

## BE-027

### The marketing mix factors (7Ps) that affect the satisfaction of users of the BTS Skytrain Green Line service

Guohui Pan<sup>1</sup> Xin Liu<sup>2</sup> Uhsa Tevarattikal<sup>3</sup>, \*

Master of Development Administration, Graduate School of Suan Sunandha Rajabhat University<sup>1</sup>

International College of Business Administration, Krirk University<sup>2</sup>

Business Administration Faculty Asia University<sup>3</sup>

\*Corresponding author's e-mail: uhsateva@gmail.com

#### ABSTRACT

The objective of this research is to study (1) the factors affecting the satisfaction of users of the BTS Skytrain Green Line service in the northern region, and (2) to examine the characteristics of satisfaction among users of the BTS Skytrain Green Line service in the northern region. This research utilizes quantitative research methods by collecting data through questionnaires. The sample group consists of 400 users of the BTS Skytrain Green Line service in the northern region. The research tools used include questionnaires. The statistical methods used in the research include percentage analysis, mean, standard deviation, and multiple regression analysis."

The research findings reveal that the majority of users of the BTS Skytrain Green Line service in the northern region are predominantly female, aged between 21-30 years old, single, with a bachelor's degree education level, employed in private companies, with a monthly income of 10,001 - 20,000 baht. They use the service more than 6 times per week. Overall, users of the BTS Skytrain Green Line service in the northern region have a moderate level of satisfaction with the service. They are most satisfied with the process, followed by personnel, facilities, products and services, marketing promotion, and distribution channels, while they are least satisfied with the price. The hypothesis testing results indicate that marketing mix factors significantly influence the satisfaction of users of the BTS Skytrain Green Line service in the northern region.

**Keywords:** Satisfaction, Marketing Mix Factors (7Ps), BTS Skytrain Green Line

#### Introduction

"Currently, transportation infrastructure plays a crucial role in driving the economic and social development of a country and enhances its negotiating ability in global trade. A well-functioning, modern, and efficient transportation system is vital in elevating the standard of living of the population within the country. It also reflects that the country is developed and prioritizes the welfare of its people, as individuals can conveniently and swiftly travel without discrimination based on profession or occupation, utilizing transportation services comfortably. An efficient transportation system and quality service serve as tools to instill trust, confidence, and brand image for organizations, thereby encouraging repeat usage of the services. Moreover, it contributes to the expansion of the economy and urban society, benefiting various areas and lands by creating residential areas and industrial zones, facilitating accessibility to those areas."

The traffic problem in the Bangkok metropolitan area has been a long-standing and accumulating issue for many years. INRIX, a traffic data analysis company, revealed that Bangkok ranks as the 12th most congested city in the world. Vehicle users in Bangkok waste approximately 64.1 hours per year due to traffic congestion (BBC, 2017). The causes of traffic congestion in Bangkok stem from various factors, including urban planning and the increasing number of cars in the city. On average, there has been an increase of 360,000 cars per year in Bangkok over the past five years. Furthermore, the road infrastructure cannot cope with the increasing number of vehicles each year. Additionally, the current public transportation system is insufficient to accommodate the growing population's transportation needs. Moreover, the expansion of business and economic activities in Bangkok has led to increased activities in the inner-city areas, resulting in a higher population density. This, in turn, exacerbates the traffic crisis in the capital city of Thailand (Kasikorn Research Center, 2016).

The BTS Skytrain is a widely used mass transit system with high capacity, capable of serving over 1,000 passengers per train. It is a preferred mode of transportation for commuters and residents along its routes. The operation of the BTS Skytrain is directly related to service provision. A key aspect that differentiates service businesses is maintaining a level of service quality superior to competitors by

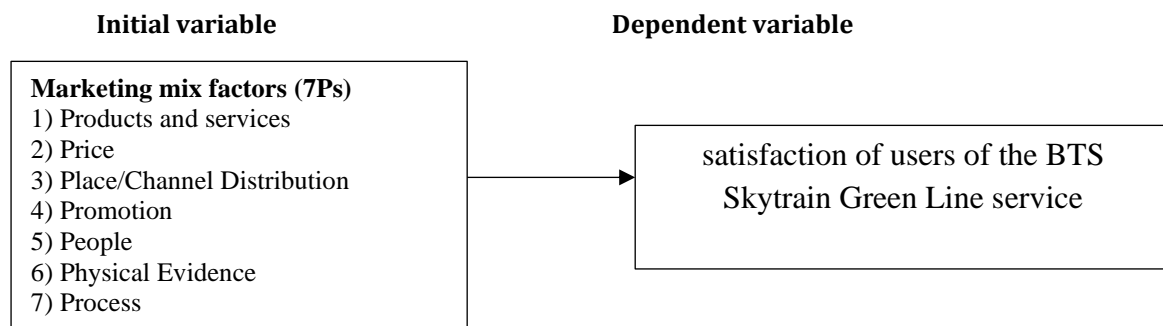
delivering service quality as expected by customers (Waseso, 2013). However, due to the continuous increase in the number of BTS Skytrain users each year, service quality in some aspects may decline due to heightened service demand. Additionally, service disruptions occurred from January to November 2017, totaling 45 incidents (Bangkok Mass Transit System Public Company Limited, 2017). Each incident has caused delays, resulting in significant numbers of passengers experiencing delays and congestion at stations, ultimately affecting passenger satisfaction with the BTS Skytrain service.

The BTS Green Line North, Mo Chit - Saphan Mai, covers a distance of 19 kilometers. It starts from Mo Chit station, passing over the Don Mueang Tollway interchange, Ladprao 5-way intersection, Ratchayothin intersection, and Kasetsart University intersection, with a total of 16 stations. These stations are key locations featuring important commercial areas such as Chatuchak Market, a large fresh market, as well as various culturally rich community attractions like the shrine of the guardian spirit of the Khlong Song (Saen Saep Canal) community. These sites serve as community focal points and are well-connected to various other public transportation lines, such as the MRT Blue Line at the Ladprao 5-way intersection station, the 11th Infantry Regiment station near the Transport Co., Ltd. bus depot, and the Wat Phra Sri Mahathat station connected to the MRT Purple Line. This connectivity allows commuters to avoid traffic congestion during rush hours. Due to the aforementioned reasons, the researchers are interested in studying the "Marketing Mix Factors Affecting the Satisfaction of BTS Green Line North users" by conducting surveys on satisfaction levels across various aspects. This aims to understand customer needs and enable the implementation of research findings to improve service and address future issues.

### Research Objective

1. To study the marketing mix factors (7Ps) that influence the satisfaction of users of the BTS Skytrain Green Line.
2. To investigate the characteristics of satisfaction among users of the BTS Skytrain Green Line.

### Framework



### Research Methodology

#### Population and Sample Group

Population refers to the group of individuals used in this research, which in this case are users of the BTS Skytrain Green Line, with the exact number being unknown.

The sample group consists of 400 users of the BTS Skytrain Green Line.

The sample size is determined using Cochran's formula (Cochran, 1977 Cited in Teerawut Ekakul, 2000), which calculates the sample size when the population size is unknown. This formula sets the population proportion at 50%, the confidence level at 95%, and the margin of error at 0.05%.

$$n = \frac{0.5(1-0.5)(1.96)^2}{0.05^2}$$

Sample Group = 385 Example

The researchers selected the sample group from users of the BTS Skytrain Green Line, for which the population size is unknown. The researchers chose to study a sample group consisting of 400 users of the BTS Skytrain Green Line. Convenience sampling was employed, where individuals who were convenient and willing to respond to the questionnaire were selected. The researchers distributed the

questionnaires themselves, distributing 25 sets per station to users of the BTS Skytrain Green Line at each of the 16 stations, totaling 400 sets.

### Research Tools

This study employs a quantitative research methodology, utilizing questionnaires for data collection. The research tool used for data collection is the questionnaire, which is divided into 3 sections as follows:

Section 1 consists of questions regarding the personal information of the respondents, as designed by the researcher. Respondents are provided with single-choice answers.

Section 2 consists of questions regarding opinions on the 7Ps marketing mix factors of users of the BTS Skytrain Green Line (Benchapha Jaengwetchai, 2016). These questions are rated on a Likert's Scale with 5 levels of approximation, with scoring criteria as follows:

Score Level 5 Indicates Very Strong Agreement

Score Level 4 Indicates Strong Agreement

Score Level 3 Indicates Moderate Agreement

Score Level 2 Indicates Weak Agreement

Score Level 1 Indicates Very Weak Agreement

Part 3 consists of questions regarding the satisfaction levels of users of the BTS Skytrain's Green Line. These questions are in the form of a 5-point Likert scale.

After collecting the data, the scores are summarized and averaged to interpret the meaning. This process involves categorizing the average scores into 5 levels, following the interpretation criteria set by Prakong Karnsutthi, 2553 as follows.

Averaging between 4.50 - 5.00 indicates the highest level of satisfaction.

Averaging between 3.50 - 4.49 indicates a high level of satisfaction.

Averaging between 2.50 - 3.49 indicates a moderate level of satisfaction.

Averaging between 1.50 - 2.49 indicates a low level of satisfaction.

Averaging between 1.00 - 1.49 indicates the lowest level of satisfaction.

### Data Collection

Data collection was conducted to obtain information that reflects reality. Therefore, research assistants were tasked with data collection. Data collection took place between January and March 2567, with 400 questionnaires distributed and a response rate of 100 percent.

The completeness of questionnaire responses was verified, encoded, and analyzed using statistical methods.

### Data processing and analysis

1. Analysis of the personal factors of users of the BTS Northern Green Line was conducted through the distribution of frequency and percentage.

2. Analysis of opinions regarding the 7Ps marketing mix factors among users of the BTS Northern Green Line was performed using mean and standard deviation.

3. Inferential statistics analysis involves the application of statistical methods to test hypotheses.

### Summary of Research Results

#### Summary of Personal Factors Analysis

From the study of a sample group consisting of 400 users of the BTS Green Line train service, it was found that the majority of the sample group are females (85.50%), aged between 21-30 years old (68.30%), predominantly single (78.50%), with a majority holding a bachelor's degree (90.00%). Most of them are employed in private companies (84.30%), with a monthly income ranging from 10,001 to 20,000 baht (39.90%). Additionally, the majority of users utilize the service more than 6 times per week (56.50%).

#### Summary of Market Component Analysis

1. Product and Service: Users of the BTS Green Line train service predominantly prioritize the availability of suitable ticket types (3.19%), followed by the adequacy of train frequencies (3.06%), seating availability (3.05%), the number of trains in service (2.91%), and the suitability of seating and handrails (2.89%).

2. Pricing: Most users prioritize the affordability of ticket issuance fees (2.55%), followed by the affordability of ticket prices for travel (2.27%), and lastly, affordability relative to the current economy (2.22%).

3. Distribution Channels: Users primarily prioritize the convenience of ticket purchasing (2.96%), followed by adequate ticket sales points (2.80%), and lastly, convenient and efficient ticket exchange points (2.64%).

4. Marketing Promotion: Users place importance on perceiving service-related advertising (3.18%), followed by general service advertising (3.16%), and lastly, monthly, weekly, and daily ticket package promotions (2.71%).

5. Personnel: Users value station staff providing helpful guidance (3.60%), followed by honest and sincere service providers (3.54%), knowledgeable staff able to recommend services (3.49%), friendly staff with good interpersonal skills (3.38%), and lastly, sufficient staff for service provision (average score of 3.23).

6. Physical Characteristics: Users prioritize cleanliness of trains and stations (3.69%), followed by station security systems (3.60%), clear signage or connecting points between stations (2.99%), and lastly, adequacy of amenities such as restrooms (2.60%).

7. Processes: Users prioritize journey speed (3.73%), followed by travel convenience (3.54%), and lastly, travel safety with round-the-clock staff availability for assistance and quick incident reporting (3.41%).

#### Summary of User Satisfaction Analysis:

Regarding user satisfaction, it was found that users of the BTS Green Line train service primarily prioritize overall service satisfaction received from using the BTS Green Line train service (3.20%). Following this is the overall satisfaction level towards using the BTS Green Line train service (3.15%), and lastly, the perception that the service received from using the BTS Green Line train service is better than what users expected (3.10%).

#### Summary of Hypothesis Testing Results:

Hypothesis 1.1 (H1.1): Market component factors, specifically products and services, significantly affect overall satisfaction levels with the BTS Green Line train service. It was found that factors such as the adequacy of train frequency, availability of seats and handrails, and the suitability of ticket options all had a statistically significant impact on overall satisfaction with the BTS Green Line train service, with an average significance level of  $\text{sig.} = 0.005$ . This indicates that market component factors, particularly related to products and services, do influence overall satisfaction with the BTS Green Line train service.

Hypothesis 1.2 (H1.2): Market component factors, specifically price-related factors, significantly affect overall satisfaction levels with the BTS Green Line train service. It was found that factors such as the suitability of ticket prices for travel, the appropriateness of fare charges, and compatibility with the current economy all had a statistically significant impact on overall satisfaction with the BTS Green Line train service, with an average significance level of  $\text{sig.} = 0.000$ . This indicates that price-related market component factors influence overall satisfaction with the BTS Green Line train service.

Hypothesis 1.3 (H1.3): Market component factors related to distribution channels significantly influence overall satisfaction levels with the BTS Green Line train service. It was found that factors such as convenience in ticket purchasing, adequacy of ticket sales outlets, and efficiency of ticket exchange facilities all had a statistically significant impact on overall satisfaction with the BTS Green Line train service, with an average significance level of  $\text{sig.} = 0.000$ . This suggests that distribution channel-related market component factors influence overall satisfaction with the BTS Green Line train service.

Hypothesis 1.4 (H1.4): Market component factors related to marketing promotion significantly affect overall satisfaction levels with the BTS Green Line train service. It was found that factors such as advertising and promotion related to service provision, perception of advertising and promotion related to service provision, and packaging of monthly, weekly, and daily ticket packages all had a statistically significant impact on overall satisfaction with the BTS Green Line train service, with an average significance level of  $\text{sig.} = 0.004$ . This indicates that marketing promotion-related market component factors influence overall satisfaction with the BTS Green Line train service.

Hypothesis 1.5 (H1.5): Market component factors related to personnel significantly influence overall satisfaction levels with the BTS Green Line train service. It was found that factors such as friendly staff, good human relations, sufficient staff for service provision, knowledgeable staff capable of providing recommendations, honest and sincere service providers, and station personnel providing helpful assistance all had a statistically significant impact on overall satisfaction with the BTS Green Line train

service, with an average significance level of  $\text{sig.} = 0.003$ . This indicates that personnel-related market component factors influence overall satisfaction with the BTS Green Line train service.

Hypothesis 1.6 (H1.6): Market component factors related to physical characteristics significantly influence overall satisfaction levels with the BTS Green Line train service. It was found that factors such as cleanliness of train compartments and stations, security systems at stations, adequacy of facilities such as restrooms and trash bins, presence of clear signage indicating routes, or clear connections between stations all had a statistically significant impact on overall satisfaction with the BTS Green Line train service, with an average significance level of  $\text{sig.} = 0.002$ . This indicates that market component factors related to physical characteristics influence overall satisfaction with the BTS Green Line train service.

Hypothesis 1.7 (H1.7): Market component factors related to processes significantly influence overall satisfaction levels with the BTS Green Line train service. It was found that factors such as convenience in travel, speed of travel, and safety in travel, with staff available at all times to request assistance or report incidents easily and quickly, had a statistically significant impact on overall satisfaction with the BTS Green Line train service, with an average significance level of  $\text{sig.} = 0.000$ . This indicates that market component factors related to processes influence overall satisfaction with the BTS Green Line train service.

## Research Discussion

### Personal Factors

Most users of the BTS Green Line train service in Northern Thailand are predominantly female (because most females do not like to drive in traffic jams), aged between 21-30 years old, single, holding bachelor's degrees, employed in private companies, with a monthly income of 10,001 - 20,000 baht, and utilizing the service more than 6 times per week. This aligns with the research conducted by Phromsiri, Panjeran, and Patthanasit (2018), which studied the factors influencing the satisfaction of BTS Green Line train service users. According to the study, the majority of users were female, totaling 282 individuals, while male users numbered 118. The age range of surveyed BTS Green Line train service users was predominantly between 16-30 years old, with the majority being single, totaling 318 individuals. In terms of educational background, most respondents held bachelor's degrees, totaling 268 individuals. Regarding occupation, the majority were employed in private companies, totaling 166 individuals. In terms of monthly income, the majority had incomes ranging from 10,001 to 25,000 baht, totaling 173 individuals. The hypothesis testing revealed that gender differences significantly affect the satisfaction of BTS Green Line train service users at a significance level of 0.05.

### Marketing Mix Factors

From the analysis results, it was found that marketing mix factors, including product and service, price, distribution channels, marketing promotion, personnel, physical evidence, and processes, have an impact on the satisfaction of users of the BTS Green Line train service in Northern Thailand. This may be due to marketing mix factors being considered stimuli that contribute to consumer satisfaction, which aligns with Oliver (1985 as cited in Mondkon Wijitrsakul, 2009) who discussed consumer satisfaction as an outcome resulting from the evaluation of purchase and service usage experiences. It can be further clarified that satisfaction refers to the positive expression of feelings resulting from evaluating experiences and receiving services that meet or exceed customer expectations. In contrast, dissatisfaction refers to the negative expression of feelings resulting from evaluating experiences of receiving services below customer expectations.

### Important Factors for Satisfaction

Users of the BTS Green Line express moderate importance towards marketing mix factors that influence their satisfaction with the BTS Green Line train service in Northern Thailand. This is because before utilizing the BTS Green Line service, users must conduct research and gather information. Therefore, users of the BTS Green Line consider or prioritize marketing mix factors such as product and service, distribution channels, marketing promotion, personnel, physical evidence, and processes. This aligns with the study conducted by Sirirat Sahuankul (2013), which investigated satisfaction with the BTS train service. From the study, it was found that respondents had opinions regarding various marketing mix factors. Specifically, product and service were deemed the most significant factor influencing overall service delivery, while distribution channels placed the highest importance on the quantity and distribution of station areas. In terms of marketing promotion, the highest importance was given to various promotional activities and sales promotions. Other psychologically related factors considered were learning from

experience and convenience from previous use of the train service. Additionally, economic and political factors prioritized policy promotion activities, particularly in expanding railway connectivity projects. In the field of sociology and demography, lifestyle factors in rapidly developing urban societies were given the highest priority. Regarding satisfaction, it was found that satisfaction with the value for the quality of service received was the highest, consistent with the research by Sopon Virawatanachaiyong (2013), which studied factors influencing the decision to use railways among residential car users in the metropolitan area, specifically the Bang Yai - Bang Sue Line. From the study, respondents placed the highest importance on time factors, particularly in terms of speed and punctuality during headway periods. Convenience factors for travelers, such as fare rates, multi-destination ticket usage in one day, and service quality, were also considered important, with convenience being the highest priority.

### Research results

**Table 1** presents the results of the multiple linear regression analysis of the marketing mix components on users of the BTS Northern Green Line.

Variability	SS	Df	MS	F	Sig.
Regression	137.818	7	19.688	70.646	.000
Residual	111.476	394	.279		
Total	249.294	399			

From Table 1, the analysis results indicate that the variables capable of predicting marketing mix components for users of the BTS Northern Green Line have a statistically significant linear relationship with the group of independent variables at the 0.05 level, and a linear regression equation can be formulated.

**Table 2** presents the results of the analysis of marketing mix components for users of the BTS Northern Green Line using Stepwise Linear Regression Analysis.

variable	B	SE	t	Sig.
Constant	.761	.181	4.214	.000
Products and services (X <sub>2</sub> )	.168	.060	2.800	.005
Price (X <sub>3</sub> )	.208	.046	4.496	.000
Distribution channel (X <sub>4</sub> )	.236	.058	4.067	.000
Marketing promotion (X <sub>5</sub> )	.138	.047	2.921	.004
Personnel (X <sub>6</sub> )	.035	.052	.680	.497
Physical characteristics (X <sub>7</sub> )	.029	.044	.671	.502
Proceed (X <sub>8</sub> )	.087	.037	2.349	.019

$r = .652$  Adjusted  $R^2 = .429$   $R^2 = .431$  SE = .28461

From Table 2, it is evident that the coefficient of determination ( $R^2 = .431$ ) indicates that marketing mix components significantly contribute to the satisfaction of users of the BTS Northern Green Line. Specifically, the distribution channel has the most significant impact ( $B = .236$ ), followed by price ( $B = .208$ ), product and service ( $B = .168$ ), promotion ( $B = .138$ ), process ( $B = .087$ ), personnel ( $B = .035$ ), and physical evidence ( $B = .029$ ), respectively.

#### Study Results Summary:

Variables that positively correlate with the satisfaction of users of the BTS Green Line train service in Northern Thailand, with statistical significance at the 0.05 level, are product and service, price, distribution channels, marketing promotion, personnel, physical evidence, and process, with coefficients of .168, .208, .236, .138, .035, .029, and .087 respectively. This means that marketing mix factors including product and service, price, distribution channels, marketing promotion, personnel, physical evidence, and process are determinants of satisfaction among users of the BTS Green Line train service in Northern Thailand. Based on these coefficients, the results can be interpreted as follows:

If we do not consider marketing mix factors on the satisfaction of users of the BTS Green Line train service in Northern Thailand, we find that the satisfaction level of users of the BTS Green Line train service in Northern Thailand is at .761 units.

If the overall satisfaction level of users of the BTS Green Line train service in Northern Thailand increases by 1 unit, it results in an increase of .168 units in the marketing mix factor of product and service.

If the overall satisfaction level of users of the BTS Green Line train service in Northern Thailand increases by 1 unit, it increases by 208 units in the marketing mix factor of price.

If the overall satisfaction level of users of the BTS Green Line train service in Northern Thailand increases by 1 unit, it results in an increase of .236 units in the marketing mix factor of distribution channels.

If the overall satisfaction level of users of the BTS Green Line train service in Northern Thailand increases by 1 unit, it results in an increase of .138 units in the marketing mix factor of marketing promotion.

If the overall satisfaction level of users of the BTS Green Line train service in Northern Thailand increases by 1 unit, it results in an increase of .035 units in the marketing mix factor of personnel.

If the overall satisfaction level of users of the BTS Green Line train service in Northern Thailand increases by 1 unit, it results in an increase of .029 units in the marketing mix factor of physical evidence.

If the overall satisfaction level of users of the BTS Green Line train service in Northern Thailand increases by 1 unit, it results in an increase of .087 units in the marketing mix factor of process.

### Recommendations

1) Regarding products and services, the research findings reveal that satisfaction with the number of train services provided is the lowest. Therefore, it is advisable to increase the number of train services to adequately accommodate users. This ensures that ticket-checking machines are regularly monitored for any issues or abnormalities to prevent malfunctions or service interruptions during rush hours. Additionally, increasing the number of handrails is recommended to prevent accidents.

2) In terms of pricing, the research findings indicate that satisfaction with affordability in the current economy is the lowest. Therefore, it is not advisable to further increase the fare for special extensions. Instead, pricing should be kept at the most reasonable level.

3) Concerning distribution channels, the research findings reveal that satisfaction with the convenience of ticket exchange points is the lowest. Therefore, it is recommended to increase the distribution channels for ticket sales or deploy more staff at ticket exchange points to adequately serve users during rush hours.

4) Regarding marketing promotions, the research findings indicate that satisfaction with the monthly, weekly, and daily ticket package offerings is the lowest. Therefore, introducing cost-effective travel packages to alleviate the financial burden on users is recommended.

5) In terms of personnel, the research findings reveal that satisfaction with the adequacy of staff for service provision is the lowest. Hence, increasing the number of station staff to assist and provide travel guidance to users during rush hours is recommended.

6) Regarding physical facilities, such as restroom availability, the research findings indicate that satisfaction is the lowest. Therefore, increasing the number of restrooms to accommodate users adequately and installing clear signage to restrooms is recommended.

7) Concerning processes, satisfaction with travel safety, particularly the availability of staff for assistance and incident reporting, is the lowest. Hence, enhancing communication channels and coordination to facilitate easy and prompt assistance and incident reporting is recommended.

### Reference

Bangkok Mass Transit System Public Company Limited (2024). Annual Report 2016/17. [Online System]. Source: <http://bts-th.listedcompany.com/ar.html>.

Benchapa Chaengwechachai. (2016). Service quality that affects the satisfaction of BTS passengers in Bangkok. Independent research. Master of Business Administration, Bangkok University.

Kasikorn Research Center. (2016). Analysis of the traffic congestion crisis: Impact on the economy & way of life of Bangkok people. [Online system]. Source: <https://www.kasikornresearch.com/th/KEconAnalysis/Pages/>.

Monthakarn Wichitsakon. (2009). Product attitudes, satisfaction and trends in yogurt consumption behavior of consumers in Bangkok. Master's degree thesis, Srinakharinwirot University.

- Prakong Karnasutta. (2010). Statistics for behavioral science research. Bangkok: Charoenphon
- Promsiri Pancharoen and Patphisitkasem. (2018). Factors affecting customer satisfaction. Users of the BTS Skytrain. Rangsit Graduate Journal of Business and Social Sciences, 4(2)
- Sirirat Sahunil. (2013). Study of satisfaction in using the BTS Skytrain service. Independent study in the field of general business management, Faculty of Business Administration. Rangsit University.
- Sophon Wiravattanayingyong. (2013). Factors influencing the decision to choose electric trains for residential car users in suburban areas. A case study of the Bang Yai - Bang Sue line. Master's degree thesis, King Mongkut's University of Technology North Bangkok.
- Teerawut Ekakul. (2000). Research methods in behavioral science. and social sciences. 1st edition. Ubon Ratchathani: Ubon Ratchathani Rajabhat Institute.
- Waseso, S. (2013). The influence of perceived service quality, mooring factor, and relationship quality on customer satisfaction and loyalty. Procedia – Social and Behavioral Sciences, 81, 306-310.