FACTORS AFFECTING CUSTOMER LOYALTY TOWARD SIGHTSEEING BUS SERVICES FOR SCHOOL: AN APPLICATION OF MULTILEVEL STRUCTURAL EQUATION MODELING

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ปัจจัยที่มีอิทธิพลต่อความภักดีของผู้ใช้บริการรถโดยสารเพื่อการทัศนาจร สำหรับสถานศึกษา: การประยุกต์ใช้โมเดลสมการโครงสร้างพหุระดับ

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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิศวกรรมศาสตรดุษฎีบัณฑิต
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สัจจากาจ จอมโนนเขวา : ปัจจัยที่มีอิทธิพลต่อความภักดีของผู้ใช้บริการรถโดยสารเพื่อการทัศนาจรสำหรับสถานศึกษา: การประยุกต์ใช้โมเดลสมการโครงสร้างพหุระดับ (FACTORS AFFECTING CUSTOMER LOYALTY TOWARD SIGHTSEEING BUS SERVICES FOR SCHOOL: AN APPLICATION OF MULTILEVEL STRUCTURAL EQUATION MODELING) อาจารย์ที่ปรึกษา : รองศาสตราจารย์ ดร.วัฒนวงศ์ รัตนวราห, 210 หน้า

วัตถุประสงค์ของงานวิจัยนี้ เพื่อศึกษาปัจจัยที่มีผลต่อความภักดีของการใช้รถทัศนาจรที่สอดคล้องตามความต้องการของผู้ใช้ เพื่อเป็นแนวทางในพัฒนาการให้บริการรถทัศนาจรสำหรับสถานประกอบการให้มีความเหมาะสมและปลอดภัยมากยิ่งขึ้น โดยแบ่งการศึกษาออกเป็น 5 ส่วน ผลจากการศึกษาส่วนแรกพบว่า จากการทบทวนวรรณกรรมจำนวน 53 ชื่อเรื่อง ปัจจัยที่ถูกนำมาศึกษาเกี่ยวกับความภักดีของผู้ใช้มากที่สุด 3 อันดับแรก คือ ความพึงพอใจ (79.25%) การรับรู้คุณภาพการให้บริการ (67.92%) และการรับรู้คุณค่า (47.17%) ตามลำดับ

สำหรับการศึกษาส่วนที่ 2 ซึ่งเป็นการศึกษาองค์ประกอบด้านคุณภาพการให้บริการรถทัศนาจรเพื่อให้สถานประกอบการใช้เป็นเกณฑ์ในการประเมินและปรับปรุงคุณภาพการให้บริการ โดยการสอบถามระดับคะแนนการรับรู้คุณภาพการให้บริการของแต่ละตัวชี้วัดจากครูและบุคลากรทางการศึกษาจำนวน 3,387 คน จากผลการวิเคราะห์องค์ประกอบเชิงสำรวจ (Exploratory Factor Analysis) สามารถแบ่งตัวชี้วัด จำนวน 27 ตัว ได้ 3 กลุ่ม คือ ตัวยานพาหนะ พนักงานขับรถและการบริหารจัดการ และจากวิเคราะห์องค์ประกอบเชิงยืนยันลำดับที่สอง (Second-ordered Confirmatory Factor Analysis) สามารถยืนยันความเป็นองค์ประกอบของปัจจัยคุณภาพด้วย 3 กลุ่มตัวแปรดังกล่าว

เมื่อพิจารณาผลการศึกษาในส่วนที่ 3 จากการวิเคราะห์โมเดลสมการโครงสร้างหลายกลุ่ม (Multi-group Structural Equation Modeling) ซึ่งตัวอย่างในการศึกษานี้คือครูจำนวน 2,254 คน โดยในส่วนนี้เป็นการศึกษาปัจจัยที่มีอิทธิพลต่อความภักดีของผู้ใช้รถทัศนาจรสำหรับสถานศึกษาในประเทศไทยซึ่งประกอบด้วย ความคาดหวัง การรับรู้คุณภาพการให้บริการ ความพึงพอใจ ความไว้วางใจ การรับรู้คุณค่า ความผูกพัน ประสบการณ์ในอดีต ความสามารถของคู่แข่ง เมื่อเปรียบเทียบระหว่างสังคมเมืองและสังคมชนบทพบว่าปัจจัยดังกล่าวมีอิทธิพลต่อความภักดีของผู้ใช้แตกต่างกันตามพื้นที่

ผลการศึกษาในส่วนที่ 4 โดยโครงสร้างของโมเดลจะเหมือนกับการศึกษาในส่วนที่ 3 จากการศึกษาพบว่าเมื่อพิจารณาประเภทของสถานศึกษา ปัจจัยดังกล่าวมีอิทธิพลต่อความภักดีของผู้ใช้แตกต่างกันในระดับประถมศึกษา มัธยมศึกษาและอาชีวศึกษา

สำหรับส่วนสุดท้ายนี้ การศึกษานี้ได้ประยุกต์ใช้การวิเคราะห์โมเดลสมการโครงสร้างพหุระดับ โดยใช้ข้อมูลจากการสอบถามจากครูจำนวน 3,261 คน จาก 742 โรงเรียน เพื่อตอบคำถามว่าความแตกต่างของแต่ละโรงเรียนมีอิทธิพลต่อการรับรู้คุณภาพการให้บริการ ความพึงพอใจและความภักดี หรือไม่ ผลจากโมเดลพบว่าการรับรู้คุณภาพการให้บริการมีอิทธิพลทางบวกต่อความพึงพอใจและความพึงพอใจมีอิทธิพลทางบวกต่อความภักดีอย่างมีนัยสำคัญทางสถิติทั้งระดับบุคคลและระดับโรงเรียน เมื่อพิจารณาปัจจัยระดับโรงเรียนพบว่า ทรัพยากรที่รัฐจัดสรรให้โรงเรียน นโยบายการมีส่วนร่วมและความใส่ใจเรื่องความปลอดภัยของโรงเรียนมีอิทธิพลทางตรงกับการรับรู้คุณภาพบริการให้บริการอย่างมีนัยสำคัญทางสถิติ

สาขาวิชา วิศวกรรมขนส่ง ลายมือชื่อนักศึกษา _____

ปีการศึกษา 2557 ลายมือชื่ออาจารย์ที่ปรึกษา _____

SAJJAKAJ JOMNONKWAO : FACTORS AFFECTING CUSTOMER LOYALTY TOWARD SIGHTSEEING BUS SERVICES FOR SCHOOL: AN APPLICATION OF MULTILEVEL STRUCTURAL EQUATION MODELING. THESIS ADVISOR : ASSOC. PROF. VATANAVONGS RATANAVARAHA, Ph.D., 210 PP.

SIGHTSEEING BUS / LOYALTY / STRUCTURAL EQUATION MODELING

The objective of this research is to study factors affecting loyalty to the use of sightseeing buses relevant to users' needs in order to be guidelines for entrepreneurs to develop tour bus service to be more suitable and safer by dividing into five sections. In the first section of related literature, the results of the study showed that the first three factors which are most taken to be studied about users' loyalty from 53 titles in review literature were satisfactions (79.25%), perceived quality (67.92%), and perceived value (47.17%) respectively.

The second study examined factors of tour bus provider quality in order to be criteria to evaluate and improve service quality for entrepreneurs by asking the score level of service provider's perceived quality of each indicator from 3,387 lecturers, and education staff. The results of analysis of exploratory factor analysis (EFA) were divided into 27 indices merged into three groups including vehicle bodies, drivers, and management administration. The second-ordered confirmatory factor analysis (CFA) confirmed being quality factors of three groups of variables as mentioned.

When considering the results of study in the third section from Multi-group Structural Equation Modeling (SEM) of which the samples in this study were 2,254

lecturers, this section focused the study of factors, which influenced loyalty to education tour bus for in Thailand, including expected service, perceived service, satisfaction, trust, perceived value, commitment, past experience, and attractiveness of competitors. When comparing between urban and rural areas, it was found that mentioned factors affecting users' loyalty are different due to geographic areas.

According to the results of the study in the fourth section, the structure of model was the same as the third section. From the study, it was found that mentioned factors which influenced the types of educational institutes were in different education levels including primary education level, secondary education level, and vocational education level.

For the last section, this study employed Multilevel SEM by using the data from questionnaires obtained from 3,261 teachers of 742 schools to answer the questions whether the differences of each school influence perceived quality, satisfaction, and loyalty or not. The results of model showed that perceived quality positively influenced satisfaction and satisfaction had positive satisfaction with the loyalty at statistical significance at both personal and school levels. When considering the school factors, it was found that the resources allocated by the government, the cooperation policy, and the schools' attention to safety directly influenced perceived quality at statistical significance.

School of Transportation Engineering Student's Signature_____

Academic Year 2014 Advisor's Signature_____

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SYMBOLS AND ABBREVIATIONS

α	=	Statistically significant level
β	=	Structural coefficient
λ	=	Factor loading coefficient
χ^2	=	Chi-square
df	=	Degree of freedom
RMSEA	=	Root mean square of approximation
SRMR	=	Standardized root mean residual
CFI	=	Comparative fit index
TLI	=	Tucker Lewis Index
SEM	=	Structural equation modeling
CFA	=	Confirmatory factor analysis
EFA	=	Exploratory factor analysis
CR	=	Composite reliability
AVE	=	Average variance extracted
IOC	=	Index of item objective congruency

CHAPER I

INTRODUCTION

1.1 Rationale for the research

1.1.1 Excursion

Presently, the institutes in Thailand focus and enhance learning activities outside the classroom in form of field trip called excursion which is accepted as an activity of the curriculum in every educational levels including primary education, secondary education (Ministry of Education, 2009). This activity will allow teachers to provide students with learning activities outside the classrooms in order to find the answers from direct experiences as well as authentic places and get knowledge from expert lecturers. Taking students out of the classroom opens students' opportunities to get benefits of social development regarding responsibilities to community and themselves, human relationship enhancement, and learning stimulation. Excursion is accepted as a valuable activity because it will establish direct experiences and desired attitudes. More importantly, this activity will cultivate youths to be proud of, protect and care for nature and environment. Such sentiments rarely occur in the students who study in the classroom only (Bhuiyan, Islam, Siwar, & Ismail, 2010; Ritchie, Carr, & Cooper, 2008; Ritchie & Coughlan, 2004).

Each excursion needs travelling for either a short or a long distance depending on each different learning objective. Since there are a lot of travelers in each trip, the education institutes need sightseeing bus services. According to

Transportation Law, this kind of sightseeing bus is classified as non-regular bus. Since the education institutes lacked of tools and procedures of selecting sightseeing bus quality, in the past 5 years, there were a large amount of incessant sightseeing bus accidents causing teachers and students' deaths and injuries.

From the accumulated results of causes resulting in sightseeing bus accidents, it was found that almost all accidents had similarly main causes including unskillful drivers, speed driving, break system damage, and some cases of drowsy drivers. Besides, the causes of violent injuries and deaths were falling from the chair seats and not having safety belts. As of the mentioned reasons, it is very necessary for schools or entrepreneurs to emphasize the sightseeing bus service quality for the safe excursion.

1.1.2 Sightseeing bus service quality

As there have never been previous studies on the indicators assessing sightseeing bus quality, the results of the studies related to public bus service quality were used to compare their similarity. The previous studies on service quality assessment of different public buses comprising urban bus and intercity bus were as follows;

de Oña, de Oña, Eboli, and Mazzulla (2013) studied the quality assessment of urban bus by using 12 indictors including frequency, punctuality, speed, proximity, fare, cleanliness, space, temperature, information, safety, courtesy, accessibility and classified them into three groups which comprised service, comfort and personnel personal by using SEM analysis.

dell'Olio, Ibeas, and Cecin (2011) assessed urban bus quality by 6 indicators including waiting time at the bus stop, journey time on the bus, vehicle

occupancy, cleanliness of the vehicle, driver's kindness, comfort of the buses by using multinomial discrete choice model.

Bordagaray, dell'Olio, Ibeas, and Cecín (2013) assessed intercity bus service quality by 9 indicators including waiting time, journey time, reliability, vehicle occupancy, driver kindness comfort, price of the ticket, quality of the vehicle, available information by analyzing ordered probit model.

Eboli and Mazzulla (2007) assessed bus service quality within university by 16 indicators including Bus stop availability, route, frequency, reliability, bus stop, overcrowding, cleanliness, cost, information, safety on board, promotion, personal security, helpfulness of personnel, complaints, environmental protection, bus stop maintenance

Thus, the indicators should be developed to particularly assess sightseeing bus service quality for educational institutes as each type of transportation has different operations. The indicators of urban buses and intercity buses may be developed to apply in the context of educational sightseeing bus.

1.1.3 Loyalty and factors relating to loyalty

Recently, there are a lot of marketing researches on customer loyalty in various businesses. If the customers encompass loyalty, they not only buy or repurchase products but also express it by word-of-mouth which will increase market shares and add benefits to business (Nam, Ekinci, & Whyatt, 2011; Park, Chung, & Rutherford, 2011). From the mentioned results, the researchers have taken the concepts of marketing to motivate entrepreneurs to develop sightseeing bus service quality. In other words, Sightseeing bus service provider is the business gaining high compensation because the schools require a lot of buses serving the large number of

students in each excursion. If tour service providers are able to make service users have loyalty by word of mouth, be interested in repurchase intention, or identification, this affects the benefits of company (Bourdeau, 2005; Chen, 2012; Kamaruddin, Osman, & Pei, 2012; Wen, Lan, & Cheng, 2005).

From the marketing concepts, not only service provider quality and the satisfaction to loyalty but also other factors relate to loyalty to consumers in sightseeing bus context. Thus, to acknowledge entrepreneurs the factors which completely relate to loyalty to consumers in the sightseeing bus context, the entrepreneurs will take them to determine other policies to establish more loyalty as it can be summarized as follows;

Customer loyalty is the relationship between attitudes and customers' behaviors towards products or services they are regularly satisfied at by supporting or repurchasing them as well as continuously telling them to others and participating in protecting products, services, and organizations of service providers they are satisfied with as mentioned earlier(Oliver, 1999).

Songsom and Trichun (2012) concluded that the factors influencing customer loyalty including Customer Social Responsibility Expectation (CSR Expectation), Switching Cost, Perceived Service Quality, Customer Satisfaction, Customer Trust, and Commitment.

However, there are many factors which still influence user loyalty are as follows; Parasuraman and Grewal (2000) found that Perceived Value had direct influence to customer loyalty, Chen (2012) found that Involvement had direct influence to customer loyalty, Kamaruddin et al. (2012); Wong and Dioko (2013) found that Customer Expectation was the factor transferred to customer satisfaction

and other factors including Motivation, Past experience, Perceived risk, Attractiveness of competitors, and Customer complaint.

1.1.4 Differences between different schools and excursion

In Thailand, urban and rural ways of life are quite different. It cannot be declined that there are still gaps in education between urban areas and rural areas. The residents in municipal regions have higher opportunities than those in rural ones. So, it may be said that municipality clearly relates to education opportunities. Family resources have also relationship to education. Children in poorer families tend to attain less educational opportunities than the richer ones (Pattaravanich & Amornsirisomboon, 2007). The problem of educational opportunity inequality is confirmed by the statistics of the exploration and many economic researches for example, the research on finance administration at school level showed that it was not efficient, sufficient, and unequal. The schools having the same sizes, providing the same education levels but different locations and students' status obtained different budget. In other words, expenses per head for schools in poor provinces will be lower than the ones in Bangkok (Chiengkul, 2009).

The mentioned reason possibly differentiates sightseeing bus quality between schools in urban and rural areas since the budget of excursion is also allocated by the government. Besides, there is availability of different social context. Thus, the study on sightseeing bus service providers between urban and rural areas should be separately studied in order to determine the suitable policy for excursion in each area for the operation of sightseeing bus service quality.

1.2 Purpose of the research

This research has the following objectives as follows;

1.2.1 To find out the factors relating to the sightseeing bus user loyalty,

1.2.2 To develop the indicators for factors assessing suitable sightseeing bus quality for Thailand,

1.2.3 To study factors influencing loyalty for selecting sightseeing bus of schools in rural areas and urban areas,

1.2.4 To study factors influencing loyalty for selecting sightseeing bus of schools in primary education, secondary education, and vocational education,

1.2.5 To study factors influencing loyalty for selecting sightseeing bus for each school.

1.3 Scope of the research

This research has the following scopes;

1.3.1 The education areas cover all sizes of provincial areas (small size, medium size, and large size)

1.3.2 This study specially focuses on the students' excursion. Travelling with other purposes will not be considered.

1.3.3 This study considers teachers as a group of sightseeing bus users because they are the decision makers in selecting sightseeing buses.

1.4 Research questions

1.4.1 What are the involved factors in the studies relating to the customers' loyalty and suitable to be studied in the context of sightseeing bus in Thailand?

1.4.2 What are the potential indicators to be used for sightseeing bus service quality assessment?

1.4.3 How do the factors relate to the involved studies relating to loyalty?

1.4.4 Is the model structure of the relationship of variables involved with customers' loyalty different based on the different areas (urban and rural)?

1.4.5 Is the model structure of the relationship of variables involved with customers' loyalty different based on the different education level (primary education, secondary education, and vocational education)?

1.4.6 What factors make user loyalty in each school different?

1.5 Contribution of the research

1.5.1 Acknowledge the factors relating to the studies about customer loyalty and the relationship type of mentioned factors in various contexts.

1.5.2 Develop the indicators for suitable sightseeing bus quality in Thailand context

1.5.3 Acknowledge the relationship between involving factors and sightseeing bus user loyalty

1.5.4 Acknowledge the factors at personnel and school levels having relation to perceived service quality, satisfaction, and sightseeing bus user loyalty.

The mentioned above results of this study can be taken to be guidelines for schools or entrepreneurs to determine the policy developing suitable sightseeing bus service for Thailand.

1.6 Organization of the research

This research is divided into 7 chapters as follows;

Chapter I: Introduction mentions the rationale and the importance of the problem objectives, scope of the study, research objectives and expected contribution of the research

Chapter II: Understanding of factors influencing customer loyalty: a quantitative review of the literature for sightseeing bus. This chapter reviews related research involved with customer loyalty in various contexts and finds out potential factors to be considered in the study of sightseeing bus context by Chi-square test.

Chapter III: Measurement modeling of the perceived service quality of a sightseeing bus service: an application of hierarchical confirmatory factor analysis. This chapter is the development of indicators for sightseeing bus service quality which is an important factor for customer satisfaction and loyalty.

Chapter IV: Factors influencing customer loyalty to educational tour buses and measurement invariance across urban and rural zones. This chapter examines the relationship of factors relating to sightseeing bus customer loyalty by developing equation model to compare between schools located in urban and rural areas.

Chapter V: Multi-group structural equation modeling of customer satisfaction and loyalty: evidence from sightseeing bus services in Thailand. This chapter is the study on the relationship between different factors and the study of sightseeing bus customer loyalty by developing Equation Structure Model comparing among schools for elementary education, secondary education, and vocational education.

Chapter VI: The complex relationship among school policy, service quality, satisfaction, and loyalty in educational tour bus service: a multilevel modeling approach. This chapter is to study the factors at personnel and school levels which affect sightseeing bus service quality.

Chapter VII: Conclusion and recommendations. This section concludes the results from chapter II–chapter VI and gives the suggestions from the findings.

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CHAPTER II

UNDERSTANDING OF FACTORS INFLUENCING CUSTOMER LOYALTY: A QUANTITATIVE REVIEW OF THE LITERATURE FOR SIGHTSEEING BUS

2.1 Abstract

This study aims to determine the factors influencing customer loyalty for bus sightseeing tours through an analysis of 53 research papers. From the analysis, 14 factors were determined to be associated with customer loyalty, i.e., switching costs, satisfaction, trust, commitment, perceived value, involvement, perceived service quality, perceived risk, past experience, complaints, attractiveness of competitors, motivation, corporate social responsibility expectations, and expectations. The findings indicated that the three leading factors considered in previous research were satisfaction, perceived service quality, and perceived value. Similarly, chi-square test results determined that the selection of these14 factors from the previous studies was independent of publication date, publication pattern, region, and transportation-related studies at $\alpha = 0.05$—except for commitment and motivation, which showed a relationship with publication pattern.

2.2 Introduction

In today's world, businesses are experiencing higher competition levels, so marketers are attempting to find strategies to develop potential pro-competitive firms. One of these strategies is to retain old customer groups, as seeking new ones can cause huge expenses that can wipe out a company's profits (Coulter, Price, & Feick, 2003; Songsom & Trichun, 2012b). Therefore, customer loyalty should be considered a top priority for firms because it not only brings existing customers back for more but also brings a positive effect on a business's reputation, their market, and profit shares from the word-of-mouth advertising (J. Nam, Ekinci, & Whyatt, 2011; Park, Chung, & Rutherford, 2011). Therefore, countless research has been conducted on how to build customer loyalty in trades and services. However, much of this research has a limited scope, as the focus is often only on specific businesses such as hotels, mobile phones, financial institutions, or online business. For customer loyalty research related to the operation of bus services, there have been only a few examples. Wen, Lan, and Cheng (2005) surveyed the loyalty of intercity bus users, and Kamaruddin, Osman, and Pei (2012) focused on evidence from public transportation services. Yet, as far as can be determined, there has been no research so far where studies on the customer loyalty of nonfixed route bus companies have been performed.

Considering nonfixed route bus business expansion in Thailand, the Land Transport Department reported that there were 12,864 registered bus firms in 2012, an increase of 50.74% since 2007. Over the same period, the number of registered nonfixed route buses rose to 37,467 in 2012, arise of 28.32% from 2007. These

increasing bus company and vehicle rates are illustrated in Figure 2.1 (Department of Land Transport (2012)).

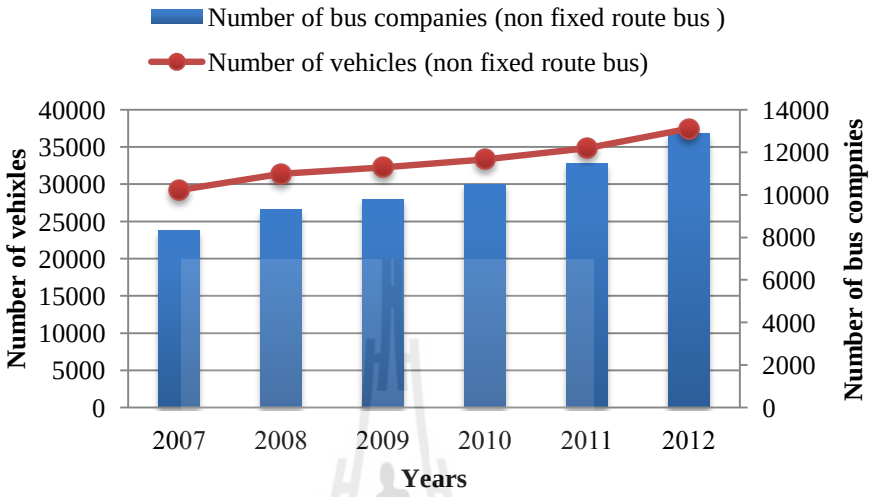


Figure 2.1 Growth of nonfixed route bus businesses in Thailand

In a study of Vatanavongs and Sajjakaj (2012), which involved the selection of school buses for sightseeing tours, it was determined that 24.7% of schools chose a service from a bus company they had used before as they had been impressed with the quality of service, while 21.7% of a sample group made the decision to use a service because of person to person communication. Both findings indicate user loyalty behavior, which demonstrates that the providers of nonfixed bus services need to determine loyalty building strategies to ensure the customer returns.

Understanding the factors influencing customer loyalty, the importance of these factors, and their composition are essential for service providers, especially in terms of quality of bus service (Wen et al., 2005). Customers perceive value when they use a bus service because of factors such as vehicle body condition, bus facilities, and the driver's manner and behavior, high levels of which provide customer

satisfaction (Bourdeau, 2005; H. H. Chang & Chen, 2009; C.-F. Chen & Chen, 2010; C. G.-Q. Chi & Qu, 2008; Chiou & Pan, 2009; Chotivanich, 2012; Davis, 2006; Deng, Lu, Wei, & Zhang, 2010; Hsieh, 2010; Hume & Mort, 2008; Kim, Jin, & Swinney, 2009; Li, 2011; J. Nam et al., 2011; S. Nam, 2008; Park et al., 2011; Songsom & Trichun, 2012a; Tsiotsou, 2006; Wen et al., 2005; Wong & Dioko, 2013; Yomnak, 2007; Žabkar, Brenčič, & Dmitrović, 2010). In fact, if customers are dissatisfied with the service quality, they would not return. With the rapid progress in information and communication technology such as online social networks, customers are able to independently express their opinions at any time. If dissatisfied customers share their negative feelings about a service on social networking sites, a business could lose not only existing customers but also the opportunity to get new ones. Conversely, if customers are satisfied and have positive feelings about the service, the probability of getting new clients or customers is high. Essentially, an increase in the number of nonfixed bus service firms possibly offers more options for clients or customers. Because there are many channels from which customers can get information, customers' knowledge and understanding about the various products and services, as well as competitor data, increase. Consequently, the trends in a fast-changing company's services are more transparent than ever before. At the same time, customers' expectations about the features and benefits of the goods and services are high because of their service experiences. Therefore, a study involving customer loyalty is more complex as loyalties vary over time depending on the service issues that need to be expressed and resolved. Considering the selection process for nonfixed route bus services by a school, there are different stakeholders engaged in the decision making, thus reflecting the individual differences in consumer behavior. The customer

loyalty of a customer deciding on a service for a school field trip may differ from the customers of other businesses who have an individual buying decision, especially in areas of concern such as the need for a safer bus. In addition, the study needs to investigate the loyalty at different levels from the individual (teacher) to school policy levels to ensure that bus companies consider all the aspects of the customer's concerns and needs.

Hence, this study aims to determine the factors influencing customer loyalty on nonfixed route bus services to provide an appropriate plan for the development of a bus business that matches users' needs and enhances the firm's competitiveness. If a bus service improves its quality in line with users' desires for convenience and safety, it would adequately sustain the business.

2.3 Material and methods

To determine the influences on customer loyalty, secondary data was analyzed from databases and e-journals, including Science Direct (http://www.science-direct.com/), SCOPUS (http://www.scopus.com/home.url), Taylor Francis (http://www.tandf.co.uk/journals/), Springer (http://www.springer.com/), EBSCO (https://search.ebscohost.com), Emerald (http://www.emeraldinsight.com/), and Google (https://www.google.co.th/), using the key words "customer loyalty", "satisfaction and loyalty", "sightseeing bus", and "tour bus."

The study process considered customer loyalty as the dependent variable, while the factors influencing loyalty were considered as the independent variables. Details of the methodological framework areas follow:

- Data searching relating to customer loyalty through various research databases as mentioned by selecting studies completed within the last 10 years (2003–2014).
- Considering the factors that influence loyalty from each research article in the context of different businesses indifferent countries as well as an analysis of the methods and model formulations.
- Summarizing the definitions of loyalty and the related factors.
- Examining the relationship patterns (i.e., direct or indirect relationships) between each factor and the loyalty together with the relationships among the independent variables, and then drawing a map to illustrate the links between all variables and customer loyalty for better understanding.
- Analyzing the factors influencing customer loyalty regarding sightseeing bus services.
- Conclusions and discussions.

2.4 Results

From the search, 53 relevant research papers were determined (Alegre & Juaneda, 2006; Aydin & Özer, 2005; Bourdeau, 2005; Carreira, Patrício, Natal Jorge, & Magee, 2014; H. H. Chang & Chen, 2009; L.-Y. Chang & Hung, 2013; Y.-H. Chang & Chen, 2007; Y.-W. Chang & Chang, 2010; C.-F. Chen & Chen, 2010; C.-F. Chen & Phou, 2013; F.-Y. Chen, Chang, & Lin, 2012; S.-C. Chen, 2012; C. G.-Q. Chi & Qu, 2008; G. Chi, 2005; Chiou, 2004; Chiou & Pan, 2009; Chotivanich, 2012; Cyr, Hassanein, Head, & Ivanov, 2007; Davis, 2006; Deng et al., 2010; Dolnicar, Grabler,

Grün, & Kulnig, 2011; Elkhani, Soltani, & Jamshidi, 2014; Erciş, Ünal, Candan, & Yıldırım, 2012; Forgas-Coll, Palau-Saumell, Sánchez-García, & Callarisa-Fiol, 2012; Forgas, Moliner, Sánchez, & Palau, 2010; Forgas, Palau, Sánchez, & Huertas-García, 2012; Gallarza & Gil Saura, 2006; Hsieh, 2010; Hume & Mort, 2008; Janita & Miranda, 2013; Kamaruddin et al., 2012; Kim et al., 2009; Li, 2011; Llach, Marimon, Alonso-Almeida, & Bernardo, 2013; Mao, 2008; Marshall, 2010; Mikulić & Prebežac, 2011; Mouakket & Al-hawari, 2012; J. Nam et al., 2011; S. Nam, 2008; Park et al., 2011; Shankar, Smith, & Rangaswamy, 2003; Songsom & Trichun, 2012a; Tsiotsou, 2006; Wattanakamolchai, 2008; Wen et al., 2005; Wong, 2013; Wong & Dioko, 2013; Wu, 2006; Yang & Peterson, 2004; Yomnak, 2007; Žabkar et al., 2010; Zhang, 2005). From these papers, an explanation for the term "loyalty to sightseeing bus services," together with its associated factors, can be given as follows:

2.4.1 Loyalty to sightseeing bus service

Customer loyalty is a customer's attitude and behavior toward products or services used regularly that make the customer willing to repatronize or re-purchase. Evidence of loyalty can be seen in word-of-mouth communications and engagement in protecting the goods and services as well as in the number of satisfied customers (R. L. Oliver, 1999). However, the characteristics of nonfixed bus route business are dissimilar to other products and services because of the irregularity of service consumption and the loose bond between the service providers and the users. Furthermore, selecting a bus service for a school tour normally requires several people to decide together what they feel is a high-value service. Therefore, there is a narrower definition of the term "loyalty" than for the other types of services in that the loyalty of nonfixed bus users depends on how the customers react to the business

service. This could be by giving praise, recommending the service to another, the repeated use of the service, all of which would enhance the service's reputation.

2.4.2 Factors influencing loyalty

When conceptualizing customer behavior, Songsom and Trichun (2012b) concluded that customer loyalty was influenced by psychological and personal factors as well as external factors such as environmental circumstances. The theoretical analysis for the search for the influential factors that influence the loyalty of clients can be performed by classifying the factors into two groups: (1) The contemporary factor group, which refers to any composition that is developed by transforming the marketing paradigm and the competitive environment of existing businesses in terms of the corporate social responsibility (CSR) expectations and switching costs. (2) The Traditional factor group can be regarded as the external or personal factors verified by the previous studies, which have been shown to influence loyalty—such as perceived service quality, customer satisfaction, customer trust, and commitment. In pursuit of other factors, Parasuraman and Grewal (2000) determined direct impact between perceived value and customer loyalty. S.-C. Chen (2012) concluded that involvement was directly associated with loyal clients. Kamaruddin et al. (2012); Wong and Dioko (2013) highlighted the indirect influences of customer expectations on customer satisfaction. Other factors were also addressed, such as motivation, past experience, perceived risk, attractiveness of competitors, and customer complaints. More explanations for each of these factors are given below.

1) Expected service is an individual's expectations that something desirable is expected to happen by oral and written expressions or any responses of acceptance or refusal. This hinges on social background, experience, and the

environmental surroundings of the individual that can be possibly disputed by other persons (Richard L. Oliver (1997) cited in Wu (2006)). Wattanakamolchai (2008); Wu (2006) stated that service expectation is directly related to perceived service quality, while Chiou (2004); Kamaruddin et al. (2012); Wong and Dioko (2013); Wu (2006) determined the influences of such factors on customer satisfaction. In addition, Wong and Dioko (2013); Wu (2006) confirmed the direct impact of this factor on perceived quality.

2) Perceived service quality is a crucial predictor as it highlights the service quality that is perceived by customers. Service quality assessment requires a comparison between the desired or expected service and actual service performance (Parasuraman, Zeithaml, & Berry, 1985). Perception refers to a process whereby individuals select, organize, and interpret the stimulus into something meaningful and harmonious (Schiffman & Kanuk, 2007). Each individual may be influenced by a service in a different way even if they were in the same situation and had the same stimulus, as each individual has different needs, values, and experiences. In addition, the consumer perception process is a continuous process, as the consumers are exposed to stimuli and feelings throughout the use of the service. Parasuraman et al. (1985) suggested that the five major components of service quality were (1) tangibility—service must be visible and palpable and related to the quality of devices and equipment as well as the quality of staff, (2) reliability—service must be dependable and precise anytime the service is used, (3) responsiveness refers to the willingness and readiness of service provision,(4) assurance represents a company's skilled employees who have good manners, which enable trust and confidence in customers, and (5) empathy can be regarded as the access to customer service through

convenient and efficient contacts. Service provision emphasizes understanding and attention to the customers. The studies of Aydin and Özer (2005); Chiou (2004) Bourdeau (2005); C.-F. Chen and Chen (2010); Chotivanich (2012); Li (2011); S. Nam (2008); Park et al. (2011); Songsom and Trichun (2012a); Tsiotsou (2006); Žabkar et al. (2010); Zhang (2005) indicated that perceived service quality was a key component that directly influenced loyalty. Similar findings were discussed in Bourdeau (2005); H. H. Chang and Chen (2009); C.-F. Chen and Chen (2010); C. G.-Q. Chi and Qu (2008); Chiou and Pan (2009); Davis (2006); Hume and Mort (2008); Kim et al. (2009); S. Nam (2008); Tsiotsou (2006); Wen et al. (2005); Wu (2006); Yomnak (2007) Chotivanich (2012); Deng et al. (2010); Hsieh (2010); Li (2011); J. Nam et al. (2011); Park et al. (2011); Songsom and Trichun (2012a); Žabkar et al. (2010). Wong and Dioko (2013) looked at the indirect influences of perceived service quality on loyalty through the levels of satisfaction. Aydin and Özer (2005); Chiou and Pan (2009); Kim et al. (2009); Songsom and Trichun (2012a) proved that perceived quality was directly associated with trust. In Bourdeau (2005); C.-F. Chen and Chen (2010); Chiou (2004); Hume and Mort (2008); Park et al. (2011); Wen et al. (2005); Wong and Dioko (2013); Wu (2006), the quality perception was determined to be directly linked to perceived value, and H. H. Chang and Chen (2009) indicated the direct relationship between perceived quality and switching costs.

3) Satisfaction refers to the level of personal feelings as a consequence of comparing the perceived service with the expected service, which can be interpreted using a three-level emotional state. If the perceived performance is less than the expectations, the customer will be dissatisfied; on the other hand, a balance between the expected and the perceived services results in a happy customer. In cases

where the service quality is greater that the perceived performance, then the customer would be extremely satisfied (Kotler, 1997; Looy, Gemmel, & Dierdonck, 2003). S.-C. Chen (2012) highlighted the direct relationship between satisfaction and involvement, while Bourdeau (2005); H. H. Chang and Chen (2009); C.-F. Chen and Chen (2010); C. G.-Q. Chi and Qu (2008); G. Chi (2005); Chiou (2004); Chiou and Pan (2009); Davis (2006); Deng et al. (2010); Hsieh (2010); Kim et al. (2009); Li (2011); Mao (2008); S. Nam (2008); Shankar et al. (2003); Tsiotsou (2006); Wen et al. (2005); Wu (2006); Yang and Peterson (2004); Yomnak (2007); Žabkar et al. (2010) S.-C. Chen (2012); Chotivanich (2012); Kamaruddin et al. (2012); J. Nam et al. (2011); Park et al. (2011); Songsom and Trichun (2012a); Wong (2013); Wong and Dioko (2013) claimed that satisfaction had an effect on loyalty. S.-C. Chen (2012); Davis (2006); Meyer, Stanley, Herscovitch, and Topolnytsky (2002) demonstrated the impact of customer satisfaction on commitment. However, the study of Wong and Dioko (2013) showed that satisfaction can be directly associated with the level of customer complaints. Bourdeau (2005); S.-C. Chen (2012); Songsom and Trichun (2012a) provided studies that supported the direct relationship between customer satisfaction and customer trust. Similarly, S.-C. Chen (2012); Hsieh (2010) determined a direct link between satisfaction and perceived value.

4) Customer trust can be defined as public confidence in the reliability and integrity of the service. Customer trust is evaluated through the use of a performance evaluation after service delivery through a comparison with the expectations of the transaction or business. In this respect, customer trust is essential in determining the level of commitment in the buyer–seller relationship (Morgan and Hunt (1994) cited in S.-C. Chen (2012); Songsom and Trichun (2012b); Wen et al.

(2005)). Chiou (2004) illustrated a direct relationship between trust and perceived value, while Chiou (2004); Chiou and Pan (2009); Deng et al. (2010); Kim et al. (2009) examined the influence of trust on customer satisfaction. Aydin and Özer (2005) clarified that trust directly influences switching costs, and Aydin and Özer (2005); S.-C. Chen (2012); Chiou (2004); Cyr et al. (2007); Deng et al. (2010); Kim et al. (2009); Li (2011); Songsom and Trichun (2012a) elucidated the direct relationship between trust and customer loyalty.

5) Perceived value is the total value compared to the total cost, thus comprising the additional costs or extra charges involved in purchasing the service (Bourdeau, 2005; Deng et al., 2010; Wong & Dioko, 2013). Bourdeau (2005); C.-F. Chen and Chen (2010); Chiou (2004); Chiou and Pan (2009); Deng et al. (2010); Hume and Mort (2008); Tsiotsou (2006); Wen et al. (2005); Wu (2006); Yang and Peterson (2004), Li (2011); Park et al. (2011); Wong and Dioko (2013) identified that perceived value had a direct impact on customer satisfaction. C.-F. Chen and Chen (2010); S.-C. Chen (2012); Chiou (2004); Cyr et al. (2007); Hsieh (2010); Li (2011); Wen et al. (2005); Yang and Peterson (2004) also determined that perceived value was directly associated with loyalty.

6) Commitment is the positive effect a service provider gives to a customer from the use of the service, which leads to a longer term relationship (S.-C. Chen, 2012; Coulter et al., 2003; Songsom & Trichun, 2012b). S.-C. Chen (2012); Davis (2006); Li (2011); Marshall (2010) determined that commitment had a direct relationship with loyalty.

7) Switching costs are the costs that occur when a customer changes from one service provider to another, despite the fact that the product offerings of

both firms are similar. This mostly occurs when a customer is deciding whether to re-purchase a product or service. However, switching costs can be characterized as both tangible and intangible costs. Tangible cost, which is measurable, includes the actual expenses paid when searching for information about a new brand of competitors (Deng et al., 2010; Songsom & Trichun, 2012b; Wen et al., 2005). According to Aydin and Özer (2005); H. H. Chang and Chen (2009); Deng et al. (2010); Songsom and Trichun (2012a); Wen et al. (2005), switching costs have a direct impact on loyalty, while Yang and Peterson (2004) determined that the moderating effects of the switching costs on perceived value influenced loyalty. Furthermore, perceived value can result in a moderating effect on satisfaction, which, in turn, influences loyalty.

8) Involvement is the condition when a customer perceives a stimulus in terms of personal or professional values or self-interest (Coulter et al., 2003; Department of Land Transport, 2012). For example, the use of a bus service from the Company A may have an impact on both the user's image and the school's image. Tsiotsou (2006) indicated thatinvolvement directly influences perceived service quality. Moreover, Chen (2012) highlighted the direct relationship between involvement and loyalty.

9) Motivation refers to the influence of the needs, drives, and desires that inspire people to meet their goals and has been determined to have a direct effect on the perceived service quality (Hsieh, 2010).

10) Past experience refers to experiences, i.e., good or bad, in the past. Hsieh (2010) indicated that past experience was directly linked to perceived quality, and Wong (2013) verified the direct relationship between past experience and satisfaction.

11) Attractiveness of competitors refers to how a customer perceives the service provision of the competitors with in the same market. If there are only a small number of competitors, customer loyalty appears to increase (Wen et al., 2005).

12) Perceived risk is the customer's perception of the possible damage that may be incurred when choosing the service. Bourdeau (2005) determined that perceived risk has a direct effect on loyalty.

13) Customer complaints can be described as the negative responses of the customer about the service problems. Wu (2006) identified that customer complaints directly impact customer loyalty.

14) Corporate social responsibility expectation is the customers' expectations that the business activities will enhance their quality of life. A direct relationship was determined among satisfaction, perceived service quality, and trust (Songsom & Trichun, 2012b).

Table 2.1 summarizes the analysis of 53 research papers with a focus on the relationship between the factors and the publication date, publication pattern, region, and transportation-related studies. Satisfaction was determined to be a loyalty-related factor in 42 articles (79.25%), followed by the other 3 factors of perceived service quality, perceived value, and trust, which were highlighted in 42 (67.92%), 36 (47.17%), and 20 (37.74%) articles, respectively. In addition, two articles supported the prominent roles of attractiveness of competitors and customer complaint factors. When considering publication dates from 2003 to 2014, 2012 had the highest number of studies associated with loyalty (9 articles), which indicated the importance of the customer satisfaction factor. Moreover, 2010 had the second highest number of studies associated with loyalty (7 articles). The trends for each factor appeared

similar, as shown in the chi-square test results in Table 2.2 (Null hypothesis: research ratio (*Fi*) is equal each year). The findings verified that the research ratios for all loyalty-related factors obtained from the review were equivalent each year with a 95% confidence level. Publication patterns classified using 3 patterns, i.e., 34 peer-reviewed journals, which were determined to have an impact factor, 6 peer-reviewed journals, which were determined to have nonimpact factors, and 13 theses, were examined. The chi-square variance test for these patterns is illustrated in Table 2.2 (Null hypothesis: research ratio (*Fi*) of each publication pattern is equal). It was determined that all factors in each publication pattern had the same research ratio with 95% confidence level, except for commitment (F6) and motivation (F9). In terms of regional publishing statistics, 14 related papers appeared in the United States, while Europe and the Asia Pacific regions had14 and 25 associated studies. In examining the chi-square test variance (Null hypothesis: research ratio (*Fi*) for each region is equal), the results of which are in Table 2.2, it was determined that the research ratio in each region was identical at a 95% confidence interval. For loyalty-related research on transportation issues, 36 titles associated with customer loyalty were determined in non-transportation studies, and 17 titles were related to transportation. The variance results based on the chi-square test indicated that the 14 loyalty-related factors in the transportation and non-transportation studies had the same research ratio with a 95% confidence level.

Table 2.1 Number of research papers among the factors, publication dates, regions, publications, and research sectors

Research profiles	Factors														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**Sum**
Year															
2003	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
2004	-	-	2	1	2	-	-	-	-	-	-	-	-	-	2
2005	-	4	3	3	2	-	2	-	-	-	1	1	-	-	5
2006	-	4	5	-	2	-	-	1	-	1	-	-	-	-	5
2007	-	2	1	1	-	-	1	-	-	1	-	-	-	-	3
2008	1	4	4	-	2	-	-	-	1	2	-	-	-	-	5
2009	-	3	2	2	1	-	-	-	-	-	-	1	-	-	3
2010	-	4	6	3	5	1	1	-	1	2	-	-	-	-	7
2011	-	4	3	2	3	1	-	-	-	1	-	-	-	-	5
2012	1	4	9	5	3	2	1	1	-	-	-	-	-	2	9
2013	1	5	4	3	4	1	-	-	-	1	-	-	1	-	6
2014	-	2	2	-	1	-	-	-	-	-	-	-	-	-	2
Publication															
Journal with IF	1	25	27	13	19	1	4	1	-	5	1	1	1	1	34
Journal without IF	1	2	6	4	1	2	1	1	-	-	-	-	-	1	6
Dissertation	1	9	9	3	5	2	-	-	2	3	-	1	-	-	13
Region															
America	1	9	10	3	5	1	-	-	-	1	-	1	-	-	14
Europe	-	9	10	6	8	1	1	1	-	2	-	-	-	-	14
Asia Pacific	2	18	22	11	12	3	4	1	2	5	1	1	1	2	25
Transportation															
No	2	24	31	13	16	4	3	2	2	7	-	2	1	1	36
Yes	1	12	11	7	9	1	2	-	-	1	1	-	-	1	17
Total	3	36	42	20	25	5	5	2	2	8	1	2	1	2	53

Note: F1 = expected service, F2 = perceived service quality, F3 = satisfaction, F4 = trust, F5 = perceived value, F6 = commitment, F7 = switching cost, F8 = involvement, F9 = motivation, F10 = past experience, F11 = attractiveness of competitor, F12 = perceived risk, F13 = customer complaint, F14 = corporate social responsibility (CSR) expectation

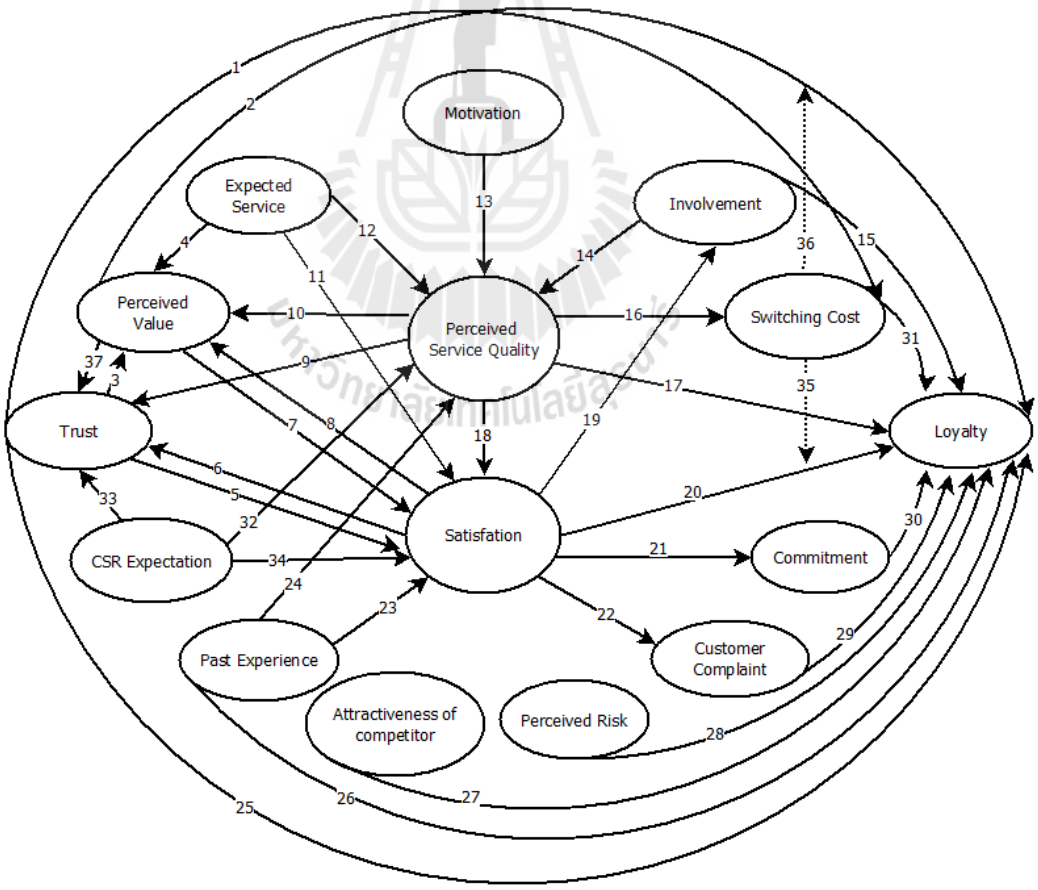
Table 2.2 Result of chi-square test

Research profiles	Factors													
	F1	**F2**	**F3**	**F4**	**F5**	**F6**	**F7**	**F8**	**F9**	**F10**	**F11**	**F12**	**F13**	**F14**
Year														
chi-square (df=11)	5.767	13.36	12.119	11.845	11.025	5.645	10.716	6.489	7.364	0.686	9.785	12.609	7.984	10.161
p-value	0.888	0.27	0.355	0.375	0.441	0.896	0.467	0.839	0.769	8.301	0.55	0.32	0.715	0.516
Publication														
chi-square (df=2)	1.932	3.796	2.365	3.33	4.046	6.227	1.938	3.321	6.395	1.717	0.57	0.85	0.57	2.483
p-value	0.381	0.15	0.307	0.189	0.132	0.044**	0.380	0.19	0.041**	0.424	0.751	0.654	0.752	0.648
Region														
chi-square (df=2)	1.154	0.361	2.205	2.158	1.354	0.365	2.806	0.99	2.328	1.167	1.142	0.99	1.142	2.328
p-value	0.562	0.835	0.332	0.34	0.508	0.835	0.246	0.61	0.312	0.558	0.565	0.61	0.565	0.312
Transportation														
chi-square (df=1)	0.002	0.082	3.217	0.126	0.618	0.369	0.159	0.981	0.981	1.657	2.158	0.981	0.481	0.307
p-value	0.962	0.775	0.073*	0.723	0.432	0.543	0.69	0.322	0.322	0.198	0.142	0.322	0.488	0.58

Note:F1=expected service, F2=perceived service quality, F3=satisfaction, F4=trust, F5=perceived value, F6=commitment, F7=switching cost, F8=involvement, F9=motivation, F10=past experience, F11=attractiveness of competitor, F12=perceived risk, F13=customer complaint, F14=corporate social responsibility (CSR) expectation, **significant at 95%

2.4.3 Factors associated with loyalty

Figure 2.2 illustrates the relationships between the 14 independent variables identified as influencing customer loyalty (the dependent variable). From these findings, 37 relationship patterns were determined. The overall pattern could be classified into 3 groups: (1) a direct relationship between a set of independent and dependent variables, resulting in 11 patterns (line 2, 15, 17, 20, 25, 26, 27, 28, 29, 30, and 31), (2) an indirect relationship between the independent variables, resulting in 24 patterns (line 1, 3, 4, 5, 6 ,7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 21, 22, 23, 24, 32, 33, 34, and 37), and (3) a moderating effect, resulting in 2 patterns (line 35 and 36).



Note: → is the direction of the causal relationship and---> is the moderating effect.

Figure 2.2 Factors associated with loyalty according to the previous studies

Table 2.3 Number of research papers among the factors for relationship patterns, publication dates, regions, publications, and research sectors

Research profiles	Factor relationship patterns*											
	R1	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**R10**	**R11**	**R12**
Year												
2003	-	-	-	-	-	-	-	-	-	-	-	-
2004	-	2	1	-	1	-	2	-	-	1	1	-
2005	1	1	-	-	-	1	2	-	1	2	-	-
2006	-	-	-	1	-	-	3	-	-	2	1	1
2007	-	1	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	1	-	-	1	-	1
2009	-	-	-	-	2	-	1	-	2	-	-	-
2010	-	3	-	-	2	1	3	1	-	1	-	-
2011	-	1	-	-	-	-	2	-	-	1	-	-
2012	-	3	-	-	-	3	4	1	2	1	1	-
2013	-	2	-	1	-	2	1	-	1	3	1	-
2014	-	-	-	-	-	-	-	-	-	-	-	-
Publication												
Journal with IF	1	9	1	1	4	4	14	-	3	9	2	-
Journal without IF	-	1	-	-	1	2	2	1	3	1	1	-
Dissertation	-	3	-	1	-	1	3	1	-	2	1	2
Region												
America	-	1	-	1	1	1	3	-	1	3	1	2
Europe	1	5	-	-	-	3	6	-	2	3	-	-
Asia Pacific	-	7	1	1	4	3	10	2	3	6	3	-
Transportation												
No	1	9	1	2	4	5	15	2	6	9	3	2
Yes	-	4	-	-	1	2	4	-	-	3	1	-
Total	1	13	1	2	5	7	19	2	6	12	4	2

* See definition in Figure2.2

Table 2.3 Number of research papers among the factors for relationship patterns, publication dates, regions, publications, and research sectors (continued)

Research profiles	Factor relationship patterns*												
	R13	**R14**	**R15**	**R16**	**R17**	**R18**	**R19**	**R20**	**R21**	**R22**	**R23**	**R24**	**R25**
Year													
2003	-	-	-	-	-	-	-	1	-	-	-	-	-
2004	-	-	-	-	1	-	-	2	-	-	-	-	1
2005	-	-	-	-	3	2	-	3	-	-	-	-	1
2006	-	1	-	-	2	3	-	4	1	-	-	-	-
2007	-	-	-	-	1	1	-	1	-	-	-	-	1
2008	-	-	-	-	1	3	-	3	-	-	-	-	-
2009	-	-	-	1	-	3	-	3	-	-	-	-	1
2010	1	-	-	-	2	4	-	6	-	-	-	1	2
2011	-	-	-	-	2	3	-	3	-	-	-	1	1
2012	-	-	1	-	3	4	1	8	2	-	-	-	4
2013	-	-	-	-	1	3	-	4	1	1	1	-	1
2014	-	-	-	-	-	1	-	1	-	-	1	-	-
Publication													
Journal with IF	-	1	-	1	11	17	-	25	1	1	2	1	7
Journal without IF	-	-	1	-	1	3	1	5	2	-	-	-	3
Dissertation	1	-	-	-	4	7	-	9	1	-	-	1	2
Region													
America	-	-	-	-	4	7	-	9	1	-	1	-	2
Europe	-	1	-	-	6	6	-	8	1	-	-	1	3
Asia Pacific	1	-	1	1	6	14	1	22	2	1	1	1	7
Transportation													
No	1	1	1	1	12	22	1	29	3	1	1	1	9
Yes	-	-	-	-	4	5	-	10	1	-	1	1	3
Total	1	1	1	1	16	27	1	39	4	1	2	2	12

* See definition in Figure2.2

Table 2.3 Number of research papers among the factors for relationship patterns, years, regions, publications, and research sector (Continued)

Research profiles	Factor relationship patterns*												
	R26	**R27**	**R28**	**R29**	**R30**	**R31**	**R32**	**R33**	**R34**	**R35**	**R36**	**R37**	**Total**
Year													
2003	-	-	-	-	-	-	-	-	-	-	-	-	1
2004	-	-	-	-	-	-	-	-	-	1	1	-	2
2005	-	1	1	-	-	2	-	-	-	-	-	-	5
2006	-	-	-	1	1	-	-	-	-	-	-	-	5
2007	-	-	-	-	-	-	-	-	-	-	-	-	3
2008	-	-	-	-	-	-	-	-	-	-	-	-	5
2009	-	-	-	-	-	1	-	-	-	-	-	-	3
2010	1	-	-	-	1	1	-	-	-	-	-	1	7
2011	-	-	-	-	1	-	-	-	-	-	-	-	5
2012	-	-	-	-	2	1	1	1	1	-	-	2	9
2013	-	-	-	-	1	-	-	-	-	-	-	-	6
2014	1	-	-	-	-	-	-	-	-	-	-	-	2
Publication													
Journal with IF	1	1	-	-	1	4	-	-	-	1	1	2	34
Journal without IF	-	-	-	-	2	1	1	1	1	-	-	1	6
Dissertation	1	-	1	1	3	-	-	-	-	-	-	-	13
Region													
America	1	-	1	1	2	-	-	-	-	-	-	-	14
Europe	-	-	-	-	1	1	-	-	-	-	-	3	14
Asia Pacific	1	1	-	-	3	4	1	1	1	1	1	-	25
Transportation													
No	1	-	1	1	4	4	1	1	1	1	1	1	36
Yes	1	1	-	-	2	1	-	-	-	-	-	2	17
Total	2	1	1	1	6	5	1	1	1	1	1	3	53

* See definition in Figure 2.2

From Table 2.3, a summary of 37 relationship patterns for the loyalty factors can be seen. These are classified by publication date, publication pattern, region, and transportation-related studies. Overall, R20 was found in 39 research studies (73.58%), followed by the three factors, i.e., R18, R7, and R17, which were found in 27 (50.94%), 19 (35.85%), and 16 (30.19%) studies, respectively. In addition, 16 relationship patterns for factors associated with customer loyalty (made up of R1, R3, R13, R14, R15, R16, R19, R22, R27, R28, R29, R32, R33, R34, R35, and R36) were cited only once in the 37 articles.

2.5 Conclusion and discussion

Boosting customer loyalty is necessary for a successful business, including businesses such as nonfixed bus services. The rationale is that repeat purchases bring about an increase in a firm's revenues. In this respect, the objective of this study was to determine the key factors associated with the development of customer loyalty. From the findings, 14 factors were determined to be involved in loyalty, 11 of which showed a direct impact on customer loyalty, i.e., switching costs, customer satisfaction, customer trust, commitment, perceived value, involvement, attractiveness of competitors, perceived service quality, customer complaint, perceived risk, and past experience, and 3 of which showed indirect effects, i.e., customer expectation, CSR expectation, and motivation. Based on this literature review, it was determined that there had been no research in which all 14 factors had been considered at the same time. Moreover, a test of the relationship between the 14 factors in terms of publication date, publication pattern, region, and transportation-related studies determined that the selection of factors in each research paper was not associated—

except for commitment and motivation factors, which showed a significant relationship to publication pattern, thus clarifying that customer loyalty-related factors appear to be general predictors. Hence, the selection of the factors associated with loyalty appears to depend on a researcher's interests. In this respect, these14 factors can be considered as part of the study, even though there are some limitations in terms of viable evidence in the previous research. Researchers might select factors according to the frequency of use. The evidence from the study elucidated that the 4 factors, which showed the highest frequency of use in the research studies, were satisfaction, perceived service quality, perceived value, and trust. For the other factors, it is necessary to examine these in terms of the needs for sightseeing buses. The four factors that should be considered are customer expectations, past experiences, commitment, and attractiveness of competitors. Therefore, the relationship can be described as follows:

When a field trip is planned, customer *expectations* regarding the vehicle's body features and service quality usually exist. This level of expectation relies on the *past experiences* of the bus users. For example, if bus passengers have previously experienced field trip accidents, they would be more concerned about bus safety, that is, they would be more concerned about such safety issues such as the presence of safety belts, a glass breaker, and fire extinguishers. After passengers use the bus service, they evaluate the *perceived service quality* by comparing their experience with the service they expected. If the perceived performances match the expectations, the customers have *satisfaction*. Subsequently, clients usually compare the quality of service with the total expenses incurred—which contributes to their *perceived value,* which provides *trust* and *commitment* to the service. This situation could build

customer loyalty which could be measured in different ways, such as through word-of mouth, social networking comments, compliments, and repeat purchases. However, it also depends on the *attractiveness of competitors*.

From the literature review, it was determined that no research had together examined the influence of all 14 factors on customer loyalty, and there was some confusion as to which factors were causes or effects. One example of this is the relationship between trust and satisfaction. Some studies proposed that there was a direct impact between trust and satisfaction (Chiou, 2004; Chiou & Pan, 2009; Deng et al., 2010; Kim et al., 2009), which was in contrast to (Bourdeau, 2005; S.-C. Chen, 2012), which indicated that satisfaction had a direct effect on trust. Hence, more research is needed to explain the relationships between the various factors so as to assist interested businesses. In this respect, structural equation modeling can be applied to confirm the cause–effect relationships between the factors related to nonfixed route bus services. In addition, there are few studies on the factors which influence bus passenger loyalty (Wen et al., 2005). dell'Olio, Ibeas, and Cecín (2010); Stradling, Carreno, Rye, and Noble (2007) tested the factors that may impact the perceived service quality of urban and intercity buses. Eboli and Mazzulla (2007) verified the factors influencing shuttle bus user satisfaction at a university campus. Wen et al. (2005) conducted an analysis of the factors associated with the loyalty of intercity bus passengers. These findings expose a research gap regarding the use of customer expectation as a major factor to evaluate satisfaction levels, which could be determined through a comparison between expectations and perceptions of service quality. Future research should focus on the multiple factors influencing the loyalty of nonfixed route bus service users by integrating the

knowledge gained through previous studies in other businesses. If this were performed, bus company owners could use this information to develop marketing strategies, which respond to the users' needs for sustainable travel safety.

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CHAPTER III

MEASUREMENT MODELING OF THE PERCEIVED SERVICE QUALITY OF A SIGHTSEEING BUS SERVICE: AN APPLICATION OF HIERARCHICAL CONFIRMATORY FACTOR ANALYSIS

3.1 Abstract

Sightseeing buses were taken to use as main vehicles for students' excursions because of a large number of students participating in each trip. Schools should give significant importance to good quality sightseeing buses. This study aimed to develop the indicators monitoring and evaluating sightseeing bus services. This study examined the sightseeing tour buses' service quality factors according to 27 parameters applied as criteria for evaluating and improving service. Data were gathered from 3,387 teachers and educational staff involved with educational field trips. The results of exploratory factor analysis (EFA) classified the parameters into three groups: vehicles, drivers and crews, and management factors. Subsequently, confirmatory factor analysis (CFA) was used to confirm the factor structure. The findings verified that the 27 parameters can indicate three perspectives of quality performance. CFA loading scores were quite high, implying that the parameters had strong potential usefulness for assessing sightseeing bus service quality. Likewise, the second-order CFA found that the three aforementioned latent variables are powerful

indicators of tour service quality level at the 0.01 significance level. In this regard, the factor of vehicles exhibited the largest CFA loading ($\beta = 0.935$). The results of this study potentially provide schools or entrepreneurs for the development of check list in assessing sightseeing bus quality which will make each trip more comfortable in travelling and safety.

3.2 Introduction

Educational field trips are one way to enrich students' knowledge through learning from actual experience that complements what the students learn from textbooks(Bhuiyan, Islam, Siwar, & Ismail, 2010). As Thailand has recently recognized the importance of this activity, excursions occurring once each academic year have been included as part of primary, secondary and vocational education curricula. These trips require schools to arrange large-group tours, which necessitate the use of sightseeing buses. As with other bus selection decisions, the school board always uses service quality information as a key criterion for choosing an educational tour bus. Therefore, bus companies must emphasize on constantly improving service quality. One common way to maintain and improve quality is to administer a service quality perception survey to users every six months or once a year. The data obtained can then provide guidance for the company's strategic decision making (Bordagaray, dell'Olio, Ibeas, & Cecín, 2013; de Oña, de Oña, Eboli, & Mazzulla, 2013; dell'Olio, Ibeas, & Cecin, 2011; Wen, Lan, & Cheng, 2005).

Assessments of the level of sightseeing bus service quality require suitable indicators that are easily comprehendedby respondents. If there are a large number of parameters, group classification is helpful in simplifying information for the

organization to use in designing policies. Hence, the main purpose of this study is to develop parameters for the evaluation of sightseeing bus service quality, as well as to elucidate the significance of each parameter. To perform an effective quality assessment, as de Oña et al. (2013) stated, evaluators must discern which parameters have the greatest influence on the perceived quality. Exploratory and confirmatory factor analysis (EFA and CFA, respectively), which are statistical methods widely used for group categorization and parameter structure verification, can be applied in this case (for more details see Bruce (2010)). Such techniques are also part of structural equation modeling or SEM (Kline, 2011).

A review of existing literature shows that a number of previous studies have focussed prominently on service quality measurement involving various categories of buses, such as urban and interurban buses as summarized in Table 3.1 (Bordagaray et al., 2013; Cafiso, Di Graziano, & Pappalardo, 2013a, 2013b; Chang & Yeh, 2005; de Oña et al., 2013; dell'Olio et al., 2011; dell'Olio, Ibeas, & Cecín, 2010; Eboli & Mazzulla, 2007; Filipović, Tica, Živanović, & Milovanović, 2009; González-Díaz & Montoro-Sánchez, 2011; Jen & Hu, 2003; Lin, Lee, & Jen, 2008; Rojo, dell'Olio, Gonzalo-Orden, & Ibeas, 2013; Rojo, Gonzalo-Orden, dell'Olio, & Ibeas, 2011; Rojo, Gonzalo-Orden, dell'Olio, & Ibeas, 2012; Susnienė, 2012; Tyrinopoulos & Aifadopoulou, 2008; Tyrinopoulos & Antoniou, 2008; Vetrivel Sezhian, Muralidharan, Nambirajan, & Deshmukh, 2014; Wen et al., 2005). However, no studies have highlighted service quality evaluation in the context of educational or sightseeing tour buses, which differ from the other bus services as most of the passengers are children, who have less self-help capabilities than adults in case of accidents. This type of bus needs more safety-related items, such as a video

presentation explaining the use of safety devices on the bus. In addition, procurements of sightseeing bus services generally involve larger contract sizes than other bus types, so that if the level of service quality is lower or does not fulfil agreed-upon standards, causing customers to discontinue their contracts, substantiallyimpacting business profits.

Table 3.1 Summary of previous studies

Author(s) / Year	Type of transportation / Country	Analysis Method	Indicators of bus quality
Ratanavaraha and Jomnonkwao (2014)	Sightseeing buses / Thailand	Confirmatory factor analysis	bus drivers in terms of age, experience, education, driving license, driving skill pertaining to the route, training, and no drinking or smoking
Vetrivel Sezhian et al. (2014)	Urban buses / India	Discriminant analysis	bus punctuality, seat comfort, cleanliness, lighting and entertainment, new fleet addition, seating for handicapped, seating for elderly, issue of proper ticket, in-time issue of ticket, issue of proper change, stopping bus at correct place, backup service during breakdown, provision for luggage, obey traffic rules, first aid facility, driver behavior, conductor behavior, information to passengers
Bordagaray et al. (2013)	Inter-urban buses / Spain	Ordered probit model	waiting time, journey time, reliability, vehicle occupancy, driver kindness, comfort, price of the ticket, quality of the vehicle and available information
Cafiso et al. (2013a)	Urban buses / Italy	Kendall's algorithm	drivers (training, skills, performance evaluation and behavior), vehicles (maintenance and advanced devices) and roads (road and traffic safety issues)
Cafiso et al. (2013b)	Urban buses / Italy	Delphi method	drivers (training, skills, performance evaluation and behavior), vehicles (maintenance and advanced devices) and roads (road and traffic safety issues)
de Oña et al. (2013)	Urban buses / Spain	Measurement model in structural equation modeling	frequency, punctuality, speed, proximity, fare, cleanliness, space, temperature, information, safety, courtesy and accessibility

Table 3.1 Summary of previous studies (Continued)

Author(s) / Year	Type of transportation / Country	Analysis Method	Indicators of bus quality
Rojo et al. (2013)	Inter-urban buses / Spain	Ordered logit and probit models	ticket price, duration of journey, delay, number of stops, State of the bus, Bus facilities (air conditioned, wash room/WC, television), features of the bus station, ticket office features
Rojo et al. (2012)	Inter-urban buses / Spain	Discrete choice models	Reason, duration, number of stop, O/D, cost, delay
Rojo et al. (2011)	Inter-urban buses / Spain	Ordered logit and probit models	Ease of purchase (ticket), Punctuality, Information on bus times, Frequency of service, State of upkeep (condition of the bus), Cleanliness (bus), Temperature (bus), Seat comfort (bus), Noise (bus), Space between seats (bus), Journey time, Safety, Number of stops, Relation quality–price
Susnienė (2012)	Urban buses / Lithuania	SERQUAL	tangible, reliability, responsiveness, assurance, empathy
dell'Olio et al. (2011)	Urban buses / Spain	Multinomial discrete choice model	waiting time at the bus stop, journey time on the bus, vehicle occupancy, cleanliness of the vehicle, driver's kindness and comfort of the buses
González-Díaz and Montoro-Sánchez (2011)	Urban buses / Spain	Qualitative research	1) Quality of service outside the vehicle (e.g. safety of baggage, friendliness and diligence dealing with incidents and problems, ease of ticket purchase and friendliness at the point of sales, satisfactory facilities in stations, information on schedules) 2) Quality of vehicle (e.g. driver friendliness, appearance and level of training, exterior cleanliness and condition of vehicle, safety and smoothness of driving, information updates during trip, interior cleanliness and condition of vehicle, quality of on-board services, passive safety and vehicle comfort.) 3) Fares and schedules

Table 3.1 Summary of previous studies (Continued)

Author(s) / Year	Type of transportation / Country	Analysis Method	Indicators of bus quality
dell'Olio et al. (2010)	Urban buses / Spain	Ordered probit model	waiting time, journey time, access time walking to the initial bus stop, safety within the vehicle, comfort during starting and stopping, comfort during the journey , deviation from the optimal route, cleanliness of the vehicle, price of the bus ticket, quality of the vehicle, reliability of the vehicle, and the kindness of the bus driver
Filipović et al. (2009)	Mass public transportation / Serbia	Sample statistics (e.g. frequency)	station comfort, vehicle comfort, tickets and pricing, information, accessibility in time, spatial accessibility, transport reliability, staff
Lin et al. (2008)	Intercity bus/ Taiwan	confirmatory factor analysis	Interaction with passengers, Tangible service equipment, Convenience of services, Operating management support
Tyrinopoulos and Antoniou (2008)	bus, trolley bus and rail (metro) / Greece	Factor analysis	1) General characteristics of the public transit system (service frequency, on-time performance, service provision hours, network coverage, general information provision, types of tickets and passes, prices of tickets and passes, tickets selling network, personnel behavior, existence of bus lanes, measures for environmentally friendly public transit) 2) Terminals and stops (walking distance to terminals and stops, information provision at terminals and stops, conditions at terminals and stops, safety at terminals and stops) 3) Vehicles (onboard conditions, vehicles cleanliness, driving behavior, onboard information provision, accessibility to disabled and mobility impaired people) 4) Transfer points (distance between transfer points, waiting time at transfer points, information provision at transfer points)

Table 3.1 Summary of previous studies (Continued)

Author(s) / Year	Type of transportation / Country	Analysis Method	Indicators of bus quality
Tyrinopoulos and Aifadopoulou (2008)	Public Transport/ Greece	Factor analysis and Multinomial logistic regression	Safety , Comfort , Cleanliness, Information and communication with the passengers, Accessibility, Terminals and stop points performance, Lines performance, General elements of the public transport system, Compound indicators
Eboli and Mazzulla (2007)	Campus buses / Italy	Measurement model in structural equation modeling	bus stop availability, routing, frequency, reliability, bus stopavailability, overcrowding, cleanliness, cost, information, safety on board, promotion, personal security, helpfulness of personnel, complaints, environmental protection and bus stop maintenance
Chang and Yeh (2005)	Buses / Taiwan	Regression analysis	driver-specific, vehicle-specific and general management
Wen et al. (2005)	Intercity buses / Taiwan	Exploratory and confirmatory factor analysis	on-board amenity, crews' attitude, station performance, operational performance
Jen and Hu (2003)	City buses / Taiwan	Measurement model in structural equation modeling	interaction with passengers, tangible service equipment, convenience of services, operating management support

Among the related studies found in the literature; The samples of studies about urban bus included Vetrivel Sezhian et al. (2014) who studied the customer expectations in a public sector passenger transport companyin India by analyzing attribute-based perceptual mapping using discriminant analysis which considered the factor of service quality using 18 indicators consisting of bus punctuality, seat comfort, cleanliness, lighting and entertainment, new fleet addition, seating for handicapped, seating for elderly, issue of proper ticket, in-time issue of ticket, issue of proper change, stopping bus at correct place, backup service during breakdown, provision for luggage, obey traffic rules, first aid facility, driver behavior, conductor behavior, information to passengers. Cafiso et al. (2013a, 2013b) have studied road

safety issues for bus transport management with 2 methods of Kendall's algorithm and Delphi method by considering related factors to bus transport management including drivers (training, skills, performance evaluation and behavior), vehicles (maintenance and advanced devices) and roads (road and traffic safety issues). de Oña et al. (2013) measured urban bus service quality using12 indicators: frequency, punctuality, speed, proximity, fare, cleanliness, space, temperature, information, safety, courtesy and accessibility. These were then classified into three groups, namely service, comfort and personal factors, and then SEM was used for the analysis. Susnienė (2012) studied the related factor to service quality of public transport according to the framework of SERQUAL model including tangibility, reliability, responsiveness, assurance, empathy considered by the level of quality of the difference between expectations and perceptions. dell'Olio et al. (2011) assessed the quality of urban bus service based on six parameters, including waiting time at the bus stop, journey time on the bus, vehicle occupancy, cleanliness of the vehicle, driver's kindness and comfort of the buses, using a multinomial discrete choice model. González-Díaz and Montoro-Sánchez (2011) proposed the indicators to be considered in monitoring and evaluating bus transport including three groups of quality (1) Quality of service outside the vehicle: safety of baggage; friendliness and diligence dealing with incidents and problems (availability of forms and trained staff); ease of ticket purchase (availability of ticket counters, ticket machines and on-line purchase) and friendliness at the point of sales; satisfactory facilities in stations, stops and shelters; information on schedules, itineraries, route changes, etc. (2) Quality of vehicle: river friendliness, appearance and level of training; exterior cleanliness and condition of vehicle; Safety and smoothness of driving; Information updates during

trip; Interior cleanliness and condition of vehicle; quality of on-board services (audio, video, food and drinks, newspapers and toilet facilities); passive safety and vehicle comfort (leg-room, curtains, tinted windows, tables, reclining seats and temperature control). (3) Fares and schedules: timetables, number of services and seats; ease of connection with other lines; punctuality of departures and arrivals; duration of service (appropriate number and duration of stops); reasonable prices, range of fares and customer loyalty. dell'Olio et al. (2010) studied the factors influencing the quality of public transport by analyzing ordered probit model which considered related variables including waiting time, journey time, access time walking to the initial bus stop, safety within the vehicle, comfort during starting and stopping, comfort during the journey, deviation from the optimal route, cleanliness of the vehicle, price of the bus ticket, quality of the vehicle, reliability of the vehicle, and the kindness of the bus driver. Filipović et al. (2009) considered the factors of station comfort, vehicle comfort, tickets and pricing, information, accessibility in time, spatial accessibility, transport reliability, staff of mass passenger public transport service in Belgrade. Tyrinopoulos and Antoniou (2008) studied about passenger's perception of transit performance in Greece. This study has considered 23 indicators divided into four groups as follows; (1) General characteristics of the public transit system (service frequency, on-time performance, service provision hours, network coverage, general information provision, types of tickets and passes, prices of tickets and passes, tickets selling network, personnel behavior, existence of bus lanes, measures for environmentally friendly public transit). (2) Terminals and stops (walking distance to terminals and stops, information provision at terminals and stops, conditions at terminals and stops, safety at terminals and stops). (3) Vehicles (onboard conditions, vehicles cleanliness,

driving behavior, onboard information provision, accessibility to disabled and mobility impaired people). (4) Transfer points (distance between transfer points, waiting time at transfer points, information provision at transfer points). Tyrinopoulos and Aifadopoulou (2008) provides an overview of the Methodology developed by the Hellenic Institute of Transport to assess the levels of quality and performance of public transport services consisting of 39 indicators divided into 7 groups including safety-comfort-cleanliness (8 items), information-communication with the passengers (2 items), accessibility (4 items), terminals and stop points performance (5 items), lines performance (5 items), general elements of the public transport system (12 items), compound indicators (3 items). Chang and Yeh (2005) have studied Taiwanese bus companies on factors affecting the safety performance and then being analyzed by regression analysis. The considered factors consisted of on-board amenity, crews' attitude, station performance, operational performance. Jen and Hu (2003) have developed a model to identify factors affecting passengers' repurchase intentions on city bus in Taiwan by analyzing SEM. It was found that perceived quality is positively and directly related to perceived benefits where perceived quality was measured by interaction with passengers, tangible service equipment, convenience of services, operating management support.

The samples used for studying interurban or intercity bus included Bordagaray et al. (2013) who applied six indicators (i.e. waiting time, journey time, reliability, vehicle occupancy, driver kindness, comfort, price of the ticket, quality of the vehicle and available information) to evaluate the service quality of interurban buses through an ordered probit model. Rojo et al. (2013); Rojo et al. (2011); Rojo et al. (2012) have studied the quality indicators of interurban bus in Spain. These considered

indicators included features of the bus station, features of ticket office, features of services (ticket price, ease of purchase of ticket, punctuality, information on bus times, frequency of service, safety, number of stops), facilities of bus (state of upkeep, cleanliness, temperature, seat comfort, noise, space between seats, toilet, television). Lin et al. (2008) have studied the relationships between behavioral intention and service quality of intercity bus in Taiwan and being analyzed by structural equation model (SEM). For service quality, it was considered according to SERVQUAL model proposed by Parasuraman, Zeithaml, and Berry who considered 20 indicators divided into4 groups including Interaction with passengers (6 items), Tangible service equipment (6 items), Convenience of services (5 items), and Operating management support (3 items). Anyhow, Lin et al. (2008) have employed confirmatory factor analysis to confirm the status quo of factors of indicators before the analysis of SEM. Considering 20 indicators of service quality divided by EFA into 4 groups including Onboard amenity (9 items), Crews' attitude (5 items), Station performance (4 items), Operational performance (4 items). Wen et al. (2005) have analyzed them by SEM and found that service quality was the factor influencing the satisfaction of interurban passengers at statistical significance level.

The samples used for studying campus bus service included Eboli and Mazzulla (2007) who carried out quality measurement of a campus bus service according to 16 indices: bus stop availability, routing, frequency, reliability, bus stop availability, overcrowding, cleanliness, cost, information, safety on board, promotion, personal security, helpfulness of personnel, complaints, environmental protection and bus stop maintenance. Ratanavaraha and Jomnonkwao (2014) found that age, experience, education, driving license, driving skill pertaining to the route, training,

and no drinking or smoking are factors of users′ expectations of sightseeing buses' drivers at statistical significance level when analyzed by CFA.

EFA and CFA were selected for use in the analysis of this study's data due to the widespread use of such techniques for assessing the service performance of various bus types. They offer an uncomplicated approach to grouping parameters as well as strong ability to indicate the potential influence of each parameter through factor loading scores.

The results of this study potentially provide schools or entrepreneurs for more effectively monitoring and evaluating sightseeing bus quality such as the development of check list including comfort in travelling and safety.

3.3 Methodology

3.3.1 Survey design

The sample group in this study comprises teachers, who make decisions on sightseeing bus service procurement, selected from areas throughout Thailand. In the sampling design, stratified random sampling was methodically applied through regional level classification (north, northeast, central and south), provincial size (small, medium and large), area (urban and rural), and educational level (primary, secondary and vocational). Data gathering took place through a postal mail, which offers significant advantages over face-to-face interviews because it reduces researcher travel costs, gives respondents more time to prepare their answers, and permits larger sample sizes. The mailed-out surveys to be returned at the response rate of 25% requiring adequate questionnaires for data analysis according to Table 3.2

totalled 2,126 schools and 5 teachers each school. The total amount was 10,630 questionnaires.

The researchers received 3,387 completed questionnaires, representing a response rate of 42.3%, which is quite adequate for analysis. Stevens (1966) suggested that the sample size for maximum likelihood (ML) estimation should be at least 15 times the number of observed variables (Golob, 2003).

In developing the questionnaire, questions were carefully chosen from previous studies to be compatible with the study context (Eboli & Mazzulla, 2007; González-Díaz & Montoro-Sánchez, 2011; Stradling, Carreno, Rye, & Noble, 2007; Wen et al., 2005), and a focus group was also used to generate questions. The focus group of 30 participants included teachers, police officers, officers from Department of Land Transport, officers from Road Safety Group Thailand, and lecturers from universities. The response scale for each question was from 1 (strongly disagree) to 7 (strongly agree). The detail of the questionnaire see Appendix 3.1.

To assess the quality of research tools using questionnaire, the researchers have measured content validity by employing Index of Item Objective Congruency: IOC) with 13 experts. All question items which covered every perspective of sightseeing buses were considered at IOC value greater than 0.50. Then, the questionnaires were piloted with 89 samples (teachers) to measure reliability and content validity. For measuring reliability, Conbach's Alpha was statistically considered (From the assessment of research tool by considering question items from literature reviews and those of focus group, it was found that the IOC value of question items was between 0.54-1.00 and Conbach's Alpha value was between 0.909 3–0.965 (>0.70, Tavakol and Dennick (2011)). In terms of content, the samples in

pilot study comprehended the question items on questionnaires very well so the final version of questionnaires was not modified.

Table 3.2 Number of samples in each zone

Level	Small and medium-sized provinces[a]					Large-sized province[b]					BKK vicinity[c]	BKK[d]	Total
	Urban		Rural		Total	Urban		Rural		Total			
	L	S	L	S		L	S	L	S				
Primary	2	2	2	2	8	4	3	4	3	16	12	24	684
Secondary	3	3	3	3	12	6	6	6	6	24	18	36	1,026
Total	5	5	5	5	20	10	10	10	10	40	30	60	1,710

Note: L = large, S = Small, BKK = Bangkok, all 416 vocational schools were gathered.
[a] Every school in every province except that of large-sized provinces, suburb province, and Bangkok
[b] Large-sized provinces including Nakorn Ratchasrima, Khon Khaen, Chiengmai, and Chonburi (Data were collected 2 times more than medium-sized and small-sized provinces)
[c] Five suburb provinces including Nonthaburi, Pathumthani, Samutraprakarn, Samutsakorn, and Nakorn Prathom (Data were collected 1.5 times more than medium-sized and small -sized provinces)
[d] Bangkok metropolitan (Data were collected 3 times more than medium-sized and small-sized provinces)

3.3.2 Variables, hypothesis and data analysis

Variables in this study incorporated 29 parameters related to sightseeing bus service quality, as demonstrated in Table 3.6. The null hypotheses were constructed to specify that the 29 variables can be used as parameters for measuring the quality of sightseeing tours through EFA for group classification and cross-validation with second-order CFA to confirm the model structure.

3.3.3 Factor analysis

Factor analysis is a modeling approach for studying hypothetical constructs of observed variables or indicators, or a technique for identifying groups of observed variables or indicators that can be directly measured (Raykov & Marcoulides, 2006). There are two basic types of factor analyses: exploratory factor

analysis (EFA) and confirmatory factor analysis (CFA). EFA is used to determine the appropriate number of common factors that are needed to explain the correlations among a set of observed variables (Muthen & Muthen, 2010). This method is applied where links between the observed and latent variables are unknown or uncertain (Byrne, 2012). In EFA, the researcher may not have any specific expectations regarding the number of underlying factors (Brown, 2006; Bruce, 2010). In contrast, CFA is used to confirm the relationships between a set of observed variables and a set of common factors or latent variables (Muthen & Muthen, 2010), and is appropriately used when the researcher has some knowledge and/or empirical research of the underlying latent variable structure (Byrne, 2012). Therefore, researches without theories cannot use CFA (Bruce, 2010). When hypotheses about hierarchical relations among constructs were considered, second-ordered CFA is used to present these hypotheses. In comparison to first-ordered CFA with correlated factors, second-ordered CFA can provide a more parsimonious and interpretable model when researchers hypothesize that higher-ordered factors underlie their data (Chen, Sousa, & West, 2005).

3.4 Findings

3.4.1 Descriptive statistics

As noted previously, the survey data to be analyzed were acquired from 3,387 school teachers and staff, including 1,272 men (37.6%) and 1,958 women (57.8%). In terms of educational level, 122 participants (3.6%) had less than a bachelor's degree, 2,089 (61.7%) had only a bachelor's degree, and 1,015 (29.9%) reported an educational level higher than a bachelor's degree. With regard to income,

1,264 respondents, or about 37.3%, earned more than 35,000 THB. Furthermore, 2,065 respondents (61.0%) were working at urban schools and 1,322 (39.0%) at rural schools. Finally, with regard to school level, the sample was about evenly divided between primary school (1,146 persons or 33.8%), secondary school (1,287 persons or 38.0%) and vocational education (954 persons or 28.2%), as illustrated in Table 3.3.

Table 3.3 Sample profile

Profile		Frequency	Percentages
Gender	Male	1,272	37.6
	Female	1,958	57.8
	No answer	157	4.6
Educational level	Matayom 6/ vocational certificate	41	1.2
	Diploma/high vocational certificate	81	2.4
	Bachelor's degree	2,089	61.7
	Master's degree	1,000	29.5
	Doctor of Philosophy (PhD.)	15	0.4
	No answer	161	4.8
Group income	<=20,000 THB	976	28.8
	>20,000 THB –25,000 THB	142	4.2
	>25,000 THB –30,000 THB	511	15.1
	>30,000 THB –35,000 THB	157	4.6
	> 35,000 THB	1,264	37.3
	No answer	337	9.9
School location	Urban	2,065	61.0
	Rural	1,322	39.0
Level of school	Prathom or primary education	1,146	33.8
education	Matayom or secondary education	1,287	38.0
	Vocational education	954	28.2

* N = 3,387; there were missing responses on some items.

With regard to development of a measurement model for the level of sightseeing bus service quality (see Table 3.4), the analysis results based on 29 observed variables in the model demonstrated that all 406 relationships between pairs of variables differed from zero at the 0.01 level of significance. The findings also showed positive coefficients in the range of 0.28–0.85, verifying the correlation

among observed variables with the same direction. Moreover, the results of Bartlett's Test of Sphericity, which provides statistical values for testing whether the correlation matrix is equal to the identity matrix, indicated χ^2 = 90187.91 (df = 435, p < 0.001), varying from zero with a significance level of 0.01, consistent with the Kaiser-Meyer-Olkin (KMO) value which is closer to 1 (KMO = 0.977). So the correlation matrix of observed variables is not the identity matrix, with a relationship among the variables that is suitable for factor analysis.

With regard to perceived quality, the sample gave the highest average score, 5.63 (SD = 1.09), on parameter 19 (bus driver's knowledge of sightseeing tour routes), followed by parameter 17 (bus driver driving safely, i.e. at a safe speed, politely, with respect for traffic rules) with an average score of 5.59 (SD. = 1.09). Parameter 26 (suggestion of safety equipment use and practises for emergency response) received the minimum average score (M = 4.34, SD. = 1.67). The study tested for normal distribution using skewness and kurtosis; as suggested by statistical criteria, the value should be close to zero, with the acceptable value between -1.50 and +1.50 (Muthén & Kaplan, 1985). In this concern, the skewness and kurtosis values for all questions (see Table 3.5) fell in the acceptable range, indicating normally distributed data.

Table 3.4 Correlation

	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
P1	1.00	0.71	0.65	0.64	0.60	0.57	0.59	0.43	0.50	0.55	0.55	0.51	0.51	0.53	0.52
P2		1.00	0.68	0.66	0.63	0.59	0.63	0.41	0.50	0.58	0.61	0.55	0.58	0.59	0.58
P3			1.00	0.73	0.64	0.59	0.63	0.50	0.58	0.56	0.56	0.54	0.52	0.54	0.53
P4				1.00	0.69	0.64	0.67	0.51	0.60	0.58	0.57	0.58	0.54	0.55	0.54
P5					1.00	0.82	0.67	0.48	0.56	0.58	0.59	0.54	0.56	0.57	0.57
P6						1.00	0.67	0.47	0.53	0.57	0.60	0.53	0.58	0.58	0.59
P7							1.00	0.54	0.64	0.63	0.62	0.60	0.59	0.61	0.61
P8								1.00	0.59	0.44	0.37	0.46	0.36	0.39	0.40
P9									1.00	0.58	0.53	0.63	0.52	0.53	0.54
P10										1.00	0.79	0.68	0.72	0.72	0.73
P11											1.00	0.69	0.79	0.76	0.76
P12												1.00	0.70	0.70	0.69
P13													1.00	0.84	0.81
P14														1.00	0.85
P15															1.00

	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28	P29
P1	0.52	0.51	0.48	0.48	0.53	0.49	0.49	0.52	0.45	0.37	0.33	0.37	0.37	0.46
P2	0.58	0.57	0.54	0.53	0.56	0.48	0.49	0.54	0.50	0.36	0.30	0.35	0.36	0.46
P3	0.53	0.51	0.51	0.48	0.54	0.52	0.52	0.54	0.44	0.43	0.37	0.40	0.38	0.47
P4	0.53	0.52	0.53	0.49	0.56	0.53	0.53	0.54	0.45	0.42	0.39	0.39	0.39	0.47
P5	0.55	0.53	0.52	0.49	0.55	0.50	0.50	0.52	0.47	0.40	0.36	0.38	0.37	0.45
P6	0.58	0.55	0.53	0.52	0.55	0.49	0.49	0.51	0.49	0.37	0.33	0.36	0.35	0.43
P7	0.60	0.58	0.57	0.54	0.60	0.53	0.54	0.56	0.50	0.45	0.38	0.40	0.39	0.51
P8	0.37	0.35	0.40	0.31	0.44	0.47	0.43	0.42	0.31	0.48	0.44	0.41	0.37	0.41
P9	0.49	0.47	0.53	0.44	0.56	0.56	0.55	0.54	0.41	0.51	0.49	0.46	0.46	0.52
P10	0.69	0.66	0.62	0.60	0.61	0.55	0.58	0.60	0.53	0.42	0.40	0.42	0.43	0.55
P11	0.73	0.72	0.65	0.63	0.59	0.53	0.54	0.59	0.58	0.36	0.33	0.39	0.40	0.52
P12	0.64	0.63	0.66	0.57	0.61	0.59	0.60	0.61	0.52	0.46	0.44	0.41	0.46	0.56
P13	0.76	0.74	0.67	0.66	0.61	0.52	0.56	0.61	0.59	0.35	0.34	0.39	0.40	0.52
P14	0.78	0.74	0.68	0.66	0.63	0.54	0.59	0.63	0.61	0.37	0.36	0.40	0.42	0.55
P15	0.79	0.75	0.68	0.67	0.62	0.55	0.60	0.62	0.61	0.39	0.38	0.41	0.42	0.54
P16	1.00	0.83	0.69	0.68	0.60	0.50	0.56	0.60	0.59	0.34	0.32	0.39	0.40	0.52
P17		1.00	0.72	0.72	0.58	0.48	0.54	0.58	0.60	0.33	0.30	0.39	0.40	0.53
P18			1.00	0.70	0.62	0.52	0.56	0.60	0.56	0.39	0.37	0.42	0.43	0.56
P19				1.00	0.57	0.45	0.53	0.56	0.58	0.32	0.28	0.38	0.38	0.51
P20					1.00	0.69	0.67	0.71	0.59	0.54	0.51	0.54	0.55	0.64
P21						1.00	0.72	0.69	0.49	0.60	0.57	0.52	0.50	0.61
P22							1.00	0.75	0.56	0.52	0.52	0.47	0.50	0.64
P23								1.00	0.62	0.53	0.50	0.52	0.53	0.63
P24									1.00	0.36	0.30	0.37	0.37	0.50
P25										1.00	0.68	0.56	0.57	0.56
P26											1.00	0.61	0.57	0.58
P27												1.00	0.64	0.63
P28													1.00	0.70
P29														1.00

Notes: For descriptions of P1 through P29, see Table *3.6*. Correlation is significant at the 0.01 level (two-tailed) for all pairs. KMO = 0.977. Bartlett's Test of Sphericity: Chi-Square = 90187.91, df = 435, $p < 0.001$.

Table 3.5 Mean, standard deviation, skewness and kurtosis

No.	M	SD	Sk	Ku	No.	M	SD	Sk	Ku
P1	5.29	1.04	-0.75	1.41	**P16**	5.51	1.09	-0.87	1.32
P2	5.48	1	-0.75	1.13	**P17**	5.59	1.09	-0.94	1.4
P3	5.3	1.14	-0.78	1.02	**P18**	5.35	1.06	-0.78	1.29
P4	5.21	1.17	-0.68	0.77	**P19**	5.63	1.09	-0.91	1.25
P5	5.3	1.15	-0.81	1.19	**P20**	5.23	1.04	-0.73	1.49
P6	5.33	1.17	-0.80	1.11	**P21**	4.79	1.29	-0.72	0.74
P7	5.22	1.16	-0.80	1.07	**P22**	5.06	1.26	-0.85	0.99
P8	4.43	1.64	-0.75	-0.14	**P23**	5.2	1.13	-0.71	0.96
P9	4.84	1.37	-0.71	0.46	**P24**	5.55	1.16	-0.99	1.4
P10	5.3	1.08	-0.74	1.21	**P25**	4.4	1.66	-0.66	-0.3
P11	5.5	1.06	-0.77	1.05	**P26**	4.34	1.67	-0.65	-0.41
P12	5.18	1.17	-0.80	1.16	**P27**	4.79	1.63	-0.86	0.17
P13	5.53	1.06	-0.76	0.95	**P28**	4.91	1.59	-0.96	0.45
P14	5.4	1.09	-0.69	0.81	**P29**	5.1	1.29	-0.94	1.14
P15	5.43	1.1	-0.77	1.05	**P16**	5.51	1.09	-0.87	1.32

Note: M = mean, SD = standard diviation, Sk = skewness, Ku = kurtosis

3.4.2 Exploratory Factor Analysis

For EFA, the analysis involved the use of scores attained from 29 sightseeing bus service quality parameters to conduct group classification. In this respect, the variables were divided into three groups using principal component analysis for factor extraction and varimax rotation with Kaiser Normalization through SPSS. Altogether, 1,692 samples (approximately a half of sample) were brought into the procedure.

In this study, factor loadings of 0.50 and higher will be considered practically significant because the 0.50 loading denotes that 25 percent of the variance is accounted for by the factor (Hair, Black, Babin, & Anderson, 2010), and many researches had used the same threshold such as, Lai and Chen (2011); Sohrabi, Vanani, Tahmasebipur, and Fazli (2012); Transportation Research Board (1999); Wen et al. (2005). During this iterative process, parameters were deleted if they (1) do not

load practically significant on any factor, (2) communality is deemed too low, or (3) cross-loaded on two or more factors (Hair et al., 2010), so P20 and P23 were discarded.For final result, three factors had eigen values higher than 1, explaining 68.32% of the variance together. Table 3.6 illustrates the EFA results on factor groups, in which factor1, vehicle convenience and necessity, encompasses nine parameters (P1–P9), with EFA loading values between 0.535 and 0.734. Factor 2 is described as the driver and crew factor, involving eleven parameters (P10–P19, and P24) presenting EFA loadings of 0.533 to0.798. Finally, factor 3, management, consists of seven parameters (P21, P22, P25–P29), with EFA loadings of 0.621 to 0.715.

3.4.3 Reliability

With regard to the reliability of a research instrument, statistical theory has determined that Cronbach's alpha should be more than 0.7 (Hair et al., 2010). According to Table 3.6, the three latent variables indicate Cronbach's alpha equal to 0.922, 0.958 and 0.903, respectively, representing acceptable values.

Convergent validity was question items or indicators measuring the same topic. The co-variance of explanation by the same factor should be high. Convergent validity of the factors was estimated by standardized factor loadings, composite reliability (CR), and average variance extracted (AVE) (Hair et al., 2010). The CR and the AVE were calculated as equation 1 and equation 2, respectively.

$$CR = \frac{\left(\sum_{i=1}^{n} L_i\right)^2}{\left(\sum_{i=1}^{n} L_i\right)^2 + \left(\sum_{i=1}^{n} e_i\right)} \quad (1)$$

$$AVE = \frac{\sum_{i=1}^{n} L_i}{n} \quad (2)$$

Where L_i is the standardized factor loadings of CFA, i is the number of n items, and e_i is the error variance terms for a construct. Evidence of convergent validity,Hair et al. (2010) recommended all factor loadings should be statistically significant and standardized factor loadings equal 0.50 or higher. The CR of 0.70 or higher and AVE of 0.50 or greater are deemed acceptable. Table 3.6 and Table 3.7 summarize the factor loadings, CR and AVE of the model. All the measures fulfill the recommended levels, with all standardized factor loadings are higher than 0.50, the CR ranges from 0.871 to 0.961 and the AVE ranges from 0.51 to 0.69. Therefore, the results indicate that convergent validity of the measures was reasonable.

Table 3.6 Results of EFA and CFA of perceptions of educational bus users

Code	Indicators	EFA (N=1962)		CFA (N=1965)		
		Communalities	Loadings [a]	Loadings [b]	t-value	Error variances
	Factor 1: Vehicles					
P1	No disturbing noise from engine when sitting inside a bus	0.632	0.677	0.702	51.764	0.501
P2	Neatness and cleanliness inside a bus	0.657	0.661	0.778	68.420	0.395
P3	Good working condition of air-conditioning system and efficient cooling system (neither bad odors nor water leaking)	0.714	0.735	0.745	61.833	0.440
P4	Clean and adjustable bus seats with a space between two seats in a row	0.734	0.754	0.796	78.430	0.363
P5	Provision of a complete set of audio-video entertainment facilities (i.e.,TV, DVD player, MP3, karaoke machine, etc.) with good working condition	0.720	0.754	0.818	86.676	0.346
P6	Good working condition of bus audio	0.685	0.705	0.791	75.471	0.386
P7	Decent appearance of vehicle body	0.535	0.578	0.637	40.526	0.598
P8	Bus having a clean and convenient toilet	0.701	0.665	0.834	97.678	0.299
P9	Installation of a complete set of bus safety equipment (i.e. glass breaking device, safety beltand emergency door, etc.) with instruction signs	0.613	0.569	0.773	67.244	0.442
	Factor 2: Drivers and crews					
P10	Good personality and appearance of driver and crew that is neat, clean, and meets uniform standards	0.681	0.659	0.851	109.808	0.286
P11	Friendly, helpful and polite customer service of driver and crew	0.750	0.755	0.860	120.703	0.265
P12	Effective and correct emergency management	0.642	0.629	0.826	93.980	0.330
P13	Service willingness to customers	0.792	0.812	0.867	131.774	0.242
P14	Quick and enthusiastic service provision	0.798	0.807	0.887	149.274	0.211
P15	Professional crew service	0.792	0.796	0.882	144.984	0.195
P16	Bus driver with good driving skills	0.783	0.813	0.875	127.715	0.239

Table 3.6 Results of EFA and CFA of Perceptions of Educational Bus Users (continued)

Code	Indicators	EFA (N=1962)		CFA (N=1965)		
		Communalities	Loadings [a]	Loadings [b]	t-value	Error variances
P17	Bus driver driving safely, i.e. at a safe speed, politely, with respect for traffic rules	0.765	0.810	0.841	104.367	0.317
P18	Driver and crew knowing how to fix engine	0.658	0.699	0.793	81.644	0.365
P19	Bus driver's knowledge of sightseeing tour routes	0.638	0.737	0.761	68.920	0.429
P24	On-time performance	0.533	0.626	0.692	51.591	0.532
	Factor 3: Management					
P21	Having good customer contact system (i.e. call center for informing problems) with easy access	0.638	0.643	0.814	68.732	0.293
P22	Pleasurably allowing customers for a pre-trip inspection	0.621	0.571	0.831	73.046	0.532
P25	Installation of Global positioning system *(*GPS)	0.680	0.764	0.620	35.797	0.553
P26	Suggestion of safety equipment usage via video (especially how to use glass breaking device, fire extinguisherand safety belt, etc.) and practices for emergency response	0.714	0.815	0.566	28.546	0.608
P27	For long-distance travel distance beyond 400 km, two drivers must be provided by the business owner because a driver is not supposed to continue driving formore than 4 hours as issued by law	0.624	0.740	0.620	35.093	0.603
P28	Receiving accident insurance coverage over mandatory insurance for all seats	0.631	0.730	0.604	34.594	0.625
P29	Appropriate driver recruitment process of bus company i.e. age, experience, etc.	0.715	0.693	0.747	57.532	0.437

Notes: [a] EFA loading ≥ 0.5 is accepted.[b]Standardized estimation and all CFA loadings are significant at α=0.01.

Table 3.7 Variance explained, Cronbach's alpha, composite reliability, and average variance extracted

	Variance explained (%)	Cronbach's α	CR	AVE
Factor 1: Vehicles	29.193	0.922	0.927	0.587
Factor 2: Drivers and crews	20.703	0.958	0.961	0.690
Factor 3: Management	18.420	0.903	0.871	0.510

3.4.4 Model fit indices

This section covers the findings from the second-order CFA of the measurement model of sightseeing bus service quality level, carried out for the purpose of conducting cross-validation. The results of EFA through Mplus 7.11, based on 1,695 respondents (the portion of the sample remaining after EFA analysis), illustrated goodness-of-fit statistics as follows: chi-square (χ^2) = 1594.03, degrees of freedom (*df*) = 331, *p*-value < 0.001, root mean square of approximation (RMSEA) = 0.047, comparative fit index (CFI) = 0.972, Tucker Lewis Index (TLI) = 0.965, standardized root mean residual (SRMR) = 0.033. When compared to the suggested values that χ^2 (*df*) should have $p > 0.05$ (Kline, 2011), RMSEA should be ≤ 0.06, CFI should be > 0.95, TLI should be ≥ 0.95 and SRMR should be ≤ 0.08 (Hu & Bentler, 1999), all statistical values of the measurement model are consistent with the criteria, except for chi-square testing. As the χ^2 value is sensitive to a large sample size (n > 200), this test tends to reject the hypothesis (Kline, 2011; MacCallum, Browne, & Sugawara, 1996). Due to the large sample size in this study (n = 1,695), it can be concluded that the model has good fit, as supported by various studies such as Delbosc and Currie (2012), Chung, Song, and Park (2012) and Van Acker and Witlox (2010).

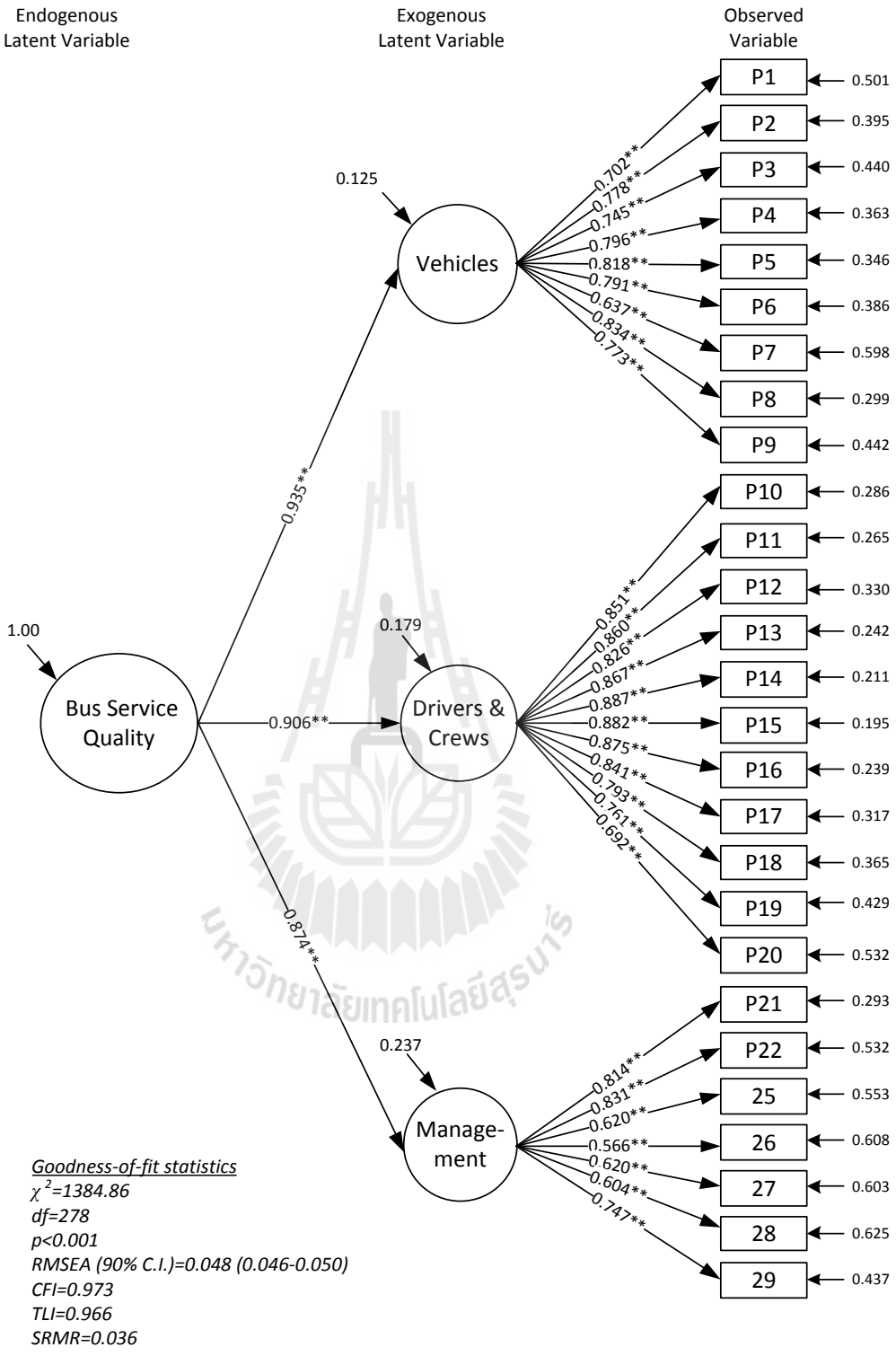

Figure 3.1 Model result of second-ordered confirmatory factor analysis

3.5 Model parameters estimated

As shown in Figure 3.1 and Table 3.6, the relationship among variables in the sightseeing bus service quality model was thoroughly clarified, in that the first-order model displays the relations between three exogenous latent variables relating to service quality obtained from EFA—namely vehicles, drivers and crews, and management factors—and 27 observed variables (quality parameters). The results indicated that all variables are significant at the 0.01 level, meaning that all 27 parameters can be used to measure the quality level of the three factors. More detailed explanation with regard to each factor is as follows:

- Regarding the measurement of vehicle factor from nine observed variables, P8, Bus having a clean and convenient toilet, exhibited the maximum CFA loading score ($\beta = 0.834$), followed by P5, provision of a complete set of audio-video entertainment facilities in good working condition ($\beta = 0.818$).

- Concerning the driver and crew factor, eleven observed variables were included. The findings identified CFA loadings for all variables in the range of 0.692–0.887; P14, quick and enthusiastic service provision, offered the highest CFA loadings core of 0.887.

- Finally, with respect to management, the seven observed variables that constituted this factor obtained CFA loadings in the range of 0.566–0.831. On this factor, P22, Pleasurably allowing customers for a pre-trip inspection, had the highest CFA loading at 0.831.

As for the second-order model reflecting the relationship between endogenous latent variables relating to quality level of sightseeing bus services and the three aforementioned exogenous latent variables, all three exogenous latent variables were

found to be significant at the 0.01 level, thus signifying that such variables are statistically considered acceptable parameters that can be applied to measure the quality level of the sightseeing tour performance. In addition, the findings found that F1, vehicles, obtained the maximum CFA loading score ($\beta = 0.935$), followed by F2, drivers and crews ($\beta = 0.906$), whereas the minimum score was associated with F3, management ($\beta = 0.874$). However, this model was reasonably adjusted to enable construct validity, as shown by the adjusted results in Appendix 3.2.

3.6 Conclusion and discussion

This study focussed on the examination of factors involving sightseeing bus service quality, based on 29 parameters. The first step in the research procedure entailed classifying the parameters into groups so as to make application to service improvement easier. EFA was used to categorize the parameters into three groups with 27 parameters (two parameters were deleted), described as vehicles, drivers and crews, and management. Our findings are similar to those of Wen et al. (2005), although the two studies differ with regard to bus type and groups of parameters. Wen et al. (2005) studied interurban bus service and divided 22 parameters into four groups: onboard amenities (captured by factors 1 of this study), crew's attitude (factor 2 of this study), station performance (ignored by this study), operational performance (factors 3 of this study). We subsequently conducted a CFA to confirm the factor structure from the EFA.

Based on the results, it can be stated that the 27 parameters are powerful indices for measuring the quality level of three factors at the 0.01 significance level. In addition, it was discovered by this study that these three factors can be used to

statistically assess the level of sightseeing bus service quality at the 0.01 significance level according to the second-order CFA. All CFA loading scores in the model were relatively high (> 0.5), indicating that the parameters have strong potential for reliably measuring perceptions of the quality level of sightseeing bus services.

In addition, CFA loadings obtained from this study can be useful as key information for improving service performance; for example, as the vehicle factor obtained the maximum CFA loading score in the second-order model, bus companies should place a high priority on this factor. Likewise, special consideration should be given to the highest-scoring parameters in the first-order model, which indicated the clean and convenient toilet were of great concern to customers. When considering the driver and crew factor, which obtained the second-highest CFA loading score, quick and enthusiastic service provision parameter had the maximum loading value; hence, bus companies must pay close attention to this point to provide superior service. Furthermore, the companies may effectively use the CFA loadings to construct weighted scores for service quality assessment. Improvements in service quality are related to customer satisfaction and customer loyalty, which result in various behaviours (such as word-of-mouth compliments and repeat orders) that generate greater returns for a firm (Lai & Chen, 2011; Suki, 2014; Wen et al., 2005).

And when considering the other side which is the school side, the schools are able to take the results of this study to develop check list for their procedures of selecting sightseeing bus assessment in order to get the sightseeing buses which are more comfortable and safer. The weight of factors may be employed to score each indicator.

This study has developed a model according to the Thai context. For other countries in which sightseeing bus management differs from Thailand, they are able to initially take the results of this study to use since many indicators have been developed in different countries. The indicators in this study should be re-analyzed as prototypes.

This study has developed the indicators for service users only. For further studies, there should be entrepreneurs' assessment after using the results of this study to reduce the gap between service users and service suppliers. Moreover, this study has specifically considered factors of quality. For further studies, there should be the study among the indicators and the satisfaction and users' loyalty.

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3.8 References

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Appendix 3.1: The questionaire of this study

1. Demographic item:

1.1) Name of Institute
(a) School / College / Institute_____
(b) Be in the service of_____
(c) Province_____
(d) Institute status ❍1) Public ❍ 2) Private
(e) Location ❍1) Inside urban city ❍2) Outside urban city

1.2) What level of education is available in your educational institute? (more than 1 answer acceptable)
❍1) Kindergarten ❍ 2) Elementary ❍ 3) Secondary
❍ 4) Upper secondary ❍ 5) Vocational Certificate
❍ 6) High Vocational Diploma

1.3) Number of students in your institute _____students

1.4) Sex ❍1) Male ❍2) Female

1.5) Age _____ years

1.6) Highest education level
❍1) Upper Secondary / Vocational Certificate ❍2) Diploma/ High Vocational
❍3) Bachelor's degree ❍ 4) Master's degree ❍ 5) Doctor's degree

1.7) Average income _____THB/ month

1.8) Position
❍1) Institute Administrator ❍2) Teacher/Lecturer ❍3) Staff/Supporting staff

2. Quality item:

Directions: According to the latest use of sightseeing bus, how do you agree at these parameters? (7=strongly agree, 1= strongly disagree)

No.	Parameters	Score	No.	Parameters	Score
1	No disturbing noise from engine when sitting inside a bus	-------	16	Bus driver with good driving skills	-------
2	Neatness and cleanliness inside a bus	-------	17	Bus driver driving safely, i.e. at a safe speed, politely, with respect for traffic rules	-------
3	Good working condition of air-conditioning system and efficient cooling system (neither bad odors nor water leaking)	-------	18	Driver and crew knowing how to fix engine	-------
4	Clean and adjustable bus seats with a space between two seats in a row	-------	19	Bus driver's knowledge of sightseeing tour routes	-------
5	Provision of a complete set of audio-video entertainment facilities (i.e.,TV, DVD player, MP3, karaoke machine, etc.) with good working condition	-------	20	Having good equipment and bus maintenance place	-------

No.	Parameters	Score	No.	Parameters	Score
6	Good working condition of bus audio	-------	21	Having good customer contact system (i.e. call center for informing problems) with easy access	-------
7	Decent appearance of vehicle body	-------	22	Pleasurably allowing customers for a pre-trip inspection	-------
8	Bus having a clean and convenient toilet	-------	23	Convenience of service use i.e. convenient location	-------
9	Installation of a complete set of bus safety equipment (i.e. glass breaking device, safety beltand emergency door, etc.) with instruction signs	-------	24	On-time performance	-------
10	Good personality and appearance of driver and crew that is neat, clean, and meets uniform standards	-------	25	Installation of Global positioning system *(*GPS)	-------
11	Friendly, helpful and polite customer service of driver and crew	-------	26	Suggestion of safety equipment usage via video (especially how to use glass breaking device, fire extinguisher and safety belt, etc.) and practices for emergency response	-------
12	Effective and correct emergency management	-------	27	For long-distance travel distance beyond 400 km, two drivers must be provided by the business owner because a driver is not supposed to continue driving formore than 4 hours as issued by law	-------
13	Service willingness to customers	-------	28	Receiving accident insurance coverage over mandatory insurance for all seats	-------
14	Quick and enthusiastic service provision	-------	29	Appropriate driver recruitment process of bus company i.e. age, experience, etc.	-------
15	Professional crew service	-------			

Appendix 3.2: The result of model modification

Relationship	Est.	Est./SE.
P2 WITH P1	0.355	14.568
P3 WITH P1	0.236	9.250
P3 WITH P2	0.263	10.001
P4 WITH P1	0.187	7.146
P4 WITH P2	0.120	4.217
P4 WITH P3	0.301	12.129
P5 WITH P4	0.106	5.200
P6 WITH P5	0.543	28.706
P7 WITH P2	-0.147	-6.136
P9 WITH P2	-0.124	-5.019
P9 WITH P7	0.228	9.092
P11 WITH P10	0.207	7.776
P12 WITH P7	0.140	5.363
P12 WITH P9	0.292	11.573
P14 WITH P13	0.277	10.869
P13 WITH P11	0.200	8.645
P15 WITH P12	-0.102	-3.740
P15 WITH P13	0.122	4.159
P15 WITH P14	0.292	10.356
P16 WITH P10	-0.165	-5.636
P16 WITH P12	-0.174	-6.498
P17 WITH P10	-0.066	-2.502
P17 WITH P11	0.082	3.711
P17 WITH P16	0.409	18.248
P18 WITH P15	-0.089	-3.558
P18 WITH P17	0.215	9.539
P19 WITH P16	0.130	5.022
P19 WITH P17	0.323	14.166
P19 WITH P18	0.285	12.342
P24 WITH P10	-0.140	-5.334
P24 WITH P12	-0.101	-3.839
P24 WITH P19	0.100	4.367
P24 WITH P22	0.180	6.522
P26 WITH P25	0.426	20.402
P27 WITH P22	-0.112	-4.130
P27 WITH P25	0.216	8.870
P27 WITH P26	0.359	15.939
P28 WITH P25	0.230	10.622
P28 WITH P26	0.327	14.752
P28 WITH P27	0.410	19.204
P29 WITH P26	0.159	6.776
P29 WITH P27	0.449	12.208

CHAPTER IV

FACTORS INFLUENCING CUSTOMER LOYALTY TO EDUCATIONAL TOUR BUSES AND MEASUREMENT INVARIANCE ACROSS URBAN AND RURAL ZONES

4.1 Abstract

The study analyzes factors that influence the loyalty behavior of educational tour bus users in Thailand. Factors that are examined include consumer service expectations, service quality perceptions, satisfaction, trust, perceived value, commitment, past experience, and competitor perceptions; these variables are studied via application of Structural Equation Modeling (SEM). According to the study results, user satisfaction and perceived value of bus services imposed significant and direct influences on loyalty levels ($p < 0.001$) while service expectations, service quality perceptions, and past experiences indirectly affected loyalty levels. However, as the hypothesis that the model parameters show invariance between urban and rural areas was not proven, separate models for the two zones must be developed to determine appropriate policies for both areas. The intention of this study is to provide guidelines that assist educational tour bus owners in developing services that are suitable and safe according to user needs.

4.2 Introduction

4.2.1 Background

Currently, educational institutions in Thailand significantly emphasize and promote out-of-classroom learning, which are also called “field trips” or “school tours”. Such educational modules have been incorporated into curriculum activities at all levels of Thai education. This form of education is viewed as a valuable activity for providing students with real-world learning experiences and for equipping students with desirable skills. In essence, such activities allow youth to value, possess, and develop a heightened awareness of the environment that is rarely afforded only through classroom learning.

Both educational institutions and parents must be cognizant of student safety and risk-taking behaviors associated with school trip arrangement (Ritchie, Carr, & Cooper, 2008) because each educational trip involves an excursion (distances traveled depend on the learning objectives of the trip). Similarly, because tours typically require the transport of a significant number of students, it is vital for schools to employ educational tour bus services. Regarding this, educational institutions must choose tours based on safety considerations because young passengers generally possess fewer self-help skills than adults in accident situations. In addition to safety considerations, tour buses must offer strong service provisions and management protocols similar to those of public buses (Carreira, Patrício, Natal Jorge, & Magee, 2014; de Oña, de Oña, & Calvo, 2012; de Oña, de Oña, Eboli, & Mazzulla, 2013; Wen, Lan, & Cheng, 2005).

Mostly, educational tour bus businesses enjoy high returns as school trips always employ several buses for transporting students. Nevertheless, if a service

provider can increase user loyalty levels through word-of-mouth strategies, and repurchase intention or identification, the bus company may enjoy even greater profits (Bourdeau, 2005; S.-C. Chen, 2012; G. Chi, 2005; Deng, Lu, Wei, & Zhang, 2010; Hsieh, 2010; Kamaruddin, Osman, & Pei, 2012; Li, 2011; Mao, 2008; S. Nam, 2008; Wen et al., 2005; Wong & Dioko, 2013; Wu, 2006; Yomnak, 2007). Hence, this research paper specifically studies the factors that affect consumer loyalty to educational tour bus lines to provide guidelines for improving bus entrepreneur knowledge of appropriate and safe tour bus services based on user needs.

For Thailand, the ways of lives between urban society and rural society are rather different. Rural communities are the areas which are away from downtown or outside municipal areas. These areas have little materialism progression. There are informal association of which most of population earns their livings by agricultural careers, fisheries, and farmers. The social units of rural communities are villages inhibiting 20 to 100 units. For urban communities, they are accepted as the center of both progression and deterioration. Urban society is the permanent location pooling overcrowded population from different backgrounds. Urban communities are usually in downtown or municipal areas.

4.2.2 Objective and Article Structure

The objective of this study is to examine the factors influencing loyalty to the use of educational tour buses in accordance with customers' needs in order to be entrepreneurs' guidelines on developing tour bus service to be more suitable and safer. This will solve the problems of service quality, travel safety by tour buses and decrease accident occurrences in Thailand sustainably. However, due to economic and social differences between Thai populations residing in urban and rural areas, it is

essential to examine such factors in consideration of these geographic differences in determining strategic approaches.

The content in this article is divided into 5 sections as follows;

- Introduction: This section mentions to background, the importance of problem, solutions and the determination of objective of the study.
- Literature review and research hypotheses: This section examines factors involved with objective of the study from previous research and hypotheses .
- Methodology: This section consists of methodology, samples, and variables to be used for studying, questionnaire design, data collection, and data analysis.
- Findings: This section presents the results of this study consisting of descriptive statistics, the results from the model development.
- Conclusions and discussion: These sections are the conclusion and discussion of significant results of findings.

4.3 Literature review and research hypotheses

Previous studies have focused on business customer loyalty in relation to tourism, hotels and restaurants, retail management, transportation management, telecommunications, online marketing, entertainment, purchasing, and finance and banking. A review of this literature shows that patron loyalty is influenced by a combination of psychological and internal factors and external factors induced by the environment, which include customer expectations, perceived service quality,

customer satisfaction, perceived value, customer trust, commitment, and competitor attractiveness.

Expected service refers to an individual's prediction of an event that may occur in the future, which can be expressed by oral, written, or other responses in the form of acceptance or refusal depending on one's social background, past experiences, and circumstances, and which others may not agree with (Oliver (1997) cited in Wu (2006)). Studies by Wattanakamolchai (2008); Wu (2006), revealed that the expected service factor has a direct effect on perceived service quality; while Kamaruddin et al. (2012); Wong and Dioko (2013) found a direct relationship between expected service and satisfaction. Considering the aforementioned review, this study proposes the first hypothesis as follow:

H1: Expected service positively affects perceived service quality.

H2: Expected service positively affects satisfaction.

Past experience refers to all experiences, either good or bad, that an individual has encountered in the past. According to Hsieh (2010), past experiences exert a direct influence on perceived service quality. Thus, this study hypothesizes that:

H3: Bad past-experience negatively affects perceived service quality.

Perceived service quality refers to the customer's perception of service quality. It is determined by comparing the service desired or expected with as it is perceived by the customer (Parasuraman, Zeithaml, & Berry, 1985). According toBourdeau (2005); Wen et al. (2005) perceived service quality has an indirect influence on customer loyalty through the avenue of satisfaction. As well, Park,

Chung, and Rutherford (2011); Wong and Dioko (2013) found a direct relationship between perceived service quality and perceived value. Accordingly, this study hypothesizes that:

H4: Perceived service quality positively affects satisfaction.

H5: Perceived service quality positively affects perceived value.

Customer trust refers to the actual number of individuals that support a service. This group is understood as being engaged in the transfer of reliability and integrity. Each service provider perceives customer trust differently based on a customer's decision to attain a service and to compare it with the agreement. Furthermore, trust is vital to determine commitment patterns that illustrate the relationships between brands and customers (Morgan & Hunt, 1994). As stated by previous studies, that is, S.-C. Chen (2012); Li (2011), trust has a direct influence on loyalty. Thus, the sixth hypothesis is stated as follows:

H6: Trust positively affects loyalty.

Satisfaction refers to the level of personal sentiment that a customer feels toward a service. It is determined by comparing the perceived service with the that expected by an individual (Kotler, 1997; Looy, Gemmel, & Dierdonck, 2003). According to S.-C. Chen (2012), satisfaction has a direct effect on involvement. Antón, Camarero, and Laguna-García (2014); Chou, Lu, and Chang (2014) also found that satisfaction directly affects loyalty. Thus, the seventh hypothesis is stated as follows:

H7: Satisfaction positively affects loyalty.

Perceived value refers to a customer's perception of the total value of service in relation to its total cost. The cost takes account of additional costs incurred from purchasing components that charge customers additional fees (Bourdeau, 2005; Deng et al., 2010; Wong & Dioko, 2013). Park et al. (2011); Wong and Dioko (2013) found that perceived value directly influences satisfaction. S.-C. Chen (2012); Y.-C. Chiou and Chen (2011) showed a direct relationship between perceived value and loyalty. Accordingly, this study hypothesizes that:

H8: Perceived value positively affects satisfaction.

H9: Perceived value positively affects loyalty.

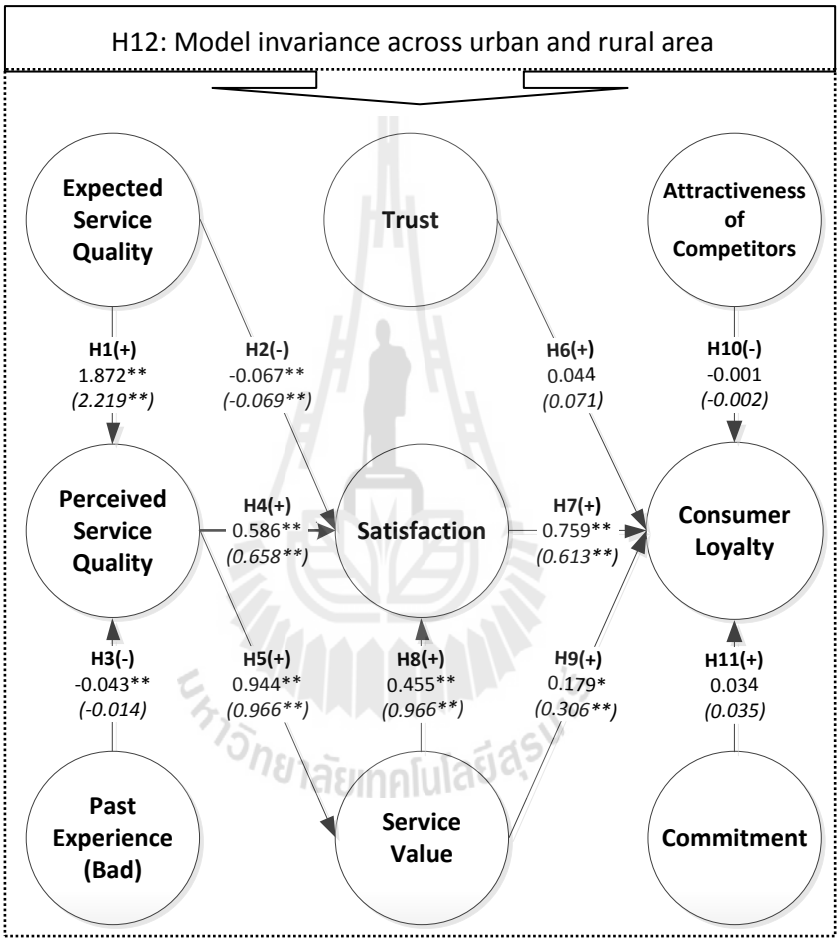
Competitor attractiveness refers to the customer's perceptions of competitor services available on the market. A smaller number of available competitors may lead to higher levels of customer loyalty for a given service (Wen et al., 2005). The following is the tenth hypothesis.

H10: Competitor attractiveness negatively affects loyalty.

Commitment refers to a service provider's capacity to improve a customer's attitude through the use of a service, thereby, creating a positive relationship between the customer and service (S.-C. Chen, 2012; Coulter, Price, & Feick, 2003; Songsom & Trichun, 2012). According to S.-C. Chen (2012); Li (2011), commitment directly affects loyalty. This leads to the eleventh hypothesis as follow:

H11: Commitment positively affects loyalty.

Based on the aforementioned review, 11 hypotheses were constructed as illustrated in Table 4.1 and Figure 4.1. Using these hypotheses, the researchers conducted a structural equation model to confirm the statistical significance of the 11 relationship patterns in the context of educational tour bus services in Thailand.



Note:
Hypothesis number and direction
Standardized coefficients of SEM for urban areas
(Standardized coefficients of SEM for rural areas)
*0.01≤ p ≤0.05, ** p ≤ 0.01

Figure 4.1 Hypothesis frameworks

Table 4.2 is the conclusion of different related research on transportation connected to this study. It is found that each of related research including intercity bus, city bus, airline, high-speed railway has different variables used and research hypotheses. The first three most interesting variables are quality perception, satisfaction, and loyalty. In terms of hypotheses, the one which is most studied is H4 followed by H5. For this current study which examines the context of educational tour bus in Thailand, 9 involving variables used and 11 hypotheses tests are interestingly studied

Table 4.1 Relationships between factors

Hypothesis	Relationship	References
1	expected service → (+) perceived service quality	Wattanakamolchai (2008); Wu (2006)
2	expected service → (+) satisfaction	J. S. Chiou (2004); Kamaruddin et al. (2012); Wong and Dioko (2013); Wu (2006)
3	past experience → (-) perceived service quality	Hsieh (2010)
4	perceived service quality →(+) satisfaction	Bourdeau (2005); Chang and Chen (2009); C.-F. Chen and Chen (2010); C. G.-Q. Chi and Qu (2008); J. S. Chiou and Pan (2009); Y.-C. Chiou and Chen (2011); Chotivanich (2012); Chou et al. (2014); Davis (2006); Deng et al. (2010); Hsieh (2010); Hume and Mort (2008); Kim, Jin, and Swinney (2009); Li (2011); J. Nam, Ekinci, and Whyatt (2011); S. Nam (2008); Park et al. (2011); Songsom and Trichun (2012); Tsiotsou (2006); Wen et al. (2005); Wong and Dioko (2013); Wu (2006); Yomnak (2007); Žabkar, Brenčič, and Dmitrović (2010)
5	perceived service quality →(+) perceived value	Bourdeau (2005); C.-F. Chen and Chen (2010); J. S. Chiou (2004); Y.-C. Chiou and Chen (2011); Hume and Mort (2008); Park et al. (2011); Wen et al. (2005); Wong and Dioko (2013); Wu (2006)

Table 4.1 Relationships between factors (continued)

Hypothesis	Relationship	References
6	trust →(+)loyalty	Aydin and Özer (2005); S.-C. Chen (2012); J. S. Chiou (2004); Cyr, Hassanein, Head, and Ivanov (2007); Deng et al. (2010); Kim et al. (2009); Li (2011); Songsom and Trichun (2012)
7	satisfaction →(+) loyalty	Bourdeau (2005); Chang and Chen (2009); C.-F. Chen and Chen (2010); S.-C. Chen (2012); C. G.-Q. Chi and Qu (2008); G. Chi (2005); J. S. Chiou (2004); J. S. Chiou and Pan (2009); Y.-C. Chiou and Chen (2011); Chotivanich (2012); Chou et al. (2014); Davis (2006); Deng et al. (2010); Hsieh (2010); Kamaruddin et al. (2012); Kim et al. (2009); Li (2011); Mao (2008); J. Nam et al. (2011); S. Nam (2008); Park et al. (2011); Shankar, Smith, and Rangaswamy (2003); Songsom and Trichun (2012); Tsiotsou (2006); Wen et al. (2005); Wong (2013); Wong and Dioko (2013); Wu (2006); Yang and Peterson (2004); Yomnak (2007); Žabkar et al. (2010)
8	perceived value →(+) satisfaction	C.-F. Chen and Chen (2010); S.-C. Chen (2012); J. S. Chiou (2004); Y.-C. Chiou and Chen (2011); Cyr et al. (2007); Hsieh (2010); Li (2011); Wen et al. (2005); Yang and Peterson (2004)
9	perceived value →(+) loyalty	C.-F. Chen and Chen (2010); S.-C. Chen (2012); J. S. Chiou (2004); Y.-C. Chiou and Chen (2011); Cyr et al. (2007); Hsieh (2010); Li (2011); Wen et al. (2005); Yang and Peterson (2004)
10	attractiveness of competitor → (-) loyalty	Wen et al. (2005)
11	commitment →(+) loyalty	S.-C. Chen (2012); Davis (2006); Li (2011); Marshall (2010)

Table 4.2 The differences of analysis method, variables, context, and hypotheses among this study and previous transportation studies.

Authors (Year)	**Analysis Method**	**Variables**												
		Expected service quality			**Perceived service quality**			**Past experience**	**Trust**	**Satisfac-tion**	**Perceived values**	**Compet-itors**	**Commit-ment**	**Loyalty**
		Vehicles	*Drivers*	*Man.*	*Vehicles*	*Drivers*	*Man.*							
This study	SEM and Multi-group analysis	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Carreira et al. (2014)	SEM	–	–	–	✓	✓	✓	–		✓	✓	–	–	✓
Chou et al. (2014)	SEM	–	–	–	✓	✓	✓	–	–	✓	–	–	–	✓
de Oña et al. (2013)	SEM	–	–	–	✓	✓	✓	–	–	✓	–	–	–	
Kamaruddin et al. (2012)	SEM	–	–	–	–	–	✓	–	–	✓	–	–	–	✓
Y.-C. Chiou and Chen (2011)	SEM	–	–	–	–	–	✓	–	–	✓	✓	–	–	✓
Wen et al. (2005)	SEM	–	–	–	✓	✓	✓	–	✓	✓	✓	✓	–	✓

Authors (Year)	**Type of public transportation**	**Country**	**Hypotheses**											
			H1	**H2**	**H3**	**H4**	**H5**	**H6**	**H7**	**H8**	**H9**	**H10**	**H11**	**H12**
This study	Sightseeing bus	Thailand	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Carreira et al. (2014)	Mid-distance bus	Portugal	–	–	–	✓	✓	–	–	–	–	–	–	–
Chou et al. (2014)	High-speed Railway	Taiwan	–	–	–	✓	–	–	✓	–	–	–	–	–
de Oña et al. (2013)	City bus	Spain	–	–	–	✓	–	–	–	–	–	–	–	–
Kamaruddin et al. (2012)	Monorail, bus and train	Malaysia	–	✓	–	–	–	–	–	✓	–	–	–	–
Y.-C. Chiou and Chen (2011)	Airline	Taiwan	–	–	–	✓	✓	–	✓	✓	✓	–	–	–
Wen et al. (2005)	Intercity bus	Taiwan	–	–	–	✓	✓	✓	✓	✓	✓	✓	–	–

Notes: "Man." refer to management, "✓" means variables and hypotheses were included the studies.

4.4 Methodology

This study had15 steps as follows; (1) determining statement of problem and objectives of the study, (2) reviewing related literature, (3) determining hypotheses and involved variables, (4) developing the first draft of questionnaire, (5) checking the content validity of questionnaire by experts, (6) adjusting questionnaire according to experts' suggestions, (7) using adjusted questionnaire to do pilot survey, (8) checking reliability from pilot survey and adjusting questionnaire, (9) surveying data, (10) checking the correctness of data and recording them, (11) analyzing basic data, (12) developing the model, (13) generalizing the results of model, (14) concluding and analyzing data, (15) analyzing the limitations of data and future work.

4.4.1 Participant

The sample group used in this study comprised teachers who decided to employ educational tour bus services. Teachers were selected from all provinces in Thailand via stratified random sampling. The samples were divided into sub-groups by regional level (North, Northeast, Central, and South), provincial level (small, medium, and large), area level (urban and rural) and educational level (primary, secondary, and vocational education). The questionnaire administered was entirely completed by a group of 2,554 participants, which was composed of 1,556 urban teachers and 998 rural teachers that were eligible for analysis according to Stevens (1966) suggested that the sample size for maximum likelihood (ML) estimation should be at least 15 times the number of observed variables (Golob, 2003) (observed variables = 30).

4.4.2 Research variables

In developing the structural equation model, "*loyalty*" is constrained as the endogenous latent variable. Additionally, the model contains the following five

variables: competitor attractiveness, trust, satisfaction, perceived value, and commitment, all of which have a direct influence on loyalty according to the hypotheses. The following three variables: expected service quality, perceived service quality, and past experience have an indirect effect on loyalty through other variables. All the variables are manifested as latent variables with the exception of past experience, which represents an observed variable. The question item specifications illustrated in Table 4.4 show that each item was scaled over seven opinion levels (7 = Strongly Agree to 1 = Strongly Disagree).

The questionnaire in this study was developed from the previous studies of which the question items of each latent variable were corrected to suit the context of giving educational tour bus service. After the researcher had adjusted them, the experts checked content validity. To ensure the reliability and validity of the questionnaire design, 13 researchers tested the content validity using the index of item objective congruency (IOC) measure. The content measurement-based results were found to be clear. The results also covered all the educational tour bus variables as the IOC scores for all the items fell within the range of 0.54 and 1.00 (these values are higher than 0.5). A pilot test was then conducted for 89 samples to examine questionnaire reliability via Cronbach's alpha by considering item scores higher than 0.7 (Tavakol & Dennick, 2011). Cronbach's alpha values ranging between 0.909 and 0.965 were found, and these values are higher than the suggested value.

With regard to data surveys, the researchers collected data by mail. Although the rate of returned mail was rather low, this method saved travelling. The advantage of mail-survey was that the respondents have time to think carefully before making decision better than face to face interview. As a survey acquires uncertain

response rate, the researchers decided to settle response rate on 25% (considering on the previous studies). To obtain sufficient questionnaires for data analysis, 10,630 questionnaires were sent to 5 teachers in 2,126 schools. After 45 days of sending the questionnaires, the result of response rate from mail survey was 3,387 questionnaires but there were 2,554 questionnaires which had complete data for this study.

4.4.3 Data analysis

4.4.3.1 Structural Equation Modeling

Structural equation modeling (SEM) was developed from theories that demonstrate latent variable–latent variable and latent variable–observed variable relationships. The result of the calculation can be understood as the product of the following three analysis methods: factor analysis, path analysis, and parameter estimation in regression analysis. SEM comprises the following two sub-models: the measurement and structural models.

To test model invariance values for different groups, the calculation can be understood as a measurement that is commonly used for scrutinizing SEM validity (Brown, 2006; Koh & Zumbo, 2008). The application is used to determine whether the parameter values in the model for population group 1 are similar to those of population group 2. The model assessment of invariance test applies the likelihood-ratio test (LRT) (also referred to as the chi-square difference test) by comparing each hypothesis with an inspection of the goodness of fit, which considers significant differences in degrees of freedom. In term, an absence of statistical significance denotes model fit between sample groups (A.Bollen, 1989; Cheung & Rensvold R. B., 2002).

4.4.3.2 Model fit criteria

To test for construct validity, specific statistical values were considered. χ^2 / df was set to a value of less than five (Sun, Geng-Qing Chi, & Xu, 2013; Washington, Karlaftis, & Mannering, 2003), the root mean square error of approximation (RMSEA) was set to below 0.07 (Steiger, 2007), the comparative fit index (CFI) was set to higher than 0.90 (Hu & Bentler, 1999), the Tucker-Lewis index (TLI), also known as the non-normed fit index (NNFI), was equal to or greater than 0.80 (Hooper, Coughlan, & Mullen, 2008), and the standardized root mean square residual (SRMR) was established at less than 0.08 (Hu & Bentler, 1999).

$$SRMR = \sqrt{\sum_i \sum_k r_{jk} / p^*} \tag{4.1}$$

Where r_{jk} = standardized residuals from a covariance matrix with j rows and k columns; p^* = the number of non-duplicated elements in the covariance matrix

$$RMSEA = \sqrt{\frac{\chi_T^2 - df_T}{df_T (N-1)}} \tag{4.2}$$

$$TLI = 1 - \frac{\max\left[(\chi_T^2 - df_T), 0\right]}{\max\left[(\chi_T^2 - df_T), (\chi_B^2 - df_B), 0\right]} \tag{4.3}$$

$$CFI = \frac{\left(\chi_B^2 / df_B\right) - \left(\chi_T^2 / df_T\right)}{\left(\chi_B^2 / df_B\right) - 1} \tag{4.4}$$

Where $\chi^2_T = \chi^2$ values of the target model; $df_T = df$ of the target model; $\chi^2_B = \chi^2$ values of the baseline model; $df_B = df$ of the baseline model.

4.4.3.3 Multi-group SEM

Multi-group analysis is a testing of invariance across different groups (e.g., urban and rural area), and is important issue if the researcher wishes to make group comparisons (F. F. Chen, Sousa, & West, 2005). In testing for invariance across groups, sets of parameters are put to the test in a logically ordered and increasingly restrictive fashion. Depending on the model and hypotheses to be tested, the following sets of parameters are most commonly of interest in answering questions related to multi-group equivalence: (a) factor loadings, (b) factor covariances, (c) structural regression paths, and (d) latent factor means (Byrne, 2012).

Multi-group SEM predominantly comprises the following (Byrne, 2012; Teo, Lee, Chai, & Wong, 2009). First, model is fitted separately in each group. Separate testing provides an overview of how consistent the model results are. If consistency is found, then multi-group testing proceeds. Second, a chi-square value of fitted baseline model is computed for the pooled sample of all groups. Third, constraints are added to the model; for example, factor loadings, intercepts, structural paths held equal across groups. The constrained model is fitted, and the chi-square value is derived. Finally, a chi-square difference test is applied. The value related to this test represents the difference between the chi-square values for the baseline and other models in which equality constraints have been imposed on particular parameters. This difference value is distributed as chi-square with degrees of freedom equal to the difference in degrees of freedom. Evidence of non-invariance is claimed if this chi-square difference value is statistically significant.

4.5 Findings

4.5.1 Descriptive statistics

From the data survey of the factors influencing educational tour bus service from 2,554 teachers and education personnel, the details are shown in Table 4.3. When considering the type of schools, it was found that the samples who teach in the schools in urban areas were 1,556 people (60.9%) divided by gender as 561 males (31.6%) and 925 females (59.4%). In terms of education level, it was found that 51 samples (3.3%) have education level lower than bachelor's degree, 962 samples (61.8%) have bachelor's degree, and 482 samples (30.9%) have education level higher than bachelor's degree. Considering work positions, it was found that there were 85 school administrators (5.5%), 1301 teachers (83.6%), and 103 supporting officers (6.6%). Considering income, it was found that samples' average income was 32,434.3 THB. Finally, the samples' average age was 45.6 years.

In terms of outside urban areas, there were 998 samples (39.1%) divided by gender as 398 males (33.9%) 549 females (55.0%). Considering education level, it was found that 45 samples (4.5%) have education level lower than bachelor's degree, 634 samples (63.5%) have bachelor's degree, and 263 samples (26.4%) have education level higher than bachelor's degree. Considering work positions, it was found that there were 40 school administrators (4.0%)), 847 teachers (84.9%), and 69 supporting officers (6.9%). Considering income, it was found that samples' average income was 26,101.5 THB. Finally, the samples' average age was 41.8 years.

Table 4.3 Samples' profiles

Profiles	Urban area (n=1556)		Rural area (n=998)	
	Frequency	**Percent**	**Frequency**	**Percent**
Gender				
Male	561	36.1	398	39.9
Female	925	59.4	549	55
No answer	70	4.5	51	5.1
Educational level				
Matayom 6/ vocational certificate	12	0.8	16	1.6
Diploma/high vocational certificate	39	2.5	29	2.9
Bachelor's degree	962	61.8	634	63.5
Master's degree	472	30.3	262	26.3
Doctor of Philosophy (PhD.)	10	0.6	1	0.1
No answer	61	3.9	56	5.6
Position				
Institute Administrator	85	5.5	40	4
Teacher/Lecturer	1301	83.6	847	84.9
Staff/Supporting staff	103	6.6	69	6.9
No answer	67	4.3	42	4.2
Average of income	32,434.3THB		26,101.5 THB	
Average of age	45.6 years		41.8 years	

Table 4.4 illustrates the results of the samples for the urban and rural zones based on descriptive statistics (i.e., mean, standard deviation, skewness, kurtosis), which were obtained from 30 question items. For the urban sample, item 23 for user expectations of bus drivers and crewmembers produced the highest mean (mean = 5.89, SD = 0.93) followed by item 22, which reflects what customers expect of the vehicle (mean = 5.76, SD = 0.95). Similarly, item 23 generated the highest mean for the rural zone (mean = 5.83, SD = 0.97) followed by item 22 (mean = 5.76, SD = 1.01).

For this study, maximum likelihood estimation was applied on the condition that the data must be normally distributed. Accordingly, skewness and kurtosis can be used as normal distribution indices. Kline (2011) recommended that

skewness levels should be less than 3.0 while kurtosis levels should be lower than 10.0. As demonstrated in Table 4.4, both the statistical values for a sample fall within the acceptable range to enable further analysis.

Table 4.4 Descriptive statistics of items for the rural and urban samples

	Item	Urban (n=1556)				Rural (n=998)			
		M	SD	Sk	Ku	M	SD	Sk	Ku
	Past Experience								
1	From travel experience, have you ever faced a problem of bus breakdown on the way?	1.81	1.00	1.17	1.14	1.82	1.02	1.13	0.68
	Perceived Value (Cronbach's α =0.950)								
2	When comparing to perceived value, I think it's worth to pay for the service	5.58	1.07	-0.92	1.21	5.53	1.06	-1.02	1.53
3	I'm satisfied with the service when comparing to the amount I paid for it because the price is reasonable	5.60	1.06	-0.98	1.41	5.55	1.04	-0.98	1.61
4	When I use the service of "this tour company", I feel more worthy than the other one that I used before	5.51	1.09	-1.00	1.50	5.45	1.10	-0.95	1.30
	Satisfaction (Conbach's α = 0.957)								
5	I'm very happy to use the service of "this tour company"	5.56	1.08	-0.95	1.39	5.51	1.09	-1.02	1.78
6	In overall, I'm very satisfied with the service of "this tour company"	5.60	1.06	-0.88	1.17	5.59	1.09	-1.08	1.73
7	Service quality that I perceived is more than I expected	5.50	1.06	-0.86	1.10	5.47	1.07	-0.90	1.33
8	Service quality that I perceived is as in my dream	5.37	1.14	-0.96	1.29	5.33	1.16	-0.93	1.36
	Trust (Cronbach's α =0.965)								
9	I believe that "this tour company" offers us the best service	5.44	1.10	-1.09	1.74	5.40	1.10	-1.05	1.56
10	I always trust "this tour company"	5.52	1.09	-0.98	1.38	5.46	1.06	-0.96	1.64

Table 4.4 Descriptive statistics of items for the rural and urban samples (Continued)

	Item	Urban (n=1556)				Rural (n=998)			
		M	**SD**	**Sk**	**Ku**	**M**	**SD**	**Sk**	**Ku**
11	"This tour company" always knows what they should do to satisfy customer	5.55	1.08	-0.98	1.40	5.49	1.06	-0.90	1.25
12	"This tour company" is very honest	5.60	1.10	-0.98	1.36	5.54	1.11	-0.96	1.26
13	"This tour company" is more reliable	5.61	1.09	-0.94	1.14	5.52	1.10	-0.95	1.31
14	"This tour company"is a large enterprise which has a stable and reliable business	5.46	1.14	-0.96	1.30	5.39	1.12	-0.92	1.11
	Commitment (Cronbach's α =**0.934)**								
15	I'm proud to use the service from "this tour company"	5.34	1.12	-0.73	0.75	5.26	1.12	-0.67	0.54
16	I 'm more concerned with long-term success of "this tour company"	5.14	1.25	-0.77	0.78	5.19	1.14	-0.70	0.69
17	I intend to use the service from "this tour company"	5.43	1.10	-0.81	0.94	5.33	1.10	-0.74	0.85
18	I think that "this tour company" is a leading part of travel service	5.48	1.10	-0.80	0.95	5.37	1.12	-0.75	0.77
19	I think that the use of service from "this tour company" creates my image	5.35	1.14	-0.74	0.77	5.29	1.11	-0.61	0.43
	Attractiveness of Competitors (Conbach α = 0.925)								
20	"The other tour companies make I feel more satisfied	4.93	1.36	-0.87	0.81	5.01	1.23	-0.77	0.77
21	I would be happier if I used service from "the other tour companies"	4.83	1.40	-0.80	0.50	4.94	1.28	-0.73	0.74
	Expected Qualities (Conbach's α =0.935)								
22	Vehicle	5.76	0.95	-0.77	0.72	5.67	1.01	-0.88	1.11
23	Drivers and crews	5.89	0.93	-0.91	1.38	5.83	0.97	-0.94	1.13
24	Service and management	5.62	1.04	-0.60	0.20	5.55	1.06	-0.64	0.26
	Perceived Qualities (Conbach's α =**0.909)**								
25	Vehicle	5.31	0.92	-0.62	1.07	5.23	0.94	-0.80	1.44
26	Drivers and crews	5.57	0.90	-0.76	1.63	5.49	0.91	-0.88	1.54
27	Service and management	5.18	0.96	-0.65	1.06	5.07	0.97	-0.69	1.02
	Loyalty (Conbach's α =0.951)								
28	Word of mouth	5.63	1.00	-1.02	1.84	5.57	0.99	-1.19	2.58
29	Re-purchase	5.67	1.04	-1.11	2.02	5.60	1.03	-1.07	1.95
30	Identification	5.36	1.07	-0.93	1.26	5.29	1.07	-0.98	1.32

M=Mean, SD=Standard deviation, Sk=Skewness, Ku=Kurtosis, item 1 was measured by 7 points (1=never, 2= hardly, 3=seldom, 4=sometimes, 5=usually, 6= almost every time, 7=every time), item 2 – item 21 were measured by 7 points (7=Strongly Agree to 1=Strongly Disagree),but item 22 – item 30 were calculated by averages of sub-items (see Appendix 4.1).

4.5.2 Structural equation modeling

4.5.2.1 Structural Model

The SEM hypotheses for educational tour bus customer loyalty are illustrated in Figure 4.1. With model separation imposed between the urban and rural samples, the urban model shows that χ^2 = 1,829.602, df = 373, $p < 0.001$, χ^2 / df = 4.91, CFI = 0.977, TLI = 0.973, SRMR = 0.040, RMSEA = 0.050; whereas the rural model shows that χ^2 = 1279.667, df = 373, $p < 0.001$, χ^2 / df = 3.43, CFI = 0.976, TLI = 0.972, SRMR = 0.031, RMSEA = 0.049 (see Table 4.5). When comparing such statistical values with the suggested values listed in section 4.3.2, the values of all models demonstrate compatibility. Therefore, it can be concluded that the SEM is consistent with the empirical data. With respect to factors affecting patron loyalty according to 11 hypotheses, the structural model can be formulated as shown in Table 4.6, which considers the urban and rural areas separately as follows;

- ***Urban area***: H1 Expected service quality has a significant and positive impact on perceived service quality (β = 1.872, t = 26.371). H2 Expected service significantly and negatively affects satisfaction (β = −0.067, t = −4.846). H3 Bad past-experience exerts significant and negative effects on perceived service quality (β = −0.043, t = −4.387). H4 Perceived service quality is significantly and positively associated with satisfaction (β = 0.586, t = 10.728). H5 Perceived service quality has a significant and positive effect on perceived value (β = 0.944, t = 163.051). H6 Trust positively affects loyalty, but not to a significant degree (β = 0.044, t = 1.267). H7 Satisfaction significantly and positively influences loyalty (β = 0.759, t = 7.783). H8

Perceived value exerts a significant and positive influence on satisfaction (β = 0.455, t = 8.960). H9 Perceived value significantly and positively affects loyalty (β = 0.179, t = 2.487). H10 Competitor attractiveness negatively affects loyalty, but not to a significant degree (β = −0.001, t = −0.208). H11 Commitment has no significant positive impact on loyalty (β = 0.034, t = 1.430).

- ***Rural area***: H1 Expected service significantly and positively impacts perceived service quality (β = 2.219, t = 15.883). H2 Expected service shows significant and negative correlations with satisfaction (β = −0.069, t = −4.168). H3 Bad past-experience shows no significant negative effect on perceived service quality (β = −0.014, t = −1.125). H4 Perceived service quality significantly and positively influences satisfaction (β = 0.658, t = 5.758). H5 Perceived service quality has a significant and positive effect on perceived value (β = 0.966, t = 139.526). H6 Trust exerts no significant positive effect on loyalty (β = 0.071, t = 1.922). H7 Satisfaction significantly and positively affects loyalty (β = 0.613, t = 7.424). H8 Perceived value significantly and positively impacts satisfaction (β = 0.368, t = 3.250). H9 Perceived value shows a significant and positive relationship with loyalty (β = 0.306, t = 4.167). H10 Competitor attractiveness exerts no significant negative impact on loyalty (β = −0.002, t = −0.223). H11 Commitment has no significant positive effect on loyalty (β = 0.035, t = 1.472).

Table 4.5 Model fit indices for the invariance test

Description	χ^2	*df*	χ^2/df	CFI	TLI	SRMR	RMSEA (90% CI)	*Delta-*χ^2	*Delta-df*	*p*
Individual groups:										
Model1: Urban	1,829.602	373	4.91	0.977	0.973	0.040	0.050 (0.048-0.052)			
Model2: Rural	1,279.667	373	3.43	0.976	0.972	0.031	0.049 (0.046-0.052)			
Measurement of invariance:										
Model 3: No Constraints	3,109.269	746	4.17	0.976	0.973	0.037	0.050 (0.048-0.052)			
Model 4: Factor Loadings, Intercepts, Structural Paths held equal across groups	3,196.509	807	3.96	0.976	0.974	0.039	0.048 (0.046-0.050)	87.240	61	0.015

Table 4.6 Parameters estimated from the structural model

Hypothesis : Path		Urban			Rural		
		Std. Est.	t-value	Decision	Std. Est.	t-value	Decision
H1	Expected service quality → Perceived service quality	1.872	26.371**	Supported	2.219	15.883**	Supported
H2	Past experience → Perceived service quality	-0.043	-4.387**	Supported	-0.014	-1.125	Not Supported
H3	Expected service quality →Satisfaction	-0.067	-4.846**	Supported	-0.069	-4.168**	Supported
H4	Perceived service quality →Satisfaction	0.586	10.728**	Supported	0.658	5.758**	Supported
H5	Perceived service quality →Service value	0.944	163.051**	Supported	0.966	139.526**	Supported
H6	Service value → Satisfaction	0.455	8.690**	Supported	0.368	3.250**	Supported
H7	Trust → Loyalty	0.044	1.267	Not Supported	0.071	1.922	Not Supported
H8	Satisfaction → Loyalty	0.759	7.783**	Supported	0.613	7.424**	Supported
H9	Service value → Loyalty	0.179	2.487*	Supported	0.306	4.167**	Supported
H10	Attractiveness of competitors → Loyalty	-0.001	-0.208	Not Supported	-0.002	-0.223	Not Supported
H11	Commitment → Loyalty	0.034	1.430	Not Supported	0.035	1.472	Not Supported

*0.01≤ p ≤0.05, ** p ≤ 0.01

4.5.2.2 Measurement Model

Eight measurement models that account for perceived value, satisfaction, trust, commitment, competitor attractiveness, expected service, perceived service quality, and loyalty models were carefully constructed. These models can be described as follows (see Table 4.7):

- ***Perceived value*:** The perceived value model was measured using three observed variables that contain items 2, 3, and 4. The analysis results indicate that all three variables can be used to confirm the components of perceived value with a significance of ($p < 0.001$). For the urban model, item 4 represents maximum factor loading ($\lambda = 0.936$, $t = 242.372$); while for the rural areas, items 3 and 4 both generate the highest value of factor loadings ($\lambda = 0.917$, $t = 155.933$).
- ***Satisfaction*:** In constructing the satisfaction measurement model, four variables observed from items 5 to 8 were considered. The model showed that all variables significantly confirm the composition of satisfaction ($p < 0.001$). After model separation, item 5 generates the maximum factor loading value for the urban sample ($\lambda = 0.929$, $t = 229.939$). For the rural sample, the highest score is generated by item 6 ($\lambda = 0.926$, $t = 173.456$).
- ***Trust*:** The trust measurement model is produced from six observed variables consisting of items 9–14. The test significantly confirms the trust components ($p < 0.001$). After model separation, item 11 generates the highest factor loading values for both areas, in which the values for λ and t are equal to 0.923 and 215.753, respectively, for the urban area and 0.926 and 175.907, respectively, for the rural area.

- ***Commitment*:** The commitment model can be measured from five observed variables that include items 15–19. The commitment compositions were found to be significant ($p < 0.001$). With respect to the values for each area, item 17 generated a value of $\lambda = 0.943$, t = 257.139 for the urban area and $\lambda = 0.942$, t = 200.904 for the rural area, and these were the highest factor loading scores found for both samples.
- ***Competitor attractiveness*:** Two observed variables including items 20 and 21 were used to measure the competitor attractiveness model. According to the analysis, all the variables can significantly confirm the model's components ($p < 0.001$). The results based on model separation show that for both areas, item 20 generates the highest factor loading values for both sample areas, producing a value of $\lambda = 1.063$, t = 22.578 for the urban area and a value of $\lambda = 0.954$, t = 35.237 for the rural area.
- ***Expected service*:** The expected service model can be measured from items 22–24. The test results indicate that all the variables can be used in the model with a significance of ($p < 0.001$). Item 23 generates the highest factor loading scores for both areas, in which λ and t are 0.928 and 177.285, respectively, for the urban area and 0.934 and 140.893, respectively, for the rural area.
- ***Perceived service qualities*:** The perceived service quality model was constructed from items 25–27. All three variables significantly confirm the model composition ($p < 0.001$). Item 27 generates the maximum factor loading scores for the urban model ($\lambda = 0.748$, t = 65.895), while the highest factor loading scores for rural model are generated from item 26 ($\lambda = 0.759$, t = 55.367).

- ***Loyalty*:** Items 28–30 were used to produce the loyalty model, and these variables significantly confirm the components of loyalty model ($p < 0.001$). Item 30 generates the highest factor loading scores for both geographic areas ($\lambda = 0.936$, t = 258.442 for the urban area and $\lambda = 0.923$, t = 174.942 for the rural area).

4.5.3 Multi-group analysis

The invariance test results of the model are illustrated in Table 4.5. As can be seen in model 3, with no constraints to test whether the model demonstrates an equal form, the model generates values of χ^2 = 3,109.269, df = 746, χ^2/df = 4.17, RMSEA = 0.050, CFI = 0.976, TLI = 0.973 and SRMR = 0.037, which markedly prove the hypotheses in that the models for each sample group are fitted to the empirical data. The findings also verify that the model forms for each area demonstrate differing levels of invariance. The next stage of the analysis involves testing for invariance between the parameters (model 4) by determining the values of the factor loadings, intercepts, and structural paths for the different groups. The model generated the following values: χ^2 = 3,196.509, df = 807, χ^2/df = 3.96, RMSEA = 0.048, CFI = 0.976, TLI = 0.974 and SRMR = 0.039. These results indicate that the model is well fitted to the empirical data. In addition, a chi-square difference test between models 3 and 4 found that $\Delta\chi^2$ = 87.240, Δdf = 61, p = 0.015, meaning that under the invariance of model form, parameters between areas are insignificant at the 95% confidence level ($p < 0.05$).

Table 4.7 Parameters estimated from the measurement model

item	Urban (n=1556)			Rural (n=998)		
	Standardized estimates	t-value	p-value	Standardized estimates	t-value	p-value
item2	0.922	202.368	<0.001	0.901	129.498	<0.001
item3	0.927	210.485	<0.001	0.917	148.601	<0.001
item4	0.936	242.372	<0.001	0.917	155.933	<0.001
item5	0.929	229.939	<0.001	0.924	176.015	<0.001
item6	0.926	214.277	<0.001	0.926	173.456	<0.001
item7	0.922	211.449	<0.001	0.925	178.299	<0.001
item8	0.885	148.764	<0.001	0.902	136.388	<0.001
item9	0.905	174.635	<0.001	0.877	108.549	<0.001
item10	0.918	202.162	<0.001	0.910	146.968	<0.001
item11	0.923	215.753	<0.001	0.926	175.907	<0.001
item12	0.916	196.232	<0.001	0.907	142.407	<0.001
item13	0.921	206.540	<0.001	0.909	144.706	<0.001
item14	0.860	121.875	<0.001	0.851	91.166	<0.001
item15	0.878	135.823	<0.001	0.841	83.768	<0.001
item16	0.633	39.936	<0.001	0.720	44.306	<0.001
item17	0.943	257.139	<0.001	0.942	200.904	<0.001
item18	0.916	192.198	<0.001	0.915	151.843	<0.001
item19	0.883	141.750	<0.001	0.919	156.031	<0.001
item20	1.063	22.578	<0.001	0.954	35.237	<0.001
item21	0.810	21.988	<0.001	0.900	34.490	<0.001
item22	0.916	170.505	<0.001	0.891	110.987	<0.001
item23	0.928	177.285	<0.001	0.934	140.893	<0.001
item24	0.893	142.539	<0.001	0.876	100.388	<0.001
item25	0.738	63.350	<0.001	0.718	47.433	<0.001
item26	0.741	62.905	<0.001	0.759	55.367	<0.001
item27	0.748	65.895	<0.001	0.736	50.018	<0.001
item28	0.920	210.003	<0.001	0.917	166.860	<0.001
item29	0.909	193.516	<0.001	0.903	140.190	<0.001
item30	0.936	258.442	<0.001	0.923	174.942	<0.001

4.6 Conclusions and discussion

This study aimed to find factors that affect customer loyalty to educational tour bus companies. In fulfilling this objective, 2,554 teachers were statistically selected, 1,556 of which taught at urban schools and 998 of which taught at rural institutions. Measurements of the questionnaire with respect to content validity and reliability using Cronbach's alpha were also performed. The key findings of this study are concluded as follows:

The research results did not find the existence of factor loading, intercept, and structural path invariance between the urban and rural models because of the differences of urban and rural societies in many perspectives such as occupation, size of community, homogeneity of the population, system of interaction. Therefore, it is essential to consider urban and rural models separately to develop appropriate policy interventions for each area. These findings complement those of Bordagaray, dell'Olio, Ibeas, and Cecín (2013), who found that customers perceive service quality differently for each bus route depending on user characteristics. Similarly,Román, Martín, and Espino (2014) indicated that passenger perceived service quality characteristics significantly differ across urban and interurban routes.

When considering measurement model of eight latent variables (service expectations, service quality perceptions ,satisfaction, trust, perceived value, commitment, competitor perceptions, and loyalty), it is found that every observed variable is able to confirm being the factors of latent variables at statistical significance. The entrepreneurs may employ factor loadings from the study to be data for more service quality improvement in each item. For example, if the entrepreneurs want to increase perceived value, it was found that item 4 from the model, (When I

use the service of “this tour company”, I feel more worthy than the other one that I used before) had maximum standardized factor loading, the entrepreneurs may consider the policy determination. The entrepreneurs may determine marketing strategy of price, giving service. When compared with competitors, it has to make customers perceive worthwhile value.

Complementing the result of Wen et al. (2005), the structural model shows that satisfaction exerts the greatest level of influence on loyalty outcomes. However, the model also shows that other factors have significant effects on satisfaction such as expected service quality, perceived service quality, and perceived value. Hence, in satisfying customers, educational tour bus entrepreneurs must prioritize and understand these leading indicators in providing appropriate services.

With respect to the measurement model for expected service, three indices of customer satisfaction including vehicle, driver, and service provision, and management are recommended. Among these variables, the driver is considered to be the most significant indicator for both urban and rural areas(Jomnonkwao & Ratanavaraha, 2015). Therefore, businesses should focus on recruiting skilled and knowledgeable employees through consideration of age (Clarke, Ward, Bartle, & Truman, 2006; Karacasu & Er, 2011; Ratanavaraha & Jomnonkwao, 2014), education (Chung & Wong, 2011; Phillips & Sagberg, 2012; Ratanavaraha & Jomnonkwao, 2014), work experience (Clarke et al., 2006; Ratanavaraha & Jomnonkwao, 2014; Tseng, 2012), and training qualifications (Peck, 2011; Ratanavaraha & Jomnonkwao, 2014).

With respect to SEM, the hypotheses were significantly confirmed for both urban and rural areas with the exception of H3 (Bad past-experience negatively affects

perceived service quality for the urban area). This result may be attributable to the structure of rural lifestyles in Thailand, which support simple, generous, and forgiving perspectives. In turn, while such customers may have encountered bus breakdowns in the past, these situations would not necessarily have a significant negative effect on their perceptions of service quality.

According to the results of SEM analysis, the hypotheses which are equally confirmed for both urban and rural areas consisting of H1, H2, H4, H5, H7, H8, and H9. In using education tour buses, before travelling, the users will expect about the condition of bus bodies including tour service giving providers. When the users use them, they get perceived service quality that tour buses have the same quality as they expect or not. If the tour buses meet their expectations, the customers will have satisfaction. And when comparing the service given with money paid, the customers will get perceived value. If the customers think that it is worthwhile, this makes customers have loyalty which the customers may express to other service users by word-of mouth. The direct praises or the repeated service uses are relevant to the studies already mentioned in literature review.

The results generated by the structural models show that the customer loyalty model for the urban and rural area does not confirm three hypotheses. The first was H7 (Trust), and this is likely attributable to the fact that large educational tour businesses are rarely seen in Thailand, meaning that customers are more likely to be concerned with service quality than company image. H10 (Competitor attractiveness) was also not proven, most likely because a smaller number of educational tour businesses present in rural areas results in less competition. The results of this study show that both H7 and H10 are different from that of Wen et al. (2005) who found that

these two hypotheses of intercity bus in Taiwan context could not be rejected Finally, H11 (Commitment) was not proven, most likely because the low frequency of services provided in these areas generates negligible levels user commitment. Nevertheless, the popularity of educational excursion businesses has been continuingly growing. The Department of Land Transport (2012) reported 12,864 registered educational tour companies in 2012, representing an 50.74% increase from 2007. Similarly, the number of registered tour buses in 2012 reached 37,467, increased by 28.32% from 2007.

Because finding identifying new customers would generate higher costs than maintaining existing consumer bases (Coulter et al., 2003), customer loyalty is central to business success. When customers are truly impressed by services or products, they not only purchase services from the same company in future but are also more likely to pass information on the company to others. This word-of-mouth process can significantly increase the market share and profits of a firm. Regarding this, improvements to educational tour businesses in the areas of vehicle selection, driver recruitment, and service provision and management will increase customer satisfaction levels. Customers will be more likely to continue using a service when they acquire comparably higher gains after weighing payment levels against perceived service quality levels.

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Appendix 4.1 The questionnaire of expected service, perceived service, and loyalty.

Quality item:
From the latest use of education tour bus, please give the scores from 1-7 according to experiences you have encountered.

- Expected service: Before travelling, how much expectation do you have? (7=highest, 1=lowest)
- Perceived service: After travelling, which level of quality do you perceive? (7=highest, 1=lowest)

No.	Parameters	Expected service	Perceived service
	Vehicles		
1	No disturbing noise from engine when sitting inside a bus	-------	-------
2	Neatness and cleanliness inside a bus	-------	-------
3	Good working condition of air-conditioning system and efficient cooling system (neither bad odours nor water leaking)	-------	-------
4	Clean and adjustable bus seats with a space between two seats in a row	-------	-------
5	Provision of a complete set of audio-video entertainment facilities (i.e.,TV, DVD player, MP3, karaoke machine, etc.) with good working condition	-------	-------
6	Good working condition of bus audio	-------	-------
7	Decent appearance of vehicle body	-------	-------
8	Bus having a clean and convenient toilet	-------	-------
9	Installation of a complete set of bus safety equipment (i.e. glass breaking device, safety belt and emergency door, etc.) with instruction signs	-------	-------
	Drivers and crews		
10	Good personality and appearance of driver and crew that is neat, clean, and meets uniform standards	-------	-------
11	Friendly, helpful and polite customer service of driver and crew	-------	-------
12	Effective and correct emergency management	-------	-------
13	Service willingness to customers	-------	-------
14	Quick and enthusiastic service provision	-------	-------
15	Professional crew service	-------	-------
16	Bus driver with good driving skills	-------	-------
17	Bus driver driving safely, i.e. at a safe speed, politely, with respect for traffic rules	-------	-------
18	Driver and crew knowing how to fix engine	-------	-------
19	Bus driver's knowledge of sightseeing tour routes	-------	-------
20	Having good equipment and bus maintenance place	-------	-------
	Management		
21	Having good customer contact system (i.e. call center for informing problems) with easy access	-------	-------
22	Pleasurably allowing customers for a pre-trip inspection	-------	-------
23	Convenience of service use i.e. convenient location	-------	-------
24	On-time performance	-------	-------
25	Installation of Global positioning system *(*GPS)	-------	-------

No.	Parameters	Expected service	Perceived service
26	Suggestion of safety equipment usage via video (especially how to use glass breaking device, fire extinguisher and safety belt, etc.) and practices for emergency response	-------	-------
27	For long-distance travel distance beyond 400 km, two drivers must be provided by the business owner because a driver is not supposed to continue driving for more than 4 hours as issued by law	-------	-------
28	Receiving accident insurance coverage over mandatory insurance for all seats	-------	-------
29	Appropriate driver recruitment process of bus company i.e. age, experience, etc.	-------	-------

Loyalty Item:

From the latest use of education tour bus, how much do you agree at these question items? (7=Strongly Agree to 1=Strongly Disagree)

Code	Parameters	Score
	Word of mouth	
L1	I will recommend this "tour bus service provider" to my friend.	-------
L2	I will talk about good things of this "tour bus service provider" to my friend.	-------
L3	I will encourage my friends and people whom I know to use service of this" tour bus service provider"	-------
	Re-purchase intention	
L4	I will use service of this" tour bus service provider" next time.	-------
L5	If the level of price and quality of service are maintained, I will use service of this" tour bus service provider"	-------
	Identification	
L6	I rank this" tour bus service provider" at the first.	-------
L7	I think that this" tour bus service provider" is the best of tour buses I have ever used.	-------
L8	I love using this" tour bus service provider". If I have an opportunity to be an entrepreneur, I will provide service like this.	-------
L9	I will not be interested in any other "tour bus service providers" except only this tour bus service provider.	-------

Appendix 4.2: The references of questionaire and the measurement of content validity by experts

Direction: Items and Evaluation methods are as follows;

1. The relevance of question items to the variables to be measured
   (Put ✓ in the box on the right hand side)
2. The completeness of question complements to the definitions of variables.
   (Please give your opinions below the table of each topic)
3. The appropriateness of language use, language exquisiteness, language comprehensiveness, and communicative correctness.
   (Able to correct and give suggestions in question items)

Latent variables	**Question**	**References**	**Are the question items be able to measure Latent variables, or not?**		
			Yes	**Uncertain**	**No**
Perceived valued	Item2	Bourdeau (2005); S.-C. Chen (2012); Hsieh (2010); Mao (2008); Wen et al. (2005); Wu (2006); Zhang (2005)			
	Item3	S.-C. Chen (2012); Davis (2006); Hsieh (2010); Wen et al. (2005)			
	Item4	S.-C. Chen (2012); Wen et al. (2005)			
Satisfaction	Item5	Bourdeau (2005)			
	Item6	Bourdeau (2005); S.-C. Chen (2012); Davis (2006); Deng et al. (2010); Hsieh (2010); Kamaruddin et al. (2012); Li (2011); Wattanakamolchai (2008); Wen et al. (2005); Wong and Dioko (2013); Wu (2006); Yomnak (2007)			
	Item7	S.-C. Chen (2012); Davis (2006); Li (2011); Wen et al. (2005); Wong and Dioko (2013); Wu (2006)			
	Item8	Davis (2006); Wen et al. (2005); Wong and Dioko (2013); Wu (2006)			
Trust	Item9	Wen et al. (2005)			
	Item10	Bourdeau (2005); Wen et al. (2005)			
	Item11	Bourdeau (2005); S.-C. Chen (2012); Deng et al. (2010)			
	Item12	Bourdeau (2005); S.-C. Chen (2012); Wen et al. (2005)			
	Item13	Bourdeau (2005); S.-C. Chen (2012)			
	Item14	Bourdeau (2005); S.-C. Chen (2012); Deng et al. (2010)			
Commitment	Item15	S.-C. Chen (2012)			
	Item16	S.-C. Chen (2012)			
	Item17	S.-C. Chen (2012)			
	Item18	S.-C. Chen (2012)			
	Item19	S.-C. Chen (2012)			

Latent variables	**Question**	**References**	**Are the question items be able to measure <u>Latent variables,</u> or not?**		
			Yes	**Uncertain**	**No**
Attractiveness of competitor	Item20	Wen et al. (2005)			
	Item21	Wen et al. (2005)			
Loyalty	L1	Bourdeau (2005); S.-C. Chen (2012); G. Chi (2005); Deng et al. (2010); Hsieh (2010); Kamaruddin et al. (2012); Li (2011); Mao (2008); S. Nam (2008); Wen et al. (2005); Wong and Dioko (2013); Wu (2006); Yomnak (2007)			
	L2	Bourdeau (2005); Li (2011); Mao (2008); S. Nam (2008); Wu (2006); Yomnak (2007)			
	L3	Bourdeau (2005); S.-C. Chen (2012); Mao (2008); S. Nam (2008); Wu (2006); Yomnak (2007)			
	L4	S.-C. Chen (2012); G. Chi (2005); Davis (2006); Deng et al. (2010); Hsieh (2010); Kamaruddin et al. (2012); Li (2011); Mao (2008); Marshall (2010); Wen et al. (2005); Wong and Dioko (2013); Wu (2006); Yomnak (2007); Zhang (2005)			
	L5	S.-C. Chen (2012); Wen et al. (2005)			
	L6	Bourdeau (2005); Li (2011); S. Nam (2008); Wu (2006); Yomnak (2007); Zhang (2005)			
	L7	Bourdeau (2005); S.-C. Chen (2012); Wen et al. (2005)			
	L8	None			
	L9	Bourdeau (2005); Deng et al. (2010)			

CHAPTER V

MULTI-GROUP STRUCTURAL EQUATION MODELING OF CUSTOMER SATISFACTION AND LOYALTY: EVIDENCE FROM SIGHTSEEING BUS SERVICES IN THAILAND

5.1 Abstract

Gaining customer loyalty should be one of the top considerations for entrepreneurs, as efforts to find new customers generate greater costs than keeping existing ones, thereby directly affecting company profits. This study aims to identify factors that have direct and indirect effects on customer loyalty in the context of sightseeing bus services for educational institutes in Thailand. The analysis uses multi-group structural equation modeling (SEM). Three sample groups comprising 880 primary-school teachers, 965 secondary-school teachers, and 709 polytechnic school teachers were surveyed. The results from SEM confirmed that, for all three groups, customer satisfaction was a major factor affecting customer loyalty. Likewise, expected service quality, perceived service quality, and service value had indirect influence on customer loyalty. In addition, the invariance analysis indicated the differences of factor loadings, intercepts, and structural paths among groups at a significance level of 0.05 ($\alpha = 0.05$). The outcomes offer substantial benefits to

entrepreneurs by providing guidelines to help them determine appropriate market strategies to maintain and increase the loyalty of sightseeing bus users.

5.2 Introduction

Currently, Thailand has initiated a policy to support at least one educational tour per year for students in primary, secondary, and polytechnic schools by allocating a budget for this purpose (Ministry of Education, 2009). On each sightseeing trip, the schools provide various types of management, depending on the level of education; for instance, primary-school trip destinations may not be far from the school, whereas secondary- or polytechnic-school tours might travel to other provinces and stay overnight. Schools generally establish a procurement committee to select sightseeing bus services to be used for these trips that primarily depends on the committee's mutual decision. According to a study by Vatanavongs and Sajjakaj (2012) on sightseeing bus selection, 24.7% of the schools sampled chose the same bus services that they had used previously, based on prior satisfaction, whereas 21.7% made their decisions based on word of mouth (WOM). Both of these rationales can be considered behaviors that reflect user loyalty. Hence, businesses usually focus on gaining and retaining customer loyalty, since it is more expensive to find a new customer than to keep an existing one (Coulter, Price, & Feick, 2003), and since success in retaining customer loyalty should result in increased market share and profit for businesses (J. Nam, Ekinci, & Whyatt, 2011; Park, Chung, & Rutherford, 2011).

The school sightseeing bus business differs from other businesses, in that many users arrive at a mutual decision, by committee, on which service to choose. This fact can be a key consideration for service providers in determining customer

loyalty strategies. In addition, this type of business in Thailand nowadays is highly competitive, considering that the cumulative number of sightseeing buses as of December 31, 2013 was 40,843, representing an increase of 79.6% when compared to 2004 (Department of Land Transport, 2014). Furthermore, bus accidents are a relatively frequent occurrence in Thailand. According to a report on accidents in Thailand from September 1, 2012 through October 31, 2013, there were 829 large-sized bus crashes involving 7,820 deaths, 3,612 serious injuries, 17,923 minor injuries, and a property loss of approximately 700 million baht (Department of Land Transport, 2014). Therefore, it is essential for schools to select high-quality service providers to reduce accident risks. In this regard, accident experience is associated with service quality and, in turn, affects customer satisfaction and loyalty.

5.3 Literature reviews

There have been relatively few studies on loyalty factors in the transportation sector. Most of the existing studies are related to airline business (Y.-H. Chang & Chen, 2007; Y.-W. Chang & Chang, 2010; F.-Y. Chen, Chang, & Lin, 2012; Elkhani, Soltani, & Jamshidi, 2014; Forgas, Moliner, Sánchez, & Palau, 2010; Forgas, Palau, Sánchez, & Huertas-García, 2012; Mikulić & Prebežac, 2011). On the other hand, loyalty issues related to bus patronage are relatively rare studied only by Wen, Lan, and Cheng (2005). Previous works on bus service performance mostly highlighted matters of service quality and satisfaction (Bordagaray, dell'Olio, Ibeas, & Cecín, 2013; de Oña, de Oña, Eboli, & Mazzulla, 2013; dell'Olio, Ibeas, & Cecin, 2011; Filipović, Tica, Živanović, & Milovanović, 2009; Susnienė, 2012). Significantly, no

studies of customer satisfaction and loyalty in the context of sightseeing bus services for school tours were found.

To determine marketing strategies to boost customer loyalty, it is necessary to understand and identify the factors that have direct and indirect influence on loyalty. A review of 54 previous studies of various business sectors including tourism, restaurants, retail, telecommunication, transportation, and online marketing (Al-Nasser, Al-Rawwash, & Alakhras, 2011; Alegre & Juaneda, 2006; Aydin & Özer, 2005; Bourdeau, 2005; Carreira, Patrício, Natal Jorge, & Magee, 2014; H. H. Chang & Chen, 2009; L.-Y. Chang & Hung, 2013; Y.-H. Chang & Chen, 2007; Y.-W. Chang & Chang, 2010; C.-F. Chen & Chen, 2010; C.-F. Chen & Phou, 2013; F.-Y. Chen et al., 2012; S.-C. Chen, 2012; C. G.-Q. Chi & Qu, 2008; G. Chi, 2005; Chiou, 2004; Chiou & Pan, 2009; Chotivanich, 2012; Cyr, Hassanein, Head, & Ivanov, 2007; Davis, 2006; Deng, Lu, Wei, & Zhang, 2010; Dolnicar, Grabler, Grün, & Kulnig, 2011; Elkhani et al., 2014; Erciş, Ünal, Candan, & Yıldırım, 2012; Forgas-Coll, Palau-Saumell, Sánchez-García, & Callarisa-Fiol, 2012; Forgas et al., 2010; Forgas et al., 2012; Gallarza & Gil Saura, 2006; Hsieh, 2010; Hume & Mort, 2008; Janita & Miranda, 2013; Kamaruddin, Osman, & Pei, 2012; Kim, Jin, & Swinney, 2009; Li, 2011; Llach, Marimon, Alonso-Almeida, & Bernardo, 2013; Mao, 2008; Marshall, 2010; Mikulić & Prebežac, 2011; Mouakket & Al-hawari, 2012; J. Nam et al., 2011; S. Nam, 2008; Park et al., 2011; Shankar, Smith, & Rangaswamy, 2003; Songsom & Trichun, 2012; Tsiotsou, 2006; Wattanakamolchai, 2008; Wen et al., 2005; Wong, 2013; Wong & Dioko, 2013; Wu, 2006; Yang & Peterson, 2004; Yomnak, 2007; Žabkar, Brenčič, & Dmitrović, 2010; Zhang, 2005) found 14 potential factors associated with loyalty: switching cost, customer satisfaction, customer trust, commitment, perceived value,

involvement, perceived service quality, perceived risk, past experience, customer complaints, attractiveness of competitors, motivation, corporate social responsibility expectations, and customer expectations. However, the top four factors most commonly used in this research were satisfaction (79.63%), perceived service quality (68.52%), perceived value (46.30%), and trust (37.04%). In this study, we have selected factors that appear consistently in the field of loyalty studies (representing the significance of such factors) and are relevant to sightseeing bus services (such as attractiveness of competitors). This last factor was examined in only one study, although that one was in the transportation sector (Wen et al., 2005).

This study aims to identify factors that directly and indirectly affect customer loyalty in the context of sightseeing bus services for educational institutions in Thailand. In this respect, structural equation modeling (SEM) was included in the analysis to verify the construct validity of empirical data and test 11 hypotheses, as illustrated in Figure 5.1. The 11 hypotheses were as follows:

H1: Service value has a direct positive effect on customer satisfaction.

H2: Expected service quality has a direct negative effect on satisfaction.

H3: Perceived service quality has a direct positive effect on customer satisfaction.

H4: Perceived service quality has a direct positive effect on service value.

H5: Expected service quality has a direct positive effect on perceived service quality.

H6: Service value has a direct positive effect on loyalty.

H7: Trust has a direct positive effect on loyalty.

H8: Commitment has a direct positive effect on loyalty.

H9: Customer satisfaction has a direct positive effect on customer loyalty.

H10: Attractiveness of competitors has a direct positive effect on customer loyalty.

H11: Past experience has a direct negative effect on customer loyalty.

In addition, the study conducted invariance testing among three groups of schools (primary, secondary, and polytechnic) to see if the parameters in each model were significantly different. If so, then a set of sub-models might be considered in determining business policies rather than the overall model, due to the greater specificity of information provided.

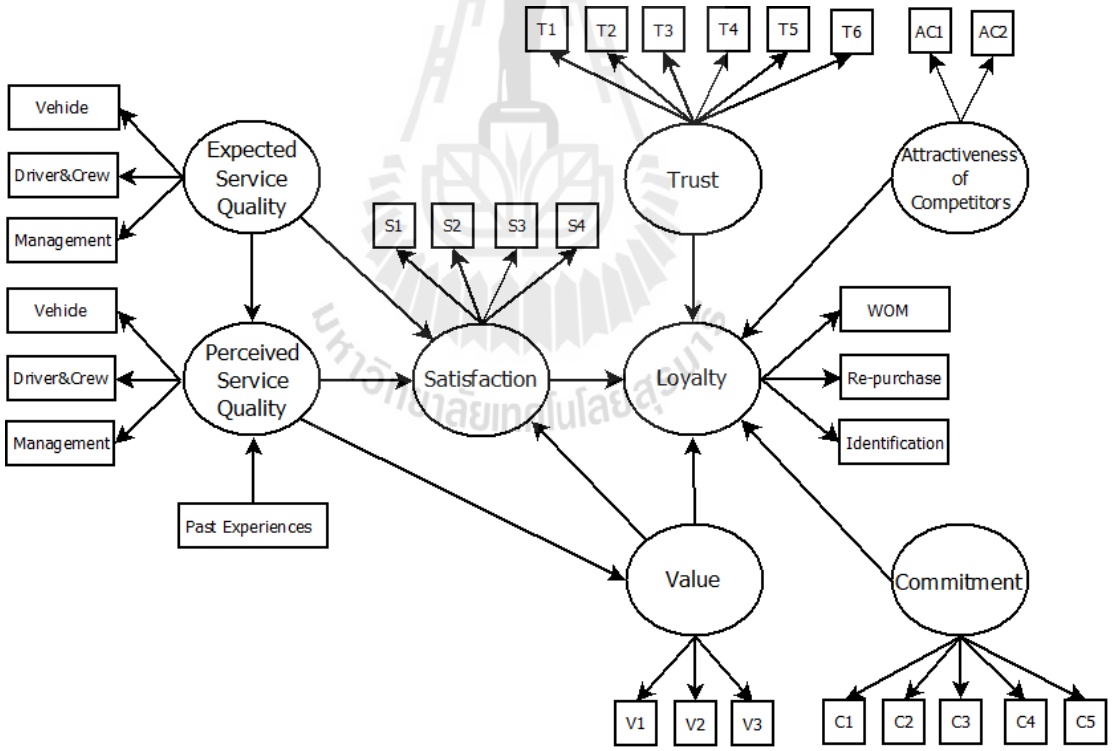

Figure 5.1 Conceptual framework

5.4 Survey design and data collection

5.4.1 Samples

The appropriate sample size for SEM development should be at least 15 times greater than the number of observed variables (Golob, 2003). As Figure 5.1 shows, there are 30 observed variables, so the sample size for constructing the model should be at least 450. Teacher groups who made decisions on bus service selection were selected from all provinces in Thailand, based on stratified random sampling using a four-step process: (1) dividing Thailand's regions into 5 strata—north, northeast, central, south, and Bangkok and vicinity; (2) classifying provinces by size into three groups—small, medium, and large; (3) categorizing school locations into two types—urban and rural; and (4) dividing the educational program into three levels—primary, secondary, and polytechnic. The survey obtained 2,554 completed questionnaires, and the sample comprised 880 primary-school teachers, 965 secondary-school teachers, and 709 polytechnic-school teachers.

5.4.2 Measures

The study considered nine factors as latent variables: loyalty, attractiveness of competitors, trust, satisfaction, perceived value, commitment, expected service quality, perceived service quality, and past experience. Each latent variable can be measured by observed variables that were obtained from 30 questionnaire items. On each item in the questionnaire, respondents were asked to indicate their opinion on a 7-point scale (1 = strongly disagree, 7 = strongly agree).

5.4.2.1 Loyalty

Loyalty (L) was measured by using three observed variables: (1) WOM, which refers to a customer's willingness to support the service by

recommending products and services to friends, family, and other persons due to their belief in the quality and value received; (2) repurchase intention, or the action of buying products and services again when one has the opportunity; and (3) identification, or whether the customer thinks first of this business when he or she needs the service (Bourdeau, 2005; S.-C. Chen, 2012; G. Chi, 2005; Deng et al., 2010; Hsieh, 2010; Kamaruddin et al., 2012; Li, 2011; Mao, 2008; S. Nam, 2008; Wen et al., 2005; Wong & Dioko, 2013; Wu, 2006; Yomnak, 2007).

5.4.2.2 Attractiveness of competitors

Attractiveness of competitors (AC) is described as the ability of other entrepreneurs who have the same type of business and target customer groups to cause impediments to a business operation. It can be measured using two questionnaire items: AC1: The other tour companies make me feel more satisfied; AC2: I would be happier if I used service from the other tour companies (Wen et al., 2005).

5.4.2.3 Trust

Trust (T) refers to the customer's perception of the reliability and integrity of the business. It is measured by six questionnaire items: T1: I believe that this tour company offers us the best service; T2: I always trust this tour company; T3: This tour company always knows what it should do to satisfy the customer; T4: This tour company is very honest; T5: This tour company is extremely reliable; T6: This tour company is a large enterprise with a stable and reliable business (Bourdeau, 2005; S.-C. Chen, 2012; Deng et al., 2010; Wen et al., 2005)

5.4.2.4 Satisfaction

Satisfaction (S) represents the internal feelings of each customer as derived from a comparison between expected service and perceived service quality (Susnienė, 2012). The study examined satisfaction based on four questionnaire items as follows: S1: I'm very happy to use the services of this tour company; S2: Overall, I'm very satisfied with the service of this tour company; S3: The service quality that I perceived was more than I expected; S4: The service quality that I perceived is like what I dreamed of (Bourdeau, 2005; S.-C. Chen, 2012; Davis, 2006; Deng et al., 2010; Hsieh, 2010; Kamaruddin et al., 2012; Li, 2011; Wattanakamolchai, 2008; Wen et al., 2005; Wong & Dioko, 2013; Wu, 2006; Yomnak, 2007)

5.4.2.5 Perceived Value

Perceived value (V) involves total value when compared with total cost. In this study, it was measured by using three questionnaire items: V1: When comparing to perceived value, I think it's worth it to pay for this service; V2: I'm satisfied with the service when compared to the amount I paid for it because the price is reasonable; V3: When I use the service of this tour company, I feel that it is worth more than the other one that I used previously (Bourdeau, 2005; S.-C. Chen, 2012; Hsieh, 2010; Mao, 2008; Wen et al., 2005; Wu, 2006; Zhang, 2005).

5.4.2.6 Commitment

Commitment (C) can be measured using five questionnaire items: C1: I'm proud to use the service from this tour company; C2: I'm more concerned with the long-term success of this tour company; C3: I intend to use the service from this tour company; C4: I think that this tour company is a leader in the

travel service sector; C5: I think that using the services of this tour company creates a good image for me (S.-C. Chen, 2012).

5.4.2.7 Expected and perceived service quality

Expected and perceived service quality were examined by referring to three major components: vehicle, driver and crew, and management (Filipović et al., 2009; Maskeliūnaite, Sivilevičius, & Podvezko, 2009; Stradling, Carreno, Rye, & Noble, 2007; Susnienė, 2012; Wen et al., 2005).

5.4.2.8 Past experience

Past experience was measured by using one question: "From your travel experience, have you ever faced a problem with a bus breakdown on the way?"

5.5.3 Reliability

Content validity of the questionnaire was tested using the Index of Item Objective Congruency (IOC) along with examination by 13 experts in the sightseeing bus sector. In this regard, the items with IOC values above 0.50 were considerably taken into modeling. The next step encompassed pilot testing of the questionnaire with 89 respondents to examine reliability using Cronbach's alpha; items with values above 0.70 were deemed acceptable (Tavakol & Dennick, 2011). According to the questionnaire test procedure, all items obtained IOC and Cronbach's alpha values in the range of 0.54–1.00 and 0.909–0.965, respectively.

5.5 Modeling methodology

In this study, SEM, a method popularly used to examine relationships among variables that have chain characteristics, was applied in the analysis. Likewise, the study conducted invariance measurement between groups to test whether the parameters in each sub-model were different. Further details are given below.

5.5.1 Structural Equation Modeling

SEM is an efficient technique in multivariate analysis, and its application has become popular to confirm relationships among observed or latent variables. This technique merges factor analysis with multiple regression analysis and entails the use of two models: a measurement model that describes how observed variables can be used to measure the latent variables, and a structural model that identifies direction and relationship between latent variables.

In testing construct validity, a χ^2 (*df*) statistical value should attain $p > 0.05$ (Kline, 2011) due to its sensitivity to large sample sizes (n > 200). The examination results with χ^2 tend to reject the hypothesis (Kline, 2011; MacCallum, Browne, & Sugawara, 1996), so it is necessary to consider goodness-of-fit indicators such as RMSEA value, which should be less than or equal to 0.06; CFI and TLI values, which should be above 0.95; and SRMR value, which should be less than or equal to 0.08 (Hu & Bentler, 1999).

5.5.2 Multi-group analysis

Multi-group analysis is a popular method for measuring the validity of a structural equation model (Brown, 2006; Koh & Zumbo, 2008). Its objective is to examine whether the parameters of population group 1 are similar to those of group 2.

Model evaluation involving invariance analysis in the measurement model applied the difference tests of chi-square and degree of freedom between the baseline model (not constrained) and the strict model (determining whether the factor loadings, intercepts, and structural paths are equal across groups). If the results are not significant, this suggests that the model displays invariance across sub models (A.Bollen, 1989; Cheung & Rensvold R. B., 2002).

5.6 Results

Table 5.1 demonstrates the results of descriptive statistics of a sample in each sub-model, comprising mean, standard deviation, skewness and kurtosis, which were used to illustrate the sample distribution. The study applied maximum likelihood estimation under the statistical rule that data must be normally distributed, while skewness and kurtosis were appropriately utilized as normal distribution indices. Kline (2011) suggested that skewness and kurtosis values should be less than 3.0 and 10.0, respectively. In addition, the results based on SEM and invariance analyses are also elucidated.

5.6.1 The primary-school sample

5.6.1.1 Descriptive statistics

The descriptive statistics for the primary-school group showed that the dependent variable contained three parameters: WOM, repurchase intention, and identification. Repurchase intention provided the maximum mean score (mean = 5.80, SD = 0.95), followed by WOM (mean = 5.74, SD = 0.91) and identification (mean = 5.47, SD = 1.01). When the 27 independent variables were considered, customer expectation of driver and crew obtained the highest mean score (mean =

5.99, SD = 0.85), followed by customer expectation of the vehicle (mean = 5.79, SD = 0.92). Skewness and kurtosis values of all parameters exhibited normal distribution.

5.6.1.2 Structural equation modeling

Goodness-of-fit statistics for the primary-school group were as follows: χ^2 = 1414.143, degrees of freedom = 376, $p < 0.001$, CFI = 0.969, TLI = 0.964, SRMR = 0.040, RMSEA = 0.056 (see Table 5.2), all of which were acceptable under the demanding criteria, thus indicating that the SEM for primary-school teachers is consistent with the empirical data. The SEM (see Figure 5.1) exemplified eight measurement models or latent variable models, comprising perceived value, satisfaction, trust, commitment, attractiveness of competitors, expected service quality, perceived service quality, and customer loyalty. When we considered the endogenous measurement model or loyalty model, the analysis found that the three parameters significantly confirmed the loyalty factors ($p < 0.001$) with factor loading scores in the range of 0.998–0.923; whereas identification represented the maximum factor loading score. Concerning the exogenous measurement model, seven models were significantly confirmed by 26 indices ($p < 0.001$) with factor loadings ranging from 0.672 to 0.942. Moreover, the indices obtaining the highest factor loading score in each exogenous measurement mode were as follows: perceived value, V2 = 0.934; satisfaction, S3 = 0.933; trust, T3 = 0.929; commitment, C3 = 0.942; attractiveness of competitors, AC2 = 0.927; expected service quality, EC = 0.916; and perceived service quality, PS = 0.750 (see Table 5.3).

With regard to the structural model or regression path of loyalty of sightseeing bus users, 10 hypotheses were confirmed at a significance level of 0.05, with the regression coefficient of each hypothesis as follows: H1 = 0.423, H2 = -

0.101, H3 = 0.627, H4 = 0.916, H5 = 2.120, H6 = 0.231, H7 = 0.118, H8 = 0.059, H9 = 0.623, H11 = -0.041. Only H10 was rejected, as attractiveness of competitors had a negative effect on customer loyalty (β = 0.306, t = 4.167, p = 0.888) (see Table 5.4).

5.6.2 The secondary-school sample

5.6.2.1 Descriptive statistics

The results based on descriptive statistics of the secondary-school group were acquired for the three parameters. Similar to the primary-school group, the sequence of maximum to minimum mean scores was as follows: repurchase intention (mean = 5.61, SD = 1.03), WOM (mean = 5.58, SD = 0.99), and identification (mean = 5.31, SD = 1.06). With regard to the observed variables as independent variables, the indices having the highest and second-highest mean scores were the same as in the primary-school group, equaling 0.591 and 0.79, respectively. As for the skewness and kurtosis values, all indices had normal distribution.

5.6.2.2 Structural equation modeling

For the secondary-school group, model fit indices displayed χ^2 = 1571.506, degrees of freedom = 376, p < 0.001, CFI = 0.968, TLI = 0.963, SRMR = 0.038, and RMSEA = 0.057, all falling in the acceptable range and thus demonstrating that the SEM was compatible with empirical data. According to the endogenous measurement model, WOM, repurchase intention, and identification significantly confirmed factors related to loyalty (p < 0.001) with factor loading scores of 0.923, 0.912, and 0.927, respectively. For seven exogenous measurement models, it was found that 26 indices could be used to verify factor structure with significance (p < 0.001), and factor loading scores fell in the range of 0.755–0.965. Indices representing the maximum factor loading of each exogenous measurement model were as follows:

perceived value, V2 = 0.939; satisfaction, S1 = 0.926; trust, T3 = 0.918; commitment, C3 = 0.932; attractiveness of competitors, AC1 = 1.121; expected service quality, EC = 0.942; and perceived service quality, PS = 0.753 (see Table 5.3).

In accordance with the structural model or regression path of loyalty of sightseeing bus customers, seven hypotheses were statistically confirmed at a significance of 0.05 ($\alpha = 0.05$). The regression coefficients of each hypothesis were as follows: H1 = 0.326, H2 = -0.080, H3 = 0.717, H4 = 0.941, H5 = 2.254, H9 = 0.815, and H11 = -0.034 (see Table 5.4).

5.6.3 The polytechnic sample

5.6.3.1 Descriptive statistics

As shown in Table 5.1, the mean and standard deviation (SD) of the three parameters used as dependent variables were as follows: WOM, mean = 5.48, SD = 1.07; repurchase intention, mean = 5.49, SD = 1.11; identification, mean = 5.20, SD = 1.14. As in the other two cases, repurchase intention obtained the maximum mean, albeit by a very narrow margin. In terms of independent variables, customer expectation of driver and crew obtained the highest mean score (mean = 5.66, SD = 1.06). Again the skewness and kurtosis values indicated that all indices were normally distributed.

5.6.3.2 Structural equation modeling

According to the SEM analysis for the polytechnic-school group, the results were as follows: χ^2 = 922.868, degrees of freedom = 376, $p <$ 0.001, CFI = 0.981, TLI = 0.978, SRMR = 0.040, and RMSEA = 0.045 (see Table 5.2). These results all corresponded to the criteria, thus indicating that the SEM for the polytechnic-school sample was consistent with empirical data. When the eight

measurement models were considered, all 29 indices significantly confirmed factors of each latent variable ($p < 0.001$) with the loyalty model attaining factors in the range of 0.909–0.931. In this regard, identification was found to have the highest factor loading score, while repurchase intention had the lowest. In the exogenous measurement model, the highest factor loadings of each model were perceived value (V2 = 0.940), satisfaction (S1 = 0.929), trust (T2 = 0.924), commitment (C3 = 0.951), attractiveness of competitors (AC1 = 0.965), expected service quality (EC = 0.928), and perceived service quality (PC = 0.766) (see Table 5.3).

With regard to the structural model of loyalty of sightseeing bus patronage, only six hypotheses were statistically confirmed at a significance level of 0.05. The regression coefficients for these hypotheses were as follows: H1 = 0.362, H3 = 0.642, H4 = 0.964, H5 = 1.754, H6 = 0.235, H9 = 0.725 (see Table 5.4).

Table 5.1 Descriptive statistics

Code	Primary school (n=880)				Secondary school (n=965)				Polytechnic school (n=709)				Pooled sample (n=2554)			
	Mean	**S.D.**	**Sk**	**Ku**	**Mean**	**S.D.**	**Sk**	**Ku**	**Mean**	**S.D.**	**Sk**	**Ku**	**Mean**	**S.D.**	**Sk**	**Ku**
WOM	5.74	0.91	-1.01	1.83	5.58	0.99	-1.11	2.30	5.48	1.07	-1.04	1.85	5.61	0.99	-1.09	2.12
Re-purchase	5.80	0.95	-0.99	1.57	5.61	1.03	-1.14	2.30	5.49	1.11	-1.04	1.65	5.64	1.03	-1.09	1.98
Identification	5.47	1.01	-0.95	1.15	5.31	1.06	-0.98	1.45	5.20	1.14	-0.87	1.09	5.34	1.07	-0.95	1.28
Exp_Veh	5.79	0.92	-0.70	0.40	5.79	0.93	-0.72	0.39	5.56	1.07	-0.93	1.30	5.72	0.97	-0.82	0.92
Exp_Crew	5.99	0.85	-0.72	0.33	5.91	0.93	-0.80	0.48	5.66	1.06	-1.02	1.76	5.87	0.95	-0.92	1.29
Exp_Man	5.69	0.97	-0.49	-0.22	5.63	1.06	-0.66	0.05	5.41	1.10	-0.62	0.57	5.59	1.05	-0.62	0.23
Per_Veh	5.38	0.89	-0.55	0.75	5.27	0.89	-0.63	1.14	5.16	1.01	-0.82	1.38	5.28	0.93	-0.70	1.23
Per_Crew	5.70	0.82	-0.65	1.03	5.51	0.89	-0.67	1.13	5.38	0.98	-0.97	1.94	5.54	0.90	-0.81	1.60
Per_Man	5.27	0.91	-0.55	0.74	5.09	0.96	-0.65	1.02	5.03	1.02	-0.73	1.13	5.14	0.96	-0.66	1.04
Past experience	1.72	0.96	1.33	1.60	1.98	1.04	0.92	0.54	1.71	0.99	1.31	1.14	1.81	1.01	1.15	0.95
V1	5.72	0.97	-0.96	1.61	5.54	1.07	-0.99	1.31	5.39	1.15	-0.83	0.93	5.56	1.07	-0.96	1.33
V2	5.74	0.95	-1.04	1.94	5.56	1.05	-0.94	1.39	5.41	1.14	-0.87	1.02	5.58	1.05	-0.98	1.47
V3	5.64	1.03	-1.03	1.55	5.45	1.08	-1.01	1.51	5.34	1.17	-0.85	1.10	5.49	1.09	-0.98	1.41
S1	5.70	0.98	-0.88	1.13	5.51	1.07	-0.99	1.66	5.40	1.19	-0.94	1.28	5.54	1.08	-0.98	1.54
S2	5.74	1.00	-0.93	1.11	5.56	1.07	-0.97	1.50	5.46	1.14	-0.93	1.33	5.60	1.07	-0.96	1.40
S3	5.64	1.00	-0.81	0.88	5.45	1.05	-0.91	1.45	5.36	1.14	-0.83	0.96	5.49	1.07	-0.87	1.19
S4	5.50	1.05	-0.84	0.92	5.31	1.14	-0.98	1.46	5.23	1.25	-0.91	1.10	5.35	1.15	-0.95	1.31
T1	5.58	1.03	-1.10	1.67	5.41	1.06	-1.11	2.04	5.26	1.20	-0.96	1.12	5.43	1.10	-1.08	1.66
T2	5.66	0.99	-0.99	1.41	5.45	1.08	-1.08	2.00	5.35	1.16	-0.76	0.79	5.50	1.08	-0.97	1.47
T3	5.69	0.98	-1.02	1.62	5.50	1.06	-0.92	1.38	5.35	1.16	-0.83	0.91	5.52	1.07	-0.95	1.33
T4	5.75	1.02	-1.08	1.91	5.56	1.09	-0.97	1.44	5.39	1.19	-0.82	0.65	5.58	1.11	-0.97	1.31
T5	5.76	1.01	-1.03	1.43	5.55	1.07	-0.93	1.37	5.38	1.20	-0.81	0.73	5.57	1.10	-0.95	1.20
T6	5.58	1.10	-1.10	1.76	5.42	1.09	-0.96	1.45	5.26	1.20	-0.74	0.62	5.43	1.13	-0.94	1.22
C1	5.44	1.10	-0.68	0.37	5.30	1.07	-0.71	0.79	5.15	1.19	-0.69	0.69	5.31	1.12	-0.70	0.66
C2	5.28	1.21	-0.83	0.98	5.10	1.19	-0.76	0.79	5.09	1.21	-0.67	0.66	5.16	1.21	-0.75	0.79
C3	5.55	1.03	-0.81	0.75	5.35	1.09	-0.80	0.99	5.24	1.17	-0.68	0.78	5.39	1.10	-0.78	0.89
C4	5.58	1.04	-0.81	0.80	5.39	1.09	-0.76	0.87	5.30	1.20	-0.71	0.76	5.43	1.11	-0.78	0.87
C5	5.48	1.07	-0.63	0.33	5.29	1.10	-0.71	0.69	5.20	1.21	-0.67	0.67	5.33	1.13	-0.69	0.64
AC1	5.00	1.35	-1.05	1.13	4.86	1.32	-0.77	0.63	5.06	1.22	-0.61	0.62	4.96	1.31	-0.84	0.84
AC2	4.90	1.37	-0.98	0.93	4.75	1.38	-0.69	0.33	5.00	1.27	-0.63	0.56	4.87	1.35	-0.79	0.62

Note: SD=Standard deviation, Sk=Skewness, Ku=Kurtosis

Table 5.2 Model fit indices for invariance test

Description	χ^2	*df*	χ^2/df	$\Delta\chi^2$	Δdf	*p*	CFI	TLI	SRMR	RMSEA (90% CI)
Individual groups:										
Model1: Primary school	1,414.143	376	3.76				0.969	0.964	0.040	0.056 (0.053-0.059)
Model2: Secondary school	1,571.506	376	4.18				0.968	0.963	0.038	0.057 (0.054-0.060)
Model3: Polytechnic school	922.868	376	2.45				0.981	0.978	0.040	0.045 (0.042-0.040)
Measurement of invariance:										
Model 4: No Constraints	3,908.517	1128	3.46				0.972	0.968	0.040	0.054 (0.052-0.056)
Model 5: Factor Loadings, Intercepts, Structural Paths heldequal across groups	4,184.38	1250	3.35	275.863	122	0.0000	0.971	0.969	0.056	0.053 (0.051-0.054)

Note: χ^2 = chi-squared statistic; *df* = degrees of freedom; *p* = level of significance; RMSEA = root mean square of approximation; CFI = comparative fit index; TLI = Tucker–Lewis index; SRMR = standardized root mean square residual

Table 5.3 The results of measurement model

Measurement Model		Primary school			Secondary school			Polytechnic school		
		estimates	**t-stat**	**p-value**	**estimates**	**t-stat**	**p-value**	**estimates**	**t-stat**	**p-value**
M1	Loyalty → WOM	0.899	126.536	<0.001**	0.923	172.503	<0.001**	0.931	164.785	<0.001**
M2	Loyalty → Re-purchase	0.898	126.893	<0.001**	0.912	152.278	<0.001**	0.909	131.646	<0.001**
M3	Loyalty → Identification	0.923	161.164	<0.001**	0.927	181.534	<0.001**	0.940	189.033	<0.001**
M4	Service value → V1	0.924	155.819	<0.001**	0.935	192.841	<0.001**	0.920	139.551	<0.001**
M5	Service value → V2	0.934	171.967	<0.001**	0.939	201.213	<0.001**	0.932	161.031	<0.001**
M6	Service value → V3	0.914	140.482	<0.001**	0.926	174.184	<0.001**	0.930	159.301	<0.001**
M7	Satisfaction → S1	0.931	177.474	<0.001**	0.920	164.851	<0.001**	0.929	157.938	<0.001**
M8	Satisfaction → S2	0.930	168.358	<0.001**	0.922	164.315	<0.001**	0.927	148.085	<0.001**
M9	Satisfaction → S3	0.933	182.019	<0.001**	0.916	156.327	<0.001**	0.922	144.870	<0.001**
M10	Satisfaction → S4	0.898	121.945	<0.001**	0.879	110.330	<0.001**	0.899	114.150	<0.001**
M11	Trust → T1	0.899	125.986	<0.001**	0.898	129.567	<0.001**	0.903	119.587	<0.001**
M12	Trust → T2	0.925	165.478	<0.001**	0.915	153.603	<0.001**	0.924	150.132	<0.001**
M13	Trust → T3	0.929	173.027	<0.001**	0.918	159.576	<0.001**	0.920	143.779	<0.001**
M14	Trust → T4	0.909	138.263	<0.001**	0.904	136.600	<0.001**	0.912	130.605	<0.001**
M15	Trust → T5	0.912	142.525	<0.001**	0.912	148.727	<0.001**	0.910	127.009	<0.001**
M16	Trust → T6	0.838	78.687	<0.001**	0.857	93.333	<0.001**	0.865	85.802	<0.001**
M17	Commitment → C1	0.851	83.344	<0.001**	0.871	100.672	<0.001**	0.868	86.183	<0.001**
M18	Commitment → C2	0.681	35.807	<0.001**	0.581	26.088	<0.001**	0.772	48.338	<0.001**
M19	Commitment → C3	0.942	182.896	<0.001**	0.932	172.376	<0.001**	0.951	202.233	<0.001**
M20	Commitment → C4	0.907	129.900	<0.001**	0.909	137.396	<0.001**	0.928	151.646	<0.001**
M21	Commitment → C5	0.887	108.923	<0.001**	0.909	137.177	<0.001**	0.892	104.944	<0.001**
M22	Attractiveness of competitors → AC1	0.924	19.371	<0.001**	1.121	12.280	<0.001**	0.965	43.421	<0.001**
M23	Attractiveness of competitors → AC2	0.927	19.380	<0.001**	0.778	12.087	<0.001**	0.877	40.126	<0.001**
M24	Expected service quality → EV	0.890	99.104	<0.001**	0.925	150.790	<0.001**	0.897	97.435	<0.001**
M25	Expected service quality → EC	0.916	109.055	<0.001**	0.942	165.344	<0.001**	0.928	117.997	<0.001**
M26	Expected service quality → ES	0.877	91.957	<0.001**	0.897	119.627	<0.001**	0.879	85.873	<0.001**
M27	Perceived service quality → PV	0.672	36.405	<0.001**	0.750	52.313	<0.001**	0.755	47.324	<0.001**
M28	Perceived service quality → PC	0.712	41.477	<0.001**	0.753	51.893	<0.001**	0.766	49.345	<0.001**
M29	Perceived service quality → PS	0.750	50.131	<0.001**	0.720	45.552	<0.001**	0.759	46.694	<0.001**

Note: → Measurement by, ** significant at α =0.01

Table 5.4 The results of structural model

Structural model		Primary school			Secondary school			Polytechnic school		
		Est.	**t-stat**	**p-value**	**Est.**	**t-stat**	**p-value**	**Est.**	**t-stat**	**p-value**
H1	Service value → Satisfaction	0.423	7.648	<0.001**	0.326	4.518	<0.001**	0.362	3.410	0.001**
H2	Expected service quality →Satisfaction	-0.101	-4.950	<0.001**	-0.080	-4.857	<0.001**	-0.018	-0.914	0.361
H3	Perceived service quality →Satisfaction	0.627	10.763	<0.001**	0.717	9.778	<0.001**	0.642	5.916	<0.001**
H4	Perceived service quality →Service value	0.916	98.100	<0.001**	0.941	123.484	<0.001**	0.964	141.791	<0.001**
H5	Expected service quality →Perceived service quality	2.12	16.046	<0.001**	2.254	15.298	<0.001**	1.754	20.075	<0.001**
H6	Service value → Loyalty	0.231	4.532	<0.001**	0.127	1.791	0.073	0.235	2.752	0.006**
H7	Trust → Loyalty	0.118	3.235	0.001**	0.049	1.158	0.247	0.033	0.637	0.524
H8	Commitment → Loyalty	0.059	2.095	0.036*	0.030	1.167	0.243	0.024	0.714	0.475
H9	Satisfaction → Loyalty	0.623	9.145	<0.001**	0.815	8.213	<0.001**	0.725	6.695	<0.001**
H10	Attractiveness of competitors → Loyalty	-0.002	-0.141	0.888	-0.010	-1.182	0.237	-0.003	-0.222	0.824
H11	Past experience → Perceived service quality	-0.041	-2.964	0.003**	-0.034	-2.584	0.010**	-0.013	-0.967	0.333

Note: → regression on, ** significant at α =0.01, * significant at α =0.05

5.6.4 Multiple group analysis

Table 5.2 presents the use of chi-square, degrees of freedom, CFI, TLI, SRMR, and RMSEA values to test the invariance of the three model groups (primary, secondary and polytechnic schools), with the hypothesis being that factor loadings, intercepts, and structural paths would be equal across groups. Considering the differences test of chi-square and degrees of freedom between the baseline model (model 4) and the strict model (model 5), the results were as follows: $\Delta\chi^2 = 275.863$, $\Delta df = 122$, and p-value < 0.001. Hence, the hypothesis was rejected, thus meaning that factor loadings, intercepts, and structural paths between the primary-, secondary-, and polytechnic-school groups were different.

5.7 Conclusions and discussion

The intention of this study was to identify factors influencing customer loyalty in the sightseeing bus service industry. The factors considered were attractiveness of competitors, trust, satisfaction, perceived value, commitment, expected service quality, perceived service quality, and past experience. In this respect, 11 hypotheses were developed to test for the significance of relationship patterns among the above-named factors, along with the relation between those factors and loyalty (see Figure 5.1). SEM was used to examine these hypotheses. Moreover, we also conducted invariance measurement between the three sub-groups in the sample, i.e., primary, secondary, and polytechnic schools. The results from development of SEM showed that all models fit well. Likewise, the results based on invariance analysis indicated that the model parameters between the three investigated sub-groups were significantly different from each other ($\alpha = 0.05$).

When we considered the SEM for each sub-group separately, five research hypotheses were confirmed for all three sub-groups, in that service value and perceived service quality had direct positive effects on customer satisfaction (hypotheses 1 and 3), perceived service quality had a direct positive effect on service value (hypothesis 4), expected service quality had a direct positive effect on perceived service quality (hypothesis 5), and customer satisfaction had a direct positive effect on customer loyalty (hypothesis 9). Therefore, it can be deduced that when users initiated their plans for a trip, they normally placed a high priority on vehicle characteristics, driver and crew, and the quality of service provided. Since these services started, customers' perceptions of previous service quality have become established, so customers can compare their perceptions of service quality and value with what they expected. If they receive the service that they expected and consider it valuable, they will experience greater satisfaction, resulting in greater loyalty. The analysis showed that there were four factors to which users of all three sub-groups paid a high level of attention: expected service quality, perceived service quality, service value, and customer satisfaction. Of these factors, only customer satisfaction directly affected customer loyalty, whereas the other three factors indirectly influenced customer loyalty through their relationship with customer satisfaction. Therefore, it can be concluded that customer satisfaction is the major factor in building customer loyalty, and that it is influenced by considerations of service quality and value. Hence, service providers must provide strategies corresponding to customers' needs, enhancing service quality in order to achieve greater satisfaction. For example, expected service quality is generally measured by three indices—vehicle, driver and crew, and management—but service providers should give the closest attention to factors with

the highest factor loadings. Based on the study, parameters related to the quality of the driver and crew had the highest loading score. Accordingly, this factor should receive more attention from business owners through development of appropriate recruitment processes that can consider age (Chung & Wong, 2011; Phillips & Sagberg, 2012), experience (Tseng, 2012) and training provision (Peck, 2011).

On the other hand, SEM showed that the sub-groups differed in their results with regard to five research hypotheses. Hypotheses 2 and 11 were confirmed only in the primary- and secondary-school groups; hypothesis 6 was confirmed only in the primary- and polytechnic-school groups; and hypotheses 7 and 8 were confirmed only in the primary-school group. The differences in these results suggest that service providers should carefully consider which factors affecting customer loyalty are most pertinent to each educational level.

In summary, the study indicates what factors have direct and indirect influence on the loyalty of sightseeing bus customers. Loyalty was measured by using three indices related to user behaviors: WOM, repurchase intention, and identification. It is important for companies to pay attention to maximizing customer loyalty, since it is more expensive to seek new customers than to keep existing ones (Coulter et al., 2003); thus success in retaining customer loyalty results in increased business profits. The outcomes from this study can provide entrepreneurs with guidance to help them determine appropriate market strategies to maintain and increase the loyalty of sightseeing bus users.

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CHAPTER VI

THE COMPLEX RELATIONSHIP BETWEEN SCHOOL POLICY, SERVICE QUALITY, SATISFACTION, AND LOYALTY FOR EDUCATIONAL TOUR BUS SERVICES: A MULTILEVEL MODELING APPROACH

6.1 Abstract

The results of this study provide useful information for schools and bus companies. Schools are offered guidance as to how to choose quality bus services, and bus firms are given ideas as to how to be profitable by building customer loyalty and satisfaction. For this purpose, data were gathered through a mail survey of 3,261 teachers from 742 schools. The study applied a multilevel SEM technique to investigate a research question that had not been previously studied. The results from the model indicated that service quality has a positive influence on satisfaction, which was found to be significantly and positively related to loyalty at both the individual and school levels. The quality of bus services was measured using three factors: type of vehicle, driver response, and bus management. These factors were determined to be priorities for bus businesses in developing user loyalty and satisfaction. When investigating the school level, factors related to government-allocated school resources, participation, and safety policies were found to have a significant direct effect on service quality.

6.2 Introduction

6.2.1 Background

A school trip or excursion integrated into the curriculum is an educational activity that truly provides out-of-class learning opportunities for students. When arranging each educational tour, a school must find and hire sightseeing buses. This need leads to a great market value for educational sightseeing tour bus services. Therefore, quality bus services that meet a school's requirements must be a high priority for bus companies because if both users and the school are satisfied, they will become repeat customers. Simultaneously, the school needs to establish mechanisms to ensure that they procure safe and comfortable sightseeing buses. A school's sightseeing bus procurement process usually involves various stakeholders, each of whom often have different consumption behaviors. In general, a high safety standard is imperative. Unlike customer loyalty for other types of businesses, in which service selection often depends only on one decision maker, educational tour bus user loyalty involves multiple levels of decision making at the individual (teacher) and school policy levels. Therefore, it is necessary for bus companies to consider various loyalty factors. For this reason, a multilevel analysis was introduced into this study.

Sightseeing bus tour companies are required to respond to the needs of customers to build customer satisfaction. Regardless of this, the occurrence of school bus trip accidents often leads to a lack of confidence in service quality and safety; therefore, bus firms must improve their service quality to reach the standards required by the schools. In addition to safety, travel comfort is an essential factor in developing user satisfaction and loyalty, meaning that companies must have effective management.

This study provides useful data relating to educational tour buses for both schools (demand) and bus companies (supply). The former can gain knowledge regarding how they can ensure high quality bus services using sightseeing bus service quality indicators, required resources, procurement procedures, and school policy, whereas the latter can gain insight into how to build customer satisfaction and loyalty from the information related to the bus service quality parameters. To answer the above research question, this study applied multilevel structural equation modeling (SEM) to model an objective response, which has not been previously done in any similar research.

6.2.2 Literature review and hypotheses

6.2.2.1 Perceived Service Quality

Perceived service quality involves customer perceptions of service quality based on a comparison of their desires or expectations and the actual received service (Parasuraman, Zeithaml, & Berry, 1985). To assess the service quality of public transportation (urban public bus, interurban public bus, rail, airline), the literature review highlighted three major factors that users consider important, which developed the basic background for Hypothesis 1 in this study:

Vehicle: Initially, users value the external vehicle conditions in terms of its appearance as new and safe. Goh, Currie, Sarvi, and Logan (2014) found that buses over 25 years old had a statistical relationship with the occurrence of accidents. Users then consider the internal vehicle conditions, such as the seating conditions and arrangement, inside temperature, cleanliness, and entertainment equipment. Users are also concerned with the provision of safety devices, such as fire extinguishers, emergency exits, glass breakers, and seat belts (Bordagaray, dell'Olio, Ibeas, & Cecín,

2013; Cafiso, Di Graziano, & Pappalardo, 2013a, 2013b; Chou, Kim, Kuo, & Ou, 2011; de Oña, de Oña, Eboli, & Mazzulla, 2013; dell'Olio, Ibeas, & Cecin, 2011; Eboli & Mazzulla, 2007; Filipović, Tica, Živanović, & Milovanović, 2009; González-Díaz & Montoro-Sánchez, 2011; Tyrinopoulos & Antoniou, 2008; Vlachos & Lin, 2014; Wen, Lan, & Cheng, 2005). Furthermore, Zhang, Zhou, and Zhang (2014) found that noise, vibration, thermal comfort, and acceleration influenced the passenger experience.

Driver: Many studies have indicated that driver kindness and friendliness is a key service quality indicator (Bordagaray et al., 2013; Cafiso et al., 2013a, 2013b; Chou et al., 2011; de Oña, de Oña, & Calvo, 2012; dell'Olio et al., 2011; González-Díaz & Montoro-Sánchez, 2011; Tyrinopoulos & Antoniou, 2008; Wen et al., 2005). Ratanavaraha and Jomnonkwao (2014) also suggested that bus company entrepreneurs carefully select drivers based on their age, experience, education, driving license, driving skills pertaining to the route, level of training, and social habits, such as no drinking or smoking, because these factors reflect the driver's quality. These results were also consistent with the findings in Goh et al. (2014) showing that age, gender, and driver experience were closely associated with accident incidence.

Service provider's management: User evaluations have rated punctuality, ease of communication, access to service information, faithfulness, and service provider promotion as important factors in assessing bus company management (Bordagaray et al., 2013; Chang & Hung, 2013; Chou et al., 2011; de Oña et al., 2013; Eboli & Mazzulla, 2007; Filipović et al., 2009; González-Díaz & Montoro-Sánchez, 2011; Tyrinopoulos & Antoniou, 2008; Vlachos & Lin, 2014; Wen et al., 2005).

H1: For educational tour bus services, the service quality can be measured by the three parameters of vehicle, driver, and service provider management at both the individual and school levels.

Furthermore, the literature review revealed that perceived service quality was directly positively associated with customer satisfaction in that if customers perceived a high level of service quality, their satisfaction was high (Chotivanich, 2012; Wen et al., 2005). Thus, Hypothesis 2 can be stated as follows:

H2: For educational tour bus services, the service quality has a direct positive influence on satisfaction at both the individual and school levels.

6.2.2.2 Satisfaction and loyalty

Satisfaction is an individual's feeling derived from a comparison between the perceived service and the expected service. Customers satisfaction can be measured on three levels: if the perceived service is found to be lower than the expected service, customers are dissatisfied; if the perceived service is equal to the expected service, customers are likely to be quite satisfied; and if the perceived service is higher than the expected service, customers are very satisfied (Kotler, 1997; Looy, Gemmel, & Dierdonck, 2003). Steven, Dong, and Dresner (2012) found that user satisfaction was associated with business performance, and previous studies indicated a direct relationship between the level of satisfaction and loyalty (Chotivanich, 2012; Wen et al., 2005). For these reasons, Hypothesis 3 is stated as follows:

H3: For educational tour bus services, satisfaction has a direct positive influence on loyalty at both the individual and school levels.

Customer loyalty is demonstrated when a customer shows regular satisfaction toward a product or service through repeat patronage, repurchasing, word-of-mouth behavior, and protecting the product, service and/or service provider (Oliver, 1999). However, educational tour bus services are different from other general products and services because the frequency of use for such a service may be low, resulting in less commitment between the users and the service provider. When selecting sightseeing tour bus services for a school, more than one person is often involved in the decision making. Further, because the service has a high value, the definition of loyalty for educational tour bus services is narrower than definitions for other general products and services. Therefore, customer loyalty for this service can be measured using three indicators: word of mouth (WOM), repurchase intentions, and identification. Thus, Hypothesis 4 can be stated as follows:

H4: For educational tour bus services, loyalty can be measured by the three indices of WOM, repurchase intention, and identification at both the individual and school levels.

6.2.2.3 The relationship between individual-level and school-level indicators

The decision to select an educational tour bus service in Thailand usually involves many people, each of whom has a different perception of service. At the individual level, the differences in the economic and social characteristics of each decision maker should be examined. However, this study was constructed using hierarchical data made up of the teacher level (level 1) and the school level (level 2). In this respect, organizational factors, such as school policies, are likely to create conditions or motives linking the implementation of individual-level factors to meeting mutual goals (Kanjanawasee, 2005). This would necessitate an investigation into the school policy and resources available for educational tour bus services (Wößmann, 2003), the level of participation (Ratanavaraha & Jomnonkwao, 2013), and the level of safety (Vicario, 2012). Based on these ideas, Hypotheses 5 and 6 are stated as follows:

H5: For educational tour bus services, the economic and social characteristics of each individual influences the perceived service quality.

H6: For educational tour bus services, the school policy influences the perceived service quality.

Table 6.1 reviews previous studies on service quality, satisfaction, and public transport user loyalty and shows that most studies primarily focused on service quality. Nevertheless, some studies considered specific indicators. For example, Ratanavaraha and Jomnonkwao (2014) examined driver issues, and Zhang et al. (2014) focused on vehicles' bodies. Many studies attempted to consider all three

parameters, including Bordagaray et al. (2013), de Oña et al. (2013), Chou et al. (2011), dell'Olio et al. (2011), González-Díaz and Montoro-Sánchez (2011), Filipović et al. (2009), Tyrinopoulos and Antoniou (2008), and Wen et al. (2005). However, each study used different research questions based on to the relevant business context. In this study, all three service quality parameters from past research relating to public transportation systems, such as urban buses, interurban buses, rail, high-speed rail, or airlines, were applied to the evaluation of educational tour bus quality.

When considering the relationship between service quality, satisfaction, and customer loyalty shown in Table 6.1, it was found that different methods could be used for analysis, such as regression analysis, an ordered probit model, SEM, and an ordered logit model. Each technique has advantages and disadvantages for the data characteristics. However, these methods can be only applied with individual-level data, which is not suitable for this study because the focus was on analyses of both the individual-level and institutional-level data. Therefore, a multilevel SEM technique was selected for the analysis because it was seen as appropriate for exploring the relationship between service quality, satisfaction, and loyalty factors at both the teacher and school levels. Furthermore, this study focused on school policies related to the quality of educational tour bus services, an area that has not been previously investigated.

Table 6.1 Summary of related studies

Authors (Year)	Type of public transportation / Country	Analysis	Quality			Satisfaction	Loyalty
			Vehicle	*Driver*	*Management*		
Goh et al. (2014)	Bus /Australia	Mixed logit model	✓	✓	-	-	-
Ratanavaraha and Jomnonkwao (2014)	Sightseeing bus / Thailand	Confirmatory factor analysis	-	✓	-	-	-
Vlachos and Lin (2014)	Airline / China	Hierarchical regression	✓	-	✓	✓	✓
Zhang et al. (2014)	Bus / China	Multiple regression analysis	✓	-	-	-	-
Bordagaray et al. (2013)	Interurban buse / Spain	Ordered probit model	✓	✓	✓	-	-
Cafiso et al. (2013a)	Urban bus / Italy	Kendall's algorithm	✓	✓	-	-	-
Cafiso et al. (2013b)	Urban bus / Italy	Delphi method	✓	✓	-	-	-
Chang and Hung (2013)	Airline/ Taiwan	Ordered probit model	-	-	✓	-	✓
de Oña et al. (2013)	Urban bus / Spain	SEM	✓	✓	✓	-	-
Chou et al. (2011)	High-speed rail / Taiwan and South Korea	SEM	✓	✓	✓	✓	✓
dell'Olio et al. (2011)	Urban bus / Spain	Multinomial discrete choice model	✓	✓	✓	-	-
González-Díaz and Montoro-Sánchez (2011)	Urban bus / Spain	Qualitative research	✓	✓	✓	-	-
Filipović et al. (2009)	Mass public transportation / Serbia	Sample statistics	✓	✓	✓	-	-
Tyrinopoulos and Antoniou (2008)	bus, trolley bus and rail (metro) / Greece	Factor analysis and Ordered logit model	✓	✓	✓	✓	✓
Eboli and Mazzulla (2007)	Campus bus / Italy	Measurement model in SEM	✓	-	✓	✓	-
Wen et al. (2005)	Intercity bus /Taiwan	EFA, CFA and SEM	✓	✓	✓	✓	✓

Note: ✓ means that variables were used in this study; - means that variables were not used in this study.

6.3 Material and Methodology

Figure 6.1 illustrates the 15 procedures used in this study: identification of problems and objectives, literature review, determination of the hypotheses and relevant variables, questionnaire design and development, survey design, data analysis, discussion, and conclusions. Details of these procedures are described in more detail in the following sections.

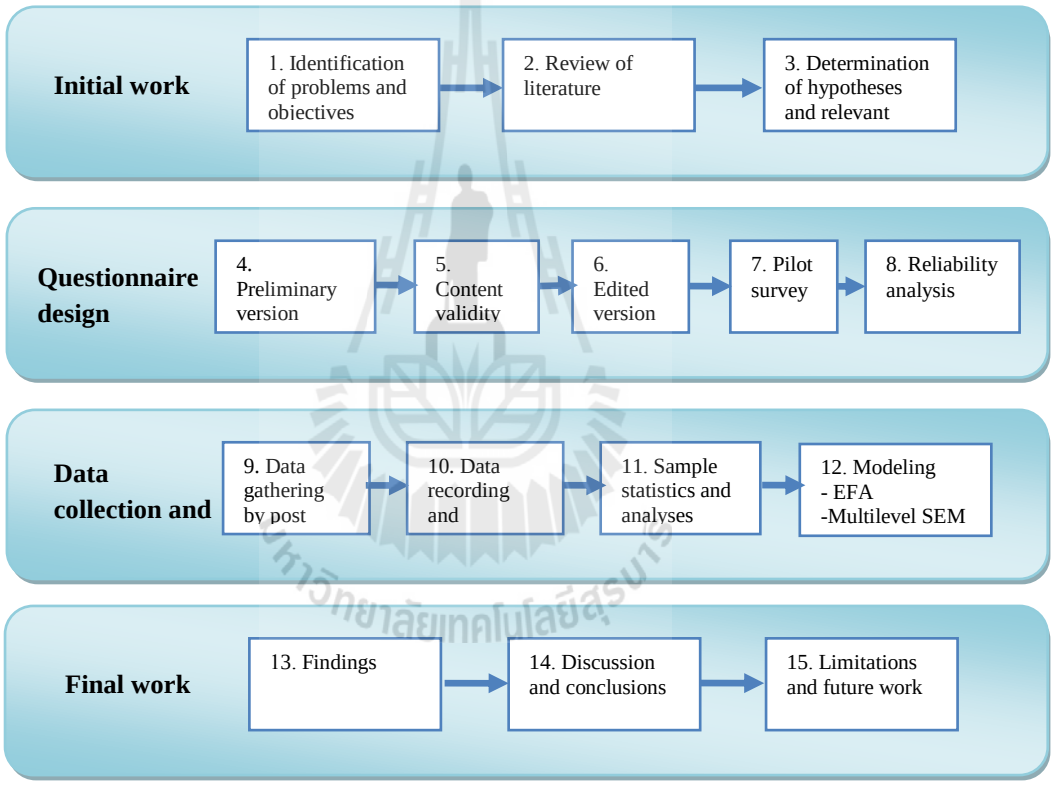


Figure 6.1 Research procedures

6.3.1 Participants and data collection

The sample in this study comprised representative teachers responsible for making decisions regarding sightseeing bus service selections. The frame survey covered all sizes of provinces in Thailand. In this respect, stratified random sampling

was applied over four steps: (1) dividing the provinces into small, medium, and large; (2) dividing the school zones into urban and rural; (3) dividing the school sizes; and (4) dividing the schools into primary, secondary, and vocational.

Golob (2003) suggested various approaches to an SEM analysis to select an appropriate sample size: (1) the minimum sample size accepted for conducting a SEM should be 200 (Kline, 2011; Loehlin, 1998); (2) the sample size for the ML estimation should be at least 15 times the number of observed variables (Stevens, 1996); (3) the sample size for the ML estimation should be at least 5 times the number of free parameters and error terms (Bentler & Chou, 1987); and (4) the sample size for the ML estimation should be at least 10 times the number of free parameters (Hoogland & Boomsma, 1998). As shown in Figure 6.2, 24 observed variables were used in this study, with sample sizes not less than the 360 deemed adequate for model construction in each sub-group. To obtain an appropriate sample size for multilevel analyses of the school sample (between levels), Muthén (1989) suggested that the number of groups must not be less than 50 and that each group should have at least 2 samples. For this study, 3,261 samples were considered adequate for the analysis.

A content validity test using an index of item objective congruency (IOC) was conducted to test the reliability of the questionnaire. This was done using an examination by 13 experts who had skills related to all aspects of sightseeing tour bus services; items obtaining an IOC of more than 0.50 were considered. After the pilot test was performed with a sample size of 89, the reliability was measured using Cronbach's alpha, which considered question items with a score above 0.70 (Tavakol

& Dennick, 2011). It was found that the question items obtained IOC scores of between 0.54 and 1.00 with a Cronbach's alpha between 0.909 and 0.965.

The postal survey had a 25% return, which was considered an adequate mail survey response rate for the analysis. As shown in Table 6.2, the sample included 2,126 schools with five teachers at each school surveyed.

Table 6.2 Number of samples in each zone

Level	**Small and medium-sized provinces[a]**					**Large-sized province[b]**					**BKK vicinity[c]**	**BKK[d]**	**Total**
	Urban		Rural		Total	Urban		Rural		Total			
	L	S	L	S		L	S	L	S				
Primary	2	2	2	2	8	4	3	4	3	16	12	24	684
Secondary	3	3	3	3	12	6	6	6	6	24	18	36	1,026
Total	5	5	5	5	20	10	10	10	10	40	30	60	1,710

Note: L=large, S=Small, all 416 vocational schools were gathered.
[a] 67 provinces were selected from all provinces, except for the large-sized province of Bangkok and its vicinity.
[b] It comprises 4 provinces, including Nakhon Ratchasima, Khon Kaen, Chiang Mai, and Chon Buri (collecting 2.0 times the number of samples of small- and medium-sized provinces).
[c] The Bangkok vicinity includes Nonthaburi, Pathum Thani, Samut Prakan, Samut Sakhon, and Nakhon Pathom (collecting 1.5 times the number of samples of small- and medium-sized provinces).
[d] Bangkok (collecting 3.0 times the number of samples of small- and medium-sized provinces)

6.3.2 Structural equation modeling and multilevel analysis

6.3.2.1 Structural equation modeling

SEM was developed to elucidate the relationship between the latent variables and the relationship between the latent variables and observed variables. This model synthesized the factor analysis, path analysis, and parameter estimation in the regression analysis. The SEM consisted of two sub-models: a measurement model and a structural model.

6.3.2.2 Multilevel Analysis

Multilevel analysis is a technique used to analyze the influences of the predicted variables on multiple levels of the dependent variable. The predicted variables are modeled across a hierarchical structure on at least two levels. Both the predicted variables and the dependent variable (at a low level) were found to be mutually related and influenced by the variables on the upper level. Multilevel data structures are commonly used in research analyses of social data and usually involve hierarchical data; in this case, the data comprise teacher (level 1) and school (level 2) information. Therefore, conventional analysis, which analyzes only one level of data, cannot provide accurate conclusions. Selection techniques must consider consistency in the data construct; for example, some top-level variables, especially policy-related variables, are more likely to determine the standard guidance or clear expectations that create the conditions or motives that drive the implementation of lower-level variables to meet the desired goals (Kanjanawasee, 2005).

6.3.2.3 Multilevel Structural equation modeling

Multilevel SEM combines SEM and multilevel analysis concepts to examine the relationship between variables that induce the construct dependence specified by two or more measurement unit levels. This technique was inspired by Muthén (1989), who analyzed variables from all levels in the same model with a two-step analysis. The model has two sub-models: a between-group model, which reflects the causal relationships between the macro-level or school-level variables, and a within-group model, which represents the causal relationships between the micro-level or individual-level variables. Then, the two sub-models were simultaneously brought into the analysis in the multilevel model. It is vital to create

specific latent variables as a group means for micro-level variables, which are the result of disaggregating the variation between the variables for both the between-group and within-group levels, as in the equation $\Sigma_T = \Sigma_W + \Sigma_B$. Muthén (1989) proposed several steps for using data from the sample estimates Σ_T, Σ_W, and Σ_B: (1) use a total sample variance–covariance matrix (S_T) to estimate Σ_T; (2) use samples pooled within the variance–covariance matrix (S_{PW}) to estimate Σ_W; and (3) use samples for the between group variance–covariance matrix (S_B) to estimate $\Sigma_W + c\Sigma_B$ when c is the common group size. To conduct the precise parameter estimation, you should be multiplied by $\sqrt{c}$ rather than c, in which S_T, S_{PW}, S_B, and c can be calculated using Equations 1–4, respectively (Ngudgratoke, 2002).

$$S_T = (N-1)^{-1}\sum_{g=1}^{G}\sum_{i=1}^{Ng}(y_{gi}-\bar{y})(y_{gi}-\bar{y})' \tag{6.1}$$

$$S_{PW} = (N-G)^{-1}\sum_{g=1}^{G}\sum_{i=1}^{Ng}(y_{gi}-\bar{y}_g)(y_{gi}-\bar{y}_g)' \tag{6.2}$$

$$S_B = (G-1)^{-1}\sum_{g=1}^{G}N_g(\bar{y}_g-\bar{y})(\bar{y}_g-\bar{y})' \tag{6.3}$$

$$C = \left[N^2 - \sum_{g=1}^{G}N_g^2\right][N(G-1)]^{-1} \tag{6.4}$$

where N is the total number of sample units, N_g is the number of samples in each group, and G is the number of groups used in this study.

From 1998 to 2004, Heck and Thomas (2009) developed multilevel SEM equation forms based on Muthen; the within-group analysis included a measurement model (Equation 5) and a structural part of the model (Equation 6), while the between-groups models used a measurement model (Equation 7) and a structural part of the model (Equation 8).

$$y_{ij} = \Lambda_W \eta_{Wij} + \varepsilon_{Wij} \tag{6.5}$$

where y_{ij} is a vector of observed variables, Λ_W is a factor loading matrix, η_{Wij} is the latent achievement factor, and ε_{Wij} is the vector of residuals contained in the error covariance matrix (Θ_W).

$$\eta_{Wij} = B_W \eta_{Wij} + \Gamma_W x_{ij} + \zeta_{Wij} \tag{6.6}$$

where B_W is the matrix of regression coefficients linking the latent variables to each other, Γ_W is an $m \; x \; q$ matrix of regression slopes linking the within-group covariates (x_{ij}) in the model to the latent factors, and ζ_{Wij} is a vector of the residuals contained in the factor variance and covariance matrix (Ψ_W).

$$v_j^* = v_B + \Lambda_B \eta_{Bj} + \varepsilon_{Bj} \tag{6.7}$$

where v_j^* is a vector of the cluster-level y_j and w_j variables and Λ_B and ε_{Bj} are defined in a manner similar to their within-group counterparts.

$$\eta_j = \alpha_j + B_B \eta_{Bij} + \Gamma_B w_j + \zeta_{Bj} \quad (6.8)$$

where α_j is the intercept parameters, B is the regression coefficients matrix for the regression of the latent variables on each other, Γ_B is a regression coefficients matrix relating the cluster-level covariates (w_{ij}) in the model to the latent factors, and ζ_{Bj} is a vector for the residuals contained in Ψ_B.

6.4 Findings

In all, 3,261 questionnaires (30.68%) were returned. As illustrated in Table 6.3, educational programs were found at the primary (34.1%), secondary (37.7%), and vocational (28.2%) levels. The school areas covered both urban (39.2%) and rural (60.8%) areas. The proportion of females and males were 60.5% and 39.5%, respectively. A majority of the respondents (68.6%) had a bachelor's degree or lower, while 31.4% had completed higher degrees. Participants were permanent teachers (95.3%) and school board members or directors (4.7%). Most respondents earned 30,000 THB/month or lower (53.6%), while 46.4% earned more than 30,000 THB/month.

Table 6.3 Respondents' characteristics

Characteristics		Frequency	Valid Percent
Level of educational program	Primary	1,111	34.1
	Secondary	1,229	37.7
	Vocational	921	28.2
Zone	Rural	1,279	39.2
	Urban	1,982	60.8
Gender	Female (0)	1,881	60.5
	Male (1)	1,228	39.5

Table 6.3 Respondents' characteristics (Continued)

Characteristics		Frequency	Valid Percent
Education	Bachelor's degree or lower (0)	2,130	68.6
	Higher than bachelor's degree (1)	977	31.4
Position	Permanent teacher (0)	2,977	95.3
	Director (1)	146	4.7
Income	<= 30,000 THB (0)	1,727	53.6
	> 30,000 THB (1)	1,496	46.4

6.4.1 Descriptive Statistics

Table 6.4 illustrates the results of the descriptive statistics analyses of a sample and shows the means, standard deviations, skewness, and kurtosis. For each latent variable's maximum mean score, the study found that loyalty and repurchasing intention had the highest average score (M= 5.51, SD = 1.19), while the driver factor had the highest mean score for service quality (M = 5.44, SD = 0.94). The overall satisfaction variable had the maximum mean (M = 5.39, SD = 1.26). For the individual characteristics, past experience (M = 1.26, SD = 0.70), being male (M = 0.39, SD = 0.49), graduating higher than a bachelor's degree (M = 0.31, SD = 0.46), being in a school director position (M = 0.05, SD = 0.21), and earning more than 30,000 THB/month (M = 0.46, SD = 0.50) were considered. For the last variable group related to school policy, the budget factor had the maximum average score (M = 5.40, SD = 0.71).

When considering the skewness and kurtosis, which described the sample distribution, the study applied a maximum likelihood estimation technique under a condition of normal distribution. Both skewness and kurtosis have been widely used to measure whether data are normally distributed. Kline (2011) suggested that skewness should be less than 3.0 and that kurtosis should be less than 10.0. Table

6.4 shows that almost all the variables had skewness and kurtosis values in compliance with this suggestion, except for the past experience and school director position variables.

In terms of the relationships between the 24 observed variables (Table 6.5), the findings indicated that the values were not equal to zero at the significance levels of 0.01 and 0.05 for the relationships between all 276 pairs of variables. Further, 226 pairs had coefficients between the variables, which had both positive (231 pairs) and negative (45 pairs) relationships. Overall, the relationships between the variables had values ranging from low to high. The highest correlation coefficient score was 0.91 from the relationship between S1 and S2, while the relationship between DP and SP2 had the lowest correlation coefficient value (0.004). Bartlett's Test of Sphericity was used to examine whether the correlation matrix was an identity matrix, and the study found that the χ^2 value = 48,895.2 (df = 300, $p < 0.001$), which differed from zero at a significance level of 0.01. This was consistent with the analysis results showing that the Kaiser-Meyer-Olkin (KMO) value approached 1 (KMO = 0.9), thus illustrating that the correlation matrix for the observed variables was not an identity matrix. This also demonstrated that the relationships between variables were adequate for use in the factor analysis.

Table 6.4 Sample statistics

Code	Variable	N	M	SD	SK	KU
L1	WOM	3,261	5.47	1.124	-1.16	1.97
L2	Re-purchase	3,261	5.51	1.186	-1.30	2.36
L3	Identification	3,261	5.12	1.268	-1.04	1.16
P1	Vehicle	3,261	5.18	0.959	-0.60	0.78
P2	Driver	3,261	5.44	0.937	-0.77	1.26
P3	Management	3,261	5.00	1.021	-0.59	0.60
S1	Satisfation1	3,261	5.32	1.288	-1.09	1.43
S2	Satisfation2	3,261	5.39	1.258	-1.08	1.38
S3	Satisfation3	3,261	5.24	1.307	-1.04	1.18
S4	Satisfation4	3,261	5.07	1.398	-0.98	0.79
PE	Past Experience	3,261	1.26	0.697	3.77	18.57
DG	Gender Dummy	3,109	0.39	0.489	0.43	-1.82
DE	Education Dummy	3,107	0.31	0.464	0.80	-1.36
DP	Position Dummy	3,123	0.05	0.211	4.30	16.47
DI	Income Dummy	3,223	0.46	0.499	0.14	-1.98
SP1	Adequate Budget	3,261	5.40	0.710	-0.59	1.15
SP2	Knowledgeable People	3,261	4.93	0.764	-0.50	0.86
SP3	Obtaining useful resources/data from government	3,261	5.15	0.723	-0.60	1.18
SP4	Setting teamwork	3,261	4.46	1.553	-0.16	-0.82
SP5	Student Participation	3,261	2.90	1.383	0.84	0.41
SP6	Parent Participation	3,261	2.70	1.308	0.98	0.79
SP7	Using previous evaluation results	3,261	4.02	1.432	-0.01	-0.53
SP8	Checking bus conditions before travel	3,261	1.44	0.329	0.60	1.51
SP9	Providing knowledge to students before travel	3,261	3.77	1.08	-0.71	-0.18

Note: N = sample size, M = mean, SD = standard deviation, Sk = skewness, Ku = kurtosis

Table 6.5 Pearson's correlations

	L2	L3	P1	P2	P3	S1	S2	S3	S4	PE	DG	DE	DP	DI	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9
L1	.90**	.86**	.57**	.61**	.63**	.79**	.81**	.77**	.74**	-.08**	-.01	.01	.05**	.05**	.28**	.26**	.31**	.13**	.10**	.12**	.17**	.10**	.11**
L2	1.00	.83**	.56**	.61**	.61**	.78**	.79**	.76**	.71**	-.10**	-.01	.01	.06**	.08**	.27**	.25**	.29**	.13**	.10**	.10**	.16**	.13**	.11**
L3		1.00	.55**	.56**	.63**	.85**	.83**	.84**	.84**	-.06**	-.02	-.02	.04*	.04*	.28**	.29**	.32**	.10**	.10**	.12**	.15**	.10**	.07**
P1			1.00	.77**	.74**	.54**	.56**	.54**	.53**	-.12**	.00	.01	.04*	.06**	.28**	.26**	.30**	.12**	.09**	.09**	.13**	.05**	.05**
P2				1.00	.75**	.57**	.60**	.57**	.54**	-.15**	-.02	.00	.03	.08**	.28**	.24**	.30**	.14**	.07**	.08**	.17**	.11**	.12**
P3					1.00	.61**	.62**	.62**	.61**	-.09**	-.03	-.02	.02	.02	.31**	.32**	.35**	.14**	.12**	.14**	.18**	.07**	.04*
S1						1.00	.91**	.88**	.84**	-.07**	.00	-.01	.05**	.06**	.27**	.25**	.31**	.11**	.08**	.10**	.16**	.11**	.09**
S2							1.00	.87**	.81**	-.09**	.00	.00	.06**	.07**	.27**	.24**	.30**	.10**	.06**	.08**	.16**	.12**	.11**
S3								1.00	.89**	-.07**	.00	-.01	.06**	.04*	.27**	.27**	.30**	.09**	.09**	.11**	.15**	.08**	.07**
S4									1.00	-.06**	-.02	-.03	.04*	.03	.27**	.29**	.31**	.09**	.10**	.12**	.14**	.09**	.05**
PE										1.00	.05*	.01	.02	-.06**	-.07**	-.01	-.04*	-.02	.03	.04*	-.04*	-.03	-.05**
DG											1.00	.07**	.17**	-.01	-.05**	.00	-.02	-.03	.00	-.04*	-.02	-.01	-.03
DE												1.00	.23**	.06**	-.05**	-.04*	-.03	-.02	-.03	-.07**	-.05*	-.03	.01
DP													1.00	.14**	.07**	.00	.03	.06**	.04*	.05**	.07**	.02	.01
DI														1.00	.09**	-.05**	.03	.16**	.03	.04*	.06**	.09**	.13**
SP1															1.00	.57**	.65**	.34**	.20**	.27**	.34**	.13**	.10**
SP2																1.00	.79**	.25**	.27**	.28**	.31**	.05**	-.01
SP3																	1.00	.34**	.28**	.30**	.39**	.08**	.07**
SP4																		1.00	.53**	.52**	.63**	.10**	.17**
SP5																			1.00	.77**	.54**	.10**	.14**
SP6																				1.00	.51**	.08**	.11**
SP7																					1.00	.11**	.17**
SP8																						1.00	.40**

*** Correlation is significant at the 0.01 level (2-tailed)*

** Correlation is significant at the 0.05 level (2-tailed)*

6.4.2 Exploratory factor analysis

Exploratory factor analysis (EFA) was applied in this study to reduce the number of variables in the school policy group, which had 9 variables (SP1–SP9). It also made it simpler and easier for the multilevel SEM analysis to bring the results into the policy determination. The EFA results in Table 6.6 indicate that SP1 through SP3 had maximum factor loadings in component 1 (named resource) equal to 0.805, 0.878, and 0.898, respectively. Likewise, SP4 through SP7 had maximum factor loadings for component 2 (named participation) equivalent to 0.756, 0.873, 0.854, and 0.744, respectively. The variables SP8 and SP9 had maximum factor loadings for component 3 (named safety policy) with values of 0.833 and 0.824, respectively.

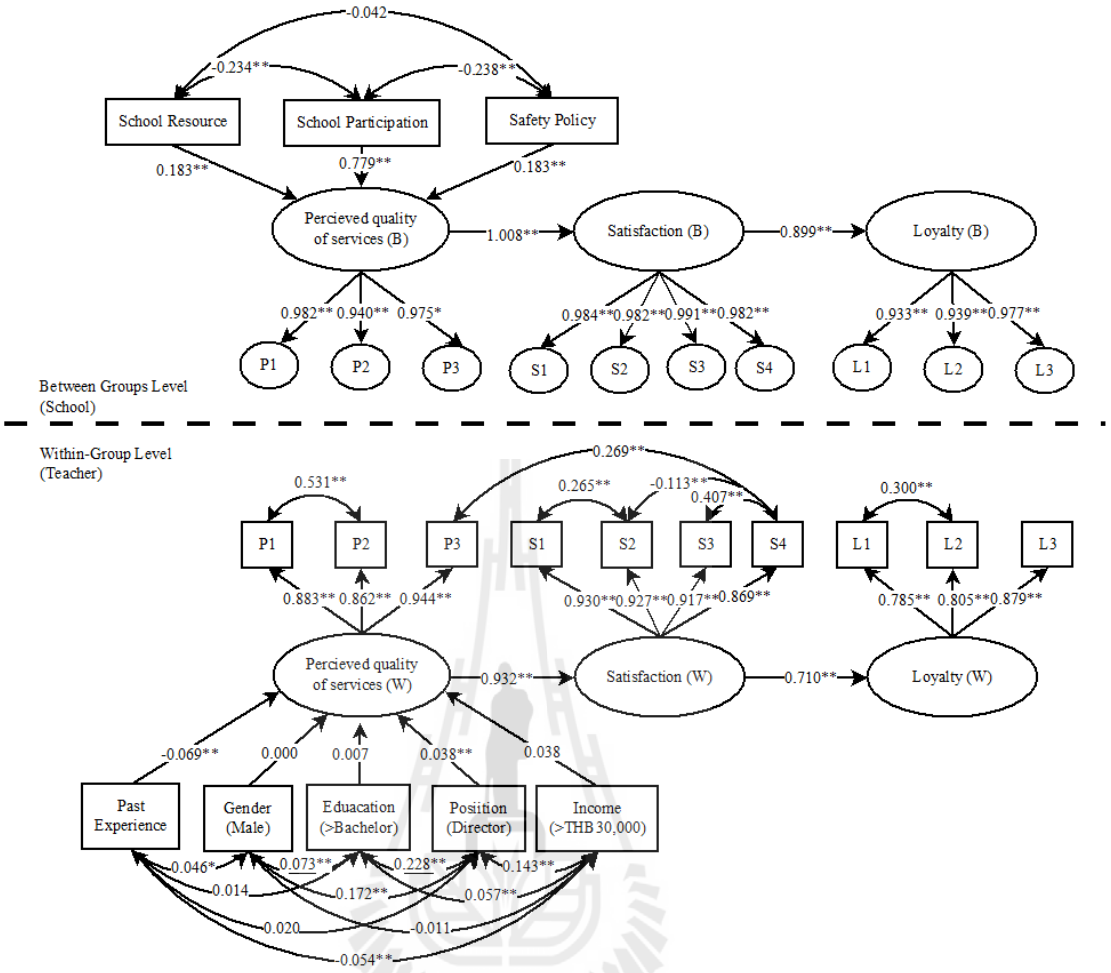
Table 6.6 EFA results

Variables		Component		
		1 *(Resources)*	**2** *(Participation)*	**3** *(Safety Policy)*
SP1	Adequate Budget	**0.805**	0.176	0.118
SP2	Knowledgeable People	**0.878**	0.165	-0.052
SP3	Obtaining useful resources/data from government	**0.898**	0.214	0.032
SP4	Setting teamwork	0.214	**0.756**	0.114
SP5	Student Participation	0.082	**0.873**	0.04
SP6	Parent Participation	0.130	**0.854**	0.002
SP7	Using previous evaluation results	0.270	**0.744**	0.117
SP8	Checking bus conditions before travel	0.080	0.020	**0.833**
SP9	Providing knowledge to students before travel	-0.014	0.134	**0.824**

Note: Extraction method: Principal component analysis, Rotation method: Varimax with Kaiser normalization

6.4.3 Multilevel SEM

The analysis in this step tested whether the variance–covariance matrix in the hypothesized model was equal to the variance–covariance matrix in the empirical model. It also included a study of the relevant factors for the individual and school levels related to and influenced by quality perception, satisfaction, and loyalty to educational tour bus services. Four individual-level factor variables were used: gender, education level, position, and income. Three school-level factor variables were used: resources allocated by government; teacher, student, and parent participation; and school safety awareness. The multilevel SEM was used to describe the differences between the levels (referring to the structural relationships between the individual [teacher] and the institutional [school] levels). Data presentation encompassed reports of the intra-class correlations (ICC), statistical values based on the model validity test, and influence values for the independent variables on the dependent variable, as shown in the model results in Figure 6.2 and Table 6.7.



Standardized estimation from Mplus 7.2; ** Significant at α=0.01; * Significant at α=0.05

Figure 6.2 Model results

Table 6.7 Multilevel SEM results

	Variable	Within Level					Between Level				
		Est.	**Est./S.E.**	**p-value**	**RV**	**R^2**	**Est.**	**Est./S.E.**	**p-value**	**RV**	**R^2**
Measurement Model	**Quality** *was measured by*;										
	Vehicle	0.883	115.973	<0.001**	0.221	0.779	0.982	121.889	<0.001**	0.036	0.964
	Driver	0.862	91.446	<0.001**	0.256	0.744	0.940	29.199	<0.001**	0.116	0.884
	Management	0.944	170.076	<0.001**	0.109	0.891	0.975	98.329	<0.001**	0.049	0.951
	Satisfaction *was measured by*;										
	Satisfation1	0.930	167.812	<0.001**	0.136	0.864	0.984	115.521	<0.001**	0.032	0.968
	Satisfation2	0.927	154.229	<0.001**	0.140	0.860	0.982	117.136	<0.001**	0.036	0.964
	Satisfation3	0.917	140.455	<0.001**	0.159	0.841	0.991	125.075	<0.001**	0.019	0.981
	Satisfation4	0.869	99.765	<0.001**	0.245	0.755	0.982	107.231	<0.001**	0.035	0.965
	Loyalty *was measured by*;										
	WOM	0.785	52.483	<0.001**	0.383	0.617	0.933	60.503	<0.001**	0.130	0.870
	Re-purchase	0.805	55.484	<0.001**	0.352	0.648	0.939	53.790	<0.001**	0.119	0.881
	Identification	0.879	69.335	<0.001**	0.227	0.773	0.977	65.543	<0.001**	0.046	0.954
Path Model	Satisfaction → Loyalty	0.710	44.554	<0.001**			0.899	38.341	<0.001**		
	Quality → Satisfaction	0.932	128.678	<0.001**			1.008	115.369	<0.001**		
	Past Experience → Quality	-0.069	-3.605	<0.001**		0.005					
	Female → Quality	0.000	0.011	0.991		0.000					
	Education → Quality	0.007	0.355	0.723		0.000					
	Position → Quality	0.038	2.553	0.011**		0.001					
	Income → Quality	0.038	1.644	0.100		0.001					
	Input→ Quality						0.183	3.352	0.001**	0.967	0.033
	Participation → Quality						0.779	17.846	<0.001**	0.393	0.607
	Safety Policy → Quality						0.183	2.566	0.010**	0.967	0.033

Model fit statistics: χ^2 = 657.286; df = 132; p < 0.001; RMSEA = 0.035; CFI = 0.982; TLI = 0.974; $SRMR_{Within}$ = 0.024; $SRMR_{Between}$ = 0.051

6.4.3.1 Intra-class correlations

The ICC is a statistical analysis used to examine the variables used in the multilevel measurement; this analysis is strongly concerned with variations in the variables at both the individual and institutional levels. In this case, the appropriate variables for the multilevel analysis were assessed from the ICC values, in which a greater value represented higher consistency. If the ICC was less than 0.05, the individual-level data did not display any variations at the institutional level; thus, such data was not utilized in the analysis. Hence, the ICC needed to be higher than 0.05 (Snijders & Bosker, 2012). In this study, 10 observed variables were analyzed at the individual and institutional levels: L1, L2, P1, P2, P3, S1, S2, S3, and S4, which represented ICCs equal to 0.208, 0.197, 0.201, 0.188, 0.184, 0.210, 0.203, 0.191, 0.188, and 0.190, respectively. These values were considered to support the multilevel model analyses.

6.4.3.2 Good-of-fit statistic

Table 6.7 shows the results of the multilevel analysis. The model obtained the following goodness-of-fit statistical values: chi-square (χ^2) = 657.286; degree of freedom (*df*) = 132; $p < 0.001$; root mean square of approximation (RMSEA) = 0.035; Comparative Fit Index (CFI) = 0.982; Tucker Lewis Index (TLI) = 0.974; standardized root mean residual (SRMR) within levels = 0.024; and SRMR between levels = 0.051. When comparing these statistical values with the suggested criteria that χ^2 (*df*) should attain $p > 0.05$ (Kline, 2011), the RMSEA should be less than or equal to 0.06, the CFI should be above 0.95, the TLI should be higher than or equal to 0.95, and the SRMR should be less than or equal to 0.08 (Hu & Bentler, 1999). The study found that all the measurement model statistical values complied

with these criteria except for the chi-square test results. This was because the χ^2 value was sensitive to a large sample size (n > 200), thus the χ^2 testing tended to reject the null hypothesis (Kline, 2011; MacCallum, Browne, & Sugawara, 1996). Therefore, because of the large number of samples in this study, it can be concluded that the model fits the expected pattern, thus demonstrating adequate construct validity. This is supported by a number of previous studies that used the same reasoning, such as Delbosc and Currie (2012), Chung, Song, and Park (2012), and Van Acker and Witlox (2010).

6.4.3.3 Measurement model

With respect to the significance of the factors for each of the observed variables at the individual level or the within-group model, it was found that the factor loadings for the observed variables of loyalty, satisfaction, and perceived quality were as follows:

- *Loyalty:* The loyalty measurement model was estimated using three observed variables: WOM, repurchase intention, and identification. Based on the analysis, all variables could be used to significantly confirm the loyalty factor ($p < 0.001$). Identification had the highest factor loadings ($\lambda = 0.879$), followed by repurchase intention ($\lambda = 0.805$) and WOM ($\lambda = 0.785$).
- *Satisfaction:* The satisfaction measurement model was estimated using four observed variables: S1, S2, S3, and S4. According to the analysis, all the variables significantly confirmed the satisfaction factor ($p < 0.001$). S1 had the maximum factor loadings ($\lambda = 0.930$), and S4 had the minimum factor loadings ($\lambda = 0.869$).

– *Perceived quality:* The perceived quality measurement model was estimated using three observed variables: vehicle, driver, and management. The analysis indicated that the perceived quality factor was significantly confirmed by all three variables ($p < 0.001$). Likewise, management had the highest factor loadings ($\lambda = 0.944$), followed by vehicle ($\lambda = 0.883$) and driver ($\lambda = 0.862$).

According to the standardized coefficients (factor loadings) at the school level or between the groups, the factor loading values for the 10 observed variables significantly confirmed the factor structure for loyalty, satisfaction, and perceived quality ($p < 0.001$). For the loyalty measurement model, a sequence of factor loadings similar to the individual level was observed as follows: identification ($\lambda = 0.977$), repurchase intention ($\lambda = 0.939$), and WOM ($\lambda = 0.933$). For the satisfaction and perceived quality measurement models, the factor loading order differed from the individual level in that the maximum value of each model was S3 ($\lambda = 0.991$) and for vehicle ($\lambda = 0.982$).

6.4.3.4 Path Model

When considering the degree of influence of the individual-level predicted variables on loyalty for educational tour bus users, loyalty was directly affected by satisfaction with a positive path coefficient of 0.710 ($p < 0.001$) and indirectly affected by service quality through loyalty with a positive path coefficient of 0.932 ($p < 0.001$) at a significance level of 0.01. Furthermore, perceived quality was influenced by past experiences with sightseeing bus tours with a negative path coefficient of 0.069 ($p < 0.001$) at a significance level of 0.01. Similarly, perceived quality was also affected by school director position with a positive path coefficient of 0.038 ($p = 0.011$) at a significance level of 0.05.

Regarding the extent of influence of the school-level predicted variables on loyalty, loyalty was directly influenced by satisfaction with a positive path coefficient of 0.899 ($p < 0.001$) and indirectly affected by service quality through loyalty with a positive path coefficient of 1.008 ($p < 0.001$) at a significance level of 0.01. Perceived quality was affected by the allocated resources from the government; teacher, student, and parent participation; and school safety awareness with positive path coefficients of 0.183 ($p = 0.001$), 0.779 ($p < 0.001$), and 0.183 ($p = 0.01$), respectively, at a significance level of 0.01.

6.5 Discussion and Conclusion

Field trips can enhance students' learning development. Therefore, it is essential that schools procure good buses for safe, convenient travel. Therefore, the research goal was to provide information related to educational tour bus services for bus companies and schools. For bus entrepreneurs, the study intentionally distributed knowledge regarding how they can ensure school satisfaction and thereby increase the number of repeat customers. For schools, the focus was to provide an approach that can be used to successfully find a qualified bus service for school trips.

In this study, 3,261 teachers from 724 schools across the country responded to a postal questionnaire that collected data about economic and social characteristics (gender, educational level, position, and income), the perception of the quality of educational tour bus services, satisfaction, loyalty, and school management issues related to sightseeing bus procurement. These data were analyzed using a multilevel SEM, which considered two levels of data: individual and school.

The multilevel SEM showed that only two individual-level factors related to the economic and social characteristics significantly influenced the perceived quality of the sightseeing bus services: past experience (β = -0.069, $p < 0.001$) and director position (β = 0.038, p = 0.011). This indicates that people who had a bad experience on a sightseeing bus tour service in the past could have a perception of service quality 0.069 times lower than that of people who did not have such an experience. Similarly, people holding a director position perceived the service quality 0.038 times higher than did people in other positions. When considering the relationships between service quality, satisfaction, and loyalty, the study found that loyalty was directly influenced by satisfaction (β = 0.710, $p < 0.001$) and indirectly affected by service quality through satisfaction (β = 0.932, $p < 0.001$). This indicates that if service users had a high perception of service quality, satisfaction would be high and would encourage customer loyalty, which is similar to the study results in Wen et al. (2005).

All three school-level factors (resources allocated by the government; teacher, student, and parent participation; and school safety awareness) significantly influenced perceived quality: resources allocated by the government (β = 0.183, p = 0.001); teacher, student, and parent participation (β = 0.779, $p < 0.001$); and school safety awareness (β = 0.183, p = 0.01). These results imply that if the government properly allocates adequate resources for field trip arrangements, the school will use a participation process and be more aware of sightseeing travel safety, which results in greater educational tour bus service quality. When considering the relationships between service quality, satisfaction, and loyalty, it was interesting to find that these three factors had mutual relationships similar to those at the individual level.

The outcomes of this study can be used to determine bus company policies. As seen in this study, service quality, satisfaction, and loyalty had mutual relationships at both the individual and school levels. In this regard, the quality of service was an initial factor that influenced satisfaction and loyalty. This study measured service quality using three parameters: vehicle, driver, and management. The findings show that bus firms should provide safe, convenient buses (e.g., new and decent vehicle bodies; clean, adjustable seats; appropriate temperature for passenger comfort; clean toilets; and complete installation of safety equipment (Cafiso et al., 2013a, 2013b; dell'Olio, Ibeas, & Cecín, 2010)). Furthermore, companies should hire skilled, knowledgeable drivers (e.g., 30–45 years old, at least 5 years of driving experience, educated at least at the high-school level, having a driver license in the length of permits, have skills appropriate to the route, complete a collaborative driver training program, no drinking or smoking (Ratanavaraha & Jomnonkwao, 2014)). Companies should also ensure good management (e.g., having equipment and a location for bus maintenance, providing easy access to customer communication systems, having a GPS tracking system, providing video showing how to use safety equipment and practices in case of an emergency, and having additional insurance coverage beyond the state regulations). Furthermore, it is necessary for companies to develop mechanisms to regularly monitor customer satisfaction for service improvement, thus making schools willing to continue using the service or encouraging teachers who use the service recommend it to other schools. Further, school satisfaction tended to ensure the delivery of good performance by the bus companies, which is similar to the findings in Steven et al. (2012).

To ensure the use of safe, convenient buses for school trips, the results from the EFA and multilevel SEM suggest that the government should allocate an adequate budget for field trip activities. Moreover, officers with standard sightseeing bus safety knowledge and skills can evaluate bus conditions before travel and provide useful information regarding each sightseeing bus company to schools, such as the number of buses, bus features, rental price, and previous evaluation results. It is also vital that schools adopt a participation process when selecting a sightseeing bus service, e.g., by establishing team discussions regarding renting safe sightseeing buses and involving students and parents in making decisions. Furthermore, previous survey results related to student satisfaction should be considered when choosing sightseeing bus services. Evidence shows that such a participation process can greatly reduce road accidents (Ratanavaraha & Jomnonkwao, 2013). Likewise, an awareness of student travel safety is essential. The school must check the condition of the bus and safety equipment before traveling and provide travel safety knowledge to all students before they go on a trip, such as the importance of wearing seat belts and what students can do to ensure a safe journey (Vicario, 2012).

In essence, studying the factors influencing educational tour bus users' loyalty can be seen as an approach that improves the safety and convenience of sightseeing tour services for bus companies in response to users' needs. This effort could improve bus company service quality, reduce accidents, and improve safety in sightseeing trips in Thailand. However, this study only considered the management factor at the school level in the multilevel analysis; therefore, other factors on this level could influence the perceived sightseeing bus service quality. This should be the focus of further work, which would add to the knowledge gained in this study.

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CHAPTER VII

CONCLUSION AND RECOMMENATIONS

The summary of this study is the conclusion of content classified by its five research objectives as follows; (1) to find out factors relating to the sightseeing bus user loyalty, (2) to develop the indicators for the quality assessment of suitable sightseeing bus service providers in Thailand, (3) to study the factors influencing the loyalty to selecting education sightseeing bus of schools in rural areas and urban areas (4) to study the factors influencing the loyalty to select education tour bus of schools in primary education level, secondary education level, and vocational level, and (5) to study the factors influencing loyalty to select education tour bus of each school.

7.1 Factors relating to sightseeing bus user loyalty

From 53 previous studies related to loyalty, it was found that there were customers' related 14 factors including switching cost, customer satisfaction, customer trust, commitment, perceived value, involvement, perceived service quality, perceived risk, past experience, customer complaint, attractiveness of competitors, motivation, CSR-expectation, and customer expectation. The first four most studied factors were satisfaction (79.25%), perceived service quality (67.92%), perceived value (47.17%), and trust (37.74%) respectively. The two factors of which there was only a single study were attractiveness of competitors and customer complaint.

The relationship was considered between factors to be studied and years, types of publication, formats, regions and research related to transportation studies. When considering years of publication from 2003–2014, it was found that in year 2012, there were nine studies relating to loyalty followed by seven studies in 2010 taking satisfaction to be studied. According to the results of variance by using chi-square test, it was found that every factor has equal proportion of research in each year at statistical significance with confidence level 95%. When considering the types of publication, they were divided into three types including 34 research papers published in peer-reviewed journal with impact factor, six research papers published in peer-reviewed journal without impact factor and 13 theses. According to variance test using chi-squared test, it was found that every factor has the equal proportion of research formats at statistical significance with confidence level 95% except commitment and motivation. When considering the regions to be studied, it was found that there were 14 titles on America, 14 titles on Europe, and 14 titles on Asia pacific. According to the variance test using chi-squared test, it was found that every factor has the equal proportion of research in each region at statistical significance with confidence level 95%. Considering related research on transportation studies, it was found that there were 36 unrelated issues and 17 related issues. From the variance test result using chi-square, it was found that all 14 factors had the equal proportion of both related and unrelated research at statistical significance with confidence level 95%.

Considering the types of relationships of variables relating to loyalty studies, it was found that there were 37 types of relationships used in research. The first three types which were most used were "satisfaction → loyalty" in 39 issues (73.58%),

"perceived service quality → satisfaction" in 27 issues (50.94%), "perceived value → satisfaction" in 19 issues (35.85%) respectively.

The results of this study are used to be the data for researchers to choose the variables involved with loyalty to be studied. Choosing the factors involved with loyalty depends on the researchers' interests. The researchers are able to use all 14 involved factors to be studied. In case of data limitations in those research contexts, the researchers may choose the factors by mainly taking the frequency of uses in research into consideration.

7.2 Development of quality indicators for sightseeing bus providers

According to exploratory factor analysis (EFA), 27 quality indicators for sightseeing bus providers were divided into three groups including vehicles, drivers, and management administration. Consequently, the second-ordered confirmatory factor analysis (CFA) was conducted to confirm the factor composition. From EFA, the results showed that the developed model had construct validity with χ^2 = 1384.86, df = 278, $p < 0.001$, root mean square of approximation (RMSEA) = 0.048, comparative fit index (CFI) = 0.973, Tucker Lewis Index (TLI) = 0.966, standardized root mean residual (SRMR) = 0.036. The three groups of indictors were able to confirm the first composition of sightseeing bus provider quality. Furthermore, all 27 indicators were able to confirm the second composition of sightseeing bus provider quality at statistical significance level 0.01. Considering the first-ordered CFA loading, it was found that the latent variable with the most CFA loading value was vehicle factor (β = 0.935), followed by that of bus drivers (β = 0.906). The last one was management administration (β = 0.874). When taking the second-ordered CFA

loading into consideration, it was found that the group of indicators of vehicles had standardized factor loadings between 0.637–0.834 (bus having a clean and convenient toilet exhibited the maximum CFA loading score). The group of indicators of bus drivers had standardized factor loadings between 0.962–0.887 (quick and enthusiastic service provision offered the highest CFA loadings). The group of indicators of management administration had standardized factor loadings between 0.566–0.831 (pleasurably allowing customers for a pre-trip inspection had the highest CFA loading).

The entrepreneurs potentially employ the factor loading data to improve service quality in accordance with the importance of each indicator. Furthermore, the schools are able to take the results of this study to develop checklist in education sightseeing bus recruitment.

7.3 Development of loyalty model to sightseeing bus for schools in urban areas and rural areas

According to the study on the factors, which affected loyalty to sightseeing bus users for schools in urban areas and rural areas, comprised expectation, perceived service quality, satisfaction, trust, perceived value, loyalty, past experiences, and competitors' ability by using multi-group structural equation modeling (SEM). This study has 12 hypotheses as follows;

H1: Expected service positively affects perceived service quality

H2: Past experience negatively affects perceived service quality

H3: Expected service positively affects satisfaction

H4: Perceived service quality positively affects satisfaction

H5: Perceived service quality positively affects perceived value

H6: Perceived value positively affects satisfaction

H7: Trust positively affects loyalty

H8: Satisfaction positively affects loyalty

H9: Perceived value positively affects loyalty

H10: Competitor attractiveness negatively affects loyalty

H11: Commitment positively affects loyalty

H12: Model invariance across urban and rural area

According to the results of data analysis, it was found that the parameter value of the model has invariance across different areas at statistical significance (H12 rejected). Thus, the models of urban and rural areas have to be separately developed in order to determine the suitable policy for those areas. The results of the developed model for separated areas were that χ^2 = 1829.602, df = 373, p < 0.001, χ^2/df = 4.91, CFI = 0.977, TLI = 0.973, SRMR = 0.040, RMSEA = 0.050 for urban areas; χ^2 = 1279.667, df = 373, p < 0.001, χ^2/df = 3.43, CFI = 0.976, TLI = 0.972, SRMR = 0.031, RMSEA = 0.049 for rural areas. The same hypotheses supported in both urban and rural areas comprised H1, H2, H4, H5, H7, H8, and H9 while the same unsupported hypotheses consisted of H6, H10, and H11. In terms of H3, it was supported in urban areas but not supported in rural areas.

7.4 Development of loyalty model to sightseeing bus for primary education secondary education and vocational education

According to the study of the factors influencing loyalty to sightseeing bus users for primary, secondary, and vocational education, there were nine factors which were the same as those of study in section 7.3 taken to develop model by establishing 12 hypotheses as follows;

H1: Service value has a direct positive effect on customer satisfaction.

H2: Expected service quality has a direct negative effect on satisfaction.

H3: Perceived service quality has a direct positive effect on customer satisfaction.

H4: Perceived service quality has a direct positive effect on service value.

H5: Expected service quality has a direct positive effect on perceived service quality.

H6: Service value has a direct positive effect on loyalty.

H7: Trust has a direct positive effect on loyalty.

H8: Commitment has a direct positive effect on loyalty.

H9: Customer satisfaction has a direct positive effect on customer loyalty.

H10: Attractiveness of competitors has a direct positive effect on customer loyalty.

H11: Past experience has a direct negative effect on customer loyalty.

H12: Model invariance across primary, secondary, and polytechnic school

From the results of variance test of model among three sample subgroups including primary education, secondary education, and vocational education, it was

found that model parameters are different among primary education, secondary education, and vocational education at statistical significance $\alpha = 0.05$ (H12 rejected)

When considering SEM on separated subgroups, it was found that goodness-of-fit statistics for the primary-school group were as follows: χ^2 = 1414.143, degrees of freedom = 376, $p < 0.001$, CFI = 0.969, TLI = 0.964, SRMR = 0.040, RMSEA = 0.056; for the secondary-school group, model fit indices displayed χ^2 = 1571.506, degrees of freedom = 376, $p < 0.001$, CFI = 0.968, TLI = 0.963, SRMR = 0.038, and RMSEA = 0.057; for the polytechnic-school group, the results were as follows: χ^2 = 922.868, degrees of freedom = 376, $p < 0.001$, CFI = 0.981, TLI = 0.978, SRMR = 0.040, and RMSEA = 0.045 by having 5 research hypotheses which SEM confirmed that all 3 subgroups including service value and perceived service quality have direct positive effects on customer satisfaction (H1 and H3), perceived service quality have direct positive effects on service value (H4), expected service quality have direct positive effects on perceived service quality (H5), and customer satisfaction have direct positive effects on customer loyalty (H9). However, there were still 5 research hypotheses which SEM confirmed only some groups as follows; H2 and H11 were confirmed in secondary-school group, and H6 was confirmed in the primary-school group and polytechnic-school group, H7 and H8 were specially confirmed in the secondary-school group while H10 was rejected by all three groups.

7.5 Study of school involved factors influencing perceived quality, satisfaction, and school loyalty to sightseeing bus selection

This study applied multilevel SEM to examine the factors influencing perceived quality, satisfaction, and school loyalty. The analysis of involved factors was at two levels including individual and school levels. The individual factors consist of sex, age, education level, income, and position. Regard to school level; it comprised three factors which include the resources allocated by government, the participation of teachers, students, and parents, and the attention to school safety. The research hypotheses were as follows,

H1: For educational tour bus service, service quality can be measured by three parameters including vehicle, driver and service provider's management, in both individual and school levels

H2: For educational tour bus service, service quality has a direct positive influence on satisfaction in both individual and school levels

H3: For educational tour bus service, satisfaction has direct positive influence on loyalty in both individual and school levels

H4: For educational tour bus service, loyalty can be measured by three indices including WOM, repurchase intention and identification in both individual and school levels

H5: For educational tour bus service, economic and social characteristics of each individual have influence on perceived service quality

H6: For educational tour bus service, school policy has influence on perceived service quality

From the results of multilevel SEM, it was found that the developed model had construct validity with the following good-of-fit statistic; chi-square (χ^2) = 657.286, degree of freedom (*df*) = 132, $p < 0.001$, Root Mean Square of Approximation (RMSEA) = 0.035, Comparative Fit Index (CFI) = 0.982, Tucker Lewis Index (TLI) = 0 .974, Standardized Root Mean Residual (SRMR) for within level = 0.024 and SRMR for between level = 0.051. Considering parameter value, it was found that H1, H2, H3, H4 were accepted. For H5, only some factors of were accepted. Thus, for individual factors, the two economic and social factors influencing perceived sightseeing bus quality at statistical significance were getting bad experience in travelling (β = -0.069, $p < 0.001$) and administration (β = 0.038, p = 0.011). With regard to H6, the factors were all accepted. It was found that at school level, the three factors influencing perceived service quality at statistical significance were school objects allocated by government (β = 0.183, p = 0.001), participation of teachers, students, and parents (β = 0.779, $p < 0.001$) and the attention to school safety (β = 0.183, p = 0.01).

The results of this study are able to be used as the data about sightseeing bus service for both entrepreneurs and schools. For entrepreneurs, they will focus on what to do for school satisfaction and repurchase intention. In terms of schools, they will emphasize how to do to find sightseeing buses which are safe and convenient for their excursions.

7.6 Recommendations

The study of the factors involved in developing user loyalty in 5 sections is initially concluded. The researchers would like to present the recommendation as follows;

1) In the study about user loyalty, there are many involved factors. Considering what factors will be used for the study depends on the researchers' interests. This is because, from the study, it was found that choosing factors was not related to the time of publication, forms of publication, regions and context of the study. However, the researchers may mainly choose the factors from the frequency of chosen factors used in research as the researchers mentioned in chapter 2.

2) For sightseeing bus quality development, the entrepreneurs should emphasize three perspectives including vehicle, drivers, and management administration. For convenient follow-ups and assessment, the entrepreneurs may develop checklist from the results of this study by considering the importance of each indicator from standardized factor loading.

3) In the procedure of selecting sightseeing buses, the schools need tools to assess each entrepreneur's quality to obtain sightseeing buses which are safe and of quality by potentially considering 27 indicators in this study.

4) To develop marketing strategies to establish sightseeing bus user loyalty, the entrepreneurs should consider it separately in accordance with areas (urban and rural areas) and types of education institutes (primary school, secondary school, and vocation school) as it was found that user loyalty model was different between the school in urban and areas and among the types of education institutes.

5) To develop marketing strategies to establish sightseeing bus user loyalty, the entrepreneurs have firstly given emphasis to perceived quality, perceived value and customers' satisfaction because the results of the study showed that Equation Model confirmed three factors influencing user loyalty in every area (in urban and rural areas) and every type of education institutes (primary education, secondary education, and vocational education)

6) For schools, to obtain safe and convenient sightseeing buses for excursion, government sector needs to allocate sufficient budget for excursion activities. Personnel should have knowledge about the standard of safe sightseeing buses and abilities to assess the bus condition before their departure. The entrepreneurs' information of hiring buses of each school such as the number of buses, bus features, rent, and the assessment from previous data should be given.

7) The schools should select sightseeing buses by cooperative procedures including committee established to hire safe sightseeing buses, student and parent representatives taking part in making decision on hiring safe sightseeing buses. Furthermore, the past survey of service user satisfaction will be taken to select sightseeing buses for the next time.

8) For further studies in the future, the relation between cost and benefits of tour bus quality development should be studied to provide sightseeing bus entrepreneurs for issues initially invested in order to acquire high benefits.

9) From the checklist which was developed from Chapter 3, the indicators for academic institution were divided into three groups including vehicle, driver, and management. For nine indicators of vehicle group, and seven indicators of management group, the assessor was able to evaluate from authentic assessment of

each entrepreneur. However, for 11 indicators of driver, the assessor may not be able to directly assess them. The data which were requested from the entrepreneurs had to be collected from the previous tour bus service. If the entrepreneurs' data of indicators are not available, the assessor may consider them from the study of Ratanavaraha and Jomnonkwao (2014) as follows;

- Drivers should be between the ages of 30 and 45
- Drivers should have knowledge not lower than a secondary-school qualification
- Drivers should possess legally right licenses of vehicles
- Drivers should have knowledge and skills in routes
- Drivers should attend training courses arranged by companies and/or other organizations
- Drivers should not drink or smoke while driving

Thus, seven driver's qualifications above can reflect drivers' service quality. In terms of scores for assessment, there are many methods for scoring such as 0–1, 1–3, 1–5, 1–7, 1–10. Choosing how to score requires the assessor's opinions to take checklist to use practically. Concurrently, the assessor should consider factor loadings of this study for the emphasis on the importance of each indicator due to its differently individual significance.

7.7 References

Ratanavaraha, V., & Jomnonkwao, S. (2014). Model of users′ expectations of drivers of sightseeing buses: confirmatory factor analysis. **Transport Policy**, 36, 253-262.

APPENDIX I

LIST OF PUBLICATIONS

List of Publications

Jomnonkwao, S., & Ratanavaraha, V. (2013, 8th-10th December). What Factors Are Related to the Analysis of Customer Loyalty toward Non-Fixed Route Bus Services? **Paper presented at the International Conference on Tourism and Hospitality Management 2013**, Colombo, Sri Lanka

Jomnonkwao, S., & Ratanavaraha, V. (2015). Measurement modelling of the perceived service quality of a sightseeing bus service: An application of hierarchical confirmatory factor analysis. **Transport Policy**. (In press)

Jomnonkwao, S., Ratanavaraha, V., Khampirat, B., Meeyai, S., & Watthanaklang, D. (2015). Factors influencing customer loyalty to educational tour buses and measurement invariance across urban and rural zones. **Transportmetrica A: Transport Science**. (In press)

BIOGRAPHY

Mr. Sajjakaj Jomnonkwao was born on the twelfth of July, 1984 at Kasetsomboon District, Chaiyaphum Province. He started his primary education at Ban Bua (Rajrajwittaya) School, secondary education at Nonkok Wittaya School. Then, he further studied Bachelor's degree in Transportation Engineering Institute of Engineering at Suranaree University of Technology. After his graduation in 2006, he worked in the position of Structural Engineer for Future Engineering & Consultant Company Limited. As he was the student who had the first rank of scores of bachelor's degree curriculum, he was selected to win the scholarship of achieving outstanding school record to master's degree and doctoral degree in Transportation Engineering at the same university.

At present, he works for Pibulsongkram Rajabhat University in the position of permanent lecturer of Logistics Engineering, Faculty of Industrial Technology. He is interested in researches on transportation in many perspectives such as using energy in transportation sector, safety in transportation, and transportation planning.