Strategic Plan(SP): The study implemented a specific Strategic Plan(SP) program. The scope of this study is limited, focusing only on a certain aspect or stage of the strategic plan without comprehensively examining the entire process or multiple impacts of the strategic plan. The depth of this study needs to be increased, as it only provides a superficial analysis and discussion of the strategic plan

without delving into the underlying deep-seated reasons or potential impacts.

Given the limitations identified in the current study, future research should aim to improve in several key areas. Firstly, to broaden the scope, future studies should endeavor to comprehensively examine the entire process and multifaceted impacts of the strategic plan, rather than focusing on just one aspect or stage. This comprehensive approach is crucial in ensuring a more thorough understanding of the strategic plan's overall effectiveness and impact, underscoring the importance of your work in the field.

Secondly, to enhance the depth of analysis, future research should delve deeper into the underlying reasons and potential impacts behind the strategic plan. This could involve exploring the interrelated factors and complexities that influence the plan's implementation and outcomes. By doing so, a more nuanced understanding of the strategic plan's inner workings and longer-term consequences can be achieved, highlighting the depth of your work in the field.

To facilitate these improvements, future studies could benefit from using more comprehensive data collection methods, including qualitative and quantitative approaches, to capture a richer and more diverse set of information. Additionally, it would be beneficial to integrate theoretical frameworks and models that are more tailored to the specific context and complexities of the strategic plan under study.

Moreover, to ensure the relevance and practicality of their findings, future researchers could collaborate with practitioners and stakeholders involved in the strategic planning process. This could generate more actionable insights and recommendations tailored to organizations' unique challenges and opportunities.

By addressing these limitations and embracing a more comprehensive and nuanced approach, future research on strategic plans can provide deeper insights and more impactful recommendations that can inform effective strategic decision-making.

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