

Regression Analysis of Satisfaction Factors and Net Promoter Score: A Case Study of a College with Small Class Size

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ABSTRACT

Thailand's aging population increases pressure on colleges to create more value for the student experience. Fortunately, colleges with small class instruction can still compete against larger colleges by focusing on satisfaction factors that are overlooked due to large class sizes. In this research study, regression analysis was used to analyze the predictive relationship between each of ten satisfaction factors and net promoter score. Simple linear regression analysis revealed that satisfaction with academic advising, satisfaction with facility condition, satisfaction with alumni success, and satisfaction with teaching quality all had moderate correlation ranging between 0.3 and 0.7 with net promoter score while other satisfaction factors had weaker correlations. Multiple linear regression analysis showed an adjusted R Square of 0.4759 which indicates that 47.59% of the variance in net promoter score can be explained by the three satisfaction factors of academic advising, faculty interactions, and alumni success. Research results suggest that college administrators should focus more on improving faculty members' academic advising effectiveness, developing closer faculty connections with students, and ensuring the professional success of graduates versus overemphasizing on other less important factors. Future studies are needed to uncover critical satisfaction factors that have a stronger relationship with net promoter score.

Keywords: Net Promoter Score, Satisfaction Factors, College Education, Marketing, Regression Analysis

Introduction

The world is getting older and some countries may get too old before they become rich first. The fertility rate measures the ratio between the number of live births in a year and the whole female population of childbearing age. For example, the fertility rate of both Thailand and Japan are 1.3 while South Korea's fertility rate is 0.8 (World Bank Group, 2022) which are well below the number that is needed to replace both parents after they die. The fertility rate can be used in addition with demographic structure which describes the age distribution of any population in order to better understand the aging demographics of any country. The recommended fertility rate for every country to maintain a stable population is 2.1 so any country with a low fertility rate would indicate that over time, the population of that country would decrease unless more family friendly and immigration friendly policies are implemented effectively. Lower population growth places immense pressure on nearly every industry leading to reduced size of both labor and customer markets which will trigger challenges in economic management.

Thailand's aging population results in fewer new students each year. Due to declining enrollment, colleges may introduce small class sizes as a strategic response. Colleges such as Thai-Nichi International College that have small class instruction of not more than 25 students

per class have to be more competitive and better satisfy customer needs. A famous study (Nye, B., Hedges, L. V., & Konstantopoulos, S., 1999) argued in support of class-size reduction in primary education because the results revealed that smaller classes with an average of 15 students versus a regular class with an average of 22 students had immediate effects on academic achievement and the effects can persist for at least 5 years. Compared to other colleges that have large class sizes of up to 100 students or more, colleges with small classes of not more than 25 students can adapt to their disadvantage in numbers and convert it to a strength by providing higher quality teaching or developing better pedagogical relationships with students. In addition to increased competition in Thailand's shrinking student market, small class colleges have to also search for new students from promising foreign markets such as nearby Myanmar which has a healthy fertility rate of 2.2 (World Bank Group, 2022) to fill in the gap.

Colleges have become just like any other business in almost all industries where the primary goal is to maintain profits or risk shutting down. In addition to providing quality education, colleges must also engage in other business related activities such as marketing and research to maintain their brand image in the eyes of the public. One of the simplest and most effective way to quickly measure the brand loyalty of any business is an invented rating scale called the net promoter score (NPS) to measure customer experience and likelihood of recommending a business (Reichheld, F. F., 2003). The net promoter score measures customer perception based on one simple question which is "How likely are you to recommend a certain brand to a friend or colleague?" Respondents give a rating between 0 (not at all likely) and 10 (extremely likely) and, depending on their response, customers fall into one of three categories to create a net promoter score. Promoters respond with a score of 9 or 10, passives respond with a score of 7 or 8, while detractors respond with a score of 0 to 6. Naturally, every business should work to minimize the number of detractors, positively convert passives, and increase the number of promoters. A previous study (Kara, A., Mintu-Wimsatt, A., & Spillan, J. E., 2021) about applying the net promoter score to higher education revealed that university experience and satisfaction influenced students' likelihood to recommend their academic program to their friends, which shows that net promoter score can be used to measure colleges just like any other business. While larger colleges and universities can depend more on their famous reputation to attract students, smaller and lesser well-known colleges, due to resource constraint, rely more on word-of-mouth marketing, which is why the metric of net promoter score is especially important for small colleges. Net promoter score measures likelihood of brand recommendation so colleges should discover which satisfaction factors lead to higher net promoter score and improve them in order to create a continuous feedback cycle of current students recommending their colleges to future students.

The net promoter score of any business that includes colleges is likely determined by the customer experience that is influenced by various satisfaction factors. Five satisfaction factors that positively correlated satisfaction with major curriculum were quality of instruction, capstone experience, academic advising, overall college experience, and preparation for career or graduate school (Tessema, M. T., Ready, K., & Yu, W., 2012). Satisfied students also stay in college until graduation according to a study about satisfaction with colleges which exhibited a moderate to strong relationship with retention intention and a relatively weak relationship with academic performance (Strahan, S., & Credé, M., 2015). In China, a study about factors leading to students' satisfaction in higher education explored the relationships between student satisfaction and teacher-student relationship, teacher preparedness, campus support facilities and institutional experiences which discovered variations among students in motivation that includes accomplishment, helping others, or personal fulfillment, and satisfaction that includes personality grooming, personal values, or psychological fulfillment (Siming, L., Gao, J., Xu,

D., & Shaf, K., 2015). Another recent study related interpersonal interactions with student satisfaction in higher education and revealed that student satisfaction with the program, teaching of lecturers, institution, campus facilities, student support provided, own learning, overall university experience and general student life were influenced by three different forms of interaction which are formal student to student, informal student to student, and student to instructor (Wong, W. H., & Chapman, E., 2023).

There is a current knowledge gap in some parts of business research about higher education that relates net promoter score to higher education as well as colleges with small classes. Few research studies connect net promoter score to higher education because the education industry may still traditionally be seen by some scholars as being separate from the business industry. Previous research about higher education also did not differentiate much between colleges that have small class sizes of not more than 25 students versus large class sizes of up to 100 students or even more. In the context of this research, small class size is defined as a class of not more than 25 students or a class with a student-to-teacher ratio of 25:1 according to a study that argued smaller class sizes resulted in more effective long-term learning (Nye, B., Hedges, L. V., & Konstantopoulos, S., 1999). This study will fill in the knowledge gap about how colleges with small classes can still compete against colleges with well-established brands that have large classes. Benefits of this research study for colleges with small class sizes is that college administrators can learn which satisfaction factors, possibly overlooked by colleges with larger class sizes, have the most influence on net promoter score and ultimately improve their competitiveness.

Literature Review

A literature review of previous relevant studies about net promoter score, satisfaction factors, and colleges with small classes is provided. Net promoter score was labeled as the single most reliable number about customer loyalty to measure business growth (Reichheld, F. F., 2003). However, a study in Norway failed to find any superiority of net promoter score compared with other loyalty metrics (Keiningham, T. L., Cooil, B., Andreassen, T. W., & Aksoy, L., 2007). Other customer metrics were also found to predict sales and revenue growth equally well compared to net promoter score (Van Doorn, J., Leeflang, P. S., & Tijs, M., 2013). Culture was also discovered to have an impact on net promoter score because a study in South Korea and Japan revealed that even though some respondents had a positive attitude toward the measured company, they provided low NPS scores to avoid the risk of ruining relationships with friends by making a recommendation (Seth, S., Scott, D., & Svihel, C., 2016). In the hotel industry in Spain, a study revealed that the key factors to achieve high net promoter score were gastronomy, cleanliness, and room comfortability (Baquero, A., 2022).

Previous studies about net promoter score in higher education have also been conducted. A previous study about the relationship between the net promoter score and students' college experiences at a state university discovered relationships between college experience, satisfaction, and likeliness to recommend and therefore college administrators should use net promoter score data to their advantage while working to enhance the college experience for students (Kara, A. & Zeren, D., 2023). The results of another study about the efficacy of the net promoter score in predicting online MBA students' intentions to give back to their alma mater showed that classes and financial aid staff were the most influential factors in the likelihood of recommendation with promoters being 2 to 14 times more likely to give back to their alma mater compared to detractors (Kara, A., Spillan, J. E., & Bell, C., 2024). Another similar study about student satisfaction with learning experience and its impact on likelihood of university recommendation revealed that students had highest satisfaction with feeling support by faculty and staff (Pinar, M., Wilder, C., Luth, M., & Girard, T., 2023).

Recent studies about satisfaction factors in higher education focused on online learning due to the Covid-19 pandemic which greatly impacted the global education industry. A positive correlation was found between online learning satisfaction and academic achievement (Basith, A., Rosmayadi, R., Triani, S. N., & Fitri, F., 2020). A study to identify key attributes affecting user satisfaction of e-learning in higher education revealed that course attributes, system attributes, interactive attributes, and instructor attributes were found to significantly influence user satisfaction, with instructor attributes being the most significant contributor (Daultani, Y., Goswami, M., Kumar, A., & Pratap, S., 2021). Another study about online learning satisfaction showed that online learning satisfaction is positively influenced by student experience, online learning readiness, and the presence of lecturers in online learning (Suhandiah, S., Suhariadi, F., Yulianti, P., Wardani, R., & Muliatie, Y. E., 2022). In the hospitality and tourism education sector, a study revealed that simulation and attractiveness is the strongest predictor of students' satisfaction towards online learning so online courses should deliver an attractive and motivating visual environment (Agyeiwaah, E., Baiden, F. B., Gamor, E., & Hsu, F. C., 2022).

Several studies across the world investigated satisfaction factors in higher education. In Pakistan, teachers' expertise was found to be the most influential factor among all the variables contributing to students' satisfaction in higher education followed by learning environment and courses offered (Butt, B. Z., & Ur Rehman, K., 2010). In Sri Lanka, university image, quality of facilities, and quality of degree program were revealed to be the most statistically significant predictors of student satisfaction (Weerasinghe, I. M. S., & Fernando, R. L. S. I., 2018). In Vietnam, the results of a study showed that lecturer interaction and course overview affected student satisfaction in online learning (Anh, D. H. M., 2022). In Turkey, another study revealed that assurance and empathy from service quality dimensions, and cultural differences and religious belief variables from socio-cultural adaptation difficulties positively affect student satisfaction (Yilmaz, K., & Temizkan, V., 2022).

Previous studies about class size suggested that educational institutions that provide smaller classes deliver more educational benefits, which can be viewed as better services when reconsidering higher education from a business perspective. A study about the challenges and opportunities of teaching larger classes at college level revealed that large classes at tertiary level create problems for both staff and students leading to less effective teaching and learning (Mulryan-Kyne, C., 2010). Class size was also found to negatively impact student assessments of courses and instructors with larger classes causing course adjustments that are harmful to students (Monks, J., & Schmidt, R. M., 2011). In a later study about student preferences for small and large class sizes, the findings showed that students liked small classes because of professor-student interaction and the better learning environment but larger classes can also have benefits due to more classmates and having decreased responsibility (Koenig, L. B., Gray, M., Lewis, S., & Martin, S., 2015). In another study about college class size, the results showed that students enrolled in larger classes had significantly fewer interactions with professors about course material and with peers about course-related ideas, but social groups can moderate some effects of class size (Beattie, I. R., & Thiele, M., 2016). In China, a study about the effect of class size in compulsory education demonstrated that small class teaching helps cultivate students' personalities leading to more effective communication and improved teaching efficiency while large class teaching resulted in low participation of students (Li, X., & Li, M., 2021). In summary, while larger classes generate more revenue for colleges, it comes at the cost of reduced educational effectiveness per each extra student in class which means that colleges with small classes can have a competitive advantage in more effective teaching versus colleges with larger classes.

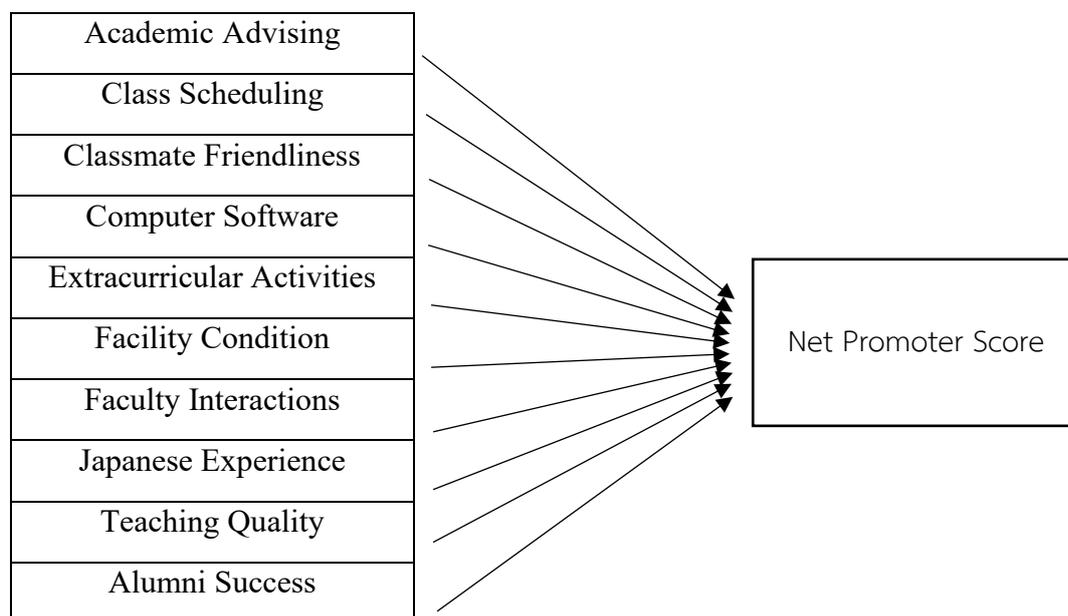
The recent previous study about the relationship between net promoter score and students' college experiences at a state university (Kara, A. & Zeren, D., 2023) provided the

model basis to support the theoretical underpinning of this study’s conceptual model. The proposed model (Kara, A. & Zeren, D., 2023) showed that students’ college experience consists of five factors of faculty, classes, advising, staff, and facilities, each of which influences overall satisfaction and ultimately likelihood to recommend or net promoter score. This citation establishes the existing research and theoretical frameworks upon which this study’s model is based in order to demonstrate the validity and relevance of the proposed relationships between variables.

This study’s proposed model is built upon the previous model (Kara, A. & Zeren, D., 2023) where additional satisfaction factors were added to explore the effects of new satisfaction factors that did not exist in previous literature while the key net promoter score variable remains the same. Based on the results of a brief, qualitative pilot study where 40 students across several small classes were asked to identify key satisfaction factors that have the highest influence on their likeliness to recommend studying in Thai-Nichi International College. The additional satisfaction factors were identified as class scheduling, classmate friendliness, computer software, extracurricular activities, Japanese experience, and alumni success. Japanese experience was included as a satisfaction factor because every student studying at the Thai-Nichi Institute of Technology are required to study a minimum of four Japanese language courses while being exposed to Japanese culture. The conceptual framework of ten satisfaction factors and net promoter score is shown in Figure 1.

Figure 1

Conceptual Framework of Satisfaction Factors and Net Promoter Score



Ten null hypotheses are formed to hypothesize the lack of relationship between each independent variable and the dependent variable:

H01: There is no relationship between satisfaction with academic advising and net promoter score.

H02: There is no relationship between satisfaction with class scheduling, and net promoter score.

- H03: There is no relationship between satisfaction with classmate friendliness and net promoter score.
- H04: There is no relationship between satisfaction with computer software and net promoter score.
- H05: There is no relationship between satisfaction with extracurricular activities and net promoter score.
- H06: There is no relationship between satisfaction with facility condition and net promoter score.
- H07: There is no relationship between satisfaction with faculty interactions and net promoter score.
- H08: There is no relationship between satisfaction with Japanese experience and net promoter score.
- H09: There is no relationship between satisfaction with teaching quality and net promoter score.
- H10: There is no relationship between satisfaction with alumni success and net promoter score.

Research Objectives

The objective of this research study is to investigate which satisfaction factors contribute to higher net promoter score. The ten satisfaction factors are academic advising, class scheduling, classmate friendliness, computer software, extracurricular activities, facility condition, faculty interactions, Japanese experience, teaching quality, and alumni success.

Research Methodology

After receiving ethics approval, data is collected by distributing questionnaires to a convenient sample of 100 undergraduate students studying in Thai-Nichi International College (TNIC) which is an international program faculty affiliated with the Thai-Nichi Institute of Technology in Bangkok, Thailand. Ideally, the researcher would like to survey additional samples of multiple international colleges in Bangkok, Thailand to increase the accuracy of inferential statistics, but due to resource and time limitations, TNIC, with a student population of slightly less than 200, was the only international college surveyed. According to recommendation of a previous study about sample size in multiple regression, the minimum sample size in multiple regression is 20 plus five times the independent variables (Khamis, H. J., & Kepler, M., 2010). In this study, there are ten independent variables so the minimum sample size is calculated to be 100, although it is acknowledged that the sample size of 100 is far from the ideal number of 400 for inferential statistics. There are potential limitations associated with smaller sample size such as reduced accuracy in statistical power and increased susceptibility to Type II errors. The questionnaires were developed based on previous studies done about students' satisfaction in higher education (Aldemir, C., & Gülcan, Y., 2004; Butt, B. Z., & Ur Rehman, K., 2010). The survey consisted of questions about students' satisfaction measured on a 5-point Likert scale ranging from "Very dissatisfied (1)" to "Very satisfied (5)". The survey has organized into ten sections asking about each of the ten satisfaction factors. The final question on the questionnaire was "How likely are you to recommend studying at TNIC to a friend or relative?" with the scale being out of 10 points ranging from "Not at all likely (0-2)", "Neutral (3-7)", and "Extremely likely (8-10)" to measure the net promoter score. Reliability for this questionnaire to evaluate internal consistency was tested using Cronbach's Alpha with the numbers ranging from 0.8013 to 0.717 for different satisfaction factors which

showed relatively high credibility and consistency. The survey data was organized and analyzed with regression analysis using Microsoft Excel.

Quantitative analysis was used to analyze the numerical data from the survey. Firstly, descriptive statistics about the level of satisfaction for each factor was shown to provide some context about the student experience before regression analysis. Secondly, simple linear regression was used to analyze the predictive relationship between each of the ten independent variables or satisfaction factors and the dependent variable of net promoter score. The statistics of interest are correlation coefficient which indicates the degree of linear relationship between the two variables, R square value which indicates the percentage of variance in the dependent variable that can be explained by the independent variable, and p-value of ANOVA which indicates a significant relationship between two variables if the value is less than 0.05 to allow rejection of null hypothesis. Thirdly, multiple linear regression analysis was used on all ten independent variables to reveal which satisfaction factors have the most predictive effect on the dependent variable of net promoter score. If any independent variables have p-values that are greater than 0.05, they must be filtered out before multiple linear regression analysis is used again on remaining significant independent variables to determine the adjusted R Square value which indicates the percentage of the variance in the dependent variable that can be explained by multiple significant independent variables.

Research Results

Microsoft Excel was used to analyze the data with descriptive statistics followed by simple linear regression and multiple linear regression analysis to fulfill the research objective. Descriptive statistics about the average scores for questions about each satisfaction factor is displayed first in Table 1 to provide some context about the student experience before regression analysis. A total of 100 undergraduate students from TNIC responded to the anonymous survey that conveniently sampled 36 first year students, 30 second year students, 24 third year students, and 10 fourth year students. Out of the ten satisfaction factors, classmate friendliness received the highest average score of 4.34 followed closely by Japanese experience at 4.32 and faculty interactions at 4.08, all of which received an average score of over 4 points out of a maximum of 5 points indicating high satisfaction with these three factors. Classroom scheduling received an average score of 3.8, facility condition received an average score of 3.78, teaching quality received an average score of 3.76, and extracurricular activities received an average score of 3.72 which shows there is some room for improvement. Finally, academic advising and alumni success each received an average score of 3.7 while computer software received the lowest average score of 3.34. Average net promoter score is 6.6 which indicates that on average, respondents are somewhere between being a passive who neither promotes or discourages using a brand, and a detractor who may actively discourage using a brand.

Table 1

Descriptive Statistics of Satisfaction Factors

Satisfaction Factors	Average Score
Classmate Friendliness	4.34
Japanese Experience	4.32
Faculty Interactions	4.08
Class Scheduling	3.8
Facility Condition	3.78
Teaching Quality	3.76

Satisfaction Factors	Average Score
Extracurricular Activities	3.72
Academic Advising	3.7
Alumni Success	3.7
Computer Software	3.34
Net Promoter Score	6.6

Note. All research factors follow a 5-point Likert scale except for net promoter score which is out of 10 points.

Simple linear regression analysis on Microsoft Excel program is then used to examine the relationships between each of the ten independent variables and the dependent variable of net promoter score to test whether the null hypotheses are true. The ten independent variables are academic advising, class scheduling, classmate friendliness, computer software, extracurricular activities, facility condition, faculty interactions, Japanese experience, teaching quality, and alumni success. The significance F or p-value of ANOVA of all ten satisfaction factors were below 0.001 and since the p-value is less than 0.05, this means rejection of all ten null hypotheses which assume no significant relationship between each of the independent variables and the dependent variable, while acceptance of alternative hypotheses. To summarize, null hypotheses H01, H02, H03, H04, H05, H06, H07, H08, H09, and H10 are all rejected indicating that each satisfaction factor has a significant relationship with net promoter score.

Simple linear regression analysis between satisfaction with academic advising and net promoter score revealed a multiple R or correlation coefficient of 0.5944 which means there is a moderate linear relationship between them. The R Square value was 0.3533 which means that 35.33% of the variance in net promoter score can be explained by satisfaction with academic advising. Simple linear regression analysis between satisfaction with class scheduling and net promoter score revealed a multiple R or correlation coefficient of 0.4235 which means there is a moderate linear relationship between them. The R Square value was 0.1793 which means that 17.93% of the variance in net promoter score can be explained by satisfaction with class scheduling. Simple linear regression analysis between satisfaction with classmate friendliness and net promoter score revealed a multiple R or correlation coefficient of 0.3324 which means there is a weak linear relationship between them. The R Square value was 0.1105 which means that 11.05% of the variance in net promoter score can be explained by satisfaction with classmate friendliness. Simple linear regression analysis between satisfaction with computer software and net promoter score revealed a multiple R or correlation coefficient of 0.3471 which means there is a weak linear relationship between them. The R Square value was 0.1205 which means that 12.05% of the variance in net promoter score can be explained by satisfaction with computer software. Simple linear regression analysis between satisfaction with extracurricular activities and net promoter score revealed a multiple R or correlation coefficient of 0.3489 which means there is a weak linear relationship between them. The R Square value was 0.1217 which means that 12.17% of the variance in net promoter score can be explained by satisfaction with extracurricular activities. Simple linear regression analysis between satisfaction with facility condition and net promoter score revealed a multiple R or correlation coefficient of 0.5249 which means there is a moderate linear relationship between them. The R Square value was 0.2755 which means that 27.55% of the variance in net promoter score can be explained by satisfaction with facility condition. Simple linear regression analysis between satisfaction with faculty interactions and net promoter score revealed a multiple R or correlation coefficient of 0.3513 which means there is a weak linear relationship between them. The R Square value was 0.1234 which means that 12.34% of the variance in net promoter score

can be explained by satisfaction with faculty interactions. Simple linear regression analysis between satisfaction with Japanese experience and net promoter score revealed a multiple R or correlation coefficient of 0.284 which means there is a weak linear relationship between them. The R Square value was 0.0807 which means that 8.07% of the variance in net promoter score can be explained by satisfaction with Japanese experience. Simple linear regression analysis between satisfaction with teaching quality and net promoter score revealed a multiple R or correlation coefficient of 0.4233 which means there is a moderate linear relationship between them. The R Square value was 0.1792 which means that 17.92% of the variance in net promoter score can be explained by satisfaction with teaching quality. Simple linear regression analysis between satisfaction with alumni success and net promoter score revealed a multiple R or correlation coefficient of 0.4849 which means there is a moderate linear relationship between them. The R Square value was 0.2351 which means that 23.51% of the variance in net promoter score can be explained by satisfaction with alumni success.

Table 2

Regression Statistics of Satisfaction Factors

Satisfaction Factors	Multiple R	R Squared
Academic Advising	0.5944	0.3533
Class Scheduling	0.4235	0.1794
Classmate Friendliness	0.3324	0.1105
Computer Software	0.3471	0.1205
Extracurricular Activities	0.3489	0.1217
Facility Condition	0.5249	0.2755
Faculty Interactions	0.3513	0.1234
Japanese Experience	0.248	0.0807
Teaching Quality	0.4233	0.1792
Alumni Success	0.4849	0.2351

Note. Multiple R indicates level of correlation. R Squared indicates the percentage of variance in dependent variable that can be explained by independent variable.

To summarize the results of the simple linear regression analysis between each of the ten independent variables and the dependent variable of net promoter score, satisfaction factors that have a moderate correlation with net promoter score with a multiple R or correlation coefficient of between 0.4 to 0.69 are academic advising, facility condition, alumni success, class scheduling, and teaching quality while the remaining satisfaction factors have weak correlation of below 0.39. None of the satisfaction factors were found to have strong correlation of 0.7 or above. Satisfaction with academic advising was found to have the strongest correlation of 0.5944 with net promoter score which explains about 35% of the variance in net promoter score. This is followed by facility condition which explains about 27% of the variance in net promoter score and alumni success which explains about 23% of the variance in net promoter score. The other satisfaction factors have relatively weak correlation and explain less than 20% of the variance in net promoter score. An interesting thing to note is that based on earlier descriptive statistics, students gave the highest average scores for satisfaction with classmate friendliness and satisfaction with Japanese experience but these two factors each had a weak relationship with net promoter score, which suggests that students do not associate TNIC with providing an environment of friendly classmates or Japanese learning experience in relation to net promoter score.

Lastly, multiple linear regression analysis was used on all ten independent variables to reveal which satisfaction factors have the most predictive effect on the dependent variable of

net promoter score. Initially, when all ten satisfaction factors were input into Microsoft Excel program for multiple linear regression analysis, six satisfaction factors of class scheduling, classmate friendliness, computer software, extracurricular activities, Japanese experience, and teaching quality were found to have p-values that are much greater than 0.5. After removing these six insignificant satisfaction factors and using multiple linear regression analysis on just the four remaining satisfaction factors of academic advising, facility condition, faculty interactions, and alumni success, one satisfaction factor of facility condition was found to have a p-value that is greater than 0.5 so facility condition was removed before further multiple linear regression analysis was conducted. Finally, when multiple linear regression analysis was done on the last three remaining significant satisfaction factors of academic advising, faculty interactions, and alumni success, all three had p-values of less than 0.05 indicate statistical significance as shown in Table 3.

Table 3
Multiple Linear Regression Statistics of Three Satisfaction Factors

	Coefficients	Standard Error	T Stat	P-Value
Intercept	-0.8695	0.8213	-1.0588	0.2927
Academic Advising	0.9757	0.1615	6.0415	0.0000
Faculty Interactions	0.3901	0.1501	2.5987	0.0108
Alumni Success	0.613	0.1573	3.898	0.0001

Note. Coefficients, Standard Error, T Stat, and P-Value of Each Satisfaction Factor.

Regression statistics showed an adjusted R Square of 0.4759 which indicates that 47.59% of the variance in net promoter score can be explained by the three satisfaction factors of academic advising, faculty interactions, and alumni success. The intercept coefficient is -0.8696, academic advising coefficient is 0.9757, faculty interaction coefficient is 0.3901, and alumni success coefficient is 0.613 which allows predictive modeling of net promoter score based on satisfaction scores with academic advising, faculty interactions, and alumni success. The regression equation of “Predicted Y = a + b1X1 + b2X2 + b3X3” may be used for prediction by inputting the revealed coefficients. For example, if a student gives satisfaction with academic advising, faculty interactions, and alumni success a rating of 4 points each, the net promoter score is predicted to be 7.0454 and if a student gives satisfaction with academic advising, faculty interactions, and alumni success a rating of 5 points each, the net promoter score is predicted to be 9.0241.

Discussion of Results

Thailand has an aging population which means that there is a declining number of Thai students studying in colleges each year resulting in tougher competition, necessity to access the international student market, and the need to create more value for the student experience. While some larger colleges can utilize their famous reputation to attract a higher number of students resulting in large class sizes of up to 100 students or more, it does come with the disadvantage of having less time to take care of each student. This provides an opportunity for smaller colleges such as TNIC with small class instruction of not more than 25 students to compete against larger colleges by being able to focus more on specific satisfaction factors that are overlooked by larger colleges due overload of students.

Colleges are just like any other businesses that require profits to survive. Not only do they need to provide quality teaching, they also need to engage in marketing activities and research to develop their brand for the public. Net promoter score is perhaps one of the simplest and most effective way to quickly measure brand loyalty which can be applied to college

education as well. By examining which satisfaction factor leads to higher net promoter score, small college administrators can improve on these satisfaction factors to create more value for the student experience in order to maintain a continuous feedback cycle of current students recommending their colleges to future students. In this particular study, satisfaction factors discovered by simple linear regression to have a moderate correlation with net promoter score are academic advising, facility condition, alumni success, class scheduling, and teaching quality while the remaining satisfaction factors have weak correlation. However, when multiple linear regression was conducted on all ten satisfaction factors, three satisfaction factors of academic advising, faculty interactions, and alumni success were found to be the most statistically significant in their relationship with net promoter score. The result is consistent with a previous study that indicated academic advising has the highest impact on student satisfaction (Tessema, M. T., Ready, K., & Yu, W., 2012) and another previous study that also correlated academic advising and faculty interaction with net promoter score (Kara, A., & Zeren, D. (2023). However, this study revealed the new significant satisfaction factor of alumni success which previous studies did not mention. Therefore, based on the results of this study, college administrators should use their scarce resources to focus more on improving faculty members' academic advising effectiveness, developing closer faculty connections with students, and ensuring the professional success of graduates to improve their net promoter score versus wasting scarce resources by overemphasizing on other less important factors which ultimately don't affect their net promoter score much.

The limitations to this research study must be acknowledged and several significant limitations are evident. The sample size of only 100 participants from a single institution may be insufficient for broad generalization. The use of convenient sampling may introduce selection bias and there is a lack of detailed information about testing regression assumptions, such as normality, multicollinearity, and homoscedasticity. There is also the absence of power analysis to confirm sample size adequacy. The results also lack visual presentation in the form of charts or graphs that would enhance reader comprehension, such as scatter plot matrices, correlation heat maps, or residual plots. This study used quantitative analysis which provided reliable numerical data which can be generalized across larger populations but cannot answer why or reveal deeper motivations behind the answers.

Research Suggestions

Future studies are needed to uncover critical satisfaction factors that have a stronger relationship with net promoter score. Using multiple linear regression analysis, this research study only identified three satisfaction factors which are academic advising, faculty interactions, and alumni success that were found to have moderate significant effect on net promoter score accounting for about 47% of its variance. Over 53% of the variance is accounted for by other hidden satisfaction factors that future studies can reveal. More detailed methodologies are also suggested, such as in-depth qualitative studies, cross-institutional comparative studies, or longitudinal studies to track net promoter score changes over time.

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New Knowledge

To summarize the results of the simple linear regression analysis between each of the ten independent variables and the dependent variable of net promoter score, satisfaction factors that have a moderate correlation with net promoter score with a multiple R or correlation coefficient of between 0.4 to 0.69 are academic advising, facility condition, alumni success, class scheduling, and teaching quality while the remaining satisfaction factors have weak correlation of below 0.39. None of the satisfaction factors were found to have strong correlation of 0.7 or above. Satisfaction with academic advising was found to have the strongest correlation of 0.5944 with net promoter score which explains about 35% of the variance in net promoter score. This is followed by facility condition which explains about 27% of the variance in net promoter score and alumni success which explains about 23% of the variance in net promoter score. The other satisfaction factors have relatively weak correlation and explain less than 20% of the variance in net promoter score. When ANOVA was used for hypothesis testing, all ten satisfaction factors were each found to have a p-value of less than 0.05. Null hypotheses H01, H02, H03, H04, H05, H06, H07, H08, H09, and H10 were all rejected to indicate the existence of significant relationships with net promoter score. Multiple linear regression statistics showed an adjusted R Square of 0.4759 which indicates that 47.59% of the variance in net promoter score can be explained by the three satisfaction factors of academic advising, faculty interactions, and alumni success. Benefits of this research study for colleges with small class sizes is that college administrators can learn which satisfaction factors, possibly overlooked by larger colleges, have the most influence on net promoter score and ultimately improve their competitiveness. The finding that academic advising is the most important factor provides valuable insights for institutional administrators. However, the new knowledge is limited due to studying only one institution with a small sample size. Broad generalization must therefore be approached cautiously. Additionally, studying within the Thai context and an institution with special characteristics (mandatory Japanese language learning) may limit the direct applicability of results to other institutions.

References

- Agyeiwaah, E., Baiden, F. B., Gamor, E., & Hsu, F. C. (2022). Determining the attributes that influence students' online learning satisfaction during COVID-19 pandemic. *Journal of Hospitality, Leisure, Sport & Tourism Education, 30*(1), 100364.
- Aldemir, C., & Gülcan, Y. (2004). Student satisfaction in higher education: A Turkish case. *Higher education management and policy, 16*(2), 109-122.
- Anh, D. H. M. (2022). Factors affecting satisfaction on online education on students digital teaching page in Ho Chi Minh City, Vietnam. *Indonesian Journal of Multidisciplinary Research, 2*(1), 179-186.
- Baquero, A. (2022). Net promoter score (NPS) and customer satisfaction: relationship and efficient management. *Sustainability, 14*(4), 2011.
- Basith, A., Rosmayadi, R., Triani, S. N., & Fitri, F. (2020). Investigation of online learning satisfaction during COVID 19: In relation to academic achievement. *Journal of Educational Science and Technology, 6*(3), 265-275.
- Beattie, I. R., & Thiele, M. (2016). Connecting in class? College class size and inequality in academic social capital. *The journal of higher education, 87*(3), 332-362.
- Butt, B. Z., & Ur Rehman, K. (2010). A study examining the students satisfaction in higher education. *Procedia-Social and Behavioral Sciences, 2*(2), 5446-5450.

- Daultani, Y., Goswami, M., Kumar, A., & Pratap, S. (2021). Perceived outcomes of e-learning: identifying key attributes affecting user satisfaction in higher education institutes. *Measuring Business Excellence*, 25(2), 216-229.
- Kara, A., Mintu-Wimsatt, A., & Spillan, J. E. (2024). An application of the net promoter score in higher education. *Journal of Marketing for Higher Education*, 34(2), 478-501.
- Kara, A., Spillan, J. E., & Bell, C. (2024). Efficacy of the Net Promoter Score in predicting online MBA students' intentions to give back to their alma mater. *Journal of Marketing Analytics*, 12(2), 113-125.
- Kara, A., & Zeren, D. (2023). The relationship between the Net Promoter Score (NPS) and students' college experiences at a state university. *International Review on Public and Nonprofit Marketing*, 20(4), 721-737.
- Keiningham, T. L., Cooil, B., Andreassen, T. W., & Aksoy, L. (2007). A longitudinal examination of net promoter and firm revenue growth. *Journal of Marketing*, 71(3), 39-51.
- Khamis, H. J., & Kepler, M. (2010). Sample size in multiple regression: 20+ 5k. *Journal of Applied Statistical Science*, 17(4), 505.
- Koenig, L. B., Gray, M., Lewis, S., & Martin, S. (2015). Student preferences for small and large class sizes. *International Journal of Humanities and Social Science*, 5(1), 20-29.
- Li, X., & Li, M. (2021). The effect of large and small class size in compulsory education in China. *Rangsit Journal of Educational Studies*, 8(1), 46-58.
- Nye, B., Hedges, L. V., & Konstantopoulos, S. (1999). The long-term effects of small classes: A five-year follow-up of the Tennessee class size experiment. *Educational evaluation and policy analysis*, 21(2), 127-142.
- Monks, J., & Schmidt, R. M. (2011). The impact of class size on outcomes in higher education. *The BE Journal of Economic Analysis & Policy*, 11(1), 1-19.
- Mulryan-Kyne, C. (2010). Teaching large classes at college and university level: Challenges and opportunities. *Teaching in higher Education*, 15(2), 175-185.
- Reichheld, F. F. (2003). The one number you need to grow. *Harvard business review*, 81(12), 46-55.
- Seth, S., Scott, D., & Svihel, C. (2016). Solving the mystery of consistent negative/low net promoter score (NPS) in cross-cultural marketing research. *Asia Marketing Journal*, 17(4), 3.
- Siming, L., Gao, J., Xu, D., & Shaf, K. (2015). Factors Leading to Students' Satisfaction in the Higher Learning Institutions. *Journal of education and practice*, 6(31), 114-118.
- Strahan, S., & Credé, M. (2015). Satisfaction with college: Re-examining its structure and its relationships with the intent to remain in college and academic performance. *Journal of College Student Retention: Research, Theory & Practice*, 16(4), 537-561.
- Suhandiah, S., Suhariadi, F., Yulianti, P., Wardani, R., & Muliati, Y. E. (2022). Online learning satisfaction in higher education: what are the determining factors?. *Cakrawala Pendidikan*, 41(2), 351-364.
- Tessema, M. T., Ready, K., & Yu, W. (2012). Factors affecting college students' satisfaction with major curriculum: Evidence from nine years of data. *International Journal of Humanities and Social Science*, 2(2), 34-44.
- Pinar, M., Wilder, C., Luth, M., & Girard, T. (2023). *Student Satisfaction with Learning Experience and Its Impact on Likelihood Recommending University: Net Promoter Score Approach*.
- Van Doorn, J., Leeflang, P. S., & Tijs, M. (2013). Satisfaction as a predictor of future performance: A replication. *International journal of research in marketing*, 30(3), 314-318.

- Weerasinghe, I. M. S., & Fernando, R. L. S. I. (2018). Critical factors affecting students' satisfaction with higher education in Sri Lanka. *Quality Assurance in Education*, 26(1), 115-130.
- Wong, W. H., & Chapman, E. (2023). Student satisfaction and interaction in higher education. *Higher education*, 85(5), 957-978.
- World Bank Group. (2022). *Fertility rate, total (births per woman)*.
<https://data.worldbank.org/indicator/SP.DYN.TFRT.IN>
- Yilmaz, K., & Temizkan, V. (2022). The effects of educational service quality and socio-cultural adaptation difficulties on international students' higher education satisfaction. *Sage Open*, 12(1), 21582440221078316.