SATISFACTION OF HIGH-LEVEL ATHLETE MANAGEMENT IN UNIVERSITIES IN SICHUAN PROVINCE, CHINA

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SATISFACTION OF HIGH-LEVEL ATHLETE MANAGEMENT IN UNIVERSITIES IN SICHUAN PROVINCE, CHINA

ABSTRACT

With ongoing development in the construction of high-level sports teams in Chinese universities, the Chinese Ministry of Education is paying more and more attention to the running quality of high-level sports teams in universities. Evaluation of the construction quality of high-level sports teams in universities has received extensive attention from universities and society. However, for various reasons, the main body of high-level sports team evaluation comprises government agencies and universities, and, there is a lack of research on management systems of high-level athletes from the perspective of high-level athletes themselves. Therefore, it is of great theoretical and practical significance to develop a satisfaction model of high-level athlete management systems in Sichuan Province, while conducting empirical analysis from the perspective of high-level athletes.

The questionnaire used in this study consists of seven parts: expectations of high-level athletes, perceived management quality, perceived management value, satisfaction of high-level athletes, complaints of high-level athletes, loyalty of high-level athletes, and personal information. A panel of four experts were involved in determining the content validity of the initial questionnaire. Subsequently, five high-level athletes tested the surface validity of the questionnaire to assess whether it was easy to understand. Then, a pilot study was conducted with 83 high-level athletes, testing reliability and validity of the questionnaire, leading to the selection of appropriate items to form a formal questionnaire. In the main study, 327 high-level athletes completed the survey. Smart PLS 3 was used to complete evaluation of the measurement model and the structural model. Main factors affecting satisfaction of high-level athletes with their management systems were found through the application of IPMA.

Through IPMA of latent variables of the model, it was found that among the three factors that affect satisfaction, perceived management quality needs to be improved first. However, IPMA based on sub-construction of perceived management quality showed that learning management, and training and competition management were both considered to be of the highest importance, yet were the least satisfactory of the five aspects of perceived management quality, and would need to be improved first.

The conclusions of this study found in this study that Sichuan universities should pay attention to evaluation of the satisfaction of high-level athlete management systems. Sichuan universities should begin improving the perception of management quality along with management value of high-level athletes. This should be followed by strengthening the publicity of high-level sports teams; improving the target orientation and expectations of high-level athletes; and improving the evaluation index system of high-level sports teams. The agenda should be to improve the management level of high-level athletes in Sichuan Province universities, thereby effectively improving the satisfaction and loyalty of high-level athletes, and enhancing the competitiveness of high-level sports teams in Sichuan universities.

Keywords: high-level athlete, satisfaction, management system, university, PLS

KEPUASAN TERHADAP PENGURUSAN ATLET TAHAP TINGGI DI UNIVERSITI DALAM WILAYAH SICHUAN, CHINA

ABSTRAK

Universiti-universiti di China kini giat membangunkan pasukan sukan di tahap tinggi. Kementerian Pendidikan China sentiasa menyokong dengan memberi perhatian terhadap kualiti pembentukan pasukan. Penilaian terhadap kualiti pembentukan pasukan sukan tahap tinggi di universiti telah menerima perhatian meluas warga universiti dan masyarakat. Bagaimanapun, menurut badan utama penilaian dari agensi kerajaan dan universiti, penilaian terhadap sistem pengurusan atlit dari perspektif atlit tahap tinggi itu sendiri masih kurang dan terbatas. Oleh itu adalah sangat siknifikan kajian ini membangunkan model kepuasan sistem pengurusan untuk atlit tahap tinggi di Wilayah Sichuan secara teori dan praktikal, disamping mengendalikan analisa empirikal dari perspektif atlit tahap tinggi.

Borang soal selidik yang digunakan dalam kajian ini terdiri daripada tujuh bahagian iaitu: harapan atlit tahap tinggi, rasa terhadap kualiti pengurusan, rasa terhadap nilai pengurusan, kepuasan atlit tahap tinggi, aduan atlit tahap tinggi, kesetiaan atlit tahap tinggi dan maklumat peribadi. Di tahap awal, empat orang panel pakar dilibatkan dalam menentukan kesahihan kandungan borang soal selidik. Kemudian lima orang atlit tahap tinggi menguji kesahihan kandungan borang soal selidik termasuk untuk dinilai sehingga ia mudah difahami. Seterusnya kajian rintis dijalankan dengan melibatkan 83 atlit tahap tinggi bagi menguji kebolehpercayaan dan kesahihan borang soal selidik yang membawa kepada proses seterusnya iaitu pemilihan item yang sesuai ke arah membentuk soal selidik rasmi. Sejumlah 327 atlit tahap tinggi telah melengkapkan borang soal selidik. Smart PLS 3 digunakan untuk menilai dan mengukur struktur model. Faktor utama yang memberi kesan kepada kepuasan atlit tahap tinggi terhadap sistem pengurusan dikenalpasti menerusi aplikasi Analisa Matrik Kepentingan-Prestasi (IPMA).

Berdasarkan analisa IPMA, daripada 3 faktor yang mempengaruhi kepuasan, terdapat pembolehubah yang tersembunyi di dalam model. Analisis awal mendapati pembolehubah "Kualiti Pengurusan" perlu dipertingkatkan dahulu. Bagaimanapun, analisis IPMA yang berdasarkan sub-pembentukan kualiti pengurusan menunjukkan pengurusan pembelajaran, dan pengurusan pertandingan dan latihan mempunyai kepentingan paling tinggi, sedangkan di awalnya pembolehubah inilah yang paling kurang memuaskan dalam lima aspek kualiti pengurusan yang perlu dipertingkatkan terlebih dahulu.

Kesimpulannya, universiti di Wilayah Sichuan perlu memberi perhatian terhadap penilaian kepuasan atlit tahap tinggi terhadap sistem pengurusan. Usaha yang boleh dijalankan oleh pihak universiti di Wilayah Sichuan adalah dengan meningkatkan persepsi terhadap kualiti dan nilai pengurusan atlit tahap tinggi. Ini boleh diikuti dengan mengukuhkan publisiti pasukan, meningkatkan orientasi sasaran dan jangkaan atlit serta meningkatkan sistem indeks penilaian pasukan sukan tahap tinggi. Agenda utama adalah untuk menambahbaik tahap pengurusan atlit tahap tinggi di universiti-universiti Wilayah Sichuan. Hanya dengan cara meningkatkan kepuasan dan kesetiaan atlit tahap tinggi serta meningkatkan daya saing di kalangan mereka secara efektif, agenda ini akan tercapai.

Kata kunci: Atlit tahap tinggi; kepuasan; sistem pengurusan; universiti; PLS.

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LIST OF SYMBOLS AND ABBREVIATIONS

Abbreviation	Meaning
3PL	Third-Party Logistics
A&E	Admission and Employment
AB	Aerobics
ACSI	American Customer Satisfaction Index Model
ASQ	Athlete Satisfaction Questionnaire
AT	Athletics
AVE	Average Variance Extracted
BB	Basketball
C&T	Curriculum and teaching
SCSB	Swedish Customer Satisfaction Barometer Model
CB-SEM	Covariance Based-SEM
CCSI	China Customer Satisfaction Index Model
CFA	Confirmatory Factor Analysis
CHESSI	Chinese Higher Education Student Satisfaction Index Model
CITC	Corrected Item-Total Correlation
CL	Campus Life
CMASS	Conceptual Model for Assessing Student Satisfaction
CMV	Common Method Variation
COM	Complaints of High-level athletes
CR	Composite Reliability
CSI	Customer Satisfaction Index

CVI	Content Validity Index
DC	Directional Cross-country
DP	Development Planning
ECSI	European Customer Satisfaction Index Model
EFA	Exploratory factor analysis
EN	Enrollment Management
EXP	Expectation of high-level athletes
F&F	Fees and Funding
FB	Football
GE	Graduate and Employment Management
GoF	Goodness of Fit
HCM	Hierarchical Component Model
HOC	Higher-Order Components
IPMA	Importance-Performance Map Analysis
ISO	International Standards Organization
KMO	Kaiser-Meyer-Olkin Test
LE	Learning Management
LO	Logistics Management
LOC	Lower-Order Components
LOY	Loyalty of High-level athletes
ML	Maximum Likelihood
NCAA	National Collegiate Athletic Association
PC	Personal Care
PLS	Partial Least Square
PLS-SEM	Partial Least Squares-SEM
PMQ	Perceived Management Quality

PMV	Perceived Management Value
SAT	Satisfaction of High-level athletes
SEM	Structural Equation Modeling
SF	Service Facilities
Sig	Significant
SPSS	Statistical Product and Service Solutions
SRMR	Standardized Root Mean Square Residual
SSG	Student Satisfaction Guarantee Model
SSI	Student Satisfaction Inventory
SSIHEI	Student Satisfaction Index model for Higher Education Institutions
ST	Shooting
SW	Swimming
TC	Training and Competition Management
TD	Taekwondo
TN	Tennis
TT	Table Tennis
UA	Universal Agreement
UMREC	University of Malaya Research Ethics Committee
VAF	Variation Accounted For
VB	Volleyball
VIF	Variance Inflation Factor
WS	Wushu
WSR	Wuli-Shili-Renli
WTO	World Trade Organization

CHAPTER 1: INTRODUCTION

1.1. Introduction

The existence of competitive sport is amongst the signs of developed society and civilization. It can help promote a sense of belonging and patriotism, while strengthening the central power and cohesion of a country (Chen, 2004). Under the influence of China's 'Whole National System' and 'Olympic Glorious Program', achievements in competitive sports have made great strides in a short period of time in various world championships and in the Olympic Games (Jiang, 2015). It took only 24 years from achieving its first gold medal at the 23rd Olympic Games in 1984 until the 2008 Beijing Olympic Games, for China to rank first in the medal tally, winning 48 gold medals.

However, changes in China's society and its economy created a number of issues, amongst which were problems with the employment and reintegration of retired athletes (Chi, 2003). Data from the General Administration of Sport of the People's Republic of China shows that nearly 4,000 athletes retire every year. The number of retired athletes is expected to increase to 5,000 or 6,000 in the years when Olympics, Asian Games, and National Games of the People's Republic of China are held. Currently, the average resettlement rate of retired athletes in various cities and provinces is just 43% (Qi & Li, 2014). The perceived lesser ability of retired athlete reintegrating with society often results in them having difficult livelihoods due to possible lower levels of education. Specifically noted were two problems encountered by retired athletes, their lack of work experience, and the poor study-related-skills of those planning to return to study (Ma, 2009). This has created great pressure and has influenced how Chinese competition sports has evolved. As a result, the Chinese government is working on progressively improving athletes' general basic knowledge level, comprehensive quality and their social adaptability.

To address these issues, in 1987 the Chinese Ministry of Education commenced setting up high-level sports teams differently, by having universities enroll retiring or active athletes during the course of their sports careers. However, this method failed to show positive results in solving the lack of general basic knowledge education among retired athletes .

At the 23rd Summer Universiade in 2005, China's Ministry of Education led a delegation for the first time, and it won 21 gold, 16 silver, and 12 bronze medals, making it the second-best result in the total number of gold medal winners. One outstanding student-athlete, Hu Kai, trained using the 'Tsinghua model', won the men's 100m championship, thus demonstrating that positive results in the sports ability levels of Chinese university students could indeed be improved. It also showed that Chinese universities could train outstanding athletes (Yang & Liu, 2009).

Entry of high-level athletes into universities disrupted normal school management and caused a lot of inconvenience to the university management. Along with this, high-level athletes might have trouble balancing their academic and competitive achievements, since they need to juggle both studying and training (Ding, Han, Shao, & Mu, 2007). Recruitment of retired professional athletes into universities has caused persistent problems including cases of impersonation and false age reporting, along with issues related to athletes' qualifying for participation in university competitive sport (Gong & Huang, 2001).

Over the years, Chinese sports professionals have begun to realize the importance of appropriate management of high-level athletes in universities. According to Zeng (2001), proper management provides the necessary measures and key foundations to ensure the establishment and maintenance of normal training, competing, studying, and, ordinary daily living for high-level sport teams in universities. The current standing of

high-level athletes in Chinese universities is generally low, which is an indisputable fact. Hong (2012) conducted a survey on the status quo of the construction of high-level sports teams in Guangdong Province, and found that the level of athletics of high-level sports teams in universities has long been in the stage of amateurization. Ma (2014) also believes that the athletic ability of high-level sports teams has always been at a low level. However, researchers believe that improving athletes' satisfaction can improve their level of competition (Duan, Li, & Luo, 2009). Riemer and Chelladurai (1995) and Xie (2007) pointed out that satisfaction and athletes' athletic performance are closely related. As an attitude, satisfaction directly affects athletes' behavior and is the guarantee for athletes to reach the highest level of competition.

As reported by Liu (2011), the satisfaction survey is an important management tool in universities all over the world, especially those in more developed countries. In order to improve the level of competition of high-level athletes, Chinese scholars have also begun studying various aspects of how high-level athletes are guided in universities. However, studies have not yet been carried out on managing high-level athletes from the perspective of their own levels of 'satisfaction'. Evaluating quality of the composition of high-level sports teams in ordinary universities in China is carried out by committees made up of high-level sports experts and is based on their own perspectives. As such, it lacks a real evaluation index system from the point of view of high-level athletes.

This study, following the empirical method, aims to establish a satisfaction model derived from the perspective of high-level university athletes, of the management systems used by their universities. This will be achieved using a questionnaire based on the 'American Customer Satisfaction Index model' (ACSI) and a structural equation model based on 'PLS' modeling method. An analysis will be conducted to discover the degree to which high-level athletes are satisfied with their university management systems. The

goals to develop a brand-new way of evaluating management systems of high-level athletes, to suggest improvements that might solve problems in management systems, to highlight improvements that embody a 'student-centered' concept, while underpinning the construction of management modes that adhere to this concept.

1.2. Statement of problem

Training of high-level athletes in Chinese universities should be carried out smoothly with the support of human and material resources as well as the guidance of Chinese government policies. Under ideal circumstances, high-level athletes will persist in training and improve their sports skills as well as their studies. Some athletes will be able to represent the school or country in Chinese University Games and international competitions such as the Summer Universiade, while still achieving satisfactory academic results. After retirement, they should be able to find satisfactory jobs within their professional knowledge.

1.2.1 The achievements of high-level athletes are poorer than professional athletes in Sichuan Province

There are 109 universities in Sichuan Province, accounting for 4.82% of the total institutions in China. There are 10 universities with eligibility to enroll high-level athletes. These account for 3.58% of the total number of universities with high-level athletes enrolled in 2017. After nearly three decades of the endeavors of 'combining sports and education' in cultivating high-level athletes, Lv (2014) found that both sports ability levels and overall quality of high-level university athletes, fell somewhere between professional athletes and those university students majoring in physical education. High-level athletes' performances failed to live up to international standards, with only a small number reaching them.

High-level athletes in Sichuan Province universities did not achieve highly in Student Sports Games, compared to professional athletes' performances in National Games of the People's Republic of China. Sichuan Province's professional athletes won 16 gold, 17 silver and 23 bronze medals at the 13th National Games of the People's Republic of China in 2017. At the 13th Student Sports Games of the People's Republic of China in 2017 student athletes won only 1 gold , 5 silver and 7 bronze medals, of which only 1 silver and 1 bronze were won by high-level athletes (Education Department of Sichuan, 2017).

1.2.2 Lack of evaluation system from the perspective of high-level athletes.

In the years of 1998, 2005 and 2010, China completed three nationwide assessments of the composition of university high-level sports teams. These played a certain role in how the construction of high-level sports teams in universities was carried out. Quality supervision of Chinese high-level sports teams is normally carried out only from the perspective of experts, and it relies on established evaluation systems to measure universities that recruit high-level athletes. It is not measured from the perspective of high-level athletes themselves. There is no evaluation system from their perspective.

1.2.3 There is a serious conflict between studying and training of high-level athletes

The friction between learning and training of high-level athletes has always been a perplexing problem for athletes (Fan & Ge, 2017). The larger part of the conflict lies with the arrangement of study and training time, and the necessity to completing the academic component. General basic knowledge foundations of high-level athletes is often poor, their training tasks are burdensome, the school credit system is strict, and many high-level athletes experience difficulty completing their studies. All of this significantly negatively impacts on their sports training.

1.2.4 Employment rates and wages of high-level athletes are relatively low.

High-level athletes achieving mastery of special professional skills found less employment following graduation, and their wages failed to reach their expectations. A survey of 20 high-level sports universities conducted by Li, Cao, and Li (2011) found that from 2006 until 2010, the percentages of athletes successfully finding employment following graduation were 53.6 % (2006), 56.1 % (2007), 46.3 % (2008), 49.6 % (2009) and 52.8 % (2010) respectively.

According to Lan (2013), the average expected salary of most unemployed athletes in the workforce is 2,872 Chinese Yuan. Most companies are only willing to give the undergraduate salary of 2,000 Chinese Yuan. This is lower than the expected salary of a graduate.

Therefore, it is very important to study the satisfaction of high-level athlete management systems from the perspective of high-level athletes. Only by improving their satisfaction can they be motivated to take the initiative to participate in learning and training, while striving to improve their sports skills levels along with general basic knowledge, thereby potentially improving their employment capacity.

Moreover, this study investigates high-level athlete satisfaction with the management systems in universities, using Smart-PLS software to analyze the data, thus finding the most important factors that affect satisfaction. It seeks to provide a theoretical basis for improving management of high-level athletes in universities, aiming to effectively improve management quality, and ultimately realize the purpose of building high-level sports teams in universities in China.

1.3 Research Objectives and Questions

1.3.1 Research objectives

The aim of this research is to establish a High-level Athletes Satisfaction Index (HASI) model for Sichuan Province university management systems. Utilizing such a satisfaction model that analyzes factors affecting satisfaction levels of high-level university athletes may lead to effective improvement measures being taken by university management. The objectives of this research as follows:

Objective 1: To construct a high-level athletes satisfaction index model of Sichuan Province university management systems.

Objective 2: To analyze possible correlations between variables of the HASI model of Sichuan Province university management systems.

Objective 3: To propose measures based on the results of the analysis toward enhancing the level of satisfaction of high level athletes university management system.

1.3.2 Research questions

The questions of this research as follows:

Question 1: What constitutes a HASI model of university management system in Sichuan Province?

Question 2: What are the correlations between variables of the HASI model on university management systems?

Question 3: What are the recommendations to improve satisfaction levels of high-level athletes with university management systems?

1.4 Significance of the Study

1.4.1 Provides a new perspective for evaluating high-level sports teams' construction.

At present, China's high-level sports teams are evaluated from the perspective of experts. However, the basis of the proposed HASI model of university management systems is from the perspective of those participating, that is, high-level athletes themselves, and this is deemed to be more objective. Hence, this study provides a new perspective for evaluating the building of high-level sports teams.

1.4.2 Provides theoretical reference for satisfaction evaluation of high-level athletes' management systems.

This research constructs a HASI model for high-level athlete management systems in universities and evaluates the satisfaction level of high-level athletes. The results reflect high-level athlete levels of evaluation of their management systems, as well as their preferential expectations. It provides more accurate and comprehensive information for better management of high-level athletes. Therefore, it can be a useful theoretical reference for universities that choose to implement a satisfaction evaluation system, from the point of view of high-level athletes, with their existing management systems.

1.4.3 Improves the management quality of high-level athletes and promote smooth development of the 'combining sports with education' aim.

This is an empirical study aiming to provide reasonable suggestions based on high-level athletes reported satisfaction with their management systems, while analyzing factors affecting satisfaction, and discovering problems that have occurred in management in Sichuan Province. Therefore, the research aims to improve management levels of high-level athletes, promote smooth development of the 'combining sports with

education' aim, and cultivate excellent competitive sports talents in Sichuan Province, China.

1.5 Conceptual Framework

In this research, the 'American Customer Satisfaction Index model' (ACSI) was adapted to construct a HASI model of university management systems. It incorporates six aspects: expectations of high-level athletes, perceived management quality, perceived management value, satisfaction of high-level athletes, complaints of high-level athletes, and loyalty of high-level athletes. There are six sub-constructs within the construct of perceived management quality. The conceptual framework of the research is as shown in Figure 1.1:

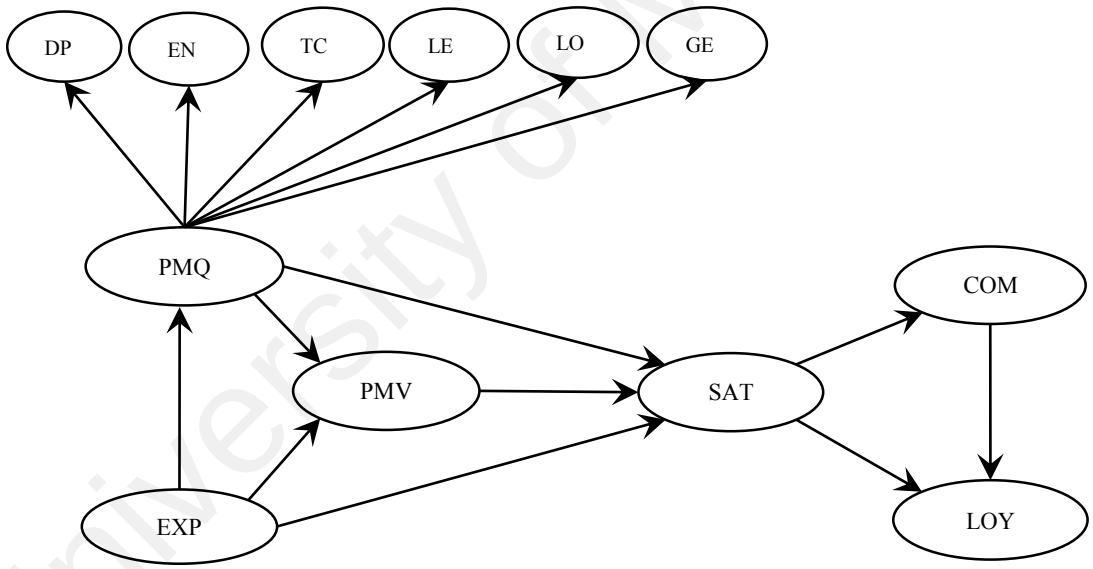


Figure 1.1: High-level Athletes Satisfaction Index model

Note: EXP=Expectation of High-level Athletes, PMQ=Perceived Management Quality, DP=Development Planning, EN=Enrollment Management, TC=Training and Competition Management, LE=Learning Management, LO=Logistics Management, GE=Graduate and Employment Management, PMV=Perceived Management Value, SAT=Satisfaction of High-level Athletes, COM=Complaints of High-level Athletes, LOY=Loyalty of High-level Athletes

1.6 Study Hypothesis

In line with previous research outcomes, in this study, hypothesizing the relationship between latent variables is proposed.

Fornell, Johnson, Anderson, Cha, and Bryant (1996) argue that customer expectations have a direct impact on perceived quality and perceived value. Liu and Lu (2012) believe that student expectations directly affect perceived quality, perceived value, and student satisfaction. Liu and Zhou (2012) believe that student expectations positively affect student satisfaction and perceived quality. Therefore, this study proposes the following assumptions:

Hypothesis 1: Expectations of high-level athletes significantly positively impact their perceptions of management quality.

Hypothesis 2: Expectations of high-level athletes significantly positively impact their perceptions of management value.

Hypothesis 3: Expectations of high-level athletes significantly positively impact the satisfaction level of high-level athletes.

Parasuraman, Zeithaml, and Berry (1994) argue that perceived quality is a major factor in customer satisfaction. Su (2012) found that perceived quality had a decisive influence on student satisfaction. Thus, perceived quality has an important impact on perceived value, and perceived value has a positive impact on student satisfaction. Yang and Ni (2014) argue that perceived value has a significant positive impact on student satisfaction. Therefore, this study proposes the following assumptions:

Hypothesis 4: Perceived management quality significantly positively impacts perceived management value.

Hypothesis 5: Perceived management quality significantly positively impacts the satisfaction level of high-level athletes.

Hypothesis 6: Perceived management value significantly positively impacts the satisfaction level of high-level athletes.

If customers actual experience with products or services is lower than originally expected, customers will be dissatisfied and this may result in customer complaints (Feng & Zhong, 2016). Hou and Zhang (2012) believe that customer satisfaction is a critical prerequisite for customer loyalty, and that improving customer satisfaction can significantly affect customer loyalty. Ai (2016) believes that perceived quality has a positive impact on student satisfaction, while student satisfaction has a positive impact on student loyalty. Therefore, the following assumptions are made:

Hypothesis 7: Satisfaction of high-level athletes significantly negatively impacts their complaints.

Hypothesis 8: Satisfaction of high-level athletes significantly positively impacts their loyalty.

Hypothesis 9: Complaints of high-level athletes significantly negatively impacts their loyalty.

1.7 Innovation of the Study

Grounded on research results of previous scholars, the present research reviews and analyzes results of customer satisfaction and student satisfaction studies, and interweaves them with high-level athlete management practices, to provide some suggestions for high-level sports team management in the future. Innovations of this research are as follows:

1.7.1 Construction of a measurement model of perceived management service quality of high-level athletes.

Currently in China, evaluation of high-level sports teams is conducted by experts from the Ministry of Education, and the satisfaction of high-level athletes is not considered in the evaluation indicators used. Chinese scholars have studied management systems of high-level sports teams solely from the point of view of experts. At present, there is no research on management systems from the perspective of high-level athletes' satisfaction. Based on research results of Chinese scholars on management systems of high-level sports teams, the author summarized common parts of management systems of high-level athletes and postulated that the quality of perceived service of high-level athletes' management consists of six dimensions, comprising secondary latent variables of management quality perception, each of which requires its corresponding explicit variables to be measured. Following analysis of reliability and validity, an index system suitable for outlining the management characteristics of high-level athletes was formed.

1.7.2 This research constructs and empirically studies a satisfaction model of management systems of high-level athletes

At present, Chinese scholars have not studied high-level athlete management systems from the perspective of high-level athlete satisfaction. Based on customer satisfaction and student satisfaction research results, this research introduces six latent variables, namely: high-level athlete expectation, perceived management quality, perceived management value, high-level athlete satisfaction, high-level athlete complaints and high-level athlete loyalty, and from these, constructs a satisfaction evaluation model of high-level athlete management systems, and also conducts an empirical study.

1.7.3 PLS structural equation model was used to analyze the satisfaction index model of high-level athletes' management systems

Most Chinese scholars use LISREL for studying structural equation models. The PLS method is mostly used in customer satisfaction evaluation models such as SBCB, ACSI and ECSI. Since the data from the satisfaction evaluation of management systems for high-level athletes in this study do not conform to the requirements of normal distribution, Smart PLS was used to verify its rationality, generate a satisfaction index and analyze the general usability of the model for all kinds of students.

1.8 Definitions

1.8.1 High-level athlete

'High-level athlete' refers to students with sports talent, who are officially admitted to general universities according to China's admission policy for high-level athletes (Zhu, Zhang, & Hu, 2016). High-level athlete candidates must display characteristics such as being under the age of 22, being a senior secondary school graduate, being a certified second level athlete in China, and having been the main team member in the top 6 of group events or in the top 3 of an individual sport, at provincial level in high school. At the same time, they must have similar academic ability as a senior secondary education graduate, be a certified first level athlete in China, or have been the main team member of the top 8 in national or international team competitions in the previous three years (Ministry of Education of the People's Republic of China, 2009).

1.8.2 Management system

'Management system' refers to the system of establishing policies and objectives, and to the achieving of them. It is an organic whole, composed of organizational structure, responsibilities, procedures, activities, capabilities and resources. In other words, it is a

complex structure set up to meet the needs of a specific goal (Wang, 2010). The management system of high-level athletes refers to the establishment of policies and training goals of high-level athletes, and the establishment of a complex structure to meet the needs of this goal. According to existing research, the management system of high-level athletes is mostly involved in target management, enrollment management, training competition management, learning management, daily life management, logistics management, and graduate employment management.

1.8.3 Satisfaction

The Oxford Dictionary's explanation of satisfaction is 'fulfilment of one's wishes, expectations, or needs, or the pleasure derived from this' (English Oxford Living Dictionaries, 2018). Cardozo (1965) first introduced the concept of customer satisfaction, then gradually formed the satisfaction theory with industry characteristics such as student satisfaction and athlete satisfaction.

1.8.3.1 Customer satisfaction

Although scholars have different interpretations of customer satisfaction, many countries that study customer satisfaction generally adopt the view of the American marketer, Kotler (1997) asserts customer satisfaction is that state of feeling formed, when the perceived effect on a customer of all products provided by an organization (including services, activities and processes), is compared with its expected value. This interpretation clearly demonstrates that satisfaction level is a function of the difference between perceived effect and expected value, and not only conforms to the psychological explanation of satisfaction, but also provides operational theoretical support for empirical research on customer satisfaction.

1.8.3.2 Student satisfaction

The concept of 'student satisfaction' developed in the 1960s. According to scholarly definition, student satisfaction generally refers to the psychological feeling of joy or disappointment generated in students, as external direct customers of higher education services, in the course of comparing the results of their education services with their own expectations (Liu, 2011).

1.8.3.3 Athlete satisfaction

The perception of 'athlete satisfaction' is relatively uniform, and most scholars use the definition of athlete satisfaction given by Chelladurai and Riemer (1997). They posit that athlete satisfaction is a positive affective state that emerges from detailed evaluation of the structures, processes, and outcomes that come with the athletic experience.

1.9 Summary

This chapter introduced the research background, detailed some of the problems existing in management of high-level athletes at this stage, and described the research purpose, problems and significance, while also giving the conceptual framework that was used in the process, as well as briefly introducing the research and analysis methods that were adopted. Attention was drawn to the innovations and possible shortcomings, as well as to the definitions of terms. A literature review related to this study will be laid out in the following chapter.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter outlines the theories and models related to the research. Firstly, classification of Chinese competitive athletes and Chinese government admission requirements for high-level athletes is introduced. Then the composition of management systems of high-level athletes in Chinese universities is put forward, along with the research of Chinese scholars on management systems of high-level athletes in universities. The development status of high-level sports in Sichuan Province is briefly detailed. Finally, the chapter analyzes the state of customer satisfaction research, student satisfaction, athlete satisfaction, and commonly used related questionnaires. The analysis of related research on satisfaction in this chapter provides a solid theoretical basis for evaluating the satisfaction of high-level athlete management systems in Sichuan Province universities.

2.2 Chinese Competitive Sports Athletes

The formation of Chinese competitive sports talent training model has its own development process. Overall, it can be divided into three stages. In the first instance, a training model was established in 1955, and it was gradually perfected in the early 1980s as a 'primary-intermediate-advanced' three-level training network model (Wang, 2017) . This training mode has occupied an important role in bringing Chinese competitive sports to a world-leading position.

Then, with the intention to improve the quality of general basic knowledge of coaches and athletes, and to solve athletes worries, the former State Sports Commission of China agreed in 1986 that six directly affiliated sports universities would take the lead in specifically recruiting athletes. The main recruitment targets are outstanding retired

athletes, and some reserve forces personnel with high levels of sports skills. The goal is to train excellent coaches and athletes(Wan, 2006). The former China State Education Commission aimed to improve sports skills of ordinary universities, and train high-level student athletes with comprehensive development in morality, intelligence, physique, aesthetics and labor. In April 1987, the 'Notice on the Trial of High-level Athletes in Some Regular Universities' was issued. It was agreed that 51 ordinary universities should first establish high-level sports teams, so as to train high-level sports talents with all-round development, for the country. The goal was to complete the participation obligations of the Universiade, along with major international and domestic sports competitions, while contributing to the national Olympic glory program and the sustainable development of competitive sports (Zhong, 2009).

Lastly, in 1993, the China State Sports Commission formulated and issued the 'Opinions of the State Sports Commission on Deepening the Reform of Physical Education' (State Sports Committee of China, 1993). This began the prelude to building a sports development model that was made suitable to the socialist market economic system. Since then, the concept of 'combining sports and education' has continuously undergone trials and developments. There have been new forms of training added, such as may be found in industry associations, clubs, and private single-sports schools that run second- and third-line sports teams. Ultimately a new situation came about, based on the three-level training network model which was supplemented by various training modes to jointly cultivate Chinese competitive sports talents (Wang, 2010) . As shown in Figure 2.1:

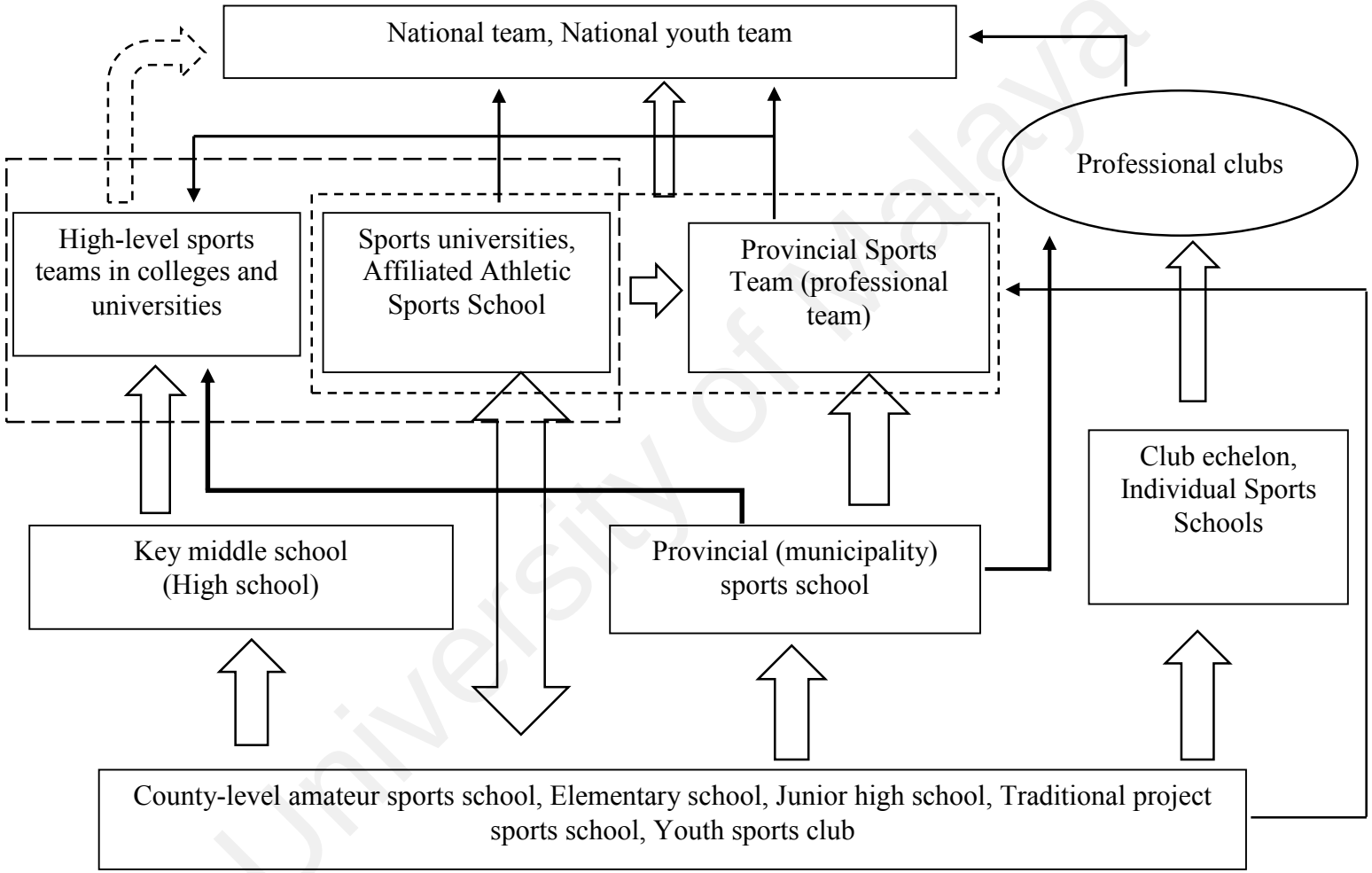


Figure 2.1: Path Map of Chinese Competitive Sports Talent Cultivation

2.2.1 Professional athlete

A professional athlete is a person who: has reached a certain level through systematic professional training, participates in sports competitions and creates achievements as a profession, and is known professionally as an athlete. In China, athletes who are trained in the 'three-level system' style from amateur sports school through to provincial team and then through to national team, and who subsequently win gold medals, are known as professional athletes (Wang, Gao, & Zuo, 2006).

Because professional athletes are not systematically educated, their level of general basic knowledge may be low, their ability to self-learn and self-improve might not be high, and their skill at adapting to changes in their social surroundings could be poor. When they retire, finding placement in employment is often difficult. Therefore, the overall training mode of professional athletes is no longer suitable for China's needs and social and economic development, and over time the outdated mode may gradually disappear.

2.2.2 Specifically recruited athletes.

Specifically recruited athletes are athletes who have taken the sports training major examination as well as the national traditional sports major examination, and then entered the school (Liu et al., 2012). The training goal of specifically recruited athletes is to train athletes, coaches, social sports instructors, sports teachers, and other types of sports talents to engage in sports-related work.

The implementation of this system for specifically recruited athletes has lowered the entrance threshold for sports training majors and national traditional sports majors. It has met the needs of some groups such as national teams, provincial and municipal retired athletes, and some promising young athletes. Allowing them to enter universities for

further study, while solving the worries of athletes and relieving the governmental burden of retired athlete placement (Wang et al., 2006). After several decades of practice, the specifically recruited athletes training model has matured both at management and institutional level. The training concept is advanced, its level is high, and its various guarantees are relatively perfect.

2.2.3 High-level athlete

A high-level athlete is a student with sports talent, who is recruited by general universities to improve their competitive level at sports competitions and to meet the university sport needs (Wang et al., 2006). The goal of cultivating high-level athletes is to complete the obligatory participation tasks of the Universiade and major international and domestic sports events, and to strengthen the sustainable advancement of the National Olympic Glory Program and competitive sports. At present, China's high-level athlete training model is immature and is very much still in a growth phase. At this stage, it is not practical to realize combining the training of excellent athletes with student athletes, as the main body, and to meet the needs of competitive sports. Here follows a short introduction to high-level athlete enrollment requirements.

In 2018, a total of 279 universities in China were granted permission for special admission of high-level sport teams by the Ministry of Education of the People' Republic of China (2017). The China government formulated relevant documents setting out specific requirements on enrollment numbers, admission qualifications, physical and skill tests, and general basic knowledge examination results for high-level athletes. The specific requirements of the document are set out below.

2.2.3.1 Number of enrollments

To comply with requirements, pilot universities should follow the laws of sports team construction and development, hire experts in the field of sports, and study and formulate the construction plan and enrollment requirements of their own sports teams. According to the degree of urgency, they should arrange and publish the enrollment plan for each event (gender, position or event) for the sports team in good time. The annual enrollment for collective events shall not exceed the maximum number of simultaneous players for the party specified in the event (e.g. volleyball teams for men and women can recruit up to 6 players each year in each school). The enrollment scale of sports teams shall not exceed 1% of the total number of pilot university undergraduate enrollments plans for the previous year, and the enrollment shall be within the scope of sports items approved and announced by the Ministry of Education.

2.2.3.2 Examination of candidates' registration qualifications

The pilot universities should determine the conditions for their enrollment according to the conditions of the Ministry of Education, specifying the competitions, ranking and standards of the main players recognized by the schools, and these shall not be lower than the requirements of the current regulations of the Ministry of Education. To strengthen the examination of candidates' registration qualifications, the sports items in their athletes' technical grade certificates should be consistent with those in universities (in principle, minor events should also be consistent, and track and field events should be strictly corresponding).

Universities can check and verify the athletes' grade certificates through the ‘comprehensive management system of athletes' technical grade’ maintained by the China sports culture and education network. They should verify the certification materials provided by the candidates and issued by the organizing Committee of the relevant

competitions. Candidates who have obtained an athlete grade certificate based on competition results of collective events (including group events and relay events) shall have their eligibility determined by the pilot universities through clear procedures and standards that confirm whether or not the candidates were main players.

2.2.3.3 Sports skills test

Sports skill tests are organized in a variety of ways, including national examination, joint examination of universities, and single examination of universities. According to the distribution of results from the national unified examination, relevant universities put forward their requirements for the qualified results for the relevant sports skills in their schools, and, in combination with the examination results of the registration qualifications, they determine and publicize the list of qualified sports skills for their own schools.

In further compliance, pilot universities should improve professional testing methods to ensure fairness and justice in testing process, design, and actual operation. In particular, collective projects should comprehensively consider such evaluation factors as basic sports skills, actual participation capability and position efficiency. Pilot universities should strictly determine the list of qualified candidates according to test results, and numbers of qualified candidates should not exceed twice the enrollment planned size of the school sports team.

2.2.3.4 Requirements for achievement in academic subjects

Pilot universities should also, in accordance with the development orientation and personnel training requirements of the university, reasonably determine the minimum requirement scheme for entrance examination academic subject scores of candidates admitted by sports teams of the university, that being generally not lower than the admission control score line for the second batch of undergraduates from provinces where

students come from. With regard to a limited amount of candidates with particularly exceptional sports test results, universities may appropriately reduce admission requirements for general basic knowledge results, but these shall not be less than 65% of admission control score lines for the second batch of undergraduate students from provinces where students come from. The number of such candidates publicized by universities shall not exceed 30% of the enrollment plan of the high-level sports teams.

Pilot universities who are organized for first level athletes, and other organizations should enroll students and student athletes separately. Academic subject examination, and sports training professional enrollment with academic subject examination should be organized in a unified way. The base line for academic subjects of high-level sports teams to admit such candidates shall not be lower than the minimum base line for academic subjects uniformly designated by sports training majors. The number of such candidates to be determined, admitted, and publicized by universities shall not exceed 20% of the school's sports team enrollment plan for the current year.

2.2.3.5. Management of high-level sports teams

As the basis for long-term and annual assessment, pilot universities are required to formulate long-term development plans, and annual objectives and tasks, for the construction of their sports teams. Students of sports teams in universities should accept dual management of their departments and sports teams. They should not only complete their professional learning tasks according to their professional training programs, but also conscientiously fulfill their obligations to participate in training and competitions.

Pilot universities should also specially formulate training programs for sports team students and take sports team training competitions as additional required credits for sports team students, when carrying out assessment. Pilot universities should set up a publicity column on their official school website or on the school's activity website, for

high-level sports teams to advertise themselves: to show sports team members names; publicize that they participated in training, competitions and honors; and that the colleges are available for supervision of all students.

2.2.3.6 Others

Enrollment universities must admit high-level athletes in strict accordance with the high-level sports team events recognized by the Ministry of Education and the admission requirements stipulated and must not admit candidates beyond the events or scale.

Candidates who have not already been centrally publicized on the Ministry of Education 'Sunshine University Entrance Examination' platform should not be accepted by provincial admission offices or admission universities. Candidates who do not meet corresponding national standards, or who have no training prospects are not permitted to be enrolled, as stipulated in the admission method for high-level athletes.

In the case of enrollment institutions that have made major enrollment omissions, or which have violated regulations in organizing sports skill tests or the separate general basic knowledge tests, and who admit high-level athletes, on verification of these failures, the enrollment of high-level athletes in these schools shall be cancelled, and those found to be responsible for the failures, will be notified and dealt with severely.

Candidates who are found cheating in sports skills tests, or in the separate examination of academic subjects, and candidates who have provided false identification, certificates, or any other materials to obtain high-level athlete qualifications, once discovered and their cheating verified, shall be disqualified from entering the examination or from general admission. The fact of cheating in examinations, or providing false materials, will be reported to the provincial recruitment office where the student originates, and this will be securely and permanently recorded by the provincial

recruitment office in the personal electronic filing of the examinee's university entrance examination. If a student has been inadvertently admitted, the relevant university will cancel his student status.

2.3 Evaluation Index System for Construction of High-level Sports Teams in Universities

Regular inspection and evaluation of the composition of high-level sports teams in ordinary universities is designed to promote scientific and healthy development in the course of constructing high-level sports teams in ordinary universities (Ministry of Education of the People' Republic of China, 2010). The evaluation of construction of high-level sports teams in Chinese universities is divided into three stages: university self-evaluation, provincial education administrative department evaluation, and comprehensive evaluation by Chinese Ministry of Education. The evaluation experts score according to the 'high-level sports team construction project evaluation index system for approved universities' published by the Ministry of Education as shown in Table 2.1. After the assessment, eligible universities recruit high-level athletes according to the Ministry of Education regulations on high-level athlete recruitment in ordinary colleges and universities; Universities that do not meet the conditions for high-level sports teams limit recruiting of high-level athletes, or have their entitlement for building high-level sports teams cancelled.

Table 2.1: High-level Sports Team Construction Project Evaluation Index System for Approved Universities

Evaluation index	Main observation	Evaluation criteria	Score distribution		Score
Organization and leadership（5）	Proof school leaders attach importance	Presence of school leaders especially responsible forfigu	1	2	
		Regular thematic meetings	1		
	Organization institution	There is a specific organization with complete staffing and clear division of labor.	2	2	
	Development planning	Development goals and plans are in line with the school's actual ability.	1	1	

Evaluation index	Main observation	Evaluation criteria	Score distribution	Score
Sports team management（10）	Enrollment management	Strict adherence to relevant enrollment policies- with relevant rules and regulations, punishment regulations and other management documents completed.		
		Enrollment methods, enrollment items, enrollment numbers, and so on published online. Completion of group report registration and corresponding processing and filing materials.	1	2.5
		Completion of relevant rules and regulations, punishment regulations and other management documents.	1.5	
	Student status management	The existence of specific high-level athlete student status management documents as well as student status management files. These should include individualized training programs, relevant regulations on participating in training and competitions, regulations on disciplinary administrative sanctions, regulations on leave from school, regulations on accommodation management, and so on.	1	2.5
		A completed listing of high-level athletes that have been recruited over the years, along with the supporting materials submitted to the China University Sports Association for registration.	0.7	
		The proportion of athletes "in school, studying and training" should reach 90%.	0.8	
	Training competition management	Have rigorous, scientific and standardized training plans and training competition summaries.	1	2.5
		Training hours should reach more than 10 hours per week,	1.5	
	Daily management	High-level teams to be supported by full-time team leaders and counselors. Have complete records of injuries, accidents, rewards, punishments and others.	2.5	2.5
Coach team building（10）	Career establishment and structure	There should be a full-time team of coaches with the following:	1	
		Reasonable knowledge structure, age structure, educational background structure and professional title structure.	1.5	2.5
	Construction and management	There should be preferential policies for introducing excellent coaches and special talents.	1.0	
		A reasonable coach workload calculation method and coach business file should be completed.	0.5	2.5
		Documents should exist recording coach competition for posts, promotion of professional titles and rewards.	1.0	
	Coach quality	Coaches should be considered to be politically sound, work conscientiously, be outstanding in performance, and show care for athletes.	1.5	2.5

Evaluation index	Main observation	Evaluation criteria	Score distribution		Score
		Coaches should attach proper importance to scientific research, and have academic achievements (academic papers, academic report articles, works, editors, materials, and so on.) of more than one, per person, per annum.	1.0		
	Training and improvement	The existence of training plans to improve the quality of coaches, along with training programs, financial support and assessment materials of sufficient high quality.	2.5	2.5	
Conditional guarantee （15）	Training venue facilities	To guarantee the training needs of high-level sports teams there should be special training venues and facilities.	4	4	
	Training aids	There should be complete, high quality auxiliary training equipment to ensure athlete health, sports recovery and medical supervision is properly carried out.	4	4	
	Funding input	The annual budget should be stable, and sufficient to meet the needs of athlete training and competition.	2	7	
		The amount of funds per capita should be at least 15,000 Yuan per athlete per annum.	5		
Teaching and training effects （50）	Teaching effect	High-level athletes should abide by school rules and regulations, study conscientiously, have good work styles, good reputations in school, and be recipients of various awards (excellent student awards, sportsmanship awards, scholarships, etc.).	2	5	
		High-level athletes should achieve a graduation rate of 95% and a bachelor's degree rate of 85%.	2		
		There should be relevant ways to support graduate students so that they can achieve a certain level.	1		
	Participation in the competition	In the prior four years, high-level athletes should have participated in the National Universiade standard or above (including Olympic Games, World Universiade and individual competitions at home and abroad) more than once.	10-9	10	
		In the prior four years, high-level athletes should have participated in sports competitions organized by the National College Student Individual Association more than twice.	8-7		
		In the prior four years, high-level athletes should have participated in provincial-level college sports competitions more than three times.	6-5		
		In the prior four years, high-level athletes should have participated in provincial-level college sports competitions or city-level college sports competitions less than twice.	4-0		

Evaluation index	Main observation	Evaluation criteria	Score distribution	Score
	Competition results	High-level athletes should have achieved at least the top 8 in Olympic Games, World Universiade and National Games, as well as achieved top 3 in National University Games, along with achieving excellent results and rankings in individual competitions at home and abroad.	35-31	
		High-level athletes should achieve at least top 8 in National University Games, and top 3 in National College students' single sports association competitions.	30-26	35
		High-level athletes should achieve top 8 in provincial-level college sports meetings, and top 3 in provincial-level college students' single sports association competitions.	25-21	
		High-level athletes should achieve top 8 in provincial college students' single sports association competitions.	20-11	
		High-level athletes should achieve top 8 in municipal competitions.	10-0	
School group work （10）	Implementation of 'National Students' Physical Health Standard'	The test rate of 'National Students' Physical Health Standard' should be 100%, and the qualification rate should be above 85%. Test data shall be reported to the Ministry of Education yearly. (If the test rate is less than 90% and the qualified rate is less than 70%, this item reduces to 1 point).	5	5
	Student group extracurricular sports competition	Morning exercises and extracurricular sports activities and competitions should be formed into a regular system.	1	
		'Sunshine Sports' should be implemented effectively.	2	5
		Student sports clubs and student sports associations should cover a wide range of topics, while student participation rates should be high.	1	
Total Score				

2.4 Athletes management system

2.4.1 American University Sports Management System

In the United States, the main institution that manages university athletics is the National Collegiate Athletic Association (NCAA). It was established in 1906 and gradually developed and expanded after 1950 (Chi, 2003). More than 1,200 universities, leagues and individual associations have joined the NCAA in the United States. NCAA has become the biggest, most versatile, and most member sports management agency in

the United States. Today's NCAA has developed into a non-profit entity that recruits and manages student athletes, manages a series of affairs involving human student athletes, such as off-campus funding, scholarships, television broadcasts, and academic qualifications. NCAA's organizational framework is shown in Figure 2.2.

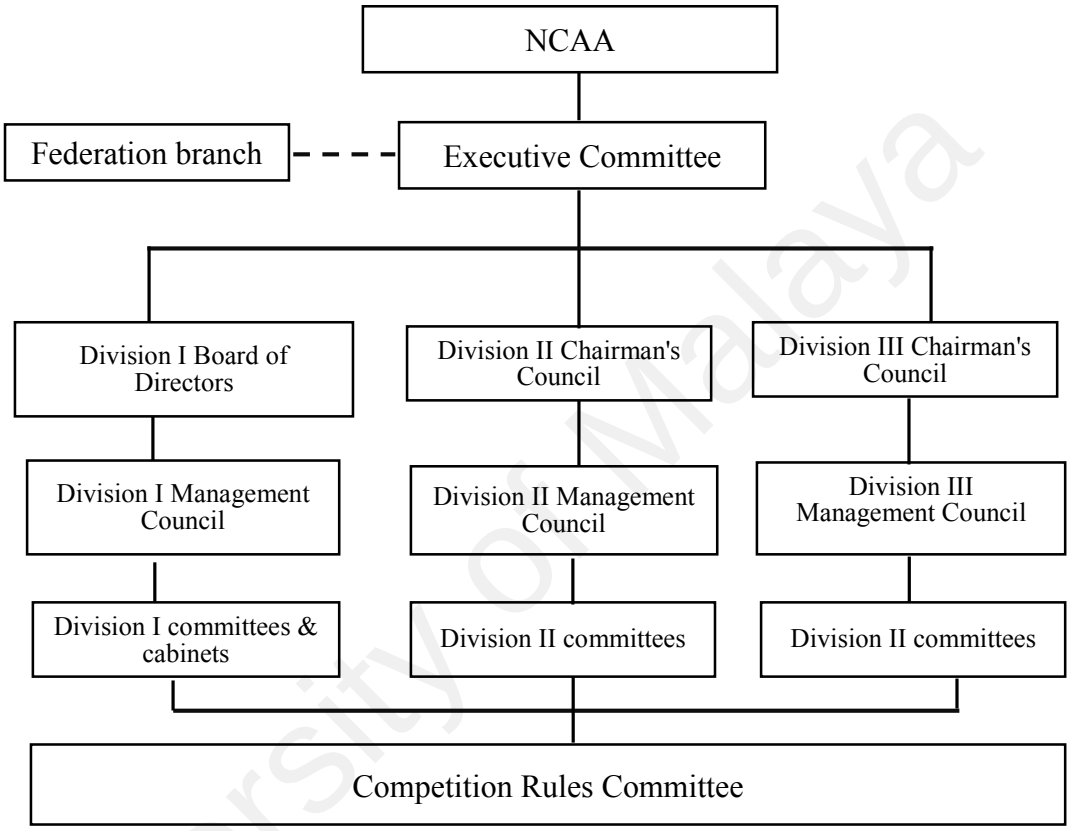


Figure 2.2: Organizational Framework of the American College Students Sports Federation

NCAA's management organization structure includes an executive committee composed of member school presidents, which is the highest authority of NCAA. This executive committee handles all issues of the association, and supervises and ensures that its subordinate grading departments can adhere to the basic objectives, basic policies, and fundamentals of the association.

Under the NCAA Executive Committee, there are three levels to manage their internal affairs, namely Divisions I, II, and III.

In Division I, it is divided into three layers, with Competition Rules Committee reporting directly to Division I committees & cabinets. All members of the Division I committees & cabinets report to the Division I Management Council, which reports to its superior Division I Board of Directors.

Division II has two management departments, one is the Division II Chairman's Council, which formulates policies, and the other is the Division II Management Council. The Division II Chairman's Council is composed of 13 members from the presidents of the member universities. This Council supervises and manages the Council. The Division II Management Council consists of 24 representatives of sports managers and administrators. Under these two councils are Division II committees whose main responsibility is to deal with issues related to Division II.

Division III also has two management departments, one is the Division III Chairman's Council, which formulates policies, and the other is the Division III Management Council. The Division III Chairman's Council is composed of 15 members from the presidents of the member universities. This Council supervises and manages the Council. The Division III Management Council consists of 19 university executive presidents, representatives of sports managers and administrators, and student athletes. Under these two councils are Division III committees whose main responsibility is to deal with issues related to Division III.

2.4.2 High-level athlete management system in China

In 1987, State Education Commission of the People's Republic of China released a document titled 'Management Measures on Cultivating High-Level Athletes in Pilot Universities (Trial Implementation)'. It required that all universities involved in the admission of high-level sport teams set up corresponding leading organizations involving management staff of the student institution, teaching institution, logistics institution and

sports institution, all under the guidance of chancellors or deans who would preside over the work in collaboration with university or college offices. These policies presented conventional requirements on ideological and moral education, teaching management, sports training, competitions, funding, and life management of high-level athletes. Increasing numbers of universities are being guided by this document and embarking on establishing high-level sports management teams that take responsibility for work related to high-level sports training.

Management structures of high-level athletes in China are a type of 'vertical management'. The advantage of this is that it can achieve unified leadership and instruction form the top down. However, this type of management structure is simple and is not conducive to mobilizing enthusiasm in university sports associations and in lower levels of management (Wang, 2012).

The management system of competitive sports in Chinese universities takes the form of an administrative, function-type management apparatus, controlled by the Chinese Ministry of Education. It falls under the General Administration of Sport of China, as well as the Ministry of Civil Affairs of China, and is assisted by the Federation of University Sports of China (FUSC) which consists of an external leadership system and an internal management system (Dong, 2008).

2.4.2.1 External leadership system

In China, the three main institutions managing university competitive sports are: The Ministry of Education of the People's Republic of China; the General Administration of Sports of China, and the Ministry of Civil Affairs of the People's Republic of China. The *de facto* main bodies are the Federation of University Sports of China, and the Department of Sports Hygiene and Art Education in the Ministry of Education. The training office of the Department of Sports Hygiene and Art Education is responsible for

extracurricular sports training in universities. Meanwhile, the Federation of University Sports of China is responsible for national university games, nationwide university sports competitions and other sports activities (Dong, 2008). As shown in figure 2.3.

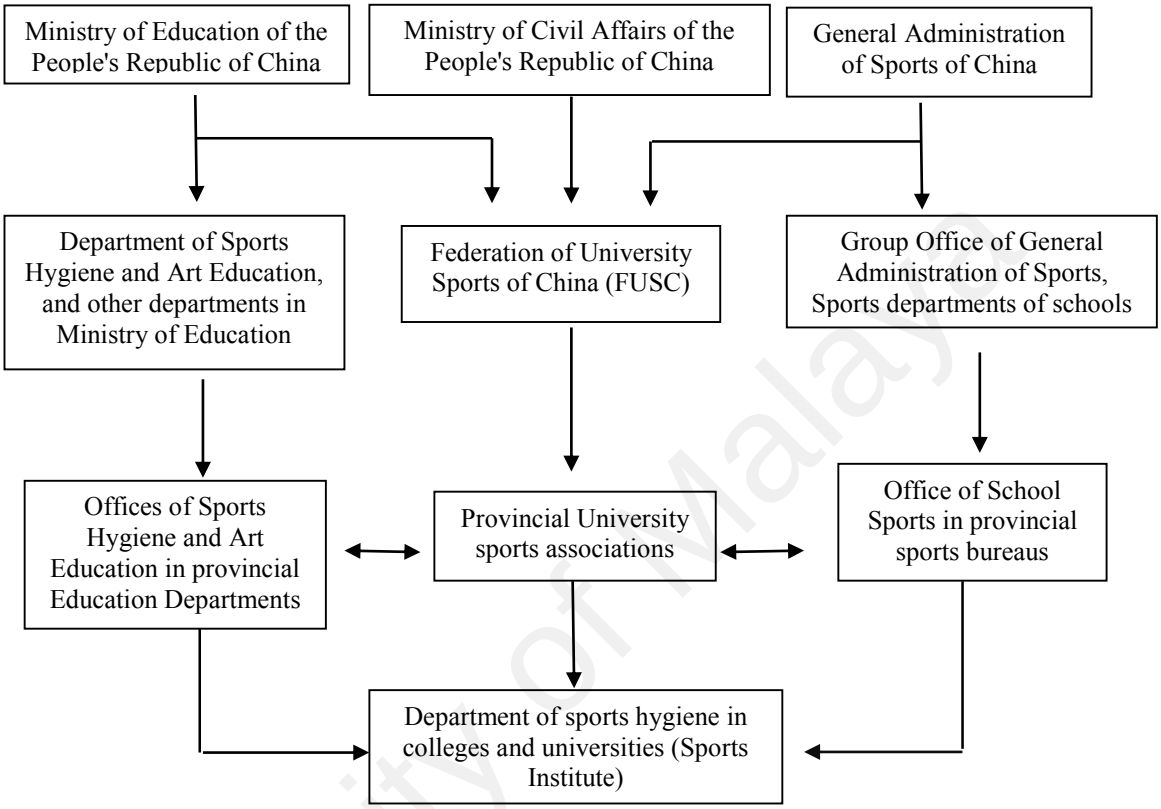


Figure 2.3: External Leadership System in Chinese University High-level Sports Teams

2.4.2.2 Internal management system

The internal management agency of university high level sports teams lies somewhere between independent mode and non-independent mode. Under the leadership of the headmaster in charge of sports, it forms a 'high-level sports team leading group'. This agency is formed by leaders from the Headmaster's Office, Dean's Office, Admissions Office, Finance Office, Sports Department, and other related departments. It is responsible for recruitment, learning, training, and other related matters (Liu, Mu & Liu, 2011). As shown in figure 2.4.

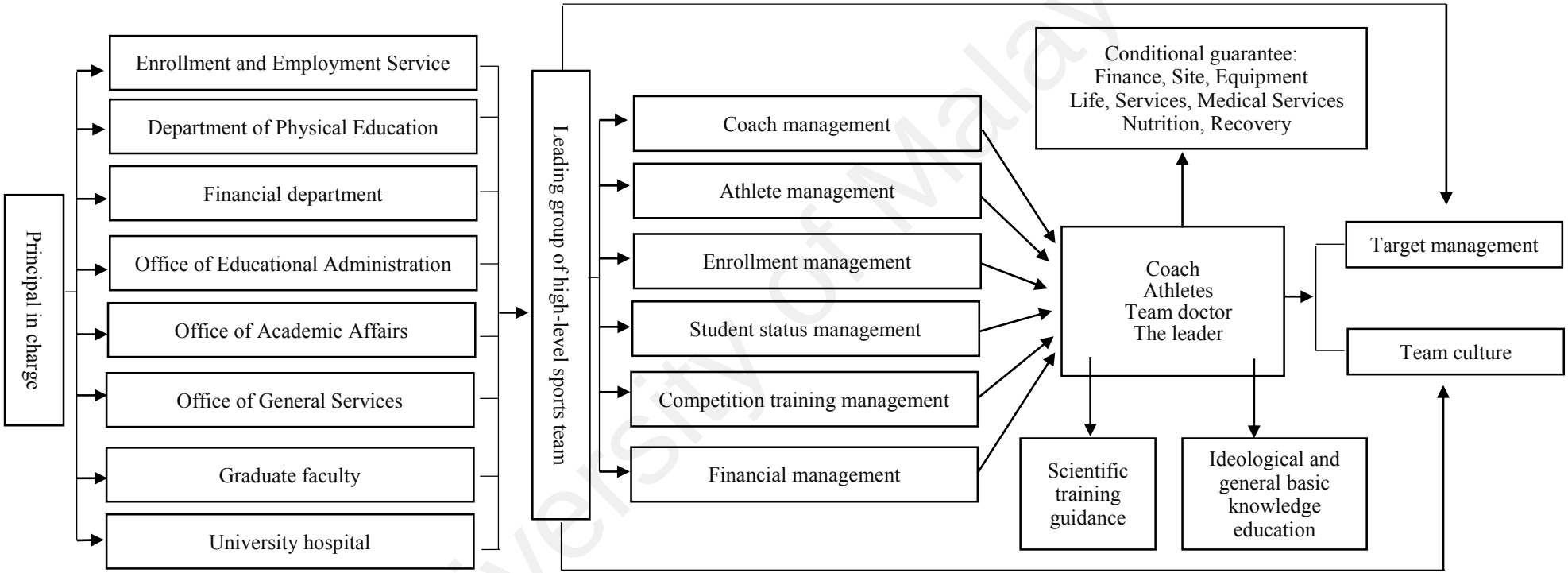


Figure 2.4: The Internal Management System of High-level Sports Teams in Universities in China

2.4.2.3 High-level athlete management systems in universities

Chinese scholarly research uncovered opinions about high-level athlete management, and the result was the provision of a rich theoretical basis for underpinning how management should be carried out. Researchers identified some of the problems that university management are likely to encounter regarding the handling of high-level athletes in a professional manner.

i. The Dimensions of high-level athlete management systems

Wang, Chen, and Shi (1997) made a comparative study on enrollment management, training management, learning management, coach management, and sports team fund management of high-level athletes in Chinese and American universities. Liu and He (2006) analyzed the management of high-level sports teams in Peking University, from six specific aspects: school status management, training management, life management, enrollment system and program management, coach team construction management, and, scientific research and logistics management.

Gao, Zhao, Tao, and Xie (2009) studied the administration of high-level sports teams in Chinese universities from five specific aspects: enrollment of high-level sports teams, academic arrangement and management of student status, coach management, fund management of sports teams, and, coaching of high-level sports teams and competition. Wang, Liu, Liu, & Wang (2011) believe that Chinese universities have established school organization management structures for high-level sports teams, which are responsible for enrollment management, student status management, training management, competition management, daily management, and logistics support management.

Zhang (2013), having investigated and analyzed the current state of management systems under the headings of: target positioning, coach management, enrollment management, training and competition management, funding and logistic support management, and graduation management of high-level sports teams, went on to put forward several relevant suggestions. Zhao (2017) analyzed the present position of high-level sports team management in Heilongjiang Province from five aspects: enrollment management, learning management, training management and competition management, and emotion cultivation of athletes.

The results of these studies showed that management of high-level sports teams mainly included: goals and policies management, enrollment management, learning management, training and competition management, coach management, funding and logistics management, graduate and employment management and others. Because this study focuses on the satisfaction levels of high-level athletes with their management systems, coach management is not included. The following will outline current scholarly research on various dimensions of high-level athlete management systems.

ii. Research on each facet of high-level management systems in universities

(a) ***Goals and policies management***

Bian (2002) stated that university management of athletes should not be limited solely to aspects of learning and training, but should include management of ideology and politics, general basic knowledge study, training and competition, diet and nutrition, and so on. All of these should be carried out by drawing up strict rules and regulations.

As reported by Wang (2011), the specified goal of high-level athlete training in most universities is quite vague or would not appear to meet the requirements of relevant state documents. Sheng (2018) believes that there are still many problems within

composition and management of high-level sports teams in universities, such as: unclear development goals, hidden dangers in enrollment policies, and nonstandard high-level sports team management systems. She proposes that management should formulate long-term development plans, define development goals, and standardize management system according to the state of current team development.

(b) ***Enrollment management***

According to Wu (2011), the status of high-level sports in universities has been greatly improved, but still, the planned structure of sports teams is simplistic and lacks certain important characteristics. Sports events mainly seem to concentrate on athletics and basketball, while other sports are not as well developed.

Xiong, Deng, and Peng (2014) believe that the operation of enrollment mechanisms of high-level sports teams in China's universities has remained unchanged for over a decade, and that procedures are complicated and do not stand up to scrutiny. Pilot university's enthusiasm has been greatly diminished, resulting in a lack of vitality for high-level sports teams. Kang and Wan (2015) analyzed the ongoing enrolling issues of high-level athletes in China and found that although universities have a comprehensive approach to enrolling, they all have certain limitations which are not conducive to the appropriate improvement of high-level sports teams.

(c) ***Training and competition management***

Ding et al. (2007) believes that the apparent phenomenon of universities attaching more importance to sports training than to general basic knowledge learning, during the training of the athlete population, is still very prevalent. From the standpoint of the management of training and competitions scientifically, coaches should account for athletes' individual circumstances, ensuring that training objectives, methods and means,

are rational, effective and scientific. Coaches should use scientific training methods to ensure high quality training (Chen and Xiong (2008)Chen and Xiong (2008)Chen and Xiong (2008) .

Around 50 % of high-level sports team athletes in Chinese universities do not have enough chances to compete when in school, and only 10 % of athletes participate in international competitions. This is directly negatively affecting athlete training and sports performance improvement (Du, 2007). Huang and Wang (2012) pointed out that China's current university competition system is extremely imperfect, that the competition arrangement is chaotic, and that competition teams enjoy a monopoly position. One possible solution would be for high-level sports teams in Chinese universities to establish a thorough university student competition system, and increase the number of matches, while making training and competition more closely integrated.

Chen (2018) believes that the largest proportion of events that Chinese high-level athletes participate in are the Universiade, the National Student Games, and the comprehensive sports games held by various provinces and cities. Basketball, football and many individual sports in other events do not appear to be influential.

(d) ***Studying management***

Ding et al. (2007) thought that to effectively solve the 'conflict between learning and training' it may be necessary to take effective measures to strengthen the status of the school athlete management, and to establish management modes suitable for athlete learning and training. In addition, strict daily management may be required to effectively control and make full use of student athlete spare time. Yu (2012), through an investigation, found that high-level athletes appear to be conflicted between study and competition, finding it difficult to balance the outcome of study with competition results.

Therefore, it is suggested to improve learning management systems so that students may properly improve athlete knowledge level and cultural accomplishment.

Li (2014) believes that so as to improve the effectiveness of high-level athlete general basic knowledge learning, that universities should establish comprehensive, strict, scientific management systems. The teaching team should familiarize themselves with high-level athlete learning processes as part of their personal professional development. High-level athletes themselves should clearly define their learning objectives and carry our future career planning efficiently.

(e) ***Logistics management***

Due to the requirements of the Ministry of Education's assessment rules for the construction of high-level sports teams in ordinary higher education organisations in 2010, the *per capita* funding of high-level sports teams is 15,000 Yuan per year, which is expected to match the training and competition needs of athletes. But the reality is as optimistic (Huang & Wang, 2012).

Miao (2011) pointed out that training conditions and funding for most universities that were running high-level sports teams, were not satisfactory. The number of venues and facilities were often insufficient, the conditions of venues and facilities were poor, and sometimes could not satisfy the training requirements of high-level sports teams. The best sports talents were often drawn to China's most famous higher learning orgnaisations like Peking University, Tsinghua University and Fudan University, resulting in a regional imbalance in the evolution of high-level sports.

Kang and Wan (2015) believe that it is difficult to guarantee athlete daily training in the absence of sufficient funding. Coach and athlete training subsidies are relatively low, training equipment is obsolete in some cases, and nutrition fails to reach proper

levels. All of this seriously hinders the improvement of high-level sports teams. This shortage of funds has seriously restricted the expansion of high-level sports teams in Chinese universities.

(f) ***Graduate and employment management***

Zhang and Zhai (2014) believe that high-level athletes ought to be well able to graduate and obtain degrees unless they have specific barriers, such as disciplinary violations. For some high-level athletes, their results may be perfect, but the process may take very long. Some high-level athletes in universities may take six to eight years before graduating. The employment rate of high-level athletes after university is relatively low. According to an investigation conducted by Sun (2017), the average initial employment rate of high-level athletes from Renmin University of China, Beihang University, Shandong Agricultural University, and Qingdao University was 67.6% in 2015, while the initial employment rate of the general population of other students in them was more than 90%.

Sports and employment guidance departments in universities should actively deal with the employment market, incorporating employment guidance throughout the whole education process and the entire university phase, in order to enhance employment skills training for high-level athletes, thus most likely generating a successful future employment environment. In the meantime, these athletes should be guided in dealing with both the adversities and opportunities of employment, by developing the correct attitude, with the intention of improving their psychological endurance (Zhu, He, & Xu, 2009).

2.5 High-level sports teams in Sichuan Province universities

Sichuan Province has trained many outstanding athletes in the field of competitive sports and is a critical component of the national Olympic strategy. With constant improvement on competitive sports levels in Sichuan Province, especially in the process of building a strong sports Province, the enhancement of high-level sports squads has become key to sustainable development of competitive sports (Yang & Hu, 2012). However, various concerns in the current training schema of high-level sports squads in ordinary universities hinder their development, these include training and transportation of reserve talents for competitive sports.

From the government documents over the years, we can establish the number of universities in China and Sichuan Province that were able to recruit high-level sports teams every year. As shown in Figure 2.5: the numbers of universities that recruited high-level athletes in Sichuan Province increased in line with growth in numbers of overall Chinese universities that could recruit high-level athletes.

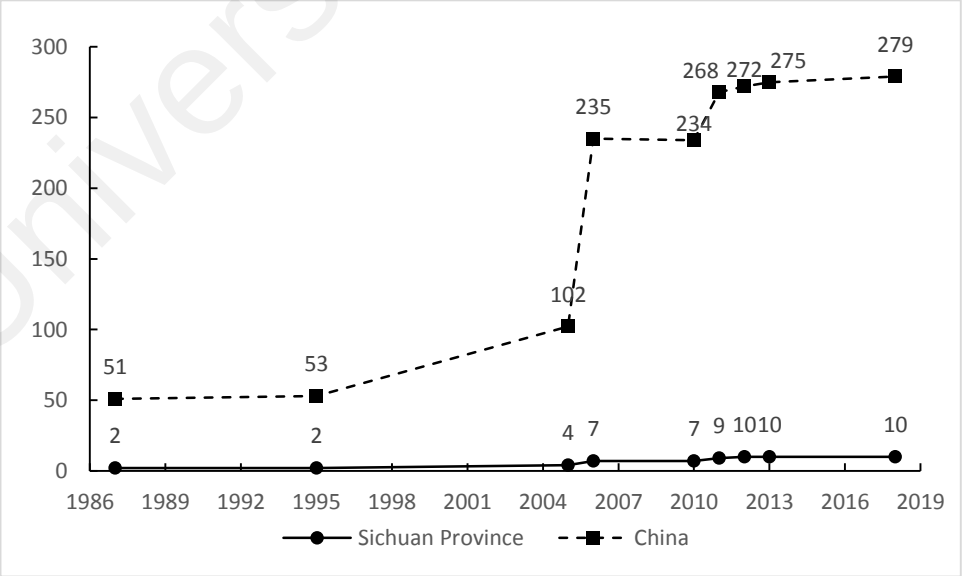


Figure 2.5: Comparison of the Number of Universities Recruiting High-level Athletes in Sichuan Province and China

It can be seen that in 1987, among the first batch of 51 universities in China to recruit high-level athletes, there were just two universities in Sichuan Province that were eligible to recruit high-level athletes. In 1995, of the 53 universities designated by the Ministry of Education to admit high-level athletes, Sichuan Province still had just two that were eligible. By 2005, 102 universities overall in China could recruit high-level athletes, while in Sichuan Province there were just four.

After nationwide evaluation in 2005, it was determined that 235 universities could recruit high-level athletes in 2006, including 7 in Sichuan Province. Following the 2010 nationwide evaluation, the Ministry of Education determined that 268 universities could recruit high-level athletes in 2011, of which 9 universities in Sichuan Province were qualified. In 2012, four new universities became eligible, and 272 universities were able to recruit high-level athletes, including one more in Sichuan. Thus, by then, 10 universities in Sichuan Province could recruit high-level athletes. In 2014, 275 universities recruited high-level athletes, and in 2018, 279 universities recruited high-level athletes. However, the numbers in Sichuan Province remained at ten.

Table 2.2: Sports Events Distribution of High-level Sports Teams in Sichuan Province Universities

Events / School	FB	VB	TN	SW	AT	AB	BB	ST	TD	TT	WS	DC
A	√	√	√	√	√							
B		√			√	√	√					
C	√		√			√	√					
D						√			√	√		
E								√				
F			√									
G	√						√					√
H											√	
I	√											
G	√		√	√	√		√					

Note:FB=Football;VB=Volleyball;TN=Tennis;SW=Swimming;AT=Athletics;AB=Aerobics;BB=Basketball; ST=Shooting; TD=Taekwondo; TT=Table Tennis WS=Wushu DC=Directional Cross-country

The amount of high-level sports crews in Sichuan Province higher level institutions has gradually increased over the years. The number has grown from 2 teams in 2 sports events in 1987 (Wang, 2012) to 28 teams in 12 sports events today (Chinese Ministry of Education, 2018). However, Table 2.2 shows the distribution of sports events in Sichuan Province universities is unbalanced.

According to the research of Chinese scholars, on one hand, Sichuan Province has made remarkable achievements in running high-level sports teams, but on the other, has experienced many problems. Firstly, the ultimate purpose of running the team seems to be unclear. It appears to lack foresight and there is an over eagerness for quick success and instant benefits. Secondly, there is a narrow perspective in the departments involved in enrollment, insofar as they appear to ignore the overall situation and not cooperate with each other. Thirdly, the relationship between training and learning appears not to be capably handled. Fourthly, there is an absence of systematic management and multiple failures in adherence to rules. The combination of all these factors seems to seriously hinder the purpose and successful task-execution of the team.

Du (2007), Guo, Wang, and Liu (2013), Jin and Xu (2009), Xie (2011), and Zhou (2015) believe that Sichuan Province has some very obviously apparent shortcomings in terms of funding, coach level, training conditions, competition opportunities and logistics support. Often, failure in making full use of abundant scientific and technological resources in universities, and not introducing advanced scientific theories and techniques into training are the main reasons preventing the rapid development of competitive sport in ordinary universities.

2.6 Customer satisfaction

According to Chinese government enrollment policy, high-level athletes in universities are primarily students, and then athletes. High-level athletes are recruited to

universities and receive higher education in China. According to International Standards Organization (ISO) 9000:2000, standard scientific research, design and development, and training and education are all included in the tertiary education service industry (Liu, 2011). The World Trade Organization (WTO) classifies service trades into 12 categories, of which the fifth is education. Therefore, based on customer satisfaction theory, this study combines student satisfaction and athlete satisfaction research, for the purposes of studying satisfaction of high-level athletes with their management systems.

2.6.1 Development of customer satisfaction

Theoretical scrutiny of customer satisfaction originated with the researching of consumer psychology at the beginning of the early 20th century. In 1965, Cardozo (1965), an American scholar, first introduced the notion of 'satisfaction' from the discipline of psychology, into the field of marketing, after which it became highly valued and generally recognized in academic circles. Afterwards, various academics have investigated customer satisfaction from a variety of different points of view.

Howard and Sheth (1969) proposed that customer satisfaction involves a cognitive state of emotion, concerned with if the service they experienced from purchasing was appropriate or not. Swan and Combs (1976) believe that customer satisfaction is a function of customer expectation and the perceived performance of products. Oliver (1981) thinks that customer satisfaction is a short-lived emotional reaction, which relies on the extent to which the expected product or service rewards are realized, along with the extent to which customer reaction expectations are accordant with actual results.

Cadotte, Woodruff, and Jenkins (1987) characterised customer satisfaction as the feeling that occurs following evaluating service or product usage. Tse and Wilton (1988) believe that customer satisfaction may be interpreted as a measurement from responding

to the perceived gap between what was expected and cognitive outcome. Westbrook and Oliver (1991) think that the emotional nature of satisfaction is defined as customers' subjective well-being and their consequent satisfaction, and *vice versa*. Parasuraman et al. (1994) believe that customer satisfaction is a function of service excellence, product excellence, and cost.

Kotler (1997) believes that customer satisfaction derives from the perceived effect on a purchaser from all items provided by an organization, including services, activities, processes and so on, and the feeling formed after comparing it with its expected value. Oliver (1997) contends that customer satisfaction comes from a psychological reaction to their needs and a judgment of their perceptions about the qualities of the offerings. or the degree to which the offerings meet their needs. Wong (2000) believes that general customer satisfaction is a kind of emotional state, and its evaluation level is affected by the usage effect.

Judging from these discoveries, the definition of customer satisfaction involves two representative viewpoints. Customer satisfaction may be defined by these two aspects: purchase-specific satisfaction, and general overall satisfaction. Anderson, Fornell, and Lehmann (1994) point out that purchase-specific satisfaction is a measurement of a customer's specific purchase behavior that emphasizes consumer experience. Cumulative satisfaction, or overall satisfaction is a measurement of the experience of a customer's long-term experience with a product or service, that emphasizes cumulative feelings about the purchase behavior.

2.6.2 The formation process of customer satisfaction model

In 1965, after studying customer expectations, efforts and satisfaction, Cardozo argued that customer satisfaction would likely result in repeat buying. Fishbein and Ajzen (1975) suggest that corporate service attitudes also affect customer buying behavior. Van

Hemel (1977) pointed out that customer satisfaction relies heavily on the level of which the customer's anticipated product benefits reached.

Oliver (1980) put forward a model of difference between performance and expectation. The model proposes that if performance exceeds customer expectation, it will increase customer satisfaction level and produce positive differences. If performance is lower than expected, it will lead to a decline in customer satisfaction and a negative difference. Kano, Seraku, Takahashi, and Tsuji (1984) pointed out that a company's product quality is closely related to the degree of customer satisfaction that results, and it is on this basis that the Kano model is proposed.

When Robinson and Fornell (1986) defined the connection between the state of consumer satisfaction and the process of commodity consumption, it resulted in customer satisfaction measurement evolving from a life concept, into a science concept in consumer psychology. This led to opening up a new era of theoretical research on customer satisfaction systems. Fornell (1989) proposed a model called the Fornell Model, which included econometric methods. This model uses partial differential least squares solution, and the index obtained is known as the customer satisfaction index (CSI).

In 1989, Fornell led a team to build the world's first national customer satisfaction index measurement model, the Swedish Customer Satisfaction Barometer (SCSB). In 1994, the United States officially launched the American Customer Satisfaction Index evaluation model, based on it.

In 1995, Taiwan, Canada, New Zealand, along with additional nations started checking customer satisfaction in various businesses. From 1998, South Korea, Malaysia, Brazil, Mexico, Australia, and Argentina, amongst others, have formulated and carried out relevant research on customer satisfaction evaluation. In 2000, Europe began to

gradually establish a European customer satisfaction index evaluation model. From this point, customer satisfaction became established as a systematic, theoretical science.

2.6.3 The evaluation models of customer satisfaction

Consumer satisfaction is a concept in economic psychology, which evaluates the condition of products and services against customers consumption experience. Customer satisfaction is regarded as a latent variable that cannot be directly observed. It has to be measured using multiple indicators in its evaluation. The measurement result is the score of latent variables, which may be utilized to measure customer satisfaction against various departments, business organizations, industries, countries, regions and so on.

Typical national customer satisfaction index models comprise the Swedish Customer Satisfaction Barometer Model (SCSB), the American Customer Satisfaction Index Model (ACSI), the European Customer Satisfaction Index Model (ECSI), and the China Customer Satisfaction Index Model (CCSI) (Liu, 2011). According to the causal relationship between model variables, each model can be separated into three parts: customer satisfaction causes, actual customer satisfaction, and customer satisfaction results (Zhang, 2011).

2.6.3.1 The Swedish Customer Satisfaction Barometer Model

The Swedish Customer Satisfaction Barometer model created by University of Michigan Professor Fornell during 1989, became the earliest national customer satisfaction index model. His research results are considered to be the most longstanding and widely used customer satisfaction index theory by far. The SCSB is formulated as a structural equation model composed of 5 latent variables and 10 measurement variables, comprising in part: expectation of customer, perception of performance, perception of value, satisfaction of customer, complaints of customer and loyalty of customer. Amongst

these, customer expectation and performance perception make up the cause variables, while customer complaints along with customer loyalty make up the result variables. As shown in Figure 2.6:

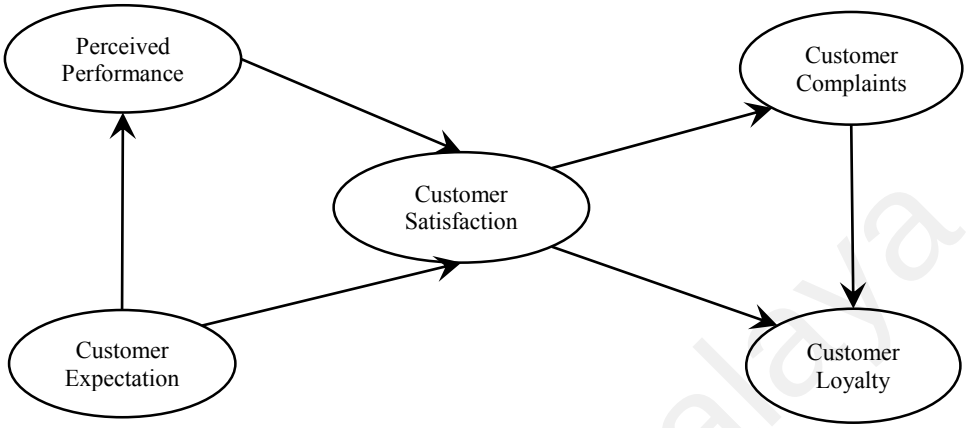


Figure 2.6: The Swedish Customer Satisfaction Barometer Model

2.6.3.2 American Customer Satisfaction Index Model

The American Customer Satisfaction Index Model was established during 1994. The ACSI was a revision derived from the SCSB model and is now the most widely used customer satisfaction index model across lots of regions and countries. As this is the case, this study also adopts the ACSI framework as its theoretical model. It has six latent variables along with a total of 14 measured variables. In the structural model, expected quality, quality perception and value perceived become antecedents of customer satisfaction. Complaints of customers and loyalty of customers become outcome variables of customer satisfaction. The specific model may be seen in Figure 2.7

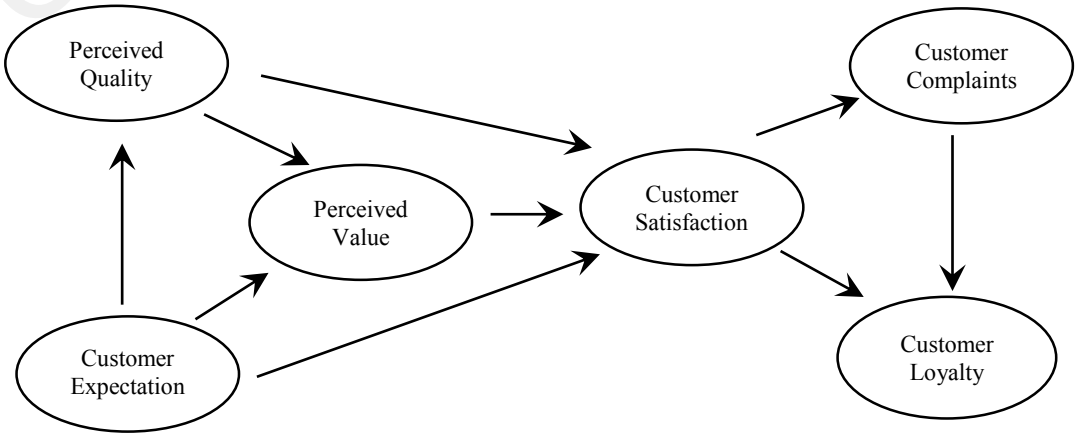


Figure 2.7: The American Customer Satisfaction Index (ACSI) model

2.6.3.3 European Customer Satisfaction Index Model

The European Customer Satisfaction Index Model is a structural equation model that was devised in 1999, founded on both the SCSB model as well as the ACSI model. It contains 7 latent variables with a total of 20 explicit variables. See Figure 2.8.

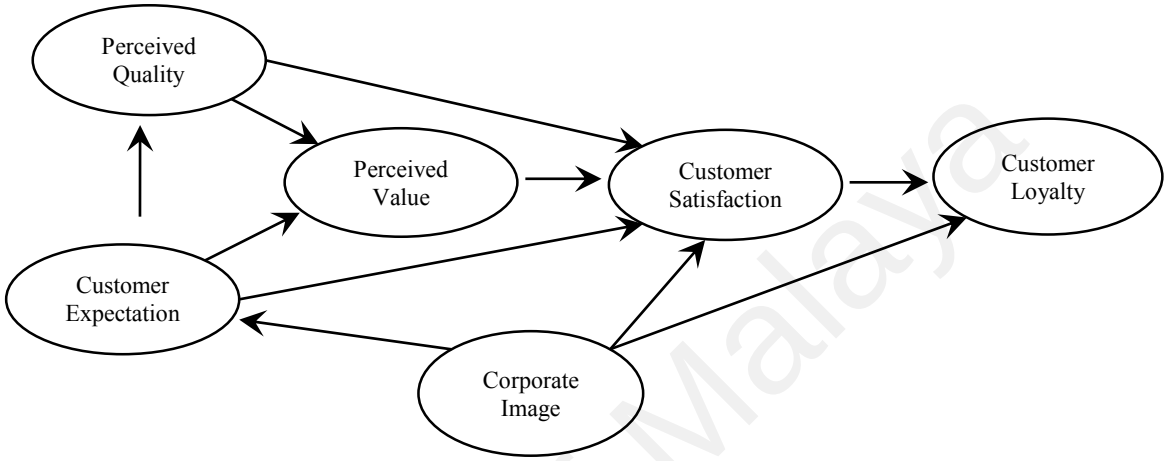


Figure 2.8: European Customer Satisfaction Index Model

2.6.3.4 China Customer Satisfaction Index Model

Based on ACSI and drawing upon advantages of ECSI, the China Customer Satisfaction Index Model came about in 2001 by Tsinghua University China Enterprise Research Centre. The model also adopted the expression form of structural equation. The model contains 6 latent variables and is measured by 18 explicit variables, seen in Figure 2.9.

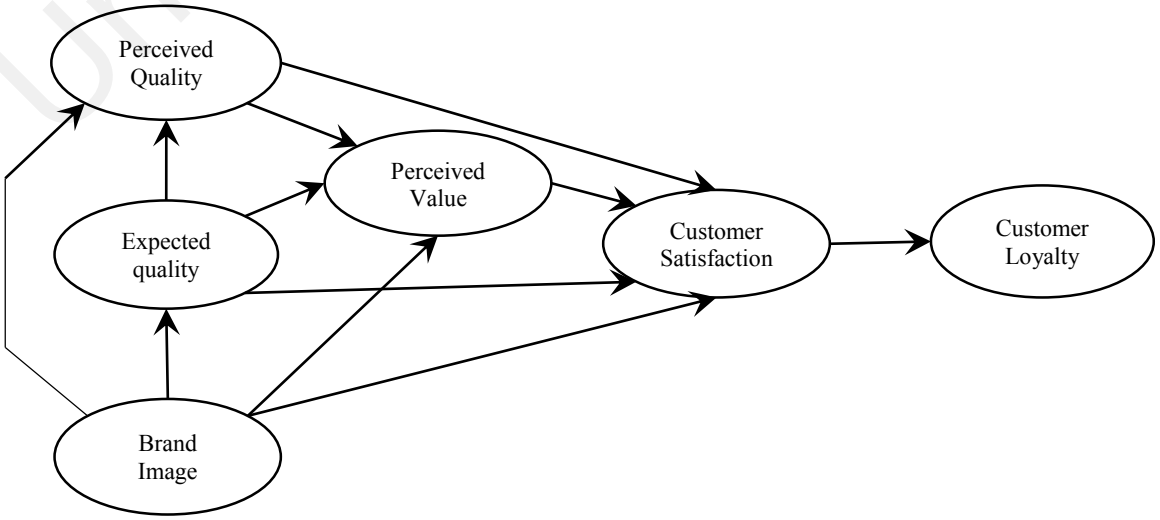


Figure 2.9: Chinese Customer Satisfaction Index Model

2.6.4 Research on customer satisfaction

Siddiqi (2011) conducted a questionnaire survey on 100 retail-banking consumers for analyzing relationships across service quality attributes, customer satisfaction and customer loyalty in the Bangladesh retail-banking sector. The results showed that in this specific retail banking environment, the quality of all service attributes were related positively to satisfaction of customers and that satisfaction of customers was related positively loyalty of customers. Based on ACSI, Shen (2011a) proposed the evaluation index system for economy hotel customer satisfaction, as a response to the demand structure of budget hotel customers. He constructed a corresponding conceptual model and verified the practicability and effectiveness of it through empirical research.

Li and Jiang (2011) used the questionnaire survey method to conduct a satisfaction survey on BRT passengers in Guangzhou. The results showed that the characteristics of high frequency, high speed, and car environment are the main factors affecting BRT passenger satisfaction. Khan (2012) conducted an e-mail questionnaire survey, measuring customer satisfaction and customer loyalty, to test how important customer loyalty was to future relationships with Pakistan's telecommunications industry. Outcomes showed customer satisfaction was significant, but customer retention did not significantly effect customer loyalty. Duan (2013) combined research results of customer satisfaction with theory and method of structural equation modeling, and after model having conducted empirical research, proposed a cultural theme hotel customer satisfaction evaluation, from the perspective of customer behavior.

Ilias, Adamantia, Michail, and Vassilios (2014) tested the moderating effect of experience in the conceptual model for estimating repurchase intention, by using structural equation model and multiple sets of analysis. Empirical research shows that previous involvement has an influencing effect on the relationship between performance

expectations and satisfaction, and on satisfaction and repurchase intention. Previous customer experience heightens the relationship across performance expectations and satisfaction, while weakening the relationship across satisfaction and repurchase intention. Zeng and Wang (2015) put forward a fuzzy evaluation model of customer satisfaction with online takeaway ordering, comparing online with offline through studying customer satisfaction evaluation systems and factors in the catering industry. The model analyzes four factors influencing customer satisfaction with online takeout, namely: food factor, price factor, service factor, and convenience factor. Of these, food factor had the most significant effect on customer satisfaction.

Peng, Li, and Chen (2016) introduced customer satisfaction theory into evaluation of Chinese professional tennis events and constructed a conceptual model for an audience satisfaction index for large tennis events. The model was analyzed using structural equation modelling. According to the results, the Wuhan Tennis Open should strengthen overall marketing, system marketing, and combined marketing of the event, and improve the incentive and after-sales service systems. Ngo and Nguyen (2016) used 261 samples to carry out an empirical analysis on the relationships between customer satisfaction, service quality, and customer loyalty in the retail-banking environment. Investigation revealed customer satisfaction and service quality brought about customer loyalty, while customer satisfaction regulated effects of service quality on loyalty of customers.

Rahimi and Kozak (2017) used a qualitative approach to exploring the overlap within customer expectations and manager perceptions of customer relationship management applications. The survey results showed that no matter what happened, price/performance ratio and core products still played a vital role in overall customer satisfaction with budget hotels. This demonstrates the need to combine management and customer perspectives on customer relationship management, to optimize customer value

by way of delivery and experience. Ali and Kaur (2018) used the American Customer Satisfaction Index (ACSI) model as a concept model to investigate customer satisfaction with third-party logistics (3PL) services in New Delhi and its hinterlands and implemented a satisfaction model for the 3PL industry from the perspective of users.

2.6.5 Customer satisfaction questionnaire

The most commonly used customer satisfaction questionnaire nowadays is the ACSI (Liu, 2011). It incorporates 6 facets and 15 items as follows:

Customer expectation: Item 1: Before purchase: general quality expectation. Item 2: Before purchase: customization expectation/personal requirement product-fit. Item 3: Before purchase: reliability expectation/frequency of failure.

Perceived quality: Item 4: After purchase: quality experience general evaluation. Item 5: After purchase: customization experience evaluation/personal requirement product-fit. Item 6: After purchase: reliability experience evaluation/ frequency of failure.

Perceived value: Item 7: Quality rating at the price. Item 8: Price rating given quality customer satisfaction (ACSI). Item 9: Overall level of satisfaction. Item 10: Disappointed expectancy (actual performance fails to meet/exceeds expectations). Item 11: Actual performance as against what the customer's ideal product or service might be in the same category.

Consumer complaint: Item 12: If there been a formal or informal customer complaint about the product or the service?

Customer loyalty: Item 13: Prospective re-purchase rating. Item 14: Increased price tolerance if repurchase. Item 15: Decreased price tolerance to induce re-purchase.

2.7 Student Satisfaction

Student satisfaction results from evaluating the gap between student expectation of school service excellence, and actual performance. From the student perspective, satisfaction evaluation expresses student evaluation of products and services they use or purchase and is a way for them to exercise power as consumers of higher education.

2.7.1 Development of student satisfaction

Havner (1984) believed student satisfaction was the student subjective appraisal of their educational institution, that is, a judgment reached after comparing perceived benefits that should be present with those that are present, based on interaction with specific institutional factors and the overall institution. Bean and Metzner (1985) suggested that student satisfaction was a kind of 'grading' to understand the degree to which students were pleased with and interested in, their courses. Chadwick and Ward (1987) argued that student satisfaction was the student's likelihood of recommending the school to future students. Oliver and Desarbo (1989) considered that student satisfaction was the quantum of student preference for subjective appraisal of educational results and encounters.

Hatcher, Kryter, Prus, and Fitzgerald (1992) concluded that student satisfaction indicated the level of attractiveness, glory affection students felt towards their school. Danielson (1998) defined student satisfaction as the attraction, pride or positive emotion that students had towards their school. Yang, Shui, Li and You (2003) thought that student satisfaction was a general emotional thought or view, of various aspects of study and life. Delucchi (2003) contended student satisfaction was a subjective experience of the student during school and the perceived value of the educational experience. Brown (2005) suggested that satisfaction would arise when students concluded that their needs had been met.

2.7.2 Research on student satisfaction

In recent years, much research on student satisfaction has been carried out, and some scholars have emphasized its importance. Hatcher et al. (1992) examined and found a positive correlation between respect for student achievement, and student satisfaction levels. Soutar and McNeil (1996) argued that student perceived quality of service could be measured in two dimensions, academic and non-academic. Browne, Kaldenberg, Browne, and Brown (1998) discovered students' general satisfaction with a university was determined by the curriculum and other factors associated with the curriculum. Palacio, Meneses, and Pérez Pérez (2002) conducted a study of Spanish university students and found that the image and reputation of a university affected students' satisfaction levels.

Mai (2005) argued that students' general perception of the school and the general perception of the quality of education impacted most on satisfaction. Mercedes, Marta, and Pilar (2005) investigated satisfaction of Spanish university students with their university education. The research results showed that teaching staff, teaching methods and curriculum management were the key factors in achieving student satisfaction and loyalty. Hasan, Ilias, Rahman, and Razak (2008) researched quality of service and satisfaction of students and found that there was a significant positive correlation between them. Hameed and Amjad (2011) found that staff, teachers, and classes had a significant impact on satisfaction of students. Ahmed and Masud (2014) conducted a quantitative survey of Malaysian universities and used structural equation models to study key factors in service quality. The results showed that academic feedback and administrative services had no direct impact on satisfaction, but that there existed positive correlation between these and satisfaction.

2.7.3 Student satisfaction measurement model

Much research on student satisfaction has been carried out thus far. Researchers have developed different student satisfaction evaluation models from different perspectives. For examples: Student Satisfaction Guarantee Model (SSG), Conceptual Model for Assessing Student Satisfaction (CMASS), Chinese Higher Education Student Satisfaction Index Model (CHESSI) and Student Satisfaction Index model for the Higher Education Institutions (SSIHEI).

2.7.3.1 Student Satisfaction Guarantee Model

Gremler and McCollough (2002) designed a student satisfaction assessment model from the perspective of improving student satisfaction with teaching results. The model included overall guarantee attitude, instructor evaluation, overall course evaluation, guaranteed learning objectives, self-evaluation. The model is shown in Figure2.10.

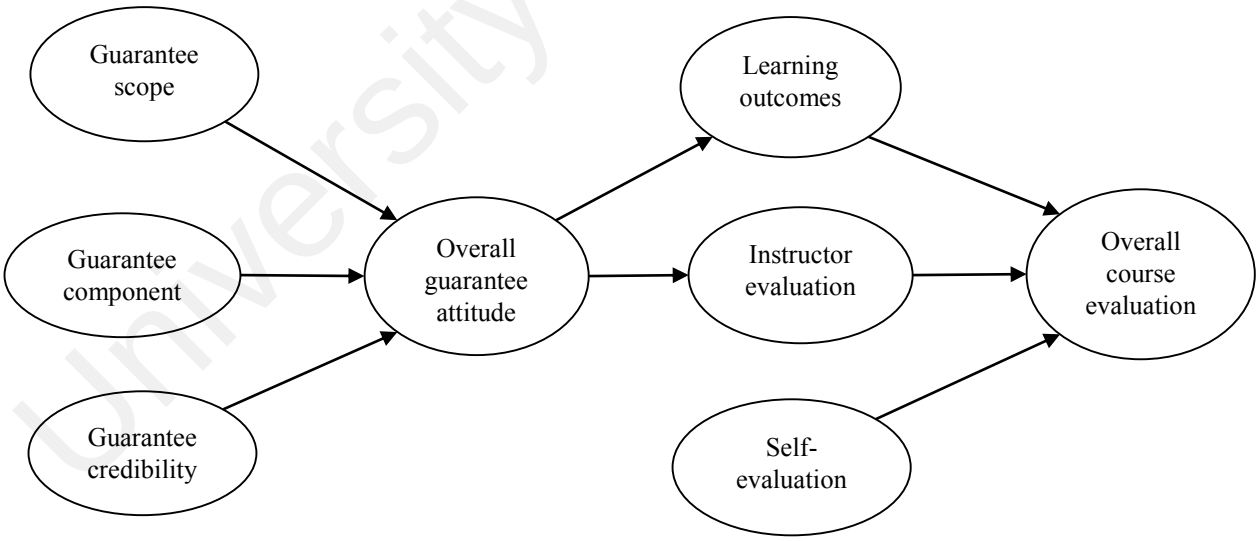


Figure 2.10: Student Satisfaction Guarantee Model

2.7.3.2 Conceptual Model for Assessing Student Satisfaction

Mavondo, Tsarenko, and Gabbott (2004) designed a satisfaction concept evaluation model to improve student satisfaction in teaching, learning, technology, library, student service, and student orientation. The model is shown in Figure 2.11:

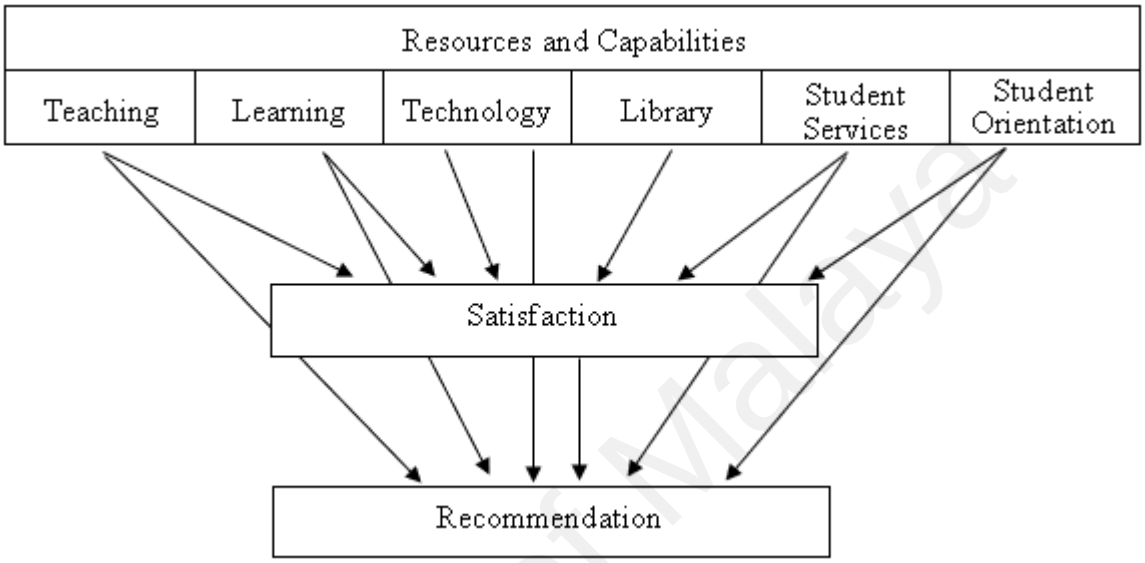
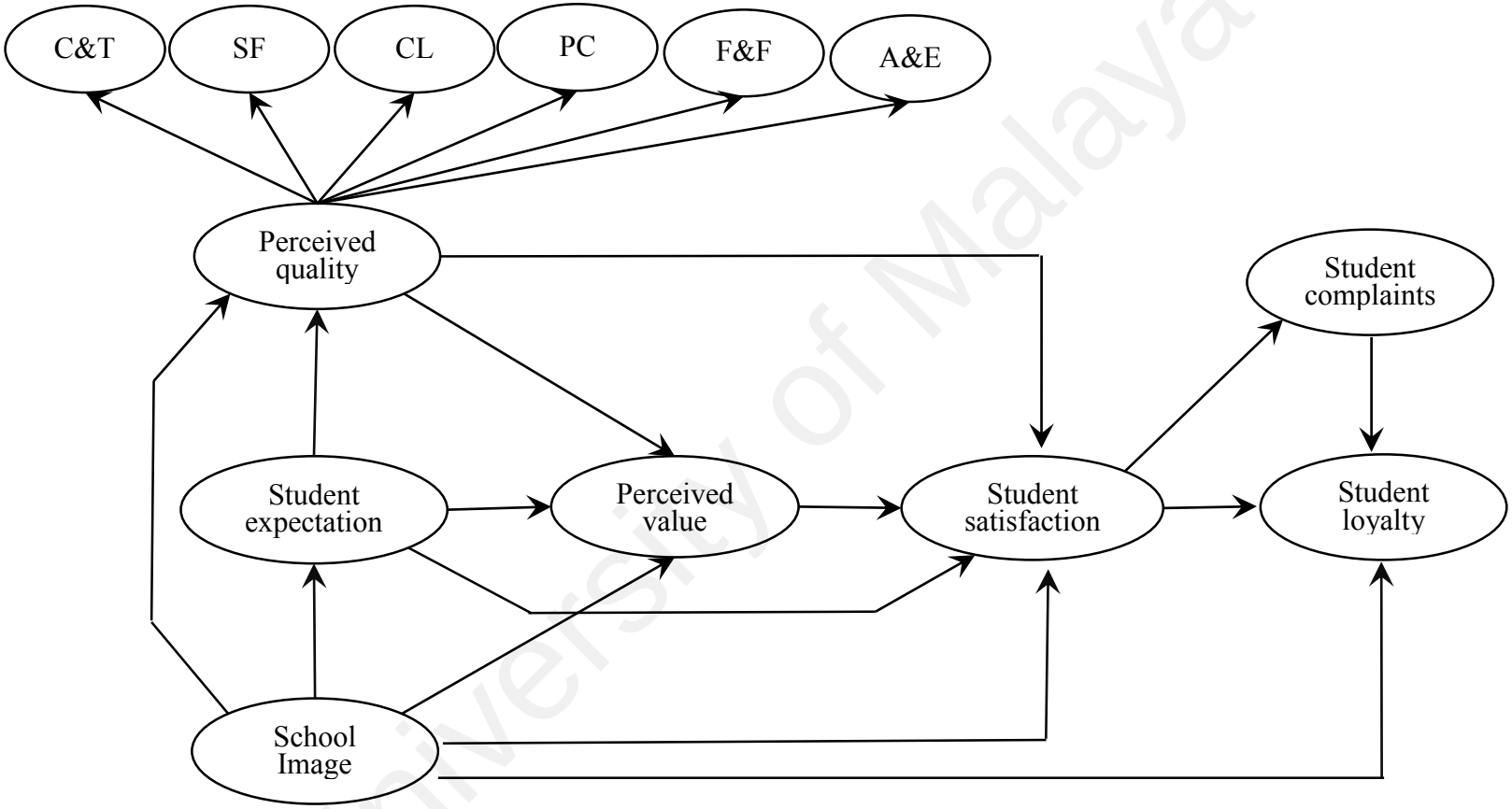


Figure 2.11: Conceptual Model for Assessing Student Satisfaction

2.7.3.3 Chinese Higher Education Student Satisfaction Index Model

Research on university student satisfaction is mainly concentrated in the United States. The construction of American student satisfaction assessment theory is based on market economy consumer theory. The National College Student Satisfaction Survey began in 1994 and is conducted annually. Liu (2011) drew lessons from the structural forms of SCSB and ACSI and based on this and the work of other scholars, and having conducted an empirical study in 10 universities in Jiangsu Province, implemented a model for student satisfaction measurement of Chinese higher education. There are seven latent variables in the model, as shown in Figure 2.12.



Notes: C&T=Curriculum and teaching, SF=Service Facilities, CL=Campus Life, PC=Personal Care, F&F=Fees and Funding, A&E=Admission and Employment

Figure 2.12: Chinese Higher Education Student Satisfaction Index Model

2.7.3.4 Student Satisfaction Index (SSI) model for Higher Education Institutions

Temizer and Turkyilmaz (2012) designed the Student Satisfaction Index (SSI) model for Higher Education Institutions based on ECSI, carrying out an observational study of private university scholars using the PLS technique. The results help in showing useful strategic advice for managers and for researchers of HEIs, about issues affecting loyalty and satisfaction of students.

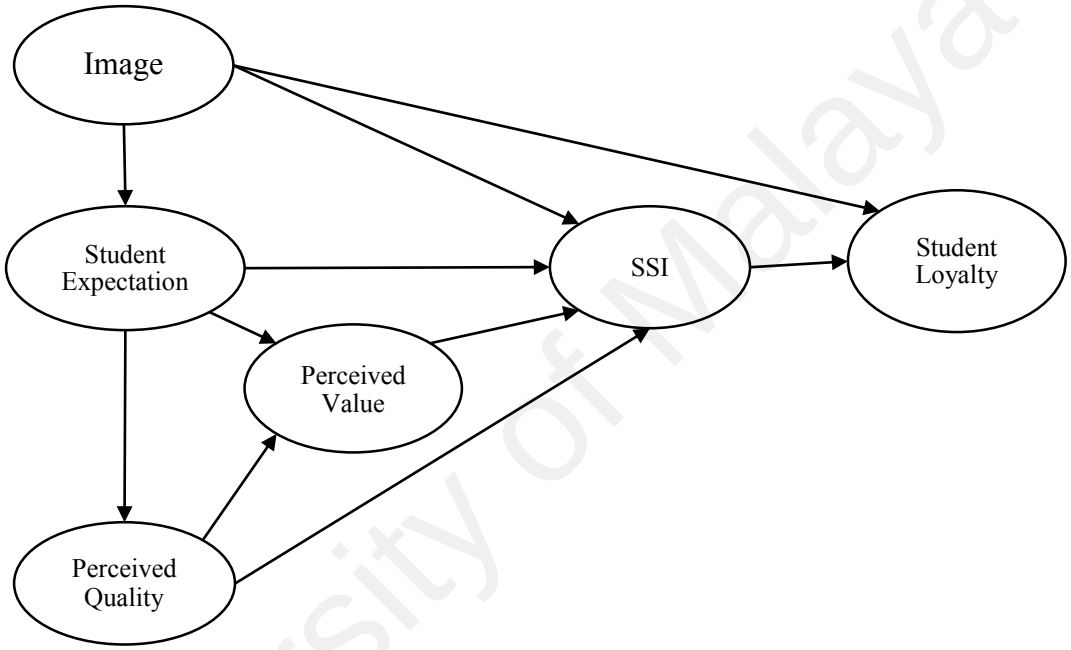


Figure 2.13: Student Satisfaction Index (SSI) model for Higher Education Institutions

2.7.4 Student satisfaction questionnaire

The Student Satisfaction Inventory (SSI) is a forerunner instrument for the Noel-Levitz Satisfaction Priorities Survey. It is mostly involved in measuring typically aged students following undergraduate programs. However, several institutions also use it to measure graduate-level students (Elizabeth City State University, 2009). The SSI reports incorporate average importance and average satisfaction scores. Along with these, a performance gap is measured by deducting the satisfaction score from the importance score. When the performance gap is large, the discrepancy between what students expect and their level of satisfaction becomes greater, and *vice-versa* (Bryant, 2006). According

to (Kao, 2003), SSI has a total of 73 items divided into 11 scales, as well as items not on a scale, such as student centeredness (6 items), campus life (15 items), effectiveness of instruction (14 items), effectiveness of recruitment and effectiveness of financial aid (6 items), provision of campus support services (7 items), effectiveness of academic advising (5 items), registration effectiveness (5 items), health and safety (4 items), consideration for the individual (6 items), service excellence (8 items), campus atmosphere (17 items), and items not on a scale (2 items). An item can be used in different scales, the scales and items included are shown in table 2.3.

Table 2.3: Scale and Items of Student Satisfaction Inventory

Scale	Items included
Student Centeredness	1，2，10，29，45，59
Campus life	1，2，3，7，29，37，41，45，51，57，59，60，62，66，67
Instructional Effectiveness	3，8，16，25，39，41，47，53，58，61，65，68，69，70，
Recruitment and Financial Aid Effectiveness	4，5，12，17，43，48
Campus Support Services	13，18，26，32，44，49，54
Academic Advising Effectiveness	6，14，19，33，55
Registration Effectiveness	11，20，27，34，50
Safety and Security	7，21，28，36
Concern for the Individual	3，14，22，25，30，59
Service Excellence	2，13，15，22，27，57，60，71
Campus Climate	9，23，24，30，31，38，40，42，46，52，56，63，64，67，73，
Items not on a scale	35，72

2.8 Athlete Satisfaction

Athlete satisfaction refers to an emotional state formed by a series of complicated evaluations of the organization, processes, and results related to their own sports experience. Satisfaction is closely related to athlete performance. Firstly, satisfaction, as an attitude, directly affects athlete behavior. Secondly, satisfaction, as an emotional response, has a direct impact on an individual's mental health. Finally, athlete satisfaction

can be used as a reference for coaches to adjust coaching behaviors and improve their training results. At the same time, it can be used as a diagnostic tool for sports organization management, which can promote communication among coaches, sports organizations and athletes, and increase team morale and cohesion.

2.8.1 Development of athlete satisfaction

Athlete satisfaction refers to the positive perception or feeling obtained by athletes, after a series of complicated evaluations of their sports organization, its processes, and their results during participation in training. This positive perception or feeling originates from satisfying individual conscious or subconscious needs, according to Riemer and Chelladurai (1995). Chelladurai and Riemer (1997) define athlete satisfaction as 'the positive affective state that arises when an athlete evaluates the structures, processes and outcomes that are related to the athletic experience'. That is to say, an athlete's satisfaction level reflects the extent to which athletic endeavor meets the athlete's personal standards.

2.8.2 Research on athlete satisfaction

Neu (1993) pointed out that task types, criteria, selection methods, self-esteem, sensory control, life satisfaction, motivation, performance, gender, age, along with decision-making behavior of their favorite coach, can all affect athlete satisfaction. Park (1998) pointed out that factors affecting athlete training satisfaction included training venues, training equipment, financial support, coaching skills, coaching methods, and coaching leadership. Amongst these, the coach's leadership style had the greatest impact on athlete satisfaction. Baker, Yardley, and Côté (2003) found that older athletes showed higher satisfaction with coaches than younger athletes, and male athletes had higher satisfaction than female athletes. In a questionnaire survey of 307 juvenile sports school athletes, Tian, Zhao, Zhao, Li, and Wang (2004) found that academic satisfaction and

sports satisfaction of juvenile athletes are at a medium level. In order to improve athlete sports satisfaction, there are two critical aspects. Firstly, improving current academic level and secondly, improving future level of sports.

Unruh, Unruh, Moorman, and Seshadri (2005) thought that athletes who perceived that their trainers were willing to listen to them and were interested in what concerned them, were likely to demonstrate a higher level of satisfaction. According to Papaioannou, Ampatzoglou, Kalogiannis, and Sagovits (2008), athlete satisfaction is a determinant of goal achievement along with approval of social agents such as coaches, parents, and teammates. Burns, Jasinski, Dunn, and Fletcher (2012) analyzed data from 175 National Collegiate Athletic Association (NCAA) student athletes. They discovered that social identity as an athlete and negative affectivity were positively related to satisfaction of athletes, while the exclusivity element of athletic social identity was negatively related to athlete satisfaction. García-Calvo et al. (2014) believed that how coach-created task climate was created, was positively related to perceived cohesion as well as to player satisfaction with their level of team-participation. They also fund that perceived peer-created task climate was positively related to perceived cohesion.

Hoffmann and Loughead (2016) reported that athletes who had been peer-mentored well, were deemed to be significantly more satisfied than those who were not, from the perspectives of: personal dedication, individual performance, team social contribution, team task contribution, team integration, ability utilization, ethics, and training and instruction. Din, Rashid, and Noh (2016) stated that aspects of coaching leadership methods, instruction and training, were major influences on all athlete satisfaction responses.

2.8.3 Athlete satisfaction measurement model

2.8.3.1 Classification of Facets of Athlete Satisfaction Model

Chelladurai and Riemer (1997) stressed the irreproducibility of athletic teams, and developed a hypothesis for calculating athlete satisfaction, emphasizing that it could be used as a measure of organizational effectiveness. Each facet is classified by three criteria. Fistly, if it is task- or social-related, secondly, if it is an outcome or a process, and thirdly, if it affects the individual or the team. The relationships between the three criteria and levels of satisfaction are shown in Figure 2.14.

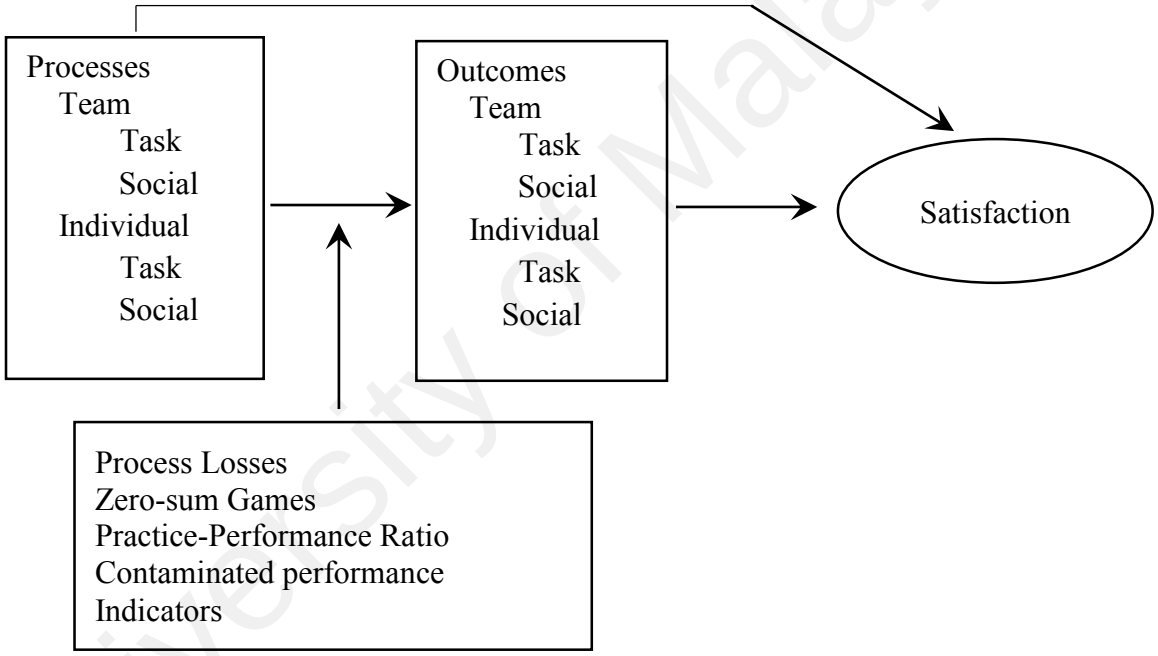


Figure 2.14: A Classification of Facets of Athlete Satisfaction Model

2.8.3.2 Model for the Effects of Coaches' Behaviors and Burnout on the Satisfaction and Burnout of Athletes

Altahayneh (2003) investigated the connection between coaches burning out and their behaviors, along with the level of burnout or satisfaction felt by college athletes. Data were analyzed using normal descriptive statistics, with Pearson product-moment correlation coefficients, as well as stepwise regression. Significant relationships were found to exist between perceived coaching behaviors and athlete outcomes.

Athletes who were more satisfied and less burnt out perceived their coaches as offering more training and instruction, social support, feedback, and being more democratic behavior and less autocratic in their general behavior,. As may be seen in Figure 2.15.

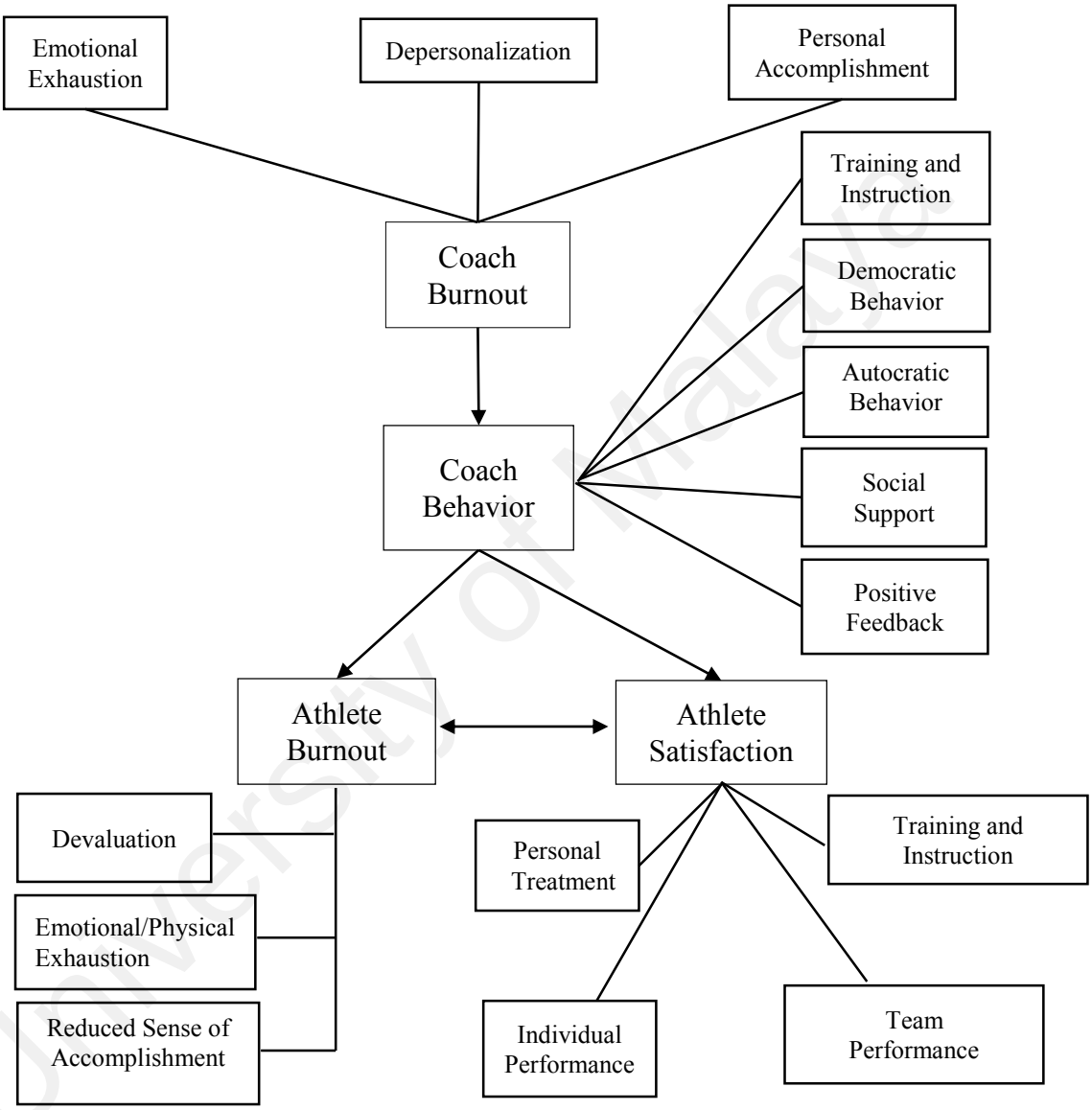


Figure 2.15: The proposed model for The Effects of Coaches' Behaviors and Burnout on the Satisfaction and Burnout of Athletes

2.8.4 Athlete satisfaction questionnaire

The most commonly used survey of athlete satisfaction now is Athlete Satisfaction Questionnaire (ASQ) (Xie & Yao, 2006) devised by Chelladurai and Riemer (1997). The ASQ assesses the most notable qualities of athletic satisfaction by differentiating between performing, leadering, team-work, organizing, and the individual athlete's perception

(Smith, 2010). It comprises 15 facets and 56 items: individual performance, involving three items; team performance, involving three items; ability utilization, involving five items; strategy, involving six items; personal treatment, involving five items; training and instruction, involving three items; team task contribution, involving three items; team social contribution, involving three items; ethics, involving three items; team integration, involving four 4 items; personal dedication, involving four 4 items; budget, involving three items; medical personnel, involving four items; academic support services, involving three items, and, external agents, involving four items (Chelladurai & Riemer, 1997).

2.9 Summary

This chapter introduced different scholarly views on how to define customer satisfaction and on how customer satisfaction research was related. It also described several major customer satisfaction measurement models. Then it introduced definitions of student and athlete satisfaction along with related research. It briefly introduced models used in research. Finally, it introduced high-level athlete management systems and Chinese scholarly research. Through the information in this chapter, it is possible to understand the theoretical foundation for the following chapters.

CHAPTER 3: METHOD

3.1 Introduction

The primary objective of this chapter is to elucidate the research design principles and the methods utilized to attain the research goals. This study mainly examines sample selection and data collecting methods, and it also describes the formation of the initial questionnaire along with the process of revising it into a formal questionnaire. Aspects of content validity and face validity along with internal consistency reliability of the questionnaire were tested, and exploratory factor analysis was carried out. Finally, a formal evaluation model and a questionnaire for the main study were formed.

3.2 Research Design

This study adopts the quantitative research method in evaluating satisfaction of high-level athletes with their management systems in Sichuan Province universities. Correlational research is employed to analyze the relationship between variables in the satisfaction model. The satisfaction evaluation questionnaire of high-level athlete management systems was developed based on ACSI and the findings of Chen (2007), , Riemer and Chelladurai (1998),Ye, Zhou, and Yu (2013), Yu (2014), and Zhan (2007). The initial questionnaire was set up using a 5 Point Likert Scale. For the purpose of preventing inertia score of high-level athletes, some reverse questions were added to the questionnaire. According to Tu, Lv, and Li (2013), completed questionnaires that result in any of the following three conditions are regarded as invalid questionnaires, and should be excluded: (1) results of all options in the questionnaire are consistent; (2) although results of options in the questionnaire are inconsistent, they are obviously arranged regularly; (3) missing value is greater than 11% in individual cases.

In order to verify content validity and surface validity, 4 experts were invited to evaluate both. Five high-level athletes were then invited to test the questionnaire face validity. Statistical Product and Service Solutions (SPSS) version 24.0 was subsequently employed to analyze the result and test questionnaire reliability and validity. Then, in building the high-level athletes satisfaction evaluation model, exploratory factor analysis was employed on perceived management quality satisfaction to verify the amount of secondary latent variables. Finally, a main study on satisfaction of high-level athlete management systems in Sichuan Province universities was conducted, and confirmatory analysis and correlation analysis among various variables were carried out using Smart PLS 3. Arising from measurement variable scores, an importance-satisfaction matrix of measurement variables was constructed, so as to discover where high-level athlete management systems needed to be improved.

3.3 Questionnaire validation procedure

Analytical means and methods in the questionnaire validation procedure comprise: instrument development, exploratory study, measurement model, and structure model (Esfahani, 2014; Lu, Lai, & Cheng, 2007) . As shown in Table 3.1.

Table 3.1: Analytical Steps in the Current Study

Step 1: Instrument Development
➢ Literature review
➢ Theoretical basis
➢ Content validity through panel of experts
➢ Face validity through pre-testing
Step 2: Exploratory Study
➢ Pilot study
➢ Corrected item-total correlation
➢ Reliability through Cronbach's alpha
➢ Exploratory factor analysis
➢ Revision
Step 3: Measurement Model
➢ Preliminary data analysis

Table 3.1, Continued

➢ Convergent validity ➢ Discriminant validity ➢ Construct reliability
Step 4: Structure Model
➢ Path analysis ➢ Coefficient of determination--R^2 ➢ Effect size--f^2 ➢ Predictive relevance--Q^2 ➢ Mediation analysis ➢ Importance-Performance Map Analysis

Adapted from (Esfahani, 2014; Lu et al., 2007)

3.4 Sample Selection

Sample size is critical as it is intended to represent the targeted population and if correct, will more likely result in reliable outcomes. If it is smaller than the anticipated size, the chance of failure convergence, lower parameter accuracy, and improper solution increases, according to Comrey and Lee (1992). On the other hand, bigger than necessary sample size wastes money and time while getting participant responses (Bell & Bryman, 2007; Zikmund, 2003). In this study, sample size is calculated by taking into account the requirement for structural equation modeling (SEM) using PLS-SEM (Partial Least Squares-SEM), which does not require a large sample size compared to CB-SEM (Covariance Based-SEM).

Hair, Hult, Ringle, and Sarstedt (2014) recommend that the minimum sample sizes should multiply by ten the highest amount of arrowheads facing a latent variable anywhere in the PLS path model. According to this standard, in the structural equation model employed in this study, the latent variable satisfaction of high-level athletes had the largest number of arrowheads pointing to the construct. Therefore, the minimum number of samples used in this study could be 30. Hair et al. (2014) also recommended using G*Power and multiple regression as an alternate method for calculating sample size

for PLS-SEM. Using G*Power 3.1 with an effect size of 0.15 and power of 0.80 produced a sample size of 77 (Sparks, 2014).

However, according to Krejcie and Morgan (1970), if the total number of test subjects is known, then the necessary representative sample size of a given population can be calculated. As of June 2018, a total of 10 universities in Sichuan Province have high-level athlete enrollment qualifications, but the director of one of them did not agree to participate in the investigation, resulting in 607 high-level athletes from 9 Sichuan Province high schools. As can be seen, only data from nine universities can be obtained. The formula of $S = \frac{X^2 \mathrm{NP}(1-\mathrm{p})}{d^2(N-1)+X^2P(1-P)}$ can be used to calculate necessary sample size (Krejcie & Morgan, 1970). S = required sample size, X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (1.96^2=3.841), N = the population size, P = the population proportion (assumed to be .50 since this would provide the maximum sample size), and d = the degree of accuracy expressed as a proportion (.05).

Here, a size of 236 subjects sufficed to represent the whole high-level Sichuan Province athlete population. According to Connelly (2008), a pilot study sample ought to be 10% of the sample expected for the larger parent study. Hence, the pilot study of the current research needed a minimum 24 sample size. This research was designed to obtain a minimum sample size of 24 for the pilot study and a minimum sample size of 236 for the final study, so as to comply with the most prescriptive requirements.

A stratified random sampling method was utilised here to select samples. Firstly, according to the school attributes, the minimum number of samples that each school should obtain was calculated. Then, each school was stratified according to their sports specialty attributes, and a minimum number of samples that each school needed to obtain for each sports specialty was calculated. As shown in Table 3.2, the overall number and

the sample number of high-level athletes in various Sichuan Province universities are shown in table 3.2:

Table 3.2: Stratification and Collection of Samples

School Code	Number of high-level athletes	Minimum number of samples	Actual number of samples	Number of valid samples
A	150	59	75	61
B	95	36	54	43
C	65	25	36	29
D	105	41	58	46
E	8	3	7	6
F	88	34	44	36
G	27	11	15	12
H	41	16	22	18
I	28	11	16	13
Total	607	236	327	264

3.5 Data Collection

Pilot study data were collected from 10th to 31th January 2018. Data of the main study were collected from 4th June to 31th July 2018. Data collection for this study was carried out on an internet service online questionnaire system known as Wen Juan Xing (www.wjx.cn). The popularity of smartphones and WeChat in China made it easier to distribute the study questionnaire. After having obtained consent confirmation letters from high-level sports team directors, coaches of each sports specialty were contacted and asked to send a link for the online questionnaire to their high-level athlete WeChat groups. High-level athletes could access and complete the questionnaire by clicking on the link. To ensure validity, the questionnaire system was set up with the following safeguards before it was published: only WeChat could be used to answer it, and each mobile phone could only access one questionnaire.

When the high-level athlete clicked on the questionnaire link, the first thing seen was research information and a participation consent form. Participants could decide to

respond to or withdraw from the questionnaire. Should they have chosen to respond, a 'submit' button was available after completion. If there were any missed questions, the system would automatically remind participants to respond to that question. The aim of this was to reduce the occurrence of missing values. The number of valid questionnaires was checked by screening for completed questionnaires and had the number of valid questionnaires not reached the minimum required sample number it was planned that one week after the initial transmission of the questionnaire link, the coach would again be reminded to send the information containing the questionnaire link, until sufficient data was received. When the amount of valid questionnaire reached or exceeded the required size, the questionnaire filling function automatically closed. Ultimately, a total of 83 questionnaires were received in the pilot study, of which 61 were valid questionnaires. A total of 327 questionnaires were received in the main study, of which 264 were valid.

3.6 Data Analysis

The present study involved a quantitative approach, using software SPSS 24.0 and Smart PLS 3 to analyze the data obtained from a survey. Sample data was statistically analyzed for demographic characteristics and missing values using SPSS 24.0. If a missing value from a single questionnaire is above 15%, then the data should be deleted (Hair et al., 2014). Also, if the missing value of an item in the sample data is greater than 10%, that item should be deleted (Yang & Lu, 2007). If the missing value is lower than 5%, it can be changed by variable mean (Hair et al., 2014).

Missing sample data in the present study mainly focused on items that were personal basic attributes, such as age, sports level, and sports specialty, and while all were less than 10 %, it was not appropriate to employ the Mean Replacement method. The missing value processing method chosen and adopted in this study was pairwise deletion. For each analysis, pairwise deletion only deletes those cases that exhibit missing values

in each pair of variables. If missing values occur in variables not used in the analysis, it will use those cases for estimation purposes (Baraldi & Enders, 2010).

In this study, questionnaire reliability was tested using Cronbach's alpha supported by Corrected Item-Total Correlation. Exploratory factor analysis was performed to delete items that did not meet requirements. The deletion rules were: (1) if a single item formed a factor, that item should be deleted (Lin & Bai, 2015); (2) if the item factor classification was different from the original idea, the item should also be deleted (Yang & Lu, 2007); (3) if factor loading on both factors was greater than 0.4 or if factor loading value on any factor was less than 0.4, that item should be deleted (Nunnally, 1978); (4) if an item had any two factor loadings in all factor loadings with a difference of less than 0.1 from each other, it was selectively deleted according to its meaning (Hu, 2006).

In the main study, the structural equation model was analyzed using Smart PLS 3. PLS-SEM is more flexible than Covariance-Based SEM (CB-SEM), being an investigative strategy which is much simpler to follow (Hair, Hollingsworth, Randolph, & Chong, 2017). PLS-SEM works well with small sizes and complex models. It makes practically no assumptions about underlying data. There are no identification issues with small sample sizes (Hair, Ringle, & Sarstedt, 2012). PLS attempts to minimize variance of all endogenous variables and is more suitable for examining predictive relationships with sample size between 30-100 (Henseler, Ringle, & Sinkovics, 2009).

According to Lohmöller (2013), PLS-SEM can be designed as a hierarchical component model (HCM) that contains observable lower-order components (LOCs) and unobservable higher-order components (HOCs) that lessen the complexity of the model while making it more firmly theoretical. To establish the HOC's measurement model, researchers usually assign all indicators from the LOCs to the HOC in the form of a repeated indicators approach (Hair et al., 2014). According to Ringle, Sarstedt, and Straub

(2012), there are 4 types of hierarchical component models, as shown in the figure 3.1. In the current study, the reflective- reflective type was used.

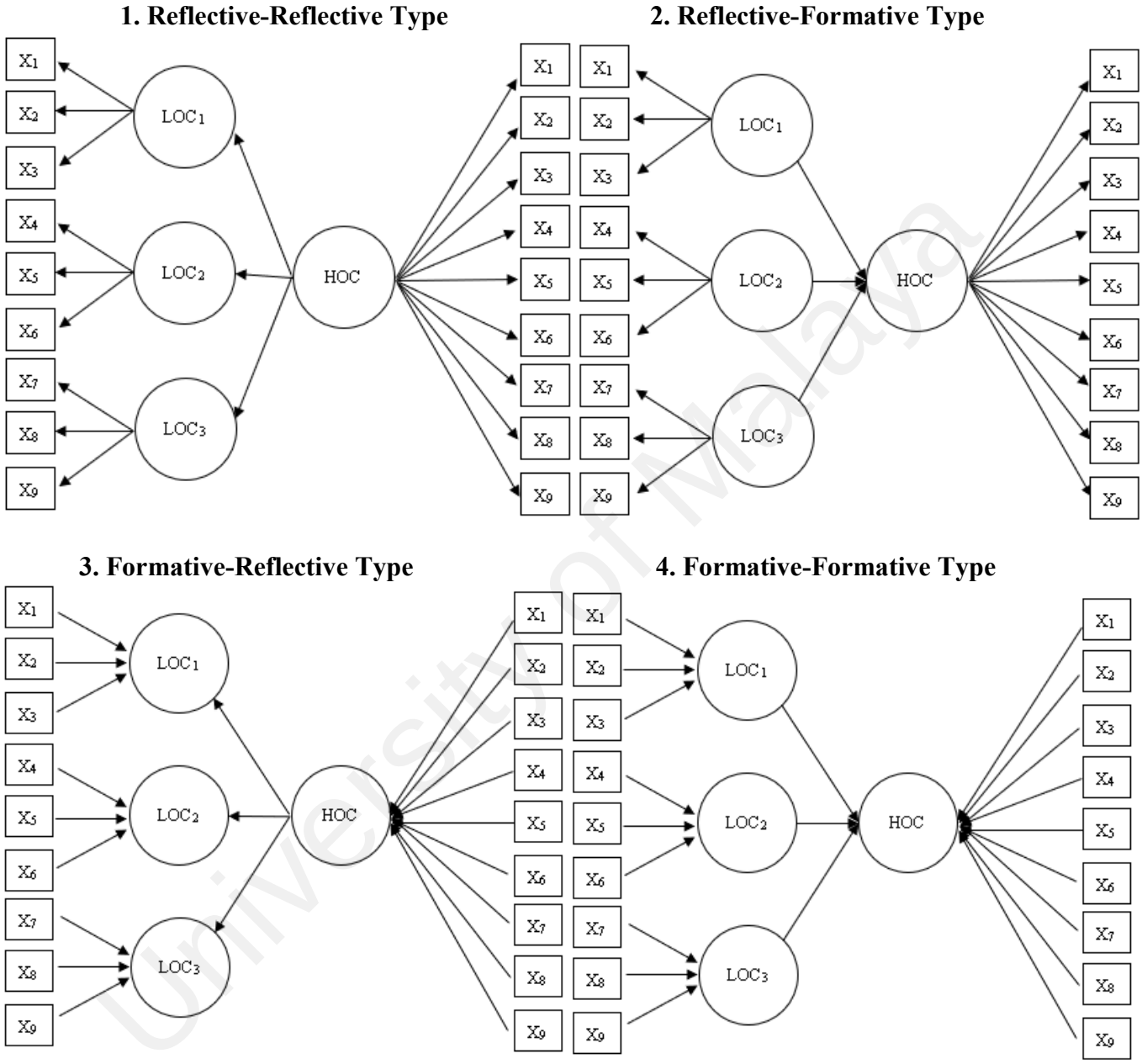


Figure 3.1: Types of Hierarchical Component Model

When evaluating a reflective model, the measurement model must first be analyzed. This includes its internal consistency, convergent validity, along with discriminant validity. Internal consistency reliability is calculated using two indicators: composite reliability and Cronbach's alpha. Composite reliability ought to be greater than 0.70 (in exploratory research, 0.60 to 0.70 is considered tolerable) (Nunnally & Bernstein, 1994). Cronbach's alpha can be considered a conservative measure of internal consistency reliability, and Cronbach's alpha should be greater than 0.70 in confirmatory studies (Hulland, 1999).

Convergent validity is evaluated using two indicators: indicator reliability and average variance extracted (AVE). Indicators should be considered for removal if they have outer loadings between 0.40 and 0.70, but only if deletion leads to an increase in composite reliability and AVE that is higher than the suggested threshold value (Hair, Ringle, & Sarstedt, 2011). The AVE should be higher than 0.50 (Hair et al., 2014). Also, discriminant validity is evaluated using cross loading and Fornell-Larcker criterion. An indicator's construct outer loadings ought to be greater than all its cross-loadings with other constructs (Hair et al., 2011). The square root of the AVE of each construct should be greater than its greatest correlation with any other Construct (Fornell-Larcker criterion).

When evaluation of the measurement model is completed, the structural model should then be evaluated. Evaluation of the structural model is done in five steps. In the first, multicollinearity is tested. The reflective model only needs to detect a variance inflation factor (VIF) value between latent variables. VIF between 0.2 and 5 indicates that there is no collinearity problem (Urbach & Ahlemann, 2010).

In the second, the significance of the model path coefficients is evaluated. T value is employed to judge significance of the path coefficient, and if T value is greater than

1.96, it indicates that the path coefficient is significant (Hair et al., 2014). If the T value is less than or equal to 1.96, the path is not significant, and the path must be deleted.

In the third, the level of Coefficient of Determination R^2 is evaluated. The coefficient represents exogenous latent variables combined effects on endogenous latent variables (Hair et al., 2014). If R^2 value of all latent variables is greater than 0.0, the model is acceptable (Zhao, 2010). When R^2 is 0.25, 0.50 and 0.75, it represents predictive power considered as 'small, moderate and large' respectively (Hair et al., 2014).

The fourth step is to evaluate Effect Size f^2. Effect size, f^2, is used to evaluate whether an omitted construct has a substantive impact on endogenous constructs (Hair et al., 2014). According to Cohen (1988), if f^2 value is 0.02, 0.15 and 0.35, they represent 'small, moderate and large' impact.

The fifth involves evaluating predictive correlation Q^2. Stone-Geisser Q^2 is used to determine model predictive relevance. A Q^2 greater than 0.0, indicates that the SEM model has predictive relevance, if it is less or equal to 0.0 it demonstrates that the SEM model has insufficient predictive power (Chin, 1998).

3.7 Instrumentation

The main instrument used to gather data in the current research is a questionnaire, as this is necessary in survey research (Babbie & Rubin, 2008). The questionnaire was adapted from Liu (2011), and its reliability and validity has been tested. Based on Liu (2011) questionnaire, and the studies of scholars such as Chen (2007), Riemer and Chelladurai (1998),Ye et al. (2013), Yu (2014) and Zhan (2007), this study establishes a structural model and a questionnaire for evaluating high-level athlete satisfaction with their management systems. After completion of a pilot study, the data obtained from it was used to carry out exploratory factor analysis on measurement variables of various

potential variables, to determine if the questionnaire was suitable to be used in an actual study.

3.7.1 Model latent variable determination

Customer satisfaction index models like SCSB, ACSI, ECSI and the CHE-SSI model of Chinese higher education university students, are all based on construction model of structural equations. The determination of latent variables is the basis for establishing structural equation models (Liu, 2011). Through reviewing prior research experience on customer satisfaction and student satisfaction and combining this with the current situation of high-level athlete management in universities in China, this study posits a high-level athlete management system satisfaction index model that has six latent variables. These are: high-level athlete expectations, perceived management quality, perceived management value, high-level athlete satisfaction, high-level athlete complaints, and high-level athlete loyalty.

3.7.2 Model measurement variable determination

Because latent variables themselves cannot be directly observed and measured, they must be explained by means of measurement variables that it is possible to directly observe and measure. When setting observable variables, it is necessary to accurately and comprehensively reflect the actual meaning of the latent variables. The following is an analysis and discussion of the setting of measurement variables for each latent variable in the high-level athlete management system satisfaction model.

3.7.2.1 High-level athlete expectation measurement variable

High-level athlete expectation refers to the expectation of high-level athletes for management quality in universities. Explanatory variables of customer expectation in the ACSI model are expectation for overall quality, expectation for reliability, and

expectation for meeting demand. Liu (2011) uses two variables to measure student expectation: overall quality expectation and expectation to meet individual student needs. However, it is believed here that high-level athletes have their own expectation particularities. They are student and athlete simultaneously, that is, they have expectation around learning and expectation around training. Therefore, expectation of meeting individual student needs is divided into two variables: meeting expectation of personalized learning, and meeting expectation of personalized training. Altogether, current research uses three variables to measure student expectation: overall expectation, expectation for personalized learning, and expectation for personalized training.

Table 3.3: Measurement Variables of High-Level Athlete Expectation and Their Sources

Code	Measurement Variables	Sources
M1	Overall expectations	ACSI
M2	Expectations for personalized learning	Liu (2011) --Question 2
M3	Expectations for personalized training	Liu (2011) --Question 3

3.7.2.2 Measurement variables for perceived management quality

The construct of perceived management quality of high-level athletes includes six sub-constructs. Each will be discussed below, and its measurement variables will be determined. The construct of perceived management quality was synthesized by combining the actual situation of high-level athlete management in Sichuan Province universities with the research results of Chen (2007), Riemer and Chelladurai (1998), Liu (2011), Ye et al. (2013), Yu (2014) and Zhan (2007).

(a) ***Development planning***

Reasonable development planning is a prerequisite for rational creation and healthy expansion of high-level sports teams in universities. Development plans mainly involve leaders attention, departmental coordination, learning goals, competition goals, cultivating goals, guiding ideology, and management regulations.

Table 3.4: Measurement Variables of Development Planning and Their Source

Code	Measurement Variables	Sources
M4	Leaders attention	Yu (2014) B1--P187
M5	Departmental Coordination	Zhan (2007) C5--P16
M6	Learning goals	Ye et al. (2013) C10--P105
M7	Competition goals	Ye et al. (2013) C7--P105
M8	Cultivating goals	Ye et al. (2013) C9--P105
M9	Guiding ideology	Ye et al. (2013) C6--P105
M10	Management regulations	Zhan (2007) C1--P16

(b) ***Enrollment management***

Wu (2011) believes that enrollment is an important link in the creation of high-level university sports squads. In the current study, enrollment management is demonstrated by enrollment policy compliance, enrollment major, enrollment numbers, channel for enrollment, sports specialty, and enrollment selection criteria.

Table 3.5: Measurement Variables of Enrollment Management and Their Source

Code	Measurement Variables	Sources
M11	Enrollment policy compliance	Ye et al. (2013) C11--P105
M12	Enrollment major	Yu et al. (2014) C6 --P187
M13	Enrollment numbers	Yu et al. (2014) C6-- P187
M14	Channel for enrollment	Ye et al. (2013) C15--P105
M15	Sports specialty	Yu et al. (2014) C6 --P187
M16	Enrollment selection criteria	Yu et al. (2014) C6 --P187

(c) ***Training and competition management***

Training and competition are used both to measure the creation of university high-level sports squads, and to participate in competitive events. They are the main components of constructing high-level sports teams (Lin & Lian, 2014). The management of training and competition is made up of training and competition plans, training schedules, training quality control, training and competition summaries, coaching ability, competition frequency, competition systems, competition levels, reward and punishment systems, and, training recovery and emergency plans.

Table 3.6: Measurement Variables of Training and Competition Management and Their Source

Code	Measurement Variables	Sources
M17	Training and competition plan	Riemer and Chelladurai (1998)--Q3
M18	Training schedule	Zhan (2007) C14--P16
M19	Training quality control	Zhan (2007) C15--P16
M20	Training and competition summary	Zhan (2007) C25--P16
M21	Coaches' ability	Riemer and Chelladurai (1998)--Q35
M22	Competition frequency	Ye et al. (2013) C58--P106
M23	Competition system	Zhan (2007) C23--P16
M24	Competition level	Riemer and Chelladurai (1998)--Q30
M25	Reward and punishment system	Ye et al. (2013) C53--P106
M26	Training recovery	Zhan (2007) C17--P16
M27	Emergency plan	Ye et al. (2013) C22--P105

(d) ***Learning management***

Learning management involves arranging learning for high-level university athletes. It is mainly composed of ideological and ethical education, pedagogical instruments and equipment, teaching management methods, teaching plans, teaching content, teaching schedule, learning quality control, and general examination standard basic knowledge.

Table 3.7: Measurement Variables of Learning Management and Their Source

Code	Measurement Variables	Sources
M28	Ideological and moral education	Ye et al. (2013) C54--P106
M29	Teaching instruments and equipment	Liu (2011) Q6 -P196
M30	Teaching management methods	Zhan (2007) C8--P16
M31	Teaching plans	Ye et al. (2013) C19 --P105
M32	Teaching content	Liu (2011) Q 7-P196
M33	Teaching schedule	Zhan (2007) C14--P16
M34	Learning quality control	Zhan (2007) C15---P16
M35	General examination standard of basic knowledge	Chen (2007) Q6--P52

(e) ***Logistics management***

Good logistics management is an important necessity for high-level university athletes to learn, train and compete (Yi, 2011). Logistics management is expressed in terms of: funding, medical care, field and equipment, nutrition, accommodation, research support, and accident insurance.

Table 3.8: Measurement Variables of Logistics Management and Their Source

Code	Measurement Variables	Sources
M36	Funding	Riemer and Chelladurai (1998)--Q19
M37	Medical care	Riemer and Chelladurai (1998)—Q52
M38	Field and equipment	Zhan (2007) C22--P16
M39	Nutrition	Ye et al. (2013) C47--P106
M40	Accommodation	Zhan (2007) C9--P16
M41	Research support	Ye et al. (2013) C46--P106
M42	Accident insurance	Ye et al. (2013) C51--P106

(f) ***Graduation and employment management***

High-level athlete graduation and employment management combines: graduation requirements, employment guidance, and socialization of high-level athletes in employment.

Table 3.9: Measurement Variables of Graduation and Employment Management and Their Source

Code	Measurement Variables	Sources
M43	Requirements of graduation	Chen (2007)-Question 6 -- P58
M44	Employment guidance	Liu (2011)- Question 42--P197
M45	Socialization in employment	Liu (2011)- Question 43--P197

3.7.2.3 Measurement variables of perceived management value of high-level athletes

The ACSI model has two variables that measure perceived value, these are quality at a stated price, and price at a stated quality. Liu (2011) thinks that the Chinese government implements a uniform price for higher education, and so, deletes the price variable under a given quality from the student satisfaction model, and instead sets a variable to measure perceived value using only quality under a given price. Quality at a given price mainly describes the improvement of students' comprehensive abilities after receiving higher education. This research also adopted the same viewpoint and devised four components to measure high-level athlete perceived management value: learning interest, training willingness, team cooperation ability, and social adaptability.

Table 3.10: Measurement Variables of Perceived Management Value and Their Source

Code	Measurement Variables	Sources
M46	Learning interest	Liu (2011)- Question 45--P197
M47	Training willingness	Customized
M48	Team cooperation ability	Liu (2011)- Question 46 --P197
M49	Social adaptability	Liu (2011)- Question 49 --P197

3.7.2.4 Measurement variables of satisfaction of high-level athletes

ACSI model uses three explanatory variables to measure customer satisfaction, and these are: overall satisfaction, comparison with expectation, and gap with ideal. This study also uses the same index to measure high-level athlete satisfaction.

Table 3.11: Measurement Variables of Satisfaction and Their Source

Code	Measurement Variables	Sources
M50	Overall satisfaction	ACSI
M51	Comparison with expectation	ACSI
M52	Gap with ideal	ACSI

3.7.2.5 Measurement variables of complaints of high-level athletes

The Swedish Customer Satisfaction Barometer (SCSB) model uses two variables for customer complaints: complaints to individuals, and complaints to management. One explanatory variable is used in the ACSI model: formal or informal complaints. Liu (2011) designed three measurement variables for student complaints. The first is 'whether or not complained'. For students who have complained, it is required to explore the 'degree of satisfaction with the resolution of complaints'. For those who have not complained, investigate 'the confidence that the complaint will be resolved if there is a problem'. There would appear to be flaws in the complaint mechanism of high-level athlete management systems in Chinese universities because it seems that high-level athletes may only complain informally to teammates or coaches, and then coaches will report to the school management department, following which, the school will solve the existing problems. Because of this, this research designed three items to measure high-level athlete

complaints: degree of complaint, satisfaction with the resolution of one's own or someone else's complaint, confidence in a resolution if a complaint is made.

Table 3.12: Measurement Variables of Complaints of High-level Athletes and Their Source

Code	Measurement Variables	Sources
M53	Degree of complaint	Customized
M54	Satisfaction with the resolution of one's own or someone else's complaint	Liu (2011)-Question53-P197
M55	Confidence in a resolution if a complaint is made	Liu (2011)-Question54-P197

3.7.2.6 Measurement variables of Loyalty of High-Level Athletes

China's Higher Education Satisfaction Index Model (Liu, 2011) separates student loyalty variables into four explanatory variables: confidence in prospects for development, possibility of recommendation to others, possibility of re-purchasing, and willingness to fund schools. This study suggests that of these four, high-level athletes are least likely to engage in funding universities. Therefore, after removing this option, this study selects three of the explanatory variables to explain high-level athlete loyalty: confidence in development prospects of high-level sports teams, possibility of recommendation to others, and possibility of re-purchasing.

Table 3.13: Measurement Variables of High-level Athletes' Loyalty and Their Source

Code	Measurement Variables	Sources
M56	Confidence in development prospects of high-level sports teams	Liu (2011)- Question 56
M57	Possibility of recommendation to others	Liu (2011)- Question 57
M58	Possibility of re-purchasing	Liu (2011)- Question 58

3.7.3 Satisfaction Evaluation Index System of High-level Athletes Management System

The satisfaction evaluation index system of high-level athlete management systems consists of six latent variables constructed in a conceptual model and a measured variable of each latent variable. Shown as Table 3.14.

Table 3.14: Satisfaction Evaluation Index System of High-level Athletes Management System

Construct	Measurement variable	
A: High-level athlete expectation	M1: Overall quality expectation, M2: Expectation for personalized learning, M3: Expectation for personalized training	
B: Perceived management quality	B1: Development planning	M4: Leaders' attention, M5: Coordination of various departments, M6: Learning goals, M7: Competition goals, M8: Cultivating goals, M9: Guiding ideology, M10: Management regulations
	B2: Enrollment Management	M11: Compliance with enrollment policies, M12: Enrollment major, M13: Number of enrollments, M14: Channel for enrollment, M15: Sports specialty, M16: Selection criteria for enrollment
	B3: Training and Competition Management	M17: Training and competition plan, M18: Training schedule, M19: Training quality control, M20: Training and competition summary, M21: Coaches' ability, M22: Competition frequency, M23: Competition system, M24: Competition level, M25: Reward and punishment system, M26: Training recovery, M27: Emergency plan
	B4: Learning Management	M28: Ideological and moral education, M29: Teaching instruments and equipment, M30: Teaching management methods, M31: Teaching plans, M32: Teaching content, M33: Teaching schedule, M34: Learning quality control, M35: General basic knowledge examination standards
	B5: Logistics Management	M36: Funding, M37: Medical care, M38: Field and equipment, M39: Nutrition, M40: Accommodation, M41: Research support, M42: Accident insurance
	B6: Graduation and Employment Management	M43: Requirements of graduation, M44: Employment guidance, M45: Popularity in employment
C: Perceived management value	M46: Learning interest, M47: Training willingness, M48: Team cooperation ability, M49: Social adaptability	
D: Satisfaction of high-level athletes	M50: Overall satisfaction, M51: Comparison with expectation, M52: Gap with ideal	
E: Complaints of high-level athletes	M53: Degree of complaint, M54: Satisfaction with the resolution of one's own or someone else's complaint, M55: Confidence in a resolution if a complaint is made.	
F: Loyalty of high-level athletes	M56: Confidence in the development prospects of high-level sports teams, M57: the possibility of recommendation to others, M58: the possibility of re-purchasing	

3.7.4 Design of Initial Questionnaire

3.7.4.1 Questionnaire design principles

Designing the questionnaire is a critical part of successful evaluation of the satisfaction index. In order to do it, these principles were followed:

(a) The questionnaire specifies the evaluation model. Only by accurately grasping the meaning of each evaluation model indicator and transforming that into relevant investigative questions, can the expected target of the evaluation be realized.

(b) The questions raised should be easy for high-level athletes to understand and answer, and the statement of the problem should be as simple and straightforward as possible, avoiding long sentences and vague concepts.

(c) The questionnaire should include high-level athlete personal information, such as gender, grade, and other control variables. A commitment to guarantee high-level athlete data protection should be made, ensuring that personal information will solely be for statistical analysis and will be strictly maintained confidential.

(d) Use closed questions as much as possible in the questionnaires, to facilitate statistical analysis. In order to better understand student suggestions and opinions on high-level athlete management systems, an open question can be set at the end of the questionnaire.

Based on these principles, a preliminary draft of the satisfaction assessment questionnaire for high-level athlete management systems in universities was designed. The initial questionnaire was to be answered using the 5 Point Likert Scale. The questionnaire consisted of four major sections. The first part was the invitation letter for

the questionnaire, the next was the research information form, the third was the consent form, and the last was the specific questions of the questionnaire.

3.7.4.2 Questionnaire translation method

The research object of this study involves high-level athletes in Chinese universities. The questionnaire used is in Chinese, and high-level athletes can easily understand it. For thesis writing purposes, the questionnaire was rendered into English. Back-transliteration procedure based on the improved Brislin's model (1970) was employed to translate (Wang & Xia, 2016). Five bilingual translators (Chinese and English) were recruited to form a panel of experts. They were professors and associate professors with more than seven years university English teaching and student management experience.

First step: Three bilingual translators independently translate the Chinese original questionnaire into English. In comparing the three English translations with the Chinese original, where any differences were found, the three language experts negotiated together until consensus was reached.

Second step: Two additional translators blindly and independently back translated the English translation into Chinese (without referring to the original) and compared differences. After consensus, the questionnaire was modified to make it a Chinese translated questionnaire.

Third step: The original Chinese questionnaire and its English to Chinese translated version were reviewed and evaluated. Where the two versions were inconsistent, explanations of the divergent items of the Chinese original questionnaire were provided to the five bilingual translators, to help them understand the specific meaning of the item. After discussion and agreement, the five bilingual translators re-submitted the Chinese translation questionnaire.

Fourth step: Five bilingual translators jointly discussed and translated the Chinese translated questionnaire back into a final English translation questionnaire. Thus, ensuring that the English questionnaire script meant the same as the Chinese version. The Chinese version and English version of the initial questionnaire are shown in Appendix A.

3.8 Ethical Considerations

Ethical considerations in research are critical. University of Malaya employs a research ethics committee (UMREC) to undertake ethical review of each non-medical study centered on human participants, including funded and unfunded research (University of Malaya, 2018). The questionnaire for evaluation of satisfaction level of high-level athletes management system in Sichuan Province universities obtained approval from University of Malaya Research Ethics Committee (UMREC), reference number UM.TNC2/UMREC-248.

All participants were randomly selected and voluntarily participated in this study, without any coercion. Permission was sought before the investigation was conducted, and they had a choice to refuse to participate. Their privacy was well protected, and individuals were not physically or mentally injured. There were no disturbing questions contained in the survey, and respondents could close the fill-in page at any time and withdraw from it. The data was stored on a network drive with planned disposal after five years. Personal information that was collected was only to be used for data analysis, and no personal identification information was collected from the participants so that respondents could not be identified from the code or label.

3.9 Content Validity and Face Validity

Kinnear and Gray (2006) point out that validity of a test rests with whether or not it measures what it is supposed to measure. Norland (1990) reported that content validity may be measured with an expert panel along with field testing. In this study, four experts were invited to use the Content Validity Index (CVI) evaluation form to evaluate the questionnaire content validity of the using a 4-point correlation evaluation. Experts scored according to the relevance of each item to the research concept: 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant, 4 = highly relevant (Davis, 1992).

CVI includes CVI for item, and CVI for scale (S-CVI) (Davis, 1992). Lynn (1986) gives the following criteria for I-CVI: when the number of experts is less than or equal to five, the I-CVI should be 1.00, that is, all experts should believe that the item has good correlation with the concept content to be measured, and that the content validity of the item is considered to be good. When the number of experts is six or more, the standard can be lowered, but the requirement should be not less than 0.78. Davis (1992) suggested that S-CVI/UA should be no less than 0.8.

The CVI evaluation results the present study are shown in Table 3.15. Four experts were asked to evaluate the questionnaire validity. The CVI values of items M5, M11, M28, and M41 were found to be less than 1, and so these four items had to be deleted. The S-CVI/UA of the questionnaire was 0.93, and the S-CVI/Ave was 0.97, indicating that the questionnaire had good content validity.

Table 3.15: CVI Statistics of Questionnaire

Code	Item	Number of rated 3 or 4	I-CVI	Result
M1	Overall quality expectations	4	1	Keep
M2	Expectations for personalized learning	4	1	Keep
M3	Expectations for personalized training	4	1	Keep
M4	Leaders' attention	4	1	Keep
M5	Coordination of various departments	2	0.5	Delete
M6	Learning goals	4	1	Keep
M7	Competition goals	4	1	Keep
M8	Cultivating goals	4	1	Keep
M9	Guiding ideology	4	1	Keep
M10	Management regulations	4	1	Keep
M11	Compliance with enrollment policies	2	0.5	Delete
M12	Enrollment major	4	1	Keep
M13	Number of enrollments	4	1	Keep
M14	Channel for enrollment	4	1	Keep
M15	Sports specialty	4	1	Keep
M16	Selection criteria for enrollment	4	1	Keep
M17	Training and competition plan	4	1	Keep
M18	Training schedule	4	1	Keep
M19	Training quality control	4	1	Keep
M20	Training and competition summary	4	1	Keep
M21	Coaches' ability	4	1	Keep
M22	Competition frequency	4	1	Keep
M23	Competition system	4	1	Keep
M24	Competition level	4	1	Keep
M25	Reward and punishment system	4	1	Keep
M26	Training recovery	4	1	Keep
M27	Emergency plan	4	1	Keep
M28	Ideological and moral education	3	0.75	Delete
M29	Teaching instruments and equipment	4	1	Keep
M30	Teaching management methods	4	1	Keep
M31	Teaching plans	4	1	Keep
M32	Teaching content	4	1	Keep
M33	Teaching schedule	4	1	Keep
M34	Learning quality control	4	1	Keep
M35	General basic knowledge examination standards	4	1	Keep
M36	Funding	4	1	Keep
M37	Medical care	4	1	Keep
M38	Field and equipment	4	1	Keep
M39	Nutrition	4	1	Keep
M40	Accommodation	4	1	Keep
M41	Research support	3	0.75	Delete
M42	Accident insurance	4	1	Keep
M43	Requirements of graduation	4	1	Keep

Table 3.15, Continued

Code	Item	Number of rated 3 or 4	I-CVI	Result
M44	Employment guidance	4	1	Keep
M45	Popularity in employment	4	1	Keep
M46	Learning interest	4	1	Keep
M47	Training willingness	4	1	Keep
M48	Team cooperation ability	4	1	Keep
M49	Social adaptability	4	1	Keep
M50	Overall satisfaction	4	1	Keep
M51	Comparison with expectation	4	1	Keep
M52	Gap with ideal	4	1	Keep
M53	Degree of complaint	4	1	Keep
M54	Satisfaction with the resolution of one's own or someone else's complaint	4	1	Keep
M55	Confidence in a resolution if a complaint is made	4	1	Keep
M56	Confidence in the development prospects of high-level sports teams	4	1	Keep
M57	The possibility of recommending to others	4	1	Keep
M58	The possibility of re-purchasing	4	1	Keep
	Proportion relevant	Average I-CVI =	0.97	

S-CVI/UA= 54/58= 0.93 Three way to calculate S-CVI/AVE: 1) I-CVI average of all item = .97
2) Average value of 3 or 4 ratios for each expert = (57/58+56/58+57/58+56/58)/4=0.97
3) The total number of times rated 3 or 4 divided by the total number of ratings 226/232=0.97

After deleting items M5, M11, M28, and M41, according to the expert's suggestion, the questionnaire was modified to form a new one. Five high-level athletes answered the 54-item questionnaire. All high-level athletes were able to complete the questionnaire smoothly, indicating the comprehensibility of the questionnaire, it's easy answerability, an d reliable face-validity.

After completing questionnaire content and face validity evaluation, and in further collaboration with high-level athletes who offered opinions, the statements of some items were modified. The revised questionnaire was utilised in the pilot study to collect data and to satisfactorily test its reliability and validity.

3.10 Pilot Study

A pilot study involves a micro version of the planned macro study. It is carried out with a smaller like group of participants to those intended to be recruited later in the full scale study (Doody & Doody, 2015). Pilot studies are very useful in underpinning academic research (Kilanowski, 2006) and may enhance a study's credibility (Padgett, 2016).

3.10.1 Demographic characteristics

In this study, the pilot study selected three schools in which to conduct a pretest questionnaire survey. There was a total of 83 questionnaires collected, of which 61 were valid. The sample composition of the pilot study is shown in Table 3.16.

Table 3.16: Demographic Characteristics of High-level Athletes in Pilot Study

	Characteristics	Number	Percentage (%)
Gender	Male	33	54.10%
	Female	28	45.90%
Sports level	First-level athletes	17	27.87%
	Second-level athletes	38	62.30%
	National master-level athletes	2	3.28%
	Missing	4	6.56%
Grade	First grade	26	42.62%
	Second grade	13	21.31%
	Third grade	15	24.59%
	Fourth grade	7	11.48%
Source	Retired athletes	5	8.20%
	Active athletes	12	19.67%
	Sports school students	3	4.92%
	Ordinary high school students	37	60.66%
	Others	4	6.56%

In terms of gender, men accounted for 54.1% and women 45.90%. From the sports level perspective, 27.87% of high-level athletes were first-level athletes, 62.30% were second-level, and national master-level athletes only accounted for 3.28%, while unknown amounted to 6.56%. At grade level, first grade accounted for 42.62%, second grade 21.31%, third grade 24.59%, fourth grade 11.48%. Regarding source, retired

athletes accounted for 8.20%, active athletes 19.67%, sports school students 4.92%, ordinary high school students 60.66%, and others 6.56%.

3.10.2 Questionnaire reliability

In this study, Cronbach's alpha and Corrected Item-Total Correlation (CITC) were used to analyze questionnaire reliability, in order to understand its consistency and stability and to measure its reliability. Cronbach's alpha, created in 1951 by Lee Cronbach, provides a measure for internal consistency in tests and scales. Nowadays Cronbach's alpha is one of the most popular objective measure of reliability (Tavakol & Dennick, 2011). George and Mallery (2003) suggest these principles regarding the use of Cronbach's alpha: if equal or more than 0.90: it is excellent; if equal or more than 0.80: it is good; if equal or more than 0.70: it is acceptable; if equal or more than 0.60: it is questionable; if equal or more than 0.5: it is poor; and, if equal or less than 0.50: it is unacceptable.

Another measurement regularly used to confirm reliability is corrected item-total correlation (CITC). It refers to 'a correlation of an item or indicator with the composite score of all the items forming the same set' (Koufteros, 1999). Items with an item-total correlation value of less than 0.25 are generally eliminated (Nunnally & Bernstein, 1994). Cronbach's alpha of each questionnaire latent variable and CITC are shown in table 3.17:

Table 3.17: Results of Questionnaire Reliability in Pilot Study (N = 61)

LV		MV	Cronbach's Alpha	Mean	CITC	Alpha if Item Deleted
A: Expectation of high-level athletes		M1	.84	4.03	.75	.74
		M2		3.84	.74	.76
		M3		4.28	.66	.83
B: Perceived management quality	B1: Development planning	M4	.91	4.35	.64	.91
		M6		4.05	.81	.89
		M7		4.21	.77	.90
		M8		4.30	.80	.89
		M9		4.48	.70	.90
		M10		4.11	.82	.89
	B2: Enrollment Management	M12	.90	4.10	.78	.88
		M13		4.07	.73	.89
		M14		4.39	.77	.88
		M15		4.33	.87	.87
		M16		4.30	.71	.90
	B3: Training and Competition Management	M17	.92	4.44	.81	.90
		M18		4.39	.85	.90
		M19		4.34	.74	.91
		M20		4.64	.20	.93
		M21		4.28	.80	.90
		M22		4.39	.77	.91
	B4: Learning Management	M23	.89	4.18	.15	.94
		M24		4.18	.77	.91
		M25		4.28	.87	.90
		M26		4.33	.79	.91
		M27		4.38	.82	.90
		M29		4.11	.50	.90
		M30		3.79	.79	.86
		M31		4.10	.87	.86
		M32		4.30	.85	.86
		M33		3.85	.71	.87
		M34		3.31	.40	.92
		M35		4.30	.81	.86
	B5: Logistics Management	M36	.92	4.25	.90	.89
		M37		4.21	.87	.89
		M38		4.11	.74	.91
		M39		4.32	.75	.91
		M40		4.07	.81	.90
		M42		4.26	.56	.93
	B6:Graduation and Employment Management	M43	.84	4.16	.79	.71
		M44		4.18	.81	.68
		M45		4.05	.55	.93
C: Perceived management value		M46	.93	4.16	.86	.91
		M47		4.10	.82	.92
		M48		4.31	.81	.92
		M49		4.36	.87	.90
D: High-level athlete satisfaction		M50	.88	4.23	.70	.89
		M51		3.77	.80	.80
		M52		3.85	.82	.79
E: High-level athlete complaints		M53	.91	4.10	.75	.94
		M54		4.05	.86	.84
		M55		4.35	.89	.82
F: High-level athlete loyalty		M56	.93	4.31	.79	.96
		M57		4.02	.89	.88
		M58		4.02	.93	.85

Table 3.17 shows minimum Cronbach's alpha value of each latent variable in the scale is 0.84 (Enrollment and Employment Management) and the maximum value is 0.93 (Loyalty of high-level athletes). All Cronbach's alpha values are higher than the threshold of 0.70 (George & Mallery, 2003), indicating that latent variables have good reliability. It can be seen from Cronbach's alpha, that if the item is deleted that the deletion of most measurement variables does not increase the reliability of the corresponding variables.

According to Wang and Yang (2012), if an item Cronbach's alpha value increases after it is deleted, and simultaneously the CITC value of the item is less than 0.25, then the item should be deleted. As can be seen in Table 3.17, although deletion of items M34, M42, M45, M50, M53 and M56 could increase Cronbach's alpha values of corresponding latent variables, the CITC values of these item was more than 0.25, and in view of content validity, these measurement variables were retained.

CITC value of items M20 and M23 are less than 0.25, and after deleting them, Cronbach's alpha value of the corresponding latent variables increases. Therefore, deletion of items M20 and M23 should occur. Correlation coefficient between the remaining measurement variables and the relevant latent variables is relatively high, Cronbach's alpha values across every dimension is greater than 0.70, indicating that the entire questionnaire has good reliability.

3.10.3 Exploratory research

Exploratory factor analysis (EFA) is a commonly employed, widely applied statistical technique in researching social sciences (Costello & Osborne, 2005). EFA is a useful technique for scale development because it has the potential to reduce high numbers of items or indicators to size that is easier to manipulate (Gerbing & Anderson, 1988).

The satisfaction evaluation model of the high-level athlete management systems constructed in this study is based on ACSI and contextualized based on Chinese scholarly research. There are some self-made scales in the questionnaire, and perceived management quality variables are divided into six sub-constructs lacking a solid theoretical basis. Because this is the case, exploratory factor analysis of each latent variable of the scale is carried out in the study, using survey data from the pilot study.

When screening items using exploratory factor analysis process three criteria were used. Firstly, if the factor formed after analysis contained just one item, the item had to be deleted (Lin & Bai, 2015). Secondly, when an item's factor loading was less than 0.4, or if the factor loading on both factors was greater than 0.4, the item was to be deleted (Nunnally, 1978). Thirdly, if an item had two factor loadings on all factors and the difference between them was less than 0.1, it was selectively deleted according to its meaning (Lederer & Sethi, 1991).

3.10.3.1 Perceived management quality EFA

Kaiser-Meyer-Olkin Test (KMO) measures shared variance in items (Beavers et al., 2013). According to Kaiser (1974), if KMO is larger than 0.90, it is ideal for factor analysis. If KMO was found to be between 0.80 and 0.90, it was just suitable. If KMO is in the range of 0.70-0.80, it is still possible to do factor analysis. However, KMO factor analysis is barely possible in the range of 0.60-0.70. While KMO is not suitable in the range of 0.50-0.60, and if KMO is less than 0.50 and is very unsuitable. Bartlett's test (introduced in 1937 by Maurice Bartlett) is an inferential procedure used to assess the equality of variance in different populations (Arsham & Lovric, 2011). Small values of significance level (less than 0.05) indicate that factor analysis may be useful. In this study, KMO and Bartlett tests were carried out on the pilot study data to determine if it was a good fit for factor analysis. As shown in Table 3.18: KMO value of perceived

management quality is 0.81, significance probability is less than .001, and KMO measurement result is therefore significant, meaning that factor analysis can be performed.

Table 3.18: KMO and Bartlett's Test Perceived Management Quality

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.81**
Bartlett's Test of Sphericity	Approx. Chi-Square	2287
	Df	630
	Sig.	.001

In the current study, EFA is carried out on perceived management quality dimension using principal component analysis method. Varimax Rotation is used to extract factors with eigenvalues greater than 1.0, after seven steps of iteration, six factors are extracted. Factor explanation variance and factor loading are shown in Table 3.19.

Table 3.19: Factor Loading for Perceived Management Quality

Item	**Component**					
	1	**2**	**3**	**4**	**5**	**6**
M26	0.83					
M27	0.82					
M25	0.82					
M24	0.81					
M18	0.76					
M19	0.76					
M22	0.74					
M17	0.73					
M21	0.72					
M35		0.87				
M32		0.79				
M30		0.75				
M44		0.74				
M45		0.69				
M33		0.69				
M43		0.69				
M31		0.68				
M42		0.49				
M7			0.80			
M8			0.77			
M10			0.73			
M4			0.68			
M6			0.68		0.40	
M9			0.63			

Table 3.19, Continued

Item	Component					
	1	2	3	4	5	6
M15				0.82		
M13				0.79		
M14				0.69		
M12				0.64		
M16				0.61		
M29				0.54		
M36					0.82	
M40					0.78	
M37					0.72	
M38					0.67	
M39					0.66	
M34						0.63
Cumulative %	19.72	36.97	49.70	61.52	73.25	77.11

As can be seen in Table 3.19, although six factors have been formed, according to the rules of screening items for factor analysis, some items do not meet the requirements and had to be deleted and analyzed again. Factor analysis results after deleting items M29, M34 and M42 are shown in Table 3.20 and Table 3.21:

Table 3.20: KMO and Bartlett's Test for Perceived Management Quality (after delete M29, M34 and M42)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.82
Bartlett's Test of Sphericity	Approx. Chi-Square	2095
	df	528
	Sig.	.001

Table 3.21: Factor Loading for Perceived Management Quality (after delete M29, M34 and M42)

Item	Component				
	1	2	3	4	5
M26	0.83				
M27	0.82				
M25	0.81				
M24	0.81				
M19	0.76				

Table 3.21, Continued

Item	Component				
	1	2	3	4	5
M18	0.76				
M22	0.74				
M17	0.72				
M21	0.71				
M35		0.88			
M32		0.79			
M30		0.75			
M44		0.74			
M45		0.69			
M33		0.69			
M43		0.69			
M31		0.68			
M7			0.79		
M8			0.77		
M10			0.73		
M4			0.71		
M6			0.70		
M9			0.66		
M36				0.82	
M40				0.78	
M37				0.73	
M38				0.67	
M39				0.65	
M15					0.84
M13					0.81
M14					0.70
M16					0.67
M12					0.62
Cumulative %	20.84	38.52	52.30	64.76	76.64
Cronbach's Alpha	0.95	0.94	0.91	0.93	0.93

After EFA, graduation and employment management sub-construct and learning management sub-construct were merged into a new sub-construct, but since graduation and employment were both related to learning, the new sub-construct was still nominated under learning management. Finally, the construct of management quality perception, composed of five factors, was formed. According to Wu (2010), if cumulative variance exceeds 60%, it indicates that extracted factors are representative for all variables.

Although cumulative variance decreased from 77.11% to 76.64%, factor loading of each item still met requirements. Structural validity of the perceived management quality construct was 0.77, indicating that it had good validity. The next step was to carry out EFA for each latent variable.

3.10.3.2 High-level athlete expectation EFA.

Expectations of high-level athletes are measured by three items. M2 and M3 are defined by researchers based on previous studies. Therefore, it is necessary to carry out factor analysis on expectation of high-level athletes. As shown in Table 3.22, KMO of high-level athlete expectation is 0.72 and Sig is less than .001, so, it is possible to perform factor analysis. Table 3.23 shows that three items form a factor with a cumulative variance of 76.47%. There is a highly significant correlation between indicators, and structural validity of high-level athlete expectations is good.

Table 3.22: KMO and Bartlett's Test for Expectation of High-level athletes

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.72
Bartlett's Test of Sphericity	Approx. Chi-Square	75.0
	df	3.0
	Sig	.001

Table 3.23: Factor Loading for Expectation of High-level Athletes

Item	Component
	1
M1	0.89
M2	0.88
M3	0.84
Cumulative %	76.47
Cronbach's Alpha	0.84

3.10.3.3 Perceived management value factor analysis

This study used four indicators to measure the high-level athlete management value perception. So as to confirm if the structural model of perceived management value was

consistent or not with the definition of the conceptual model, factor analysis of perceived management value variables was carried out. Table 3.24 shows KMO values of management value perception at 0.80, and Sig. less than .001. It passes Bartlett's Test, indicating that factor analysis can be performed. As shown in Table 3.25, the four entries form a factor with a cumulative variance of 83.23%. Structural validity of perceived management value is good.

Table 3.24: KMO and Bartlett's Test for Perceived Management Value

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.80
Bartlett's Test of Sphericity	Approx. Chi-Square	204
	df	6.0
	Sig.	.001

Table 3.25: Factor Loading for Perceived Management Value

Item	Component
	1
M49	0.93
M46	0.92
M47	0.90
M48	0.89
Cumulative %	83.23
Cronbach's Alpha	0.93

3.10.3.4 Factor analysis of high-level athletes' satisfaction

This study used the same three entries as the ACSI did, to measure satisfaction variables of high-level athletes. In order to verify structural validity of the satisfaction variables, factor analysis was also carried out. The results are shown in Table 3.26. KMO value of high-level athlete satisfaction variable is 0.72, Sig is less than .001, so, it passes the Bartlett's Test and factor analysis can be performed. As shown in Table 3.27, three items form a factor with a cumulative variable of 80.81%. It shows that the questionnaire structural validity satisfaction is good.

Table 3.26: KMO and Bartlett's Test for Satisfaction of High-level Athletes

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.72
Bartlett's Test of Sphericity	Approx. Chi-Square	99.6
	df	3.0
	Sig.	.001

Table 3.27: Factor Loading for Satisfaction of High-level Athletes

Item	Component
	1
M52	0.92
M51	0.91
M50	0.86
Cumulative %	80.81
Cronbach's Alpha	0.88

3.10.3.5. Factor analysis of high-level athlete complaints

Three items were selected for use in this study to measure high-level athlete complaints. In order to verify whether the structure of high-level athlete complaints was consistent with the conceptual model definition, factor analysis was performed on high-level athlete complaints. The results are shown in Table 3.28. KMO value of high-level athlete satisfaction variable is 0.71, Sig is less than .001, it passes Bartlett's Test, and factor analysis can be performed. It can be seen from the factor analysis results in Table 3.29, three items form a factor, and cumulative variance is 85.34%. It shows that structural validity of high-level athlete complaint is very good.

Table 3.28: KMO and Bartlett's Test for Complaint of High-level Athletes

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.71
Bartlett's Test of Sphericity	Approx. Chi-Square	138.0
	df	3.0
	Sig.	.001

Table 3.29: Factor Loading for Complaint of High-level Athletes

Item	Component
	1
M55	0.95
M54	0.94
M53	0.88
Cumulative %	85.34
Cronbach's Alpha	0.91

3.10.3.6 Factor analysis of high-level athlete loyalty

Three indicators are used in this study to test high-level athlete loyalty. So as to confirm the structural model of high-level athlete loyalty was consistent with the conceptual model definition, this study conducted a factor analysis of high-level athlete loyalty. As can be seen in Table 3.30, KMO value of high-level athlete loyalty is 0.70, Sig is less than .001, and Bartlett's Test is passed, indicating that factor analysis can be performed. Table 3.31 shows that three items form a factor with a cumulative variance of 88.39%. This indicates a highly significant correlation between indicators, and structural validity of high-level athlete complaints is good.

Table 3.30: KMO and Bartlett's Test of Loyalty of High-level Athletes

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.70
	Approx. Chi-Square	174.1
	df	3.0
	Sig.	.001

Table 3.31: Factor Loading for Loyalty of High-level Athletes

Item	Component
	1
M58	0.97
M57	0.95
M56	0.90
Cumulative %	88.39
Cronbach's Alpha	0.93

According to Wu (2010), if the Cumulative is more than 60%, it indicates that the questionnaire has good structural validity. After EFA, it was found that structural validity of each latent variable was good. Nevertheless, some scholars have still suggested that minimum sample size for EFA should not be less than 100 (Arrindell & Van der Ende, 1985; Maccallum, Widaman, Zhang, & Hong, 1999).

However, according to Guadagnoli and Velicer (1988), if there are four or more variables in the components with loadings more than 0.60, the pattern may be introduced no matter the sample size. According to analysis outcome, results obtained by EFA using 61 samples in this study are valid. After testing questionnaire reliability and validity, a formal questionnaire with 49 items was formed with proven reliability and validity.

Since some items were deleted, and items from graduation and employment management in the conceptual model were combined with items from learning management, to facilitate subsequent statistical analysis, the indicators were recoded, as shown in Table 3.32.

Table 3.32: Recoded Measurement Variables

Measurement variable	Recode	Measurement variable	Recode
M1: Overall quality expectations	EXP1	M30:Teaching management methods	LE1
M2:Expectations for personalized learning	EXP2	M31: Teaching plans	LE2
M3:Expectations for personalized training	EXP3	M32: Teaching content	LE3
M4: Leaders' attention	DP1	M33: Teaching schedule	LE4
M5:Coordination of various departments	/	M34: Learning quality control	/
M6: Learning goals	DP2	M35: General basic knowledge examination standards	LE5
M7: Competition goals	DP3	M43: Requirements of graduation	LE6
M8: Cultivating goals	DP4	M44: Employment guidance	LE7
M9: Guiding ideology	DP5	M45: Popularity in employment	LE8
M10: Management regulations	DP6	M36: Funding	LO1
M11: Compliance with enrollment policies	/	M37: Medical care	LO2
M12: Enrollment major	EN1	M38: Field and equipment	LO3
M13: Number of enrollments	EN2	M39: Nutrition	LO4
M14: Channel for enrollment	EN3	M40: Accommodation	LO5
M15: Sports special	EN4	M41: Research support	/
M16: Selection criteria for enrollment	EN5	M42: Accident insurance	/
M17: Training and competition plan	TC1	M46: Learning interest	PMV1
M18: Training schedule	TC2	M47: Training willingness	PMV2
M19: Training quality control	TC3	M48: Team cooperation ability	PMV3
M20:Training and competition summary	/	M49: Social adaptability	PMV4
M21: Coaches' ability	TC4	M50: Overall satisfaction	SAT1
M22: Competition frequency	TC5	M51: Comparison with expectation	SAT2
M23: Competition system	/	M52: Gap with ideal	SAT3
M24: Competition level	TC6	M53: Degree of complaint	COM1
M25: Reward and punishment system	TC7	M54: Satisfaction with the resolution of one's own or someone else's complaint	COM2
M26: Training recovery	TC8	M55: Confidence in a resolution if a complaint is made	COM3
M27: Emergency plan	TC9	M56: Confidence in the development prospects of high-level sports teams	LOY1
M28: Ideological and moral education	/	M57: The possibility of recommendation to others	LOY2
M29: Teaching instruments and equipment	/	M58: The possibility of re-purchasing	LOY3

Note: '/' means the item was deleted

3.11 Summary

This chapter focused on how the research was designed, sample selection and data analysis for the study. Quantitative research method was adopted to study satisfaction of high-level athletes with their management systems, involving high-level athletes from three Sichuan Province universities as research objects of the pilot study. Demographic characteristics of the pilot study respondents were analyzed. Reliability, along with validity were tested using the data obtained from output of the pilot study, while exploratory factor analysis was performed out on each of the latent variables. Lastly, the ultimate structure of the model and the final questionnaire to be used in the official survey were determined.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter sets out results of the data analysis and presents the findings. The proportion of samples based on demographic characteristics is described, along with the descriptive statistic of each item, as mean and standard deviation. A preparatory analysis of the data was performed prior to Smart PLS analysis. Confirmatory factor analysis (CFA) was performed to investigate construct reliability and validity in the measurement model. The structural model was used to analyze relationships between model latent variables, and to verify model predictive power. Then, importance-performance map analysis (IPMA) of latent variables and measurement variables was performed to discover where improvements were needed in the high-level athlete management system.

4.2 Respondent Profiles

During the main study phase, out of the 327 questionnaires returned by nine Sichuan Province Universities, 264 of them were completed properly. Respondents entered demographic information such as gender, sports level, grade, student source, and sports specialty. As shown in Table 4.1: In terms of gender, there are more male high-level athletes (52.65%) than females (47.35%). From the perspective of sports level, high-level athletes are mainly second-level athletes (50.76%), first-level athletes account for 37.50%, national master-level athletes account for 7.20%, and there is 4.55% missing data. At grade level, there are 33.30% high-level athletes in first grade, 30.30% in second, 21.59% in third, 14.77% in fourth. The highest number of high-level athletes (58.33%) came from ordinary high schools, this was followed by active athletes (21.97 %), sports schools' athletes 7.95 %, retired athletes 7.58 %, and 4.17% from other sources.

Table 4.1: Frequency Distribution Based on High-level Athlete Demographic Characteristics

Demographic characteristics	Variable	Frequency	Percentage (%)
Gender	Male	139	52.65 %
	Female	125	47.35%
Sports level	Second level athlete	134	50.76 %
	First level athlete	99	37.50 %
	National master level athlete	19	7.20 %
	Missing	12	4.55 %
Grade	First grade	88	33.33 %
	Second grade	80	30.30 %
	Third grade	57	21.59 %
	Fourth grade	39	14.77 %
Source	Retired athletes	20	7.58 %
	Active athletes	58	21.97 %
	Sports schools	21	7.95 %
	Ordinary high schools	154	58.33 %
	Others	11	4.17 %

4.3 Descriptive Statistics

In this study, having gone through a number of iterations, the final questionnaire involved a 7 Point Likert Scale. When the survey was completed, SPSS24.0 was applied to calculate mean value and standard deviation of a total of 49 measurement variables (expectations of high-level athletes, perceived management quality perceived management value, satisfaction of high-level athletes, complaints of high-level athletes and loyalty of high-level athletes).

4.3.1 High-level athlete expectation

The results of expectations of high-level athlete construct are shown in Table 4.2. The overall mean value of expectations construct is 5.82 ± 1.24. Among the three items of the high-level athlete expectation, expectation of learning has the highest mean value (5.98 ± 1.53). This is followed by expectation of training (5.86 ± 1.43) and then overall expectation of management (5.61 ± 1.66).

Table 4.2: Descriptive Statistics of High-level Athletes' Expectation

Construct	Code	Item	Mean	SD
Expectation	EX1	Overall expectations	5.61	1.66
	EX2	Expectations for learning	5.98	1.53
	EX3	Expectations for training	5.86	1.43
		Total	5.82	1.24

4.3.2 Perceived management quality

The results of the construct of high-level athlete perceived management quality are shown in table 4.3. The inclusive mean score of perceived management quality is 5.09± 1.24. In terms of the five perceived management quality dimensions, logistics management has the highest mean score (5.34 ± 1.39), followed by development planning (5.15 ± 1.33), learning management (5.14 ± 1.27), enrollment management (5.00 ± 1.39), and training and competition management (4.93 ± 1.21).

For the development planning dimension, the conclusion of mean score for the six items ranged from 4.38 to 5.92 (Table 4.3), where guiding ideology had the highest mean score (5.92 ± 1.46), followed by leadership emphasis (5.91 ± 1.32), learning goals (5.08 ± 1.73), management regulations (4.89 ± 1.70), competition goals (4.73 ± 1.64), and goal cultivation, which had the lowest average score (4.38 ± 1.77).

Regarding enrollment management dimension, mean scores for all five items ranged from 4.36 to 5.83 (Table 4.3), with selection criteria for enrollment having the highest mean score (5.83 ± 1.48), followed by sports specialty (4.99±1.62), number of enrollments (4.83±1.78), enrollment major (4.83±1.70), with enrollment channel having the lowest mean score (4.36±1.93).

For training and competition management dimension, mean score range for nine items was 4.37 to 5.83, with highest mean score for emergency plan (5.83 ± 1.40) and

lowest mean value for training schedule (4.37 ± 1.70). Mean values of other items were competition frequency (5.76±1.62), competition level (5.05±1.76), coach ability (5.04±1.59), training quality control (4.77±1.74), training and competition plan (4.56±1.74), reward and punishment system (4.53±1.70), and training recovery (4.47±1.67).

For learning management dimension, mean score of eight items ranged from 4.47 to 5.84, with highest mean score for employment guidance (5.84±1.31) and lowest for teaching plans (4.47±1.71). The mean scores of the other six items were teaching management methods (5.77±1.41), general examination standard basic knowledge (5.76±1.67), graduation requirements (5.01±1.78), popularity in employment (4.89±1.71), teaching content (4.83±1.79), and teaching plan (4.51±1.82).

For logistics management dimension, mean value of five items ranged from 5.96 to 4.85, with highest mean score for accommodation (5.96±1.45) and lowest score for field equipment (4.85±1.70). The other three items being nutrition (5.76±1.50), funding support (5.11±1.82), and medical care (5.02±1.95).

Table 4.3: Descriptive Statistics of Perceived Management Quality

Sub-constructs	Code	Item	Mean	SD
Development planning	DP1	Leaders' attention	5.91	1.32
	DP2	Learning goals	5.08	1.73
	DP3	Competition goals	4.73	1.64
	DP4	Cultivating goals	4.38	1.77
	DP5	Guiding ideology	5.92	1.46
	DP6	Management regulations	4.89	1.70
	Total		5.15	1.33
Enrollment Management	EN1	Enrollment major	4.83	1.70
	EN2	Number of enrollments	4.83	1.78
	EN3	Channel for enrollment	4.36	1.93
	EN4	Sports specialty	4.99	1.62
	EN5	Selection criteria for enrollment	5.83	1.48
	Total		5.00	1.39
Training and	TC1	Training and competition plan	4.56	1.74

Table 4.3, Continued

Sub-constructs	Code	Item	Mean	SD
competition management	TC2	Training schedule	4.37	1.70
	TC3	Training quality control	4.77	1.74
	TC4	Coaches' ability	5.04	1.59
	TC5	Competition frequency	5.76	1.62
	TC6	Competition level	5.05	1.76
	TC7	Reward and punishment system	4.53	1.70
	TC8	Training recovery	4.47	1.67
	TC9	Emergency plan	5.83	1.40
	Total		4.93	1.21
Learning Management	LE1	Teaching management methods	5.77	1.41
	LE2	Teaching plans	4.51	1.82
	LE3	Teaching content	4.83	1.79
	LE4	Teaching schedule	4.47	1.71
	LE5	General basic knowledge examination standards	5.76	1.67
	LE6	Requirements of graduation	5.01	1.78
	LE7	Employment guidance	5.84	1.31
	LE8	popularity in employment	4.89	1.71
	Total		5.14	1.27
Logistics management	LO1	Funding	5.11	1.82
	LO2	Medical care	5.02	1.95
	LO3	Field equipment	4.85	1.70
	LO4	Nutrition	5.76	1.50
	LO5	Accommodation	5.96	1.45
	Total		5.34	1.39
Mean value of Perceived management quality			5.09	1.24

4.3.3 Perceived management value

Perceived management value is measured by 4 items, with an overall mean score of 5.60±1.23. According to what is shown in Table 4.4, mean score of training willingness was the highest (5.99±1.31), followed by team cooperation ability (5.77±1.48) social adaptability (5.72±1.63), while the lowest mean score was for learning interest (4.92±1.65).

Table 4.4: Descriptive Statistics of Perceived Management Value

Construct	Code	Item	Mean	SD
Perceived management value	PV1	Learning interest	4.92	1.65
	PV2	Training willingness	5.99	1.31
	PV3	Team cooperation ability	5.77	1.48
	PV4	Social adaptability	5.72	1.63
		Total	5.60	1.23

4.3.4 High-level athlete satisfaction

As shown in table 4.5, overall mean score of high-level athlete satisfaction is 5.68±1.15. Highest mean score is comparison with expectation (5.79±1.43), followed by overall satisfaction (5.68±1.29), while lowest mean score is gap with ideal (5.56±1.49).

Table 4.5: Descriptive Statistics of Satisfaction

Construct	Code	Item	Mean	SD
High-level athletes' satisfaction	SA1	Overall satisfaction	5.68	1.29
	SA2	Comparison with Expectation	5.79	1.43
	SA3	Gap with ideal	5.56	1.49
	Total		5.68	1.15

4.3.5 High-level athlete complaints

Shown in Table 4.6, overall mean score of high-level athlete complaints was 5.48±1.21, highest score was satisfaction with resolution of one's or another's complaints (5.81±1.26), and the second highest was degree of complaint (5.58±1.43). The lowest mean score was for confidence in a resolution if a complaint is made (5.04±1.59).

Table 4.6: Descriptive Statistics of Complaint

Construct	Code	Item	Mean	SD
Complaints of high-level athletes	CO1	Degree of complaints	5.58	1.43
	CO2	The satisfaction with the resolution of one's or another's complaints	5.81	1.26
	CO3	Confidence in a resolution if a complaint is made	5.04	1.59
	Total		5.48	1.21

4.3.6 High-level athlete loyalty

As shown in Table 4.7, mean score of loyalty of high-level athletes was 5.73±1.33, in which, highest mean score was for confidence in development prospects of high-level sports teams (5.89±1.50), followed by possibility of recommending to others (5.73±1.65), with lowest mean value for possibility of repurchasing (5.58±1.67).

Table 4.7: Descriptive Statistics of Loyalty

Construct	Code	Item	Mean	SD
Loyalty of high-level athletes	LY1	Confidence in the development prospects of high-level sports teams	5.89	1.50
	LY2	The possibility of recommending to others	5.73	1.65
	LY3	The possibility of repurchasing	5.58	1.67
		Total	5.73	1.33

4.4 Preliminary Data Analysis

4.4.1 Missing data

If a respondent either deliberately or accidentally neglects to answer one or more questions, this is referred to as missing data. If the measure data that is missing exceeds 15% on a given questionnaire, it will normally be completely eliminated from the general data file. However, if the situation comes about that it is less than 5% missing values per indicator, they can be replaced with mean value (Hair et al., 2014).

The online questionnaire multiple-choice questions are mandatory, while fill-in-the-blank questions are not. This is the system default. Therefore, there can be no missing value in evaluation of management system parts of the questionnaire. However, some of the high-level athletes did not answer blank-filling questions in the personal information section of the questionnaire, and this created missing values. It is not appropriate to replace this type of missing information with a mean value. According to Liu (2011), it

is possible to deal with missing values of personal information by using sequential hot-deck imputation method. When filling in missing data, school, grade, and gender are used as auxiliary variables, and samples obtained from the survey are divided into several layers, after which, units are sorted according to student source variables in each layer. For units having missing data, interpolation with the previous answer value in the same layer is carried out. The missing values of the current research are shown in figure 4.1.

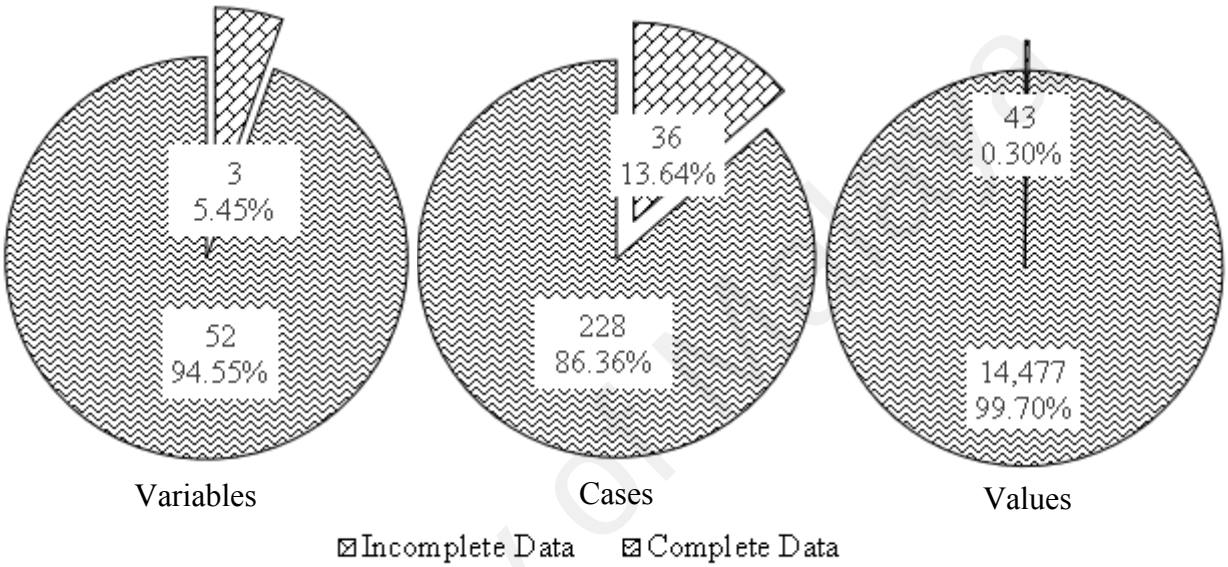


Figure 4.1: Overall Summary of Missing Data

4.4.2 Normality

PLS-SEM is a distribution free statistical method that differs from maximum likelihood (ML)-based CB-SEM in that it does not need data to be normally distributed (Astrachan, Patel, & Wanzenried, 2014). However, there is still a necessity to ensure that data are within acceptable ranges of normal, as data that is outside these ranges may prove problematic in assessing significances of parameters. Normality tests are nonparametric. Statistics for Kolmogorov-Smirnov and Shapiro-Wilk tests for normality were calculated. Should the test be non-significant ($p > .05$) it shows that sample distribution is not significantly different from a normal distribution, that is, most likely normal. But if the test should be significant ($p < .05$) then the measured distribution remains significantly different from a normal distribution (i.e. it is non-normal)(Field, 2009).

According to Razali and Wah (2011), Shapiro-Wilk test is considered to be one of the most reliable tests for all distribution types and sample sizes, whereas Kolmogorov-Smirnov test is considered the least. When P value is more than 0.05, data is deemed to be normally distributed. The Shapiro and Wilk test was primarily originated for dealing with sample sizes less than 50. But Royston (1995) gave an improved approximation to the weights, and provided an algorithm (ASR94) which can be used for any n. in the range $3 \leq n \leq 5000$. Because the number of samples in this study is just 264, results are based on Shapiro-Wilk test. After analysis, it was found that the Sig. of each indicator's data for all samples was less than 0.05, thus it was determined that the sample data here did not obey normal distribution.

Table 4.8: Test of Normality

Item	Kolmogorov-Smirnov		Shapiro-Wilk	
	Statistic	Sig.	Statistic	Sig.
EX1	0.25	.001	0.80	.001
EX2	0.34	.001	0.70	.001
EX3	0.26	.001	0.77	.001
DP1	0.27	.001	0.80	.001
DP2	0.21	.001	0.88	.001
DP3	0.16	.001	0.92	.001
DP4	0.16	.001	0.90	.001
DP5	0.29	.001	0.76	.001
DP6	0.22	.001	0.90	.001
EN1	0.20	.001	0.90	.001
EN2	0.17	.001	0.89	.001
EN3	0.21	.001	0.88	.001
EN4	0.23	.001	0.89	.001
EN5	0.25	.001	0.78	.001
TC1	0.19	.001	0.91	.001
TC2	0.17	.001	0.91	.001
TC3	0.16	.001	0.90	.001
TC4	0.18	.001	0.91	.001
TC5	0.27	.001	0.77	.001
TC6	0.24	.001	0.87	.001
TC7	0.17	.001	0.91	.001
TC8	0.15	.001	0.92	.001
TC9	0.25	.001	0.80	.001
LE1	0.24	.001	0.82	.001
LE2	0.19	.001	0.88	.001
LE3	0.18	.001	0.88	.001
LE4	0.22	.001	0.89	.001
LE5	0.31	.001	0.75	.001
LE6	0.22	.001	0.87	.001
LE7	0.24	.001	0.81	.001
LE8	0.16	.001	0.90	.001
LO1	0.25	.001	0.85	.001
LO2	0.26	.001	0.83	.001

Table 4.8, Continued

Item	Kolmogorov-Smirnov		Shapiro-Wilk	
	Statistic	Sig.	Statistic	Sig.
LO3	0.18	.001	0.90	.001
LO4	0.29	.001	0.79	.001
LO5	0.31	.001	0.74	.001
PV1	0.18	.001	0.91	.001
PV2	0.30	.001	0.77	.001
PV3	0.26	.001	0.79	.001
PV4	0.30	.001	0.78	.001
SA1	0.26	.001	0.85	.001
SA2	0.26	.001	0.81	.001
SA3	0.22	.001	0.85	.001
CO1	0.23	.001	0.86	.001
CO2	0.21	.001	0.83	.001
CO3	0.19	.001	0.90	.001
LY1	0.29	.001	0.75	.001
LY2	0.32	.001	0.76	.001
LY3	0.24	.001	0.80	.001

4.4.3 Outlier

Outliers are one or more observations that are notably different from most of the data, and which can cause serious problems in statistical analysis (Shang , Feng, Zhang, & Yu, 2015). According to Kline (2011), univariate outliers are easy to find by inspecting frequency distributions of Z scores. Therefore, in this study, outlier detection was performed by converting raw scores to Z scores. According to Hair, Anderson, Tatham, and Black (1998), for large sample size, absolute Z>4 indicates an extreme observation. As shown in table 4.9, the standardized (Z) score of all measurement variables is between - 3.83 and 3.06, and it can be determined that there are no outliers in the data.

Table 4.9: Outlier Test (Z score)

Item	Minimum	Maximum
ZSCORE(EX1)	-2.78	0.84
ZSCORE(EX2)	-3.26	0.66
ZSCORE(EX3)	-3.40	0.80
ZSCORE(DP1)	-3.73	0.83
ZSCORE(DP2)	-2.36	1.11
ZSCORE(DP3)	-2.27	1.38
ZSCORE(DP4)	-1.91	1.48
ZSCORE(DP5)	-3.37	0.74
ZSCORE(DP6)	-2.29	1.24
ZSCORE(EN1)	-2.25	1.28

Table 4.9, Continued

Item	Minimum	Maximum
ZSCORE(EN2)	-2.15	1.22
ZSCORE(EN3)	-1.74	1.37
ZSCORE(EN4)	-2.47	1.24
ZSCORE(EN5)	-3.27	0.79
ZSCORE(TC1)	-2.05	1.40
ZSCORE(TC2)	-1.98	1.54
ZSCORE(TC3)	-2.17	1.28
ZSCORE(TC4)	-2.54	1.24
ZSCORE(TC5)	-2.94	0.77
ZSCORE(TC6)	-2.30	1.11
ZSCORE(TC7)	-2.07	1.45
ZSCORE(TC8)	-2.08	1.51
ZSCORE(TC9)	-3.44	0.83
ZSCORE(LE1)	-3.38	0.87
ZSCORE(LE2)	-1.93	1.37
ZSCORE(LE3)	-2.14	1.21
ZSCORE(LE4)	-2.03	1.48
ZSCORE(LE5)	-2.84	0.74
ZSCORE(LE6)	-2.25	1.12
ZSCORE(LE7)	-3.69	0.88
ZSCORE(LE8)	-2.27	1.23
ZSCORE(LO1)	-2.26	1.04
ZSCORE(LO2)	-2.06	1.02
ZSCORE(LO3)	-2.27	1.27
ZSCORE(LO4)	-3.17	0.83
ZSCORE(LO5)	-3.43	0.72
ZSCORE(PV1)	-2.38	1.26
ZSCORE(PV2)	-3.82	0.77
ZSCORE(PV3)	-3.22	0.83
ZSCORE(PV4)	-2.89	0.79
ZSCORE(SA1)	-3.62	1.02
ZSCORE(SA2)	-3.34	0.85
ZSCORE(SA3)	-3.06	0.97
ZSCORE(CO1)	-3.20	0.99
ZSCORE (CO2)	-3.83	0.94
ZSCORE(CO3)	-2.55	1.24
ZSCORE(LY1)	-3.26	0.74
ZSCORE(LY2)	-2.86	0.77
ZSCORE(LY3)	-2.73	0.85
ZSCORE (age)	-2.08	3.06
ZSCORE (gender)	-0.95	1.05
ZSCORE (grade)	-1.10	2.60
ZSCORE (source)	-2.10	1.56
ZSCORE (sports level)	-1.13	2.14
ZSCORE (specialty)	-1.15	1.74

4.4.4 Common-method variance

Common method variation refers to artificial variation among variables caused by the same subjects or data sources, the same measurement situation, common project context or the project's own characteristics (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). This study used the same questionnaire to investigate high-level athletes in Sichuan Province universities. Data sources are relatively simple, so there may be common method biases that affect research results. In order to test whether there is a common method variation here, Harman's single factor test was employed to test for common method error. After factor analysis using 49 items of the questionnaire, seven factors were obtained, of which the first factor resulted in cumulative variation of 44.83 %, lower than the standardized 50 % (Podsakoff et al., 2003). This is shown in Table 4.10. It indicates that there was no common method variance here and therefore results would not be affected.

Table 4.10: Common-Method Variance Result

Extraction Sums of Squared Loadings		
Eigenvalues	% of Variance	Cumulative %
21.968	44.833	44.833

4.5 Measurement Model

Structural equation modeling is an analysis technique for testing measurement models (relations among indicators and latent variables) and also to examine the pathway relationships among latent variables (Harrington, 2009). There are two types of SEM, covariance-based SEM (CB-SEM) which is predominantly involved in confirming or rejecting theories, and, PLS-SEM (also called PLS path modeling) which is primarily used to develop theories in exploratory research (Hair et al., 2014). The structural equation model used in this study is PLS-SEM. The model evaluation involves two parts, the first being measurement model evaluation, and the second being structural model

evaluation. The measurement model is achieved using confirmatory factor analysis although the structural model analysis is achieved by path analysis between latent variables.

The structural equation model is essentially a causal model, meaning that when measurable variables are being selected, validity and reliability must meet specific requirements (Zhao, 2010). According to Hair et al. (2014), assessment of reflective measurement models includes: composite reliability to internal consistency, indicator reliability, and average variance extracted, in order to evaluate convergent validity. In addition, Fornell-Larcker criterion and cross loadings are used to assess discriminant validity.

4.5.1 Measurement model reliability

When carrying out measurement model reliability tests, internal consistency of the model is firstly detected. There are usually two indicators for verifying internal consistency, one is Cronbach's alpha and the other is Composite Reliability. Cronbach (1951) put forward the following criteria of judgment: Cronbach's alpha value being less than or equal to 0.35 shows low reliability, between 0.35~0.70 indicates moderate reliability, greater than 0.70 demonstrates high reliability. Nunnally (1978) suggested that an exploratory study with Cronbach's alpha greater than 0.6 would be acceptable.

Table 4.11: Internal Consistency Reliability and Convergent Validity of the Model

Constructs	Cronbach's Alpha	Composite Reliability	AVE
Complaints	0.80	0.88	0.72
Expectation	0.73	0.85	0.65
Loyalty	0.76	0.86	0.68
PMQ	0.98	0.98	0.57
PMV	0.83	0.88	0.66
Satisfaction	0.75	0.86	0.67

According to Nunnally and Bernstein (1994), while composite reliability values between 0.60 to 0.70 are deemed to be adequate when doing exploratory research, in later

stages of research, values between 0.70 and 0.90 are required to ensure satisfactory results. As shown in Table 4.11, it can be seen that Cronbach's alpha and composite reliability of all constructs of the model in this study are greater than the 0.70 standard, implying good internal consistency of the model.

4.5.2 Convergent validity

Convergent validity is the extent to which a measure correlates positively with alternative measures of the same construct. To establish convergent validity, researchers consider outer loadings of indicators, as well as average variance extracted (AVE) (Hair et al., 2014). High outer loadings on a construct imply that associated indicators have much in common, which is captured by the construct. This characteristic is also commonly called indicator reliability. Although indicator reliability of 0.70 is preferred, since the research is exploratory in nature, 0.40 or higher is acceptable (Hulland, 1999).

Outer loadings of this study are shown in Figure 4.2. All of them are greater than 0.70 except for indicators DP4, TC4, TC8, TC9, LE5, LE7, and LE8. According to Hair et al. (2014), consideration should be given to removing indicators with outer loadings between 0.40 and 0.70 only if their deletion leads to an increase in CR and AVE greater than the suggested threshold value. According to Camart, Lefait, Paquet-Deyris, and Romo (2018), if CR has already met its suggested threshold, then all the indicators used initially can be kept. As shown in Table 4.11, CR value of this study is higher than the threshold value of 0.70, and in view of content validity of the questionnaire, all items are therefore retained.

AVE is the degree to which a latent construct underpins the variance of its indicators. The threshold of AVE should be greater than 0.50. AVE values of 0.50 or higher indicate that, on average, the construct explains more than half of the variance of its indicators (Hair et al., 2014). As shown in Table 4.11, AVE values for all constructs range from

0.57 to 0.72, all are greater than the threshold of 0.50. This indicates that there is good convergence validity.

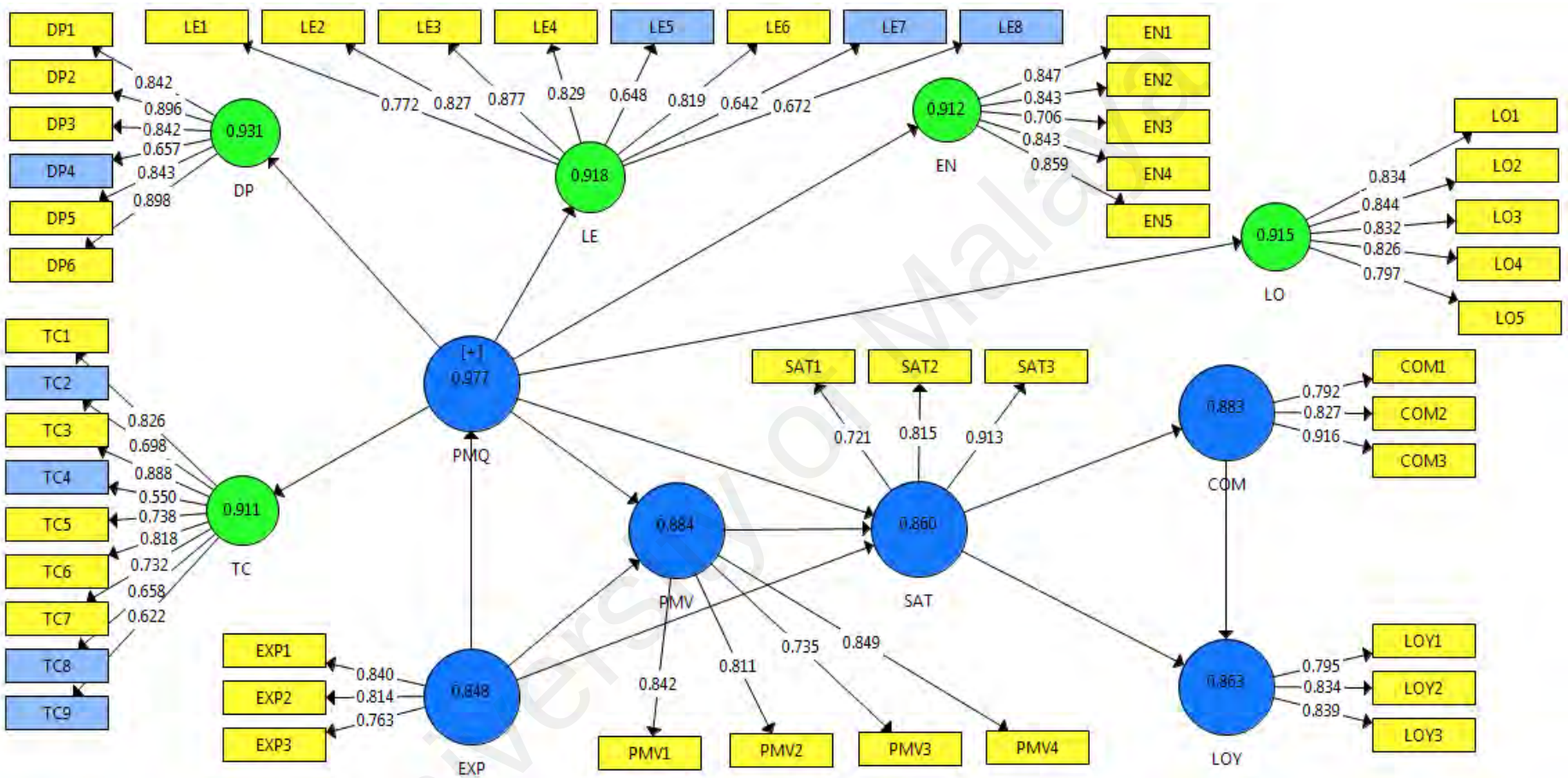


Figure 4.2: Outer-loadings of the Evaluation Model

Note: EXP=Expectation of High-level Athletes, PMQ=Perceived Management Quality, DP=Development Planning, EN=Enrollment Management, TC=Training and Competition Management, LE=Learning Management, LO=Logistics Management, GE=Graduate and Employment Management, PMV=Perceived Management Value, SAT=Satisfaction of High-level Athletes, COM=Complaints of High-level Athletes, LOY=Loyalty of High-level Athletes

4.5.3 Discriminate validity

Discriminant validity describes the level to which construct differs from other constructs by empirical standards (Hair et al., 2014). According to Hair et al. (2017), there are two measures used to evaluate model discriminate validity. The first method is carried out by examining indicator cross loadings, the second is examining Fornell-Larcker criterion.

Specifically, examining indicator cross-loadings means to examine indicator outer loadings on the associated constructs, to check whether they are higher than all loadings on other constructs. When an indicator's outer loading on the associated construct is greater than all its loadings on other constructs, it indicates that the measurement model has good discriminant validity. The result of cross-loading in the current research is as shown in Table 4.12.

Table 4.12: The result of Cross Loading

ITEM	COM	EXP	LOY	PMV	SAT	PMQ
COM1	**0.79**	-0.22	-0.40	-0.33	-0.33	-0.24
COM2	**0.83**	-0.24	-0.37	-0.34	-0.44	-0.28
COM3	**0.92**	-0.34	-0.45	-0.40	-0.42	-0.28
EXP1	-0.23	**0.84**	0.26	0.43	0.40	0.44
EXP2	-0.25	**0.81**	0.33	0.42	0.34	0.39
EXP3	-0.28	**0.76**	0.39	0.53	0.38	0.43
LOY1	-0.36	0.37	**0.80**	0.45	0.48	0.36
LOY2	-0.41	0.26	**0.83**	0.42	0.46	0.35
LOY3	-0.43	0.38	**0.84**	0.48	0.48	0.40
PMV1	-0.34	0.49	0.52	**0.84**	0.57	0.53
PMV2	-0.38	0.42	0.43	**0.81**	0.53	0.49
PMV3	-0.27	0.45	0.38	**0.73**	0.48	0.43
PMV4	-0.37	0.48	0.42	**0.85**	0.51	0.47
SAT1	-0.35	0.27	0.39	0.49	**0.72**	0.46
SAT2	-0.40	0.40	0.53	0.50	**0.82**	0.46
SAT3	-0.41	0.46	0.49	0.59	**0.91**	0.50
EN1	-0.22	0.44	0.28	0.46	0.46	**0.80**
EN2	-0.25	0.38	0.32	0.44	0.44	**0.80**

Table 4.12, Continued

ITEM	COM	EXP	LOY	PMV	SAT	PMQ
EN3	-0.18	0.38	0.25	0.39	0.34	**0.64**
EN4	-0.20	0.39	0.30	0.40	0.42	**0.80**
EN5	-0.25	0.46	0.40	0.48	0.51	**0.83**
DP1	-0.29	0.41	0.36	0.50	0.48	**0.81**
DP2	-0.25	0.47	0.37	0.49	0.48	**0.88**
DP3	-0.28	0.38	0.35	0.42	0.46	**0.79**
DP4	-0.15	0.30	0.26	0.29	0.43	**0.59**
DP5	-0.26	0.37	0.41	0.44	0.47	**0.80**
DP6	-0.29	0.43	0.38	0.47	0.50	**0.88**
LE1	-0.24	0.39	0.31	0.40	0.40	**0.76**
LE2	-0.24	0.48	0.28	0.50	0.46	**0.82**
LE3	-0.22	0.44	0.33	0.50	0.48	**0.86**
LE4	-0.22	0.44	0.35	0.45	0.42	**0.82**
LE5	-0.14	0.30	0.30	0.41	0.36	**0.57**
LE6	-0.26	0.39	0.33	0.48	0.46	**0.79**
LE7	-0.19	0.31	0.31	0.38	0.41	**0.56**
LE8	-0.24	0.47	0.39	0.50	0.43	**0.66**
LO1	-0.24	0.44	0.34	0.48	0.41	**0.80**
LO2	-0.29	0.41	0.38	0.51	0.49	**0.83**
LO3	-0.25	0.42	0.39	0.52	0.49	**0.80**
LO4	-0.26	0.43	0.35	0.43	0.39	**0.76**
LO5	-0.21	0.34	0.32	0.42	0.43	**0.75**
TC1	-0.28	0.41	0.35	0.53	0.45	**0.80**
TC2	-0.21	0.32	0.30	0.38	0.36	**0.64**
TC3	-0.31	0.49	0.43	0.57	0.55	**0.90**
TC4	-0.19	0.25	0.26	0.31	0.27	**0.51**
TC5	-0.29	0.38	0.40	0.44	0.48	**0.74**
TC6	-0.27	0.43	0.35	0.47	0.42	**0.80**
TC7	-0.27	0.31	0.37	0.44	0.40	**0.64**
TC8	-0.22	0.34	0.31	0.34	0.31	**0.58**
TC9	-0.17	0.31	0.27	0.39	0.32	**0.57**

Fornell-Larcker criterion measures discriminant validity that compares each construct's extracted average variance square root, with its correlations to all other model constructs (Hair et al., 2014). If the square root value of the average extraction variation is greater than the correlation coefficient, it indicates that the measurement model has good discriminant validity. As shown in Table 4.13: all the square root of each construct's

AVE is greater than its highest correlation with any other construct, indicating that the model has good discriminant validity.

Table 4.13: The Result of the Fornell-Larcker Criterion

Constructs	COM	EXP	LOY	PMQ	PMV	SAT
Complaints	**0.85**					
Expectation	-0.31	**0.81**				
Loyalty	-0.48	0.41	**0.82**			
Perceived Management Quality	-0.32	0.52	0.45	**0.75**		
Perceived Management Value	-0.42	0.57	0.55	0.59	**0.81**	
Satisfaction	-0.47	0.46	0.58	0.58	0.64	**0.82**

4.6 Structural model

4.6.1 Multicollinearity

Multiple collinearity describes distortion or accuracy estimation problems in a model because of the presence of accurate correlation or high correlation, between independent variables in the linear regression model. When two or more variables predict another variable, the multicollinearity problem needs to be examined (Mei, Jing, & Hui, 2012). This study used tolerance and variance inflation factor (VIF) to evaluate the multicollinearity problem of the structural equation models. If there is a collinearity problem in the structural model, then the specific structure/s with the problem/s must be merged or deleted. According to Hair et al. (2014), collinearity is indicated if tolerance levels are below 0.20 and VIFs are greater than 5.0 in the predictors.

In the model here, perceived management quality and high-level athlete complaints have only one predictor, so there is no need to evaluate the collinearity of these two variables. There are two predictors for perceived management value variables, high-level athlete expectations, and perceived management quality. There are three predictors of high-level athlete satisfaction, high-level athlete expectations, perceived management

quality, and perceived management value. There are two predictors of high-level athlete loyalty, high-level athlete satisfaction, and high-level athlete complaints. Therefore, it is necessary to perform multi-collinearity analysis on predictive variables corresponding to the three variables of perceived management value, high-level athlete satisfaction, and high-level athlete complaints.

As shown in Table 4.14, the two predictive structures of perceived management value both have a tolerance of 0.73, therefore greater than 0.2, and VIFs of 1.38, thus below the threshold of 5. Tolerances of the three predictive structures for high-level athletes are 0.62, 0.60, and 0.56, respectively, which are above the threshold, and the VIFs are 1.61, 1.67, and 1.80, respectively, below the threshold. Tolerances of the two predictive structures of loyalty of high-level athletes are 0.78, above the threshold, and VIFs 1.29, below the threshold. In summary, since all the values fall within the threshold limits, there appears to be no multicollinearity problem in the structural equation of this study.

Table 4.14: VIF and Tolerance Values for Collinearity Evaluation of the Structural Model

Dependent Constructs	Predictor Constructs	Tolerance	VIF
Perceived management value	High-level athlete expectations	.73	1.38
	Perceived management quality	.73	1.38
High-level athlete satisfaction	High-level athlete expectations	.62	1.61
	Perceived management quality	.60	1.67
	Perceived management value	.56	1.80
High-level athlete loyalty	High-level athlete satisfaction	.78	1.29
	High-level athlete complaints	.78	1.29

4.6.2 Path analysis

4.6.2.1 Significance test of path coefficient

After completing multiple collinearity testing of the structural model, it was necessary to test its path coefficient. In general, standardized path coefficients can be greater than 0.1, but ideally, above 0.2 in they are to be deemed relevant (Falk & Miller, 1992). As recommended by Hair et al. (2014), bootstrapping was used to compute empirical t values of significance for path coefficients, using 5,000 sub-samples. Significance of path coefficients is determined by comparing the T value with the P value, where significance level is 0.05. If $| t | > 1.96$, it is significant, whereas on the other hand, if $| t | \leq 1.96$, it is not. Table 4.15 shows Smart PLS output results of the structural model path coefficient tests.

Table 4.15: Path Coefficient and Significant Value of the Structural Model (n=264)

Path	Path coefficient (β)	T value	P value	Result
EXP→PMQ	0.52	11.22	.001	Supported
EXP→PMV	0.36	7.00	.001	Supported
EXP→SAT	0.065	1.11	0.27	Unsupported
PMQ→PMV	0.40	8.20	.001	Supported
PMQ→SAT	0.28	4.85	.001	Supported
PMV→SAT	0.44	7.24	.001	Supported
SAT→COM	-0.47	10.54	.001	Supported
SAT→LOY	0.45	9.50	.001	Supported
COM→LOY	-0.27	5.47	.001	Supported

Note: EXP= Expectation of high-level athletes; PMQ= Perceived management quality; PMV= Perceived management value; SAT= Satisfaction of high-level athletes; COM= Complaints of high-level athletes. LOY= Loyalty of high-level athletes.

4.6.2.2 Hypotheses testing

Based on bootstrapping results in Smart PLS 3 (Table 4.15), the research hypotheses were re-examined

Hypothesis 1: High-level athlete expectation significantly positively impacts perceived management quality.

As shown in Table 4.15, the path coefficient between high-level athlete expectations and perceived management quality is 0.52, with t-value = 11.22, and significance level $p < .001$. The results show that there is a significant relationship between expectations of high-level athletes and perceived management quality. Therefore, the results support the first hypothesis.

Hypothesis 2: High-level athlete expectation significantly positively impacts perceived management value.

The path between high-level athlete expectations and perceived management value shows a coefficient value of 0.36, with t-value = 7.00, and significance level $p < .001$. The results show that there is a significant relationship between expectation of high-level athletes and perceived management value. Therefore, the result supports the second hypothesis.

Hypothesis 3: High-level athlete expectation significantly positively impacts high-level athlete satisfaction.

As shown in Table 4.15, the link between expectation and satisfaction indicated a coefficient value of 0.065 with t-value = 1.11 and p-value=0.27. Results show that there is no significant relationship between expectation of high-level athletes and satisfaction. Therefore, the result does not support the third hypothesis.

Hypothesis 4: Perceived management quality significantly positively impacts perceived management value.

The path between perceived management quality and perceived management value indicated a coefficient value of 0.40, with t-value = 8.20, and significance level at $p< .001$.

The results show that there is a significant relationship between perceived management quality and perceived management value. Therefore, the results support the fourth hypothesis.

Hypothesis 5: Perceived management quality significantly positively impacts high-level athlete satisfaction.

As shown in Table 4.15, the path coefficient between perceived management quality and high-level athlete satisfaction is 0.28, t-value is 4.85, and significance level is $p < .001$. The results show that there is a significant relationship between perceived management quality and high-level athlete satisfaction. Therefore, the result supports the fifth hypothesis.

Hypothesis 6: Perceived management value significantly positively impacts high-level athlete satisfaction.

The path between perceived management value and high-level athlete satisfaction demonstrated a coefficient value of 0.44, with t-value = 7.24, and significance level at $p< .001$. The results show that there is a significant relationship between perceived management value and high-level athlete satisfaction. Therefore, the result supports the sixth hypothesis.

Hypothesis 7: High-level athlete satisfaction significantly negatively impacts complaints of high-level athletes.

The coefficient of the path between high-level athlete satisfaction and high-level athlete complaints is -0.47, the t-value is 10.54, and significance level is $p< .001$. The results show that there is a significant relationship between high-level athlete satisfaction and high-level athlete complaints. Therefore, the results support the seventh hypothesis.

Hypothesis 8: High-level athlete satisfaction significantly positively impacts high-level athlete loyalty.

As shown in Table 4.15, the path coefficient between high-level athlete satisfaction and loyalty of high-level athletes is 0.45, with t-value 9.50, and significance level at $p < .001$. The results show that there is a significant relationship between high-level athlete satisfaction and high-level athlete loyalty. Therefore, the result supports the eighth hypothesis.

Hypothesis 9: Complaints of high-level athletes significantly negatively impacts loyalty of high-level athletes.

As shown in Table 4.15, the path coefficient between high-level athlete complaints and loyalty of high-level athletes is -0.27, with t-value = 5.47 and significance level of $p < .001$. The results show that there is a significant relationship between high-level athlete complaints and loyalty of high-level athletes. Therefore, the result supports the ninth hypothesis.

4.6.2.3 Model revision

The path coefficient of path EXP→SAT is 0.065, the T value is 1.11 (less than 1.96), and P value is 0.27 (greater than 0.05). Liu (2011) believes that the path coefficient is meaningful only when it is close to or higher than 0.2. Therefore, the path EXP→SAT is not ideal. The model had to be revised, path EXP→SAT deleted, and the entire recalculated. Once After the path EXP→SAT was deleted, bootstrapping tests were performed again. The path coefficient of perceived management quality to satisfaction along with the path perceived management value to satisfaction, have both increased, therefore the revised model is more reasonable, seen in Figure 4.3.

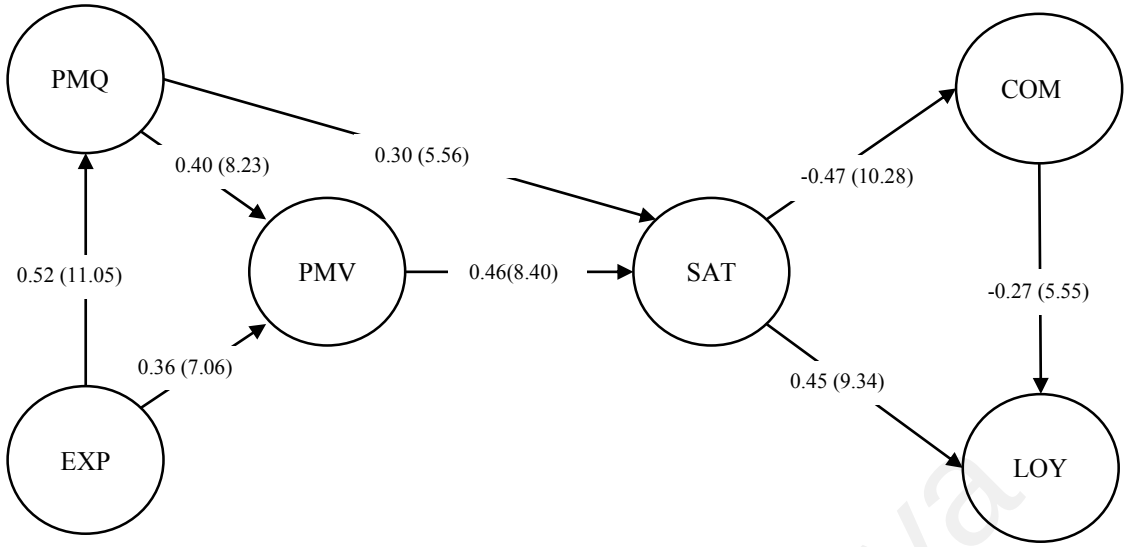


Figure 4.3: Path Coefficient and T-value of the Revised Model

4.6.2.4 Effect analysis

Path coefficient is inclusive of direct path coefficient and indirect path coefficient, and represents direct and indirect effects, respectively. The sum of direct and indirect effect is total effect. The effect of variables of the modified model is shown in Table 4.16:

Table 4.16: Effect of the Revised Model

Path	Direct effect	Indirect effect	Total effect
EXP→PMQ	0.52	0.00	0.52
EXP→PMV	0.36	0.21	0.57
EXP→SAT	0.00	0.42	0.42
PMQ→PMV	0.40	0.00	0.40
PMQ→SAT	0.30	0.19	0.49
PMV→SAT	0.46	0.00	0.46
SAT→COM	-0.47	0.00	-0.47
SAT→LOY	0.45	0.13	0.58
COM→LOY	-0.27	0.00	-0.27

According to Table 4.16, among the three independent variables of high-level athlete satisfaction, the most significant impact on overall satisfaction with high-level athlete management systems, is perceived management quality. Its impact coefficient is

0.49, which means that when perceived management quality is increased by 1-unit, overall satisfaction of high-level athletes is increased by 0.49 units.

The second major impact on overall satisfaction of high-level athlete management systems is perceived management value. The impact coefficient is 0.46, that is, when satisfaction level of perceived management value is increased by 1 unit, satisfaction of high-level athletes is increased by 0.46 units.

Although the direct effect of high-level athlete expectations on high-level athlete satisfaction is not significant, it has an indirect effect through the mediating effect. The impact coefficient is 0.42, that is, when expectation of high-level athletes is increased by 1 unit, satisfaction of high-level athletes increases by 0.42 units.

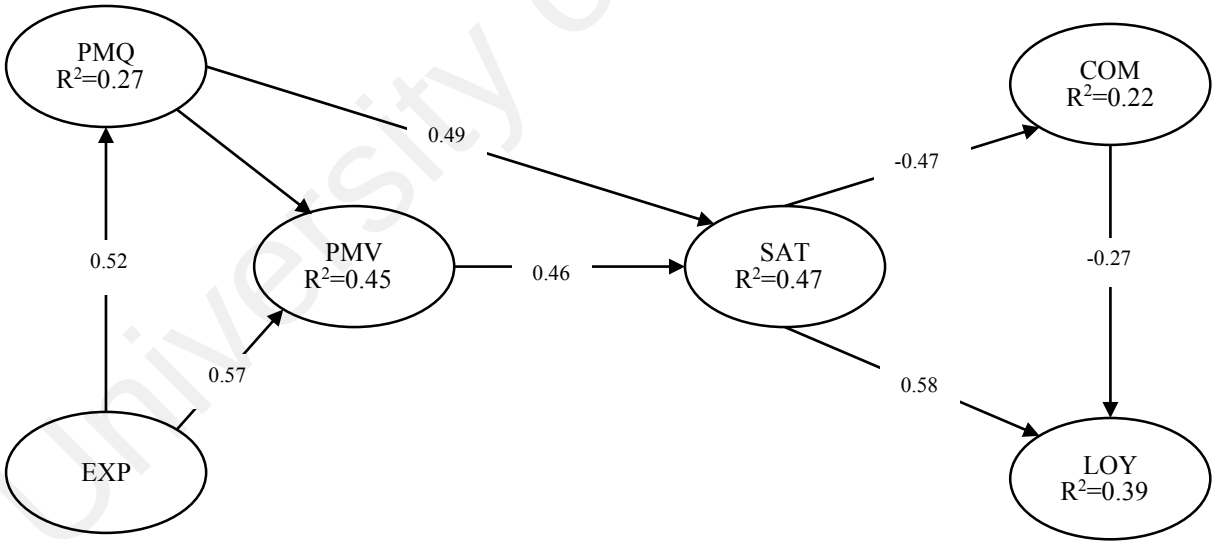
The coefficient of high-level athlete satisfaction on student loyalty is 0.58, that is, if high-level athlete satisfaction is increased by 1-unit, high-level athlete loyalty is increased by 0.58. The impact of high-level athlete complaints on high-level athlete loyalty is -0.27, indicating that if complaints of high-level athlete is increased by 1-unit, loyalty of high-level athletes is reduced by 0.27 units.

4.6.3 Coefficient of determination (R^2)

The structural model is evaluated using the coefficient of determination (R^2) value. This coefficient represents the combined effects of all independent variables on dependent variables. The R^2 value showcases the model's predictive power (Hair et al., 2014). R^2 values range from 0 to 1 with higher levels indicating higher levels of predictive accuracy. According to Backhaus, Erichson, Plinke, and Weiber (2003), there are no generally applicable thresholds for acceptable R^2 values. Aibinu and Al-Lawati (2010) reported that an excellent wellness of fit can still be present when R^2 is low. According to Cohen (1988), 0.26 is considered as substantial, 0.13 moderate, and 0.02 weak.

Whereas Hair et al. (2014), suggest as a rough rule of thumb 0.25 is weak, 0.50 is moderate, and 0.75 is substantial. However, R^2 value of latent variable is greater than 0, indicating that the model is acceptable(Zhao, 2010). It depends on model complexity and research discipline.

Figure 4.4 shows R^2 for each of the endogenous constructs. It may be seen that R^2 ranges from 0.22 to 0.47. All R^2 values are greater than 0.2, indicating that the model is acceptable. R^2 of complaints is 0.22, it indicates that 22% of complaints is due to satisfaction. R^2 of loyalty is 0.39, it indicates that 39 % of loyalty is due to satisfaction and complaints. R^2 of PMQ is 0.27, it indicates that 27% of the PMQ is due to expectation. R^2 of PMV is 0.45, it indicates that 45 % of the PMV is due to the expectation and PMQ. R^2 of satisfaction is 0.47, it indicates that 47 % of satisfaction is due to expectation, PMQ and PMV.



Note: EXP is exogenous latent variable, so it does not have R^2 value.

Figure 4.4: R^2 of Endogenous Constructs of the Model

4.6.4 Effect sizes f^2

Along with evaluating R^2 values of all endogenous constructs, changes in R^2 values when a noted exogenous construct is absent from the model, can be used to establish if

the absent construct has a substantive impact on the endogenous constructs. This measure is referred to as the f^2 effect size. The effect size can be calculated as:

$$f^2 = \frac{R^2_{included} - R^2_{excluded}}{1 - R^2_{included}}$$

Where $R^2_{included}$ and $R^2_{excluded}$ are R^2 values of the endogenous latent variable when a selected exogenous latent variable is included or excluded. A guideline for assessing f^2 is that values of 0.02, 0.15, and 0.35, respectively, represent small, medium, and large effects of exogenous latent variables (Cohen, 1988). After running PLS algorithm, results of f^2 are shown in table 4.17.

Table 4.17: Results of Effect Size f^2

Endogenous / **Exogenous**	**Complaints**	**Loyalty**	**PMQ**	**PMV**	**Satisfaction**
Complaints		0.10			
Expectation			0.38	0.17	
PMQ				0.21	0.11
PMV					0.26
Satisfaction	0.29	0.26			

According to table 4.17, exogenous constructs complaints and satisfaction for explaining endogenous latent variable loyalty have f^2 effect sizes of 0.10 and 0.26 respectively. Because of this, the effect size of construct complaints on endogenous latent variable loyalty is small, and effect size of construct satisfaction on endogenous latent variable loyalty is medium. Exogenous construct satisfaction for explaining endogenous latent variable complaints has f^2 effect size of 0.29, the effect size of construct satisfaction on endogenous latent variable complaints is medium. Exogenous construct expectation for explaining endogenous latent variable PMQ has f^2 effect size of 0.38, and effect size of construct expectation on endogenous latent variable PMQ is large.

Exogenous constructs expectation and PMQ for explaining endogenous latent variable PMV has f^2 effect sizes of 0.17 and 0.21, respectively. Hence, effect sizes of construct expectation and PMQ on endogenous latent variable PMV are both medium. Exogenous constructs PMQ and PMV for explaining endogenous latent variable satisfaction have f^2 effect sizes of 0.11 and 0.26, respectively. So, effect sizes of construct PMQ and PMV on endogenous latent variable satisfaction are both medium.

4.6.5 Predictive relevance Q^2

In addition to evaluating the magnitude of the R^2 values as a criterion of predictive accuracy, Stone-Geisser Q^2 value can be used to determine the model's predictive relevance (Sparks, 2014). If Q^2 values are greater than 0.0 it indicates that exogenous constructs have predictive relevance for endogenous constructs that are under consideration (Hair et al., 2014). Blindfolding procedure with cross-validated redundancy method was applied for calculating Q^2 (Hair et al., 2014). The Stone-Geisser Q^2 values are shown in Table 4.18. All values of predictive relevance are higher than 0.0, seemingly proving the high predictiveness of the model.

Table 4.18: Stone-Geisser Q^2 Values of Predictive Relevance

Endogenous Construct	Q^2
Complaints	0.15
Loyalty	0.25
Perceived Management Quality	0.14
Perceived Management Value	0.27
Satisfaction	0.30

4.6.6 Model fit

Goodness of Fit (GoF) was proposed by Tenenhaus, Vinzi, Chatelin, and Lauro (2005) as a diagnostic tool for assessing model fit for PLS-SEM. GoF is measured by use of the geometric mean value of the average communality score (AVE values) and the

average R^2 values (for endogenous constructs), and is calculated using the following equation (Tenenhaus et al., 2005).

$$\text{GoF} = \sqrt{\overline{\text{AVE}} \times \overline{\text{R}^2}}$$

When GoF is greater than 0.36, the model fits well; when GoF is about 0.25, the model fits moderately; when GoF is less than 0.10, the model fits poorly (Wetzels, Odekerken-Schröder, & Van Oppen, 2009). A GoF value of 0.49 was found for this model, indicating a good model fit.

However, research by Henseler, Ringle, and Sarstedt (2012) suggests that GoF does not represent a goodness-of-fit criterion for PLS-SEM. Hair et al. (2014) advise that researchers should not use GoF as a measure. Henseler et al. (2014) propose Standardized Root Mean Square Residual (SRMR) as a 'goodness of fit' measure for PLS-SEM, to avoid model misspecification. A value of less than 0.08 is considered a good fit ("Model Fit," 2014). In this research, SRMR value of the model is 0.063, below 0.08. As per the SRMR index, the model fit is also good. As shown in table 4.19:

Table 4.19: Fit Indices for Structural Model

Types of Measures	Indices	Criteria
GoF	0.49	$\text{GoF}_{\text{poor}}<0.10$; $0.10\leq\text{GoF}_{\text{moderate}}\leq0.36$; $\text{GoF}_{\text{well}}>0.36$
SRMR	0.067	<0.08

4.7 Mediation Analysis

A common method for testing mediating effects is the Sobel test. It compares the relationships amongst independent variables and dependent variables before and after inclusion of the mediation construct (Helm, Eggert, & Garnefeld, 2010). However, this test depends on distributional assumptions which often do not hold for indirect effect.

Furthermore, the Sobel test requires unstandardized path coefficients as inputs for test statistic, and it lacks statistical power, especially when applied to small sample sizes.

According to Hair et al. (2014), when testing mediating effects, it is preferred that researchers follow the method of Preacher and Hayes (2008) and bootstrap the sampling distribution of the indirect effect, which works for simple and multiple mediator models. Bootstrapping makes no assumptions about the shape of the variables' or sampling distribution of statistics, and can be confidently applied to small sample sizes (Hair et al., 2014; Pardo & Román, 2013). Using these methods is very fitting for the PLS-SEM method and shows better statistical power than the Sobel test.

This test has advantages over Sobel's test, and can help determine mediation effects with more certainty. In this approach, bootstrapping can be used twice, firstly without the presence of mediation, and secondly, with the presence of mediation. It should be noted that if the direct path is not significant, there is no mediating effect (Wong, 2016).

As can be seen from Figure 4.5, there may be four paths with mediation, namely: path EXP→SAT, path EXP→PMV, path PMQ→SAT and path SAT→LOY. To carry out mediation analysis in PLS-SEM, the first step is to assess direct effect of exogenous variables on endogenous variables. It should be significant if the mediator is not included (Zhao, Lynch Jr, & Chen, 2010).

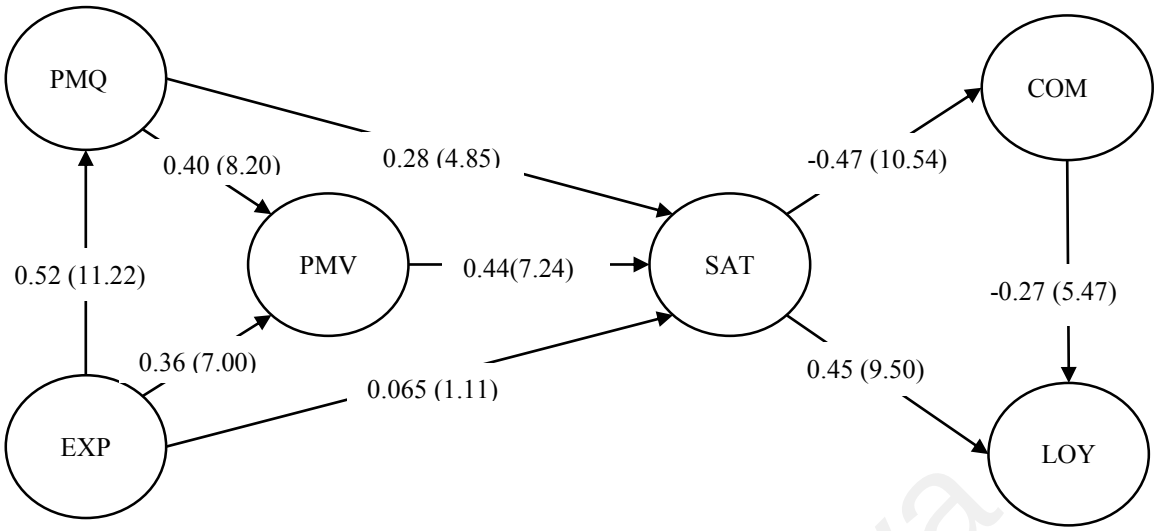


Figure 4.5: High-level Athlete Management System Satisfaction Model

4.7.1 Path analysis without mediator

Firstly, direct effect of high-level athlete expectation on satisfaction was measured. As shown in Figure 4.5, the path EXP→SAT has two mediation variables, PMQ and PMV. Therefore, after removal of the two mediation variables, bootstrapping was run again to verify path coefficients and significance. The result is shown in Figure 4.6: β=0.47, t value=10.01, and it is revealed that direct path EXP→SAT is statistically significant.

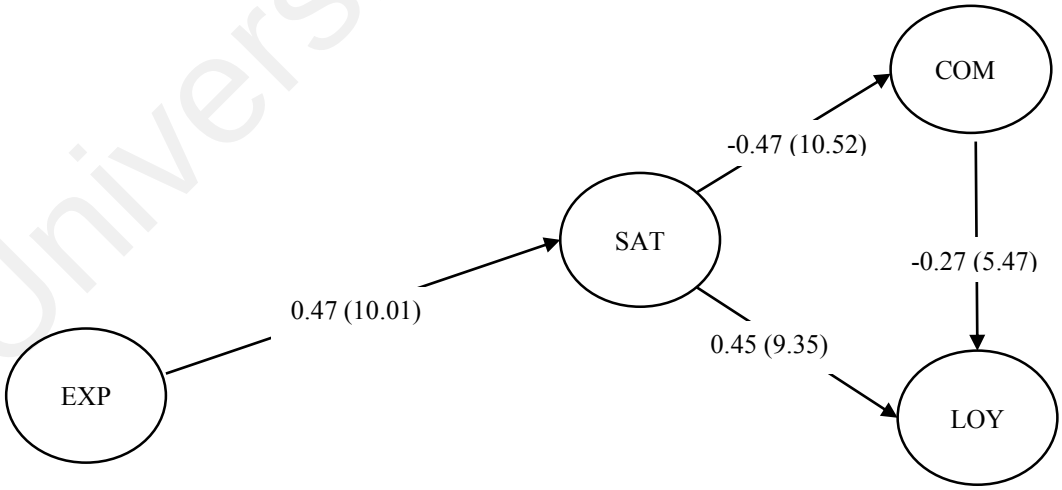


Figure 4.6: Direct Effect of EXP→SAT

Then direct impact of expectations on perceived management value was analyzed. As shown in Figure 4.5, path EXP→PMV has one mediator variable, PMQ. Therefore, after removing this mediation variable, bootstrapping was run again to verify path coefficients and significance. The result is shown in Figure 4.7: β=0.57，t value=13.40. The results reveal that direct path EXP→PMV is statistically significant.

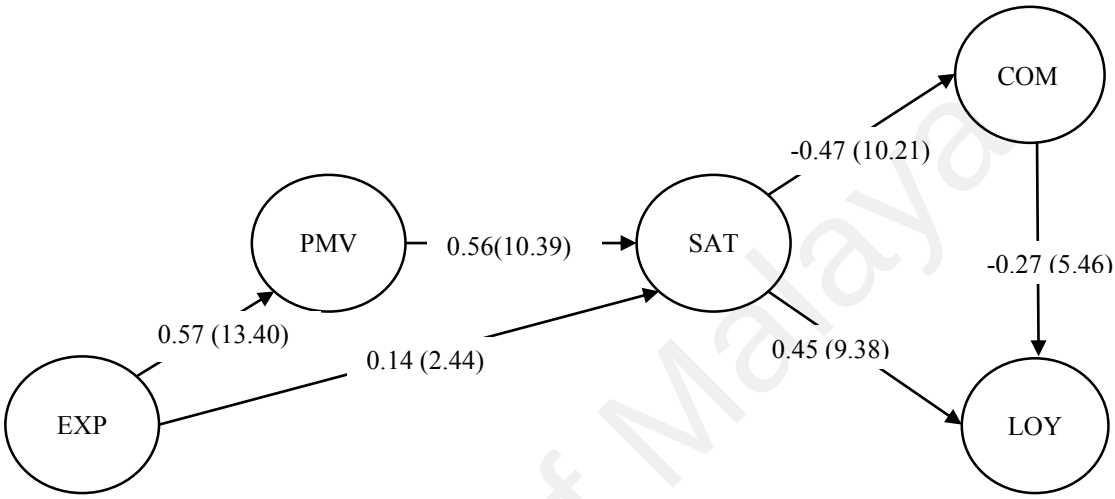


Figure 4.7: Direct Effect of EXP→PMV

Then direct impact of path PMQ→SAT was analyzed, as shown in Figure 4.6, path PMQ → SAT has a mediation variable PMV. Therefore, after removal of mediation variable PMV, bootstrapping was run again to verify path coefficients and significance. The result is shown in Figure 4.8: β = 0.46, t value = 8.19. The results reveal that direct path EXP → PMV is statistically significant.

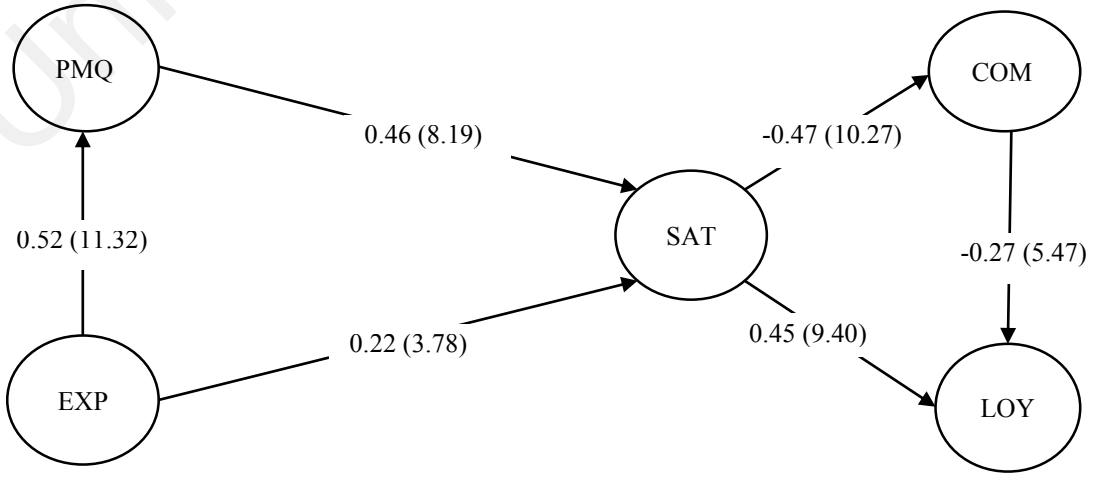


Figure 4.8: Direct Effect of PMQ→SAT

Finally, direct impact of high-level athlete satisfaction on loyalty was analyzed, as shown in Figure 4.5, path SAT → LOY has a mediation variable COM. Therefore, after removal of this mediation variable, bootstrapping was run again to verify path coefficients and significance. The result is shown in Figure 4.9: β = 0.57, t value = 14.08. The results reveal that direct path EXP→PMV is statistically significant.

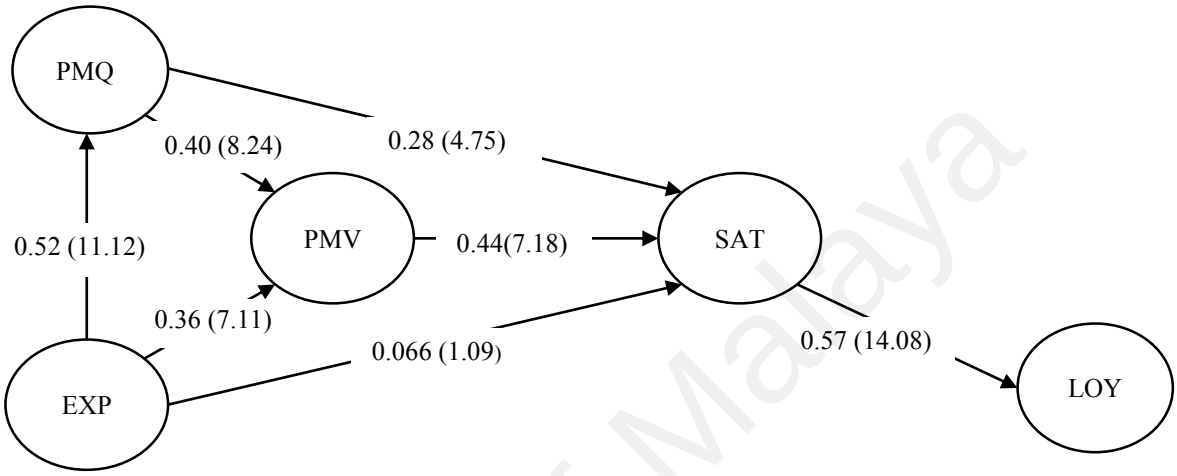


Figure 4.9: Direct Effect of SAT→LOY

4.7.2 Path analysis with mediator

If there is a significant direct then inclusion of the mediator variable in the PLS path model should occur before assessing significance of indirect path (i.e. P12*P23) as shown in figure 4.10. The significance of individual paths P12 and P23 are necessary requirements for this condition while indirect path can be determined following bootstrapping procedure. If indirect effect is found significant, then the mediator absorbs some of direct path. Variation accounted for (VAF) is calculated as VAF = (P12*P23) / (P13+ P12*P23).

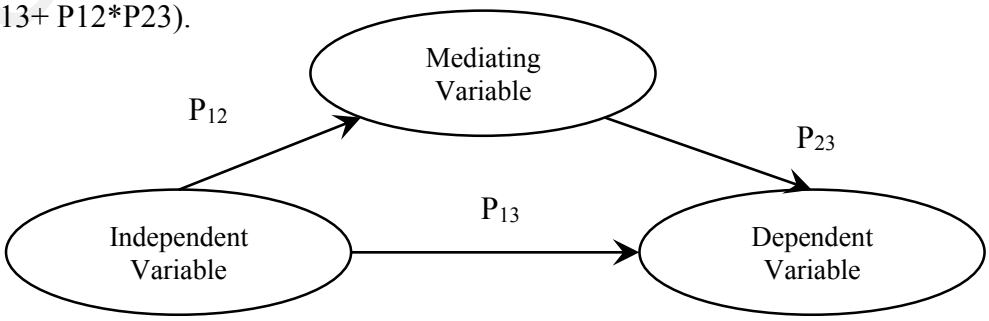


Figure 4.10: Mediation Analysis Using Bootstrapping Approach

VAF determines indirect effect size in relation to total effect (i.e., direct effect+ indirect effect). Thereby determining the extent to which dependent variable variance is directly demonstrated by the independent variable and the amount of the target construct's variance is explained by the indirect relationship via the mediator variable. VAF less than 20% indicates that (almost) no mediation takes place. In contrast, when VAF has very large outcomes of over 80% for example, it is possible to assume full mediation. A situation where VAF is larger than 20% and less than 80% can be characterized as partial mediation (Hair et al., 2014).

Table 4.20 represents the mediation test for the four paths. According to these results, the mediation effects were statistically significant. VAF value of path EXP→SAT =[(0.52*0.28)+(0.36*0.44)+(0.52*0.40*0.44)]/[(0.52*0.28)+(0.36*0.44)+(0.52*0.40*0.44)+0]=100.00%. Therefore, PMQ and PMV fully mediated the relationship between EXP with SAT. VAF value of path EXP→PMV = (0.52*0.40) / (0.52*0.40+0.36) = 0.21 / 0.57=36.84%. So, PMQ partially mediated the relationship between EXP with PMV. VAF value of path PMQ→SAT = (0.40*0.44) / (0.40*0.44+0.28) = 0.18 / 0.46 = 39.13%. So, PMV partially mediated the relationship between PMQ with SAT. VAF value of path SAT→LOY = (-0.47*-0.27) / (-0.47*-0.27+0.45) = 0.13 / 0.58 = 22.41%. So, COM partially mediated the relationship between SAT with LOY.

Table 4.20: Test of the Mediation Effects Using Bootstrapping

Path	Effect	Path	Path Coefficient		Indirect Effect	STDEV	Total Effect	VAF	T Value	P Value	Results
EXP → SAT	Direct effect without mediator	EXP→SAT	0.47		n/a	0.047	n/a	n/a	10.01	.001	Full Mediation
	Direct effect with mediator	EXP→SAT	0.065 (0.00)		n/a	0.061			1.11	0.27	
	Indirect effect path 1	EXP→ PMQ	0.52	0.15		0.047			11.22	.001	
	EXP→ PMQ→SAT	PMQ→SAT	0.28			0.059			4.85		
	Indirect effect path 2	EXP→ PMV	0.36	0.16		0.051	0.40	100%	7.00	.001	
	EXP→ PMV→SAT	PMV→SAT	0.44		0.40	0.061			7.24		
	Indirect effect path 3 EXP→ PMQ→PMV→ SAT	EXP→ PMQ	0.52	0.09		0.047			11.22		
		PMQ→PMV	0.40			0.049			8.20	.001	
		PMV→ SAT	0.44			0.061			7.24		
EXP → PMV	Direct effect without mediator	EXP→PMV	0.57		n/a	0.043	n/a	n/a	13.40	.001	Partial mediation
	Direct effect with mediator	EXP→PMV	0.36		n/a	0.051			7.00	.001	
	Indirect effect	EXP→ PMQ	0.52		0.21	0.047	0.57	36.84%	11.22	.001	
	EXP→ PMQ→PMV	PMQ →PMV	0.40			0.049			8.20	.001	
PMQ → SAT	Direct effect without mediator	PMQ →SAT	0.46		n/a	0.056	n/a	n/a	8.19	.001	Partial mediation
	Direct effect with mediator	PMQ→SAT	0.28		n/a	0.059			4.85	.001	
	Indirect effect	PMQ→PMV	0.40		0.18	0.049	0.46	39.13%	8.20	.001	
	PMQ→PMV→SAT	PMV→SAT	0.44			0.061			7.24	.001	
SAT → LOY	Direct effect without mediator	SAT→LOY	0.58		n/a	0.041	n/a	n/a	14.08	.001	Partial mediation
	Direct effect with mediator	SAT→LOY	0.45		n/a	0.048			9.50	.001	
	Indirect effect	SAT→COM	-0.47		0.13	0.045	0.58	22.41%	10.54	.001	
	SAT→COM→LOY	COM→LOY	-0.27			0.050			5.47	.001	

Note: EXP= Expectation of high-level athletes; PMQ= Perceived management quality; PMV= Perceived management value; SAT= Satisfaction of high-level athletes; COM= Complaints of high-level athletes. LOY= Loyalty of high-level athletes. * When performing Direct effect with mediator analysis, the EXP→SAT path coefficient is not significant, so the path coefficient is 0.00.

4.8 Importance-Performance Map Analysis

Importance-performance map analysis (IPMA) is useful in extending the findings of basic PLS-SEM out-comes, using latent variable scores (Fornell et al., 1996; Völckner, Sattler, Hennig-Thurau, & Ringle, 2010). IPMA contrasts unstandardized total effects (importance) and average values of latent variable scores (performance) to highlight significant areas for improvement of management activities (or the specific focus of the model). Through importance-performance map analysis, it can be known which factors are doing well in the current school and which factors need to be improved. Therefore, it is possible to improve management of high-level athletes in universities, improve student satisfaction, promote study and training of high-level athletes, and, improve the success rate in the training of high-level athletes.

4.8.1 IPMA for the Second-order latent variables

In this study, IPMA was applied for construct satisfaction of high-level athletes to discover the performance of the six latent variables. The importance of the values of these variables was calculated based on the total effect of each exogenous variable on satisfaction of high-level athletes. As shown in the Table 4.21.

Table 4.21: Performance and Importance for the IPMA of Satisfaction

Construct	Importance	Performances
Expectation of High-level athletes	0.42	80.38
Perceived Management Quality	0.49	68.81
Perceived Management Value	0.46	76.83
Satisfaction of High-level athletes	--	77.95
Complaints of High-level athletes	--	74.87
Loyalty of High-level athletes	--	78.92

Using the Performance and Importance data of the second-order latent variables obtained from the analysis, the importance - performance model of the second-order latent variables was determined, as shown in the following Figure 4.11.

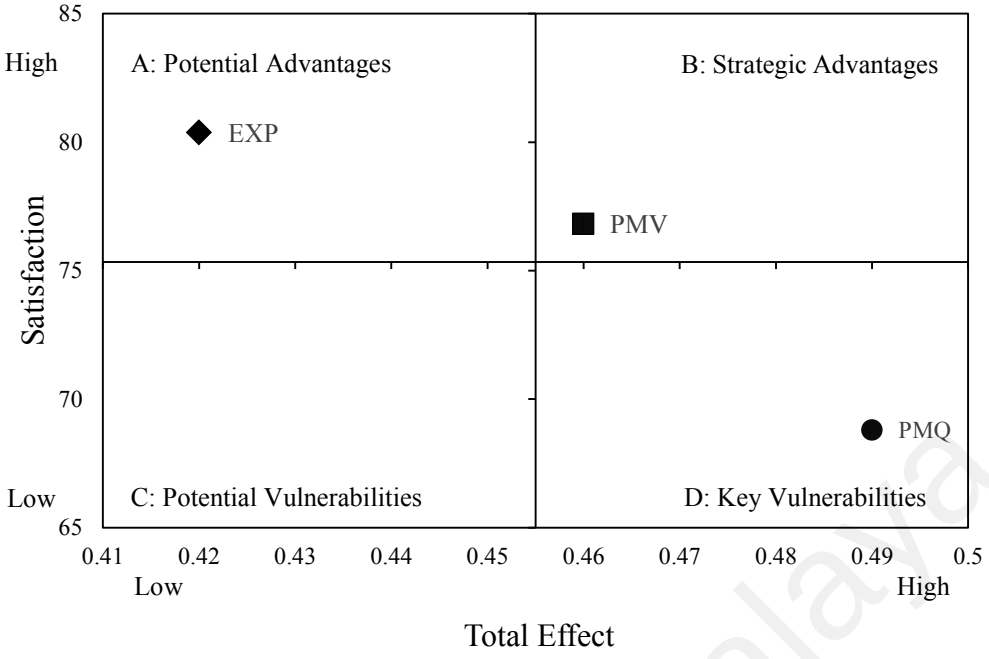


Figure 4.11: IPMA of the Second-Order Latent Variables on Satisfaction

Note: EXP= Expectation of high-level athletes; PMQ= Perceived management quality; PMV= Perceived management value; SAT= Satisfaction of high-level athletes; COM= Complaints of high-level athletes. LOY= Loyalty of high-level athletes.

IPMA of satisfaction reveals that PMQ and PMV are of primary importance for improving satisfaction. PMQ had highest importance but lowest performance in the three variables. EXP had lower importance but higher performance compared to the two other constructs. Figure 4.11 shows graphical IPMA on satisfaction of high-level athletes.

4.8.2 IPMA for the first-order latent variables

Smart PLS cannot directly give total effect of first-order latent variables. (Wilson，Bradley & Henseler, 2007) suggest adopting the two-stage method. In the first stage, using an indicators re-use approach, PLS is run to obtain latent variable scores of first-order factors. In the second stage, PLS is rerun with the latent variable score result of the first-order factor as the higher-order variable item, thus obtaining performance and importance of first-order latent variable, as shown in table 4.22:

Table 4.22: Performance and Importance for the IPMA of Satisfaction

Construct	Importance	Performances
Development Planning	0.099	65.86
Enrollment Management	0.098	60.76
Learning Management	0.106	58.98
Logistics Management	0.101	68.54
Training and Competition Management	0.104	56.15

Next, using performance and importance data of first-order latent variables, satisfaction-importance model of first-order latent variables are established, as shown in fig. 4.12.

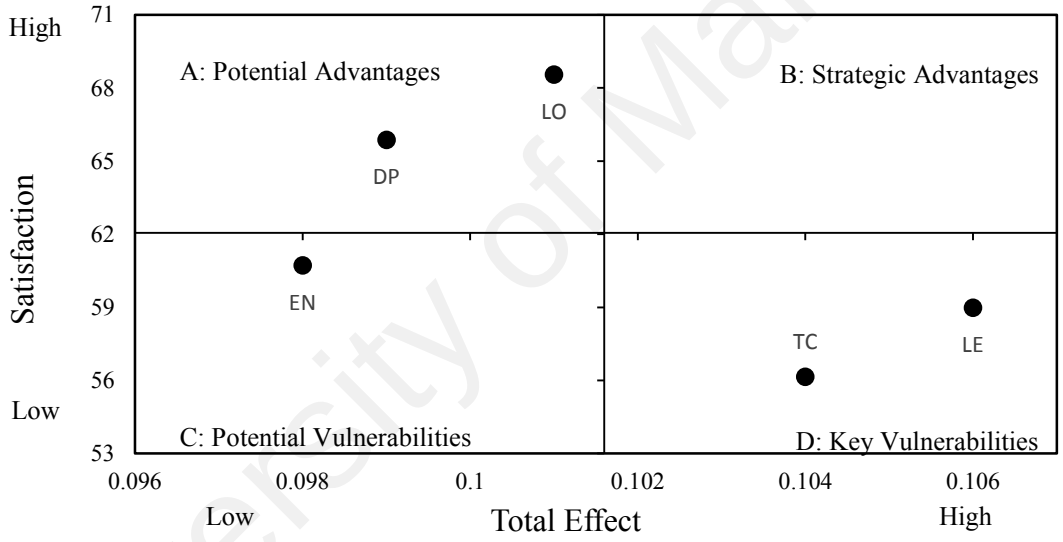


Figure 4.12: IPMA of The First-Order Latent Variables on Satisfaction

Note: DP=Development Planning EN=Enrollment Management TC=Training and Competition Management LE=Learning Management LO=Logistics Management

As can be seen in fig. 4.12, first-order latent variables DP and LO are in potential advantages region. This shows that these two factors have little influence on management satisfaction, but that performance of universities in these aspects is generally very good, and that it is good to maintain the status quo without spending much effort. The first-order latent variable EN is in the potential vulnerabilities region, which shows that EN has less influence on satisfaction of the overall management system, and that performance

of universities in these aspects is also poor. In view of the limited resources conditions of universities, improvement of factors in this area can be ignored first. If managers improve factors needing immediate improvement first, then they can improve factors in the potential advantages area. First-order latent variables TC and LE are in the key vulnerabilities area. This shows that these two latent variables are important factors affecting overall management satisfaction, but that overall performance of universities in these two aspects is somewhat deficient, bringing negative impact on management system satisfaction. This is a problem that managers of universities should focus on solving.

4.8.3 IPMA for measurement variables

From the latent variable IPMA diagram, it can be seen that in order to promote satisfaction, the most important variable to be improved on, is perceived management quality, but it is still impossible to know where exactly to improve. Therefore, the importance score of perceived management quality measurement variable that was calculated by Smart PLS, is used as the abscissa, while the performance score is used as the ordinate, as shown in table 4.23. A four-quadrant model of the measurement variables of perceived management quality dimension was redrawn using Excel. From figure 4.12, it can be clearly seen what needs to be improved.

Table 4.23: Performance and Importance for the Measurement Variables

Indicator	Standardized effects	Performance
EN1	0.021	63.76
EN2	0.021	63.76
EN3	0.017	56.00
EN4	0.021	66.54
EN5	0.022	80.56
DP1	0.021	81.76
DP2	0.023	67.99
DP3	0.020	62.12
DP4	0.016	56.31
DP5	0.021	82.01
DP6	0.023	64.90
LE1	0.020	79.48

Table 4.21, Continued

Indicator	Standardized effects	Performance
LE2	0.022	58.52
LE3	0.022	63.89
LE4	0.021	57.83
LE5	0.015	79.36
LE6	0.021	66.79
LE7	0.015	80.68
LE8	0.018	64.84
LO1	0.021	68.43
LO2	0.022	66.92
LO3	0.021	64.14
LO4	0.020	79.29
LO5	0.019	82.64
TC1	0.021	59.34
TC2	0.016	56.19
TC3	0.024	62.88
TC4	0.013	67.30
TC5	0.019	79.29
TC6	0.021	67.49
TC7	0.017	58.84
TC8	0.015	57.89
TC9	0.015	80.56

Using performance and importance data of each measurement indicator, the satisfaction-importance model of measurement variables is established, as shown in the figure 4.13:

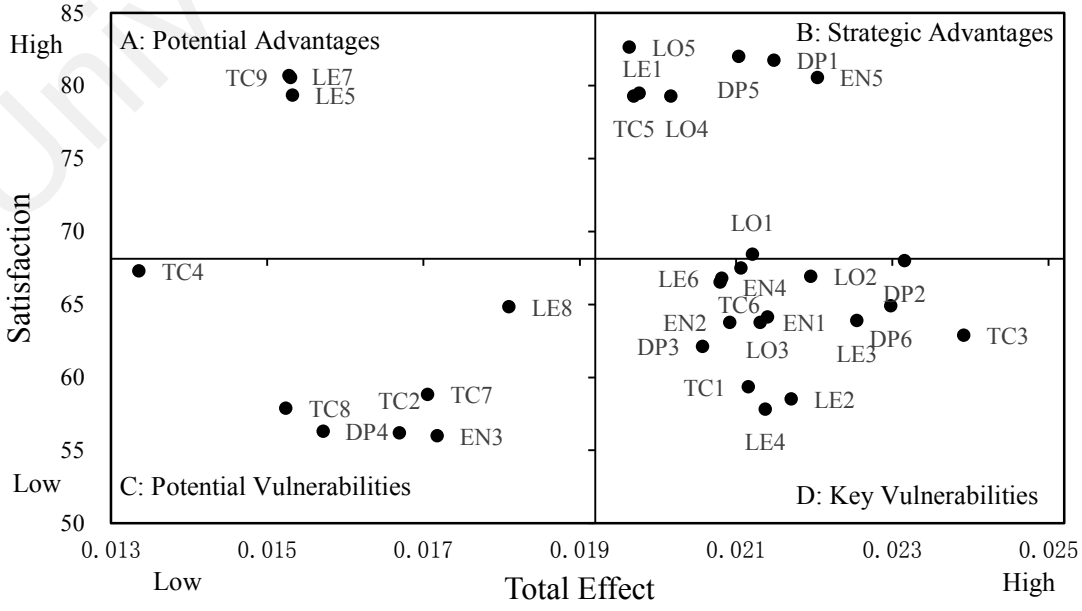


Figure 4.13: IPMA for Measurement Variables of PMQ

Figure 4.13 shows that in the high-level athlete management system satisfaction model, three of the 33 measurement variables corresponding to perceived management quality are in potential advantages quadrant, eight measurement variables in strategic advantages quadrant, seven measurement variables in potential vulnerabilities quadrant, and 15 measurement variables in key vulnerabilities quadrant.

The three measurement variables in potential advantages are: LE5-General basic knowledge examination standards, LE7-Employment guidance, and TC9-Emergency plan. These factors have little effect on satisfaction of high-level athletes, but the school performs well in these respects. Therefore, universities do not need to spend a lot of resources on these aspects, as long as the status quo is maintained.

The eight measurement variables in strategic advantages are: LO1-Funding, LO4-Nutrition, LO5-Accommodation, TC5-Competition frequency, DP1-Leader attention, DP5-Guiding ideology, LE1-Teaching management methods, and EN5-Selection criteria for enrollment. These factors are important factors affecting satisfaction of high-level athletes, and universities performed very well in these respects, thus having a positive impact on overall satisfaction of high-level athletes.

The seven measurement variables potential vulnerabilities are: TC2-Training schedule, TC4-Coach ability, TC7-Reward and punishment system, TC8-Training recovery, DP4-Cultivating goals, EN3-Channel for enrollment, and LE8-Popularity in employment. These factors have little effect on satisfaction of high-level athletes, and high-level athletes are not too concerned about these factors. Although universities perform poorly in these respects, school administrators may not need to consider improvement of these factors at the beginning. If managers improve factors that are in urgent need of improvement, then they can consider improving these factors later, letting these factors become potential advantages.

The 15 measurement variables located in key vulnerabilities are: DP2-Learning goals, DP3-Competition goals, DP6-Management regulations, EN1-Enrollment major, EN2-Number of enrollments, EN4-Sports specialty, TC1-Training and competition plan, TC3-Training quality control, TC6-Competition level, LE2-Teaching plans, LE3-Teaching content, LE4-Teaching schedule, LE6-Requirements of graduation, LO2-Medical care, and LO3-Field and equipment. These 15 factors are important factors affecting satisfaction of high-level athletes, but high-level athletes are not satisfied with the school performance in these respects. Therefore, they have negative impact on satisfaction of high-level athletes. These factors are the primary places for university administrators to improve.

From IPMA of measurement variables of perceived management quality, it shows that high-level athletes believe that the five most important factors in perceived management quality are TC3- Training quality control, DP2- Learning goals, DP6-Management regulations, LE3-Teaching content, and EN5-selection criteria for enrollment. These indicators are all related to learning and training, so for high-level athletes, management of learning and training in universities occupies an absolutely important position in their perception of the quality of the management system, thus reflecting the importance of training and competition management and learning management.

The five factors that high-level athletes are most satisfied with, within the management system are LO5- Accommodation, DP5- Guiding ideology, DP1-Leaders' attention, LE7- Employment guidance, and TC9- Emergency plan. This shows that perceived better performance of universities is mainly manifested in leadership attention, ideological and moral education, and employment guidance and safety. The five factors that high-level athletes are most dissatisfied with in management systems are TC8-

Training recovery, LE4- Teaching schedule, DP4-training goals, TC2- Training schedule, and EN3- Channel for enrollment. This shows that factors high-level athletes are most dissatisfied with are mainly setting of training objectives, planning of learning and training, and sources of enrollment.

4.9 Summary

This chapter lays out the post-analysis data discovered in the main study. Firstly, using SPSS, demographic analysis of the sample, descriptive statistical analysis, and preliminary data analysis were performed. Then the structural equation model analysis was carried out, and the measurement model and the structural model were tested, the model hypothesis was verified, and then mediation influence in the model was analyzed. Finally, IPMA testing of latent variables and measurement variables was performed.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 Introduction

This chapter deliberates on the research results and their consistency with the research objectives and hypotheses, and then goes on to expound on the main contributions. Then it summarizes the outstanding conclusions of the study, and in view of the empirical study in chapter 4, puts forward some pertinent suggestions to advance the management level of high-level athletes in Sichuan Province universities. Finally, research limitations of this study and prospects for subsequent research that might be added, are presented.

5.2 Discussion

5.2.1 Descriptive analysis

The results of the questionnaire survey of high-level athletes in Sichuan Province universities, showed that among the 264 athletes, 52.65% were male and 47.35% were female. This is basically consistent with the survey results of Zhao (2017b), finding that among 295 high-level athletes surveyed, 173 were male, accounting for 58.64% of the total, and 122 were female, accounting for 41.36%. However, when Yan (2014) surveyed 313 high-level athletes in 33 universities, it was found that there were 217 male athletes, accounting for 69.3% of the total number, and 96 females, accounting for 30.7%. In this case, there were significantly more males than females.

The reason for this phenomenon may be that women's participation in sports is influenced by Chinese social and cultural concepts. When women participate in sports, it is believed that they must show strong extroversion and aggressiveness in order to win competitions. This does not conform with gender role standards put forward by Chinese

society for women, such as being demure, dignified and submissive (Xu, 2008). Moreover, in childhood, the number of boys participating in sports is higher than girls. At a very young age, boys participate in socially organized sports activities with the help of their parents or with the help of older boys. Teachers and coaches provide them with many opportunities to participate. Society also encourages and supports boys to participate in sports, and rewards and praises their achievements. Girls are rarely encouraged and praised, and occasional physical activity is not valued. The difference between young boys and girls participation in sport determines the differences in their participation in adulthood (Xu, 2008).

In terms of enrollment sources, retired athletes accounted for 7.58%, active athletes accounted for 21.97%, students from sports schools accounted for 7.95%, ordinary high school students accounted for 58.33%, and 4.17% from 'other' sources, a result matching Yang (2018) and Ma (2014). Among the 385 high-level athletes surveyed by Yang (2018), 68.83% are ordinary university students, 18.18% are sports school students, and the rest are active or retired athletes of the physical team. Results of the survey conducted by Ma (2014) revealed 62.50% of the cohort were ordinary high school graduates, 24.54% were sports school graduates, 10.19% were provincial or municipal retired athletes, and 2.78% were vocational school graduates. Evidence suggests that ordinary high school graduates were the main source of origin for high-level athletes recruited by high-level sports teams in ordinary universities in China.

Compared with the complexity of enrollment of high-level athletes in Chinese universities, the source of enrollment for American student athletes is relatively simple. The NCAA stipulates that American college athletes must firstly graduate from high school, so American college athletes are directly enrolled from ordinary high schools, which ensures cultural learning foundations of college athletes (Zou, Li, & Zhang, 2013).

Universities in China have now realized that although direct recruitment of active or retired athletes with higher sports levels can achieve better team building results in a shorter period of time, these athletes have already been eliminated by the sports system itself, and thus do not have higher training value. Therefore, universities have increased their enrollment efforts in ordinary universities, with the hope of finding high-level athletes with higher levels of training value than ordinary high school students.

Of the 264 high-level athletes investigated in this study, national second-level athletes accounted for 50.76% of the total, national first-level athletes accounted for 37.50%, national master level athletes accounted for only 7.20%, and the remainder accounted for 4.55%. Survey results of Ma (2014) show that national second-level athletes accounted for 50.70% of the respondents, national first-level athletes accounted for 43.72%, and national master level athletes accounted for 5.58%. Guo (2014) counted the sports grades of 65 athletes participating in the survey. The results showed that 37 high-level athletes had reached national second-level, accounting for 56.9%, 23 had reached national first level, accounting for 35.4%, only 5 high-level athletes reached the national master level, accounting for 7.7%. From this, it can be seen that the survey results in this study basically correspond with those of previous studies, which indicates that at present, high-level athletes in Sichuan Province universities are mainly national first-level second-level athletes, and that their competitive level is relatively low.

The main reason for this phenomenon is the current training and selection system for athletes in China. Excellent athletes are first selected by professional teams to enter the professional sports system, and the remaining athletes enter ordinary universities. Therefore, physical condition, quality level, skill status, skills and tactics acquisition ability, along with personal efforts of athletes who enter universities, are all at a lower level than those of professional teams (Liu, 2009).

5.2.2 High-level athlete management system satisfaction index model in Sichuan Province universities

At present, Chinese management systems research on high-level university sports teams is conducted from the perspective of experts and managers. Therefore, this study's primary aim was to develop a high-level athlete management evaluation index system suitable for use by high-level athletes themselves, and then, to carry out an evaluation of satisfaction of high-level athlete management systems in universities according to the established index system. The second goal is to analyze the relationship between variables of the satisfaction model of Sichuan Province high-level athlete management systems, that is, to analyze the relationship between factors that affect satisfaction. The third goal of this study is to put forward some pertinent suggestions according to the analysis results, for improving management levels of high-level athletes in Sichuan universities.

The focus of this current evaluation system is to discover whether or not universities are as they stand now qualified to build high-level sports teams. Regarding evaluation items, each university needs to provide its own supporting materials, and then experts will score according to the evaluation index system. The evaluation system seems to lead colleges and universities to pursue more sports results while ignoring high-level athlete learning since 'teaching effect' has only 5 points, whereas 'participation' and 'competition results' have 45 points (Refer to Table 2.1, page 25). However, evaluation results only indicate whether an institution is qualified or unqualified, and cannot infer a specific improvement plan. Therefore, if intending to improve construction quality and management levels of high-level sports teams in universities, it is necessary to evaluate university management from the perspective of high-level athletes themselves. The existing evaluation system is not suitable for high-level athletes to use, so it is necessary to construct a specific management satisfaction index system for them.

In this study, using ACSI model and China's higher education student satisfaction model as reference points, a satisfaction index model for high-level athlete management systems in Sichuan Province colleges and universities was established. The ACSI model is a national customer satisfaction theory model, considered to have the most complete system and best application effect (Liu, 2011). It consists of six components: Customer Expectation Perceived Quality, Perceived Value, Customer Satisfaction, Customer Complaints, and Customer Loyalty, as shown in Figure 5.1.

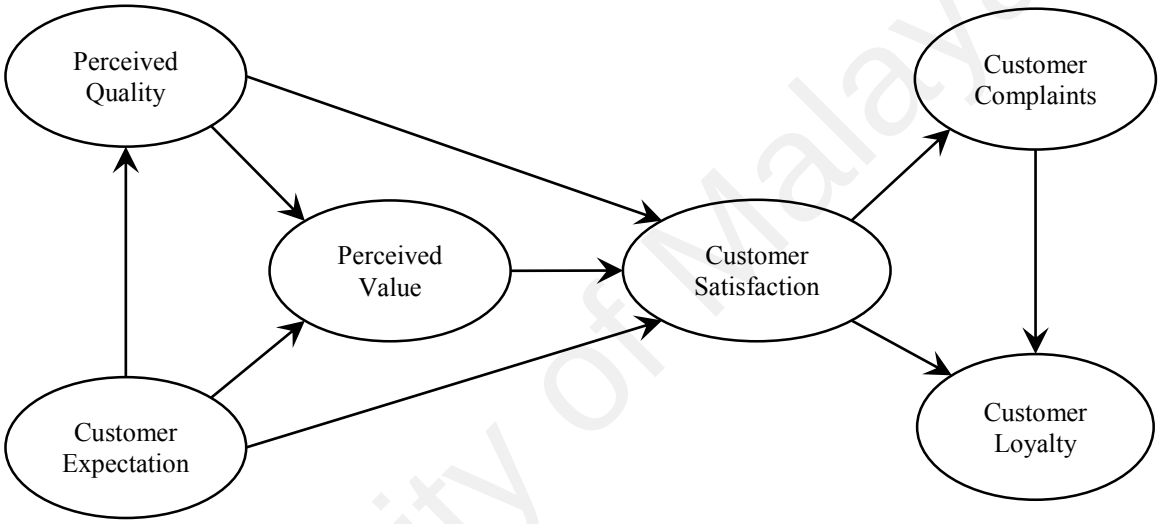


Figure 5.1: American Customer Satisfaction Index Model

Liu (2011) constructed a student satisfaction model of China's higher education, based on ACSI, ECSI, CCSI and other customer satisfaction index models along with related evaluation models of perceived service quality, in combination with actual characteristics of China's higher education services and behavior characteristics of college student education consumption. The model consists of 7 constructs comprising School Image, Student expectation, Perceived quality, Perceived value, Student satisfaction, Student complaints, Student loyalty and 6 sub-constructs of perceived quality. As shown in figure 5.2.

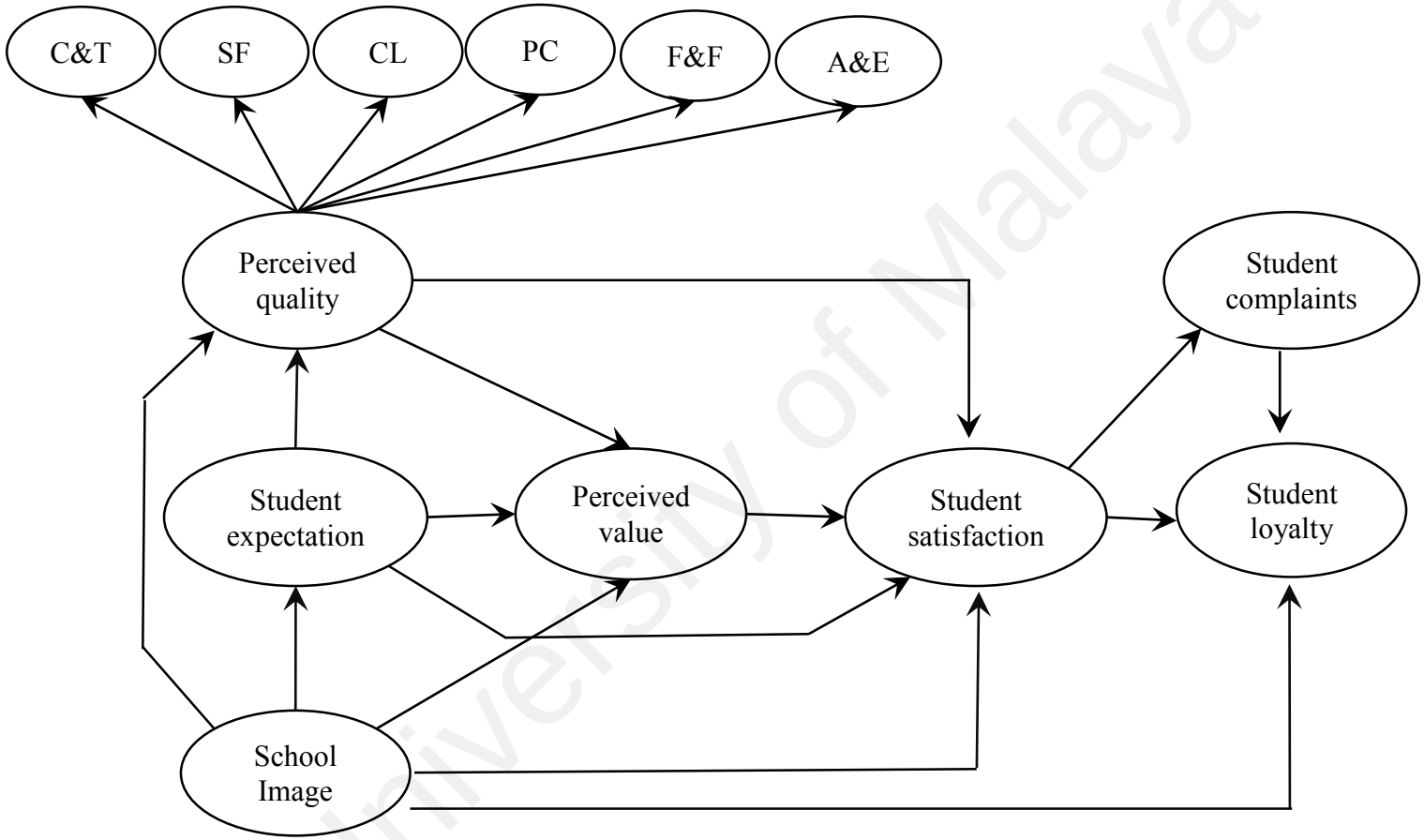


Figure 5.2: Chinese Higher Education Student Satisfaction Index Model

Notes: C&T=Curriculum and teaching, SF=Service Facilities, CL=Campus Life, PC=Personal Care, F&F=Fees and Funding, A&E=Admission and Employment

This study developed a satisfaction index model for management systems of high-level athletes in Sichuan Province universities with reference to ACSI model. It includes six latent variables: expectation of high-level athletes, perceived management quality, perceived management value, satisfaction of high-level athletes, complaints of high-level athletes, and loyalty of high-level athletes. There is a total of 49 measurement variables for the entire model. Among them, expectations of high-level athletes are evaluated by three measurement variables. The construction of perceived management quality is divided into five sub-constructions: development planning management, enrollment management, training and competition management, learning management, and logistics management, all of which are evaluated by a total of 33 measurement variables. Perceived management value is evaluated by four measurement variables. Satisfaction of high-level athletes is evaluated by three measurement variables. Complaints of high-level athletes are evaluated by three measurement variables, and loyalty of high-level athletes is evaluated by three measurement variables. The model is shown in Figure 5.3.

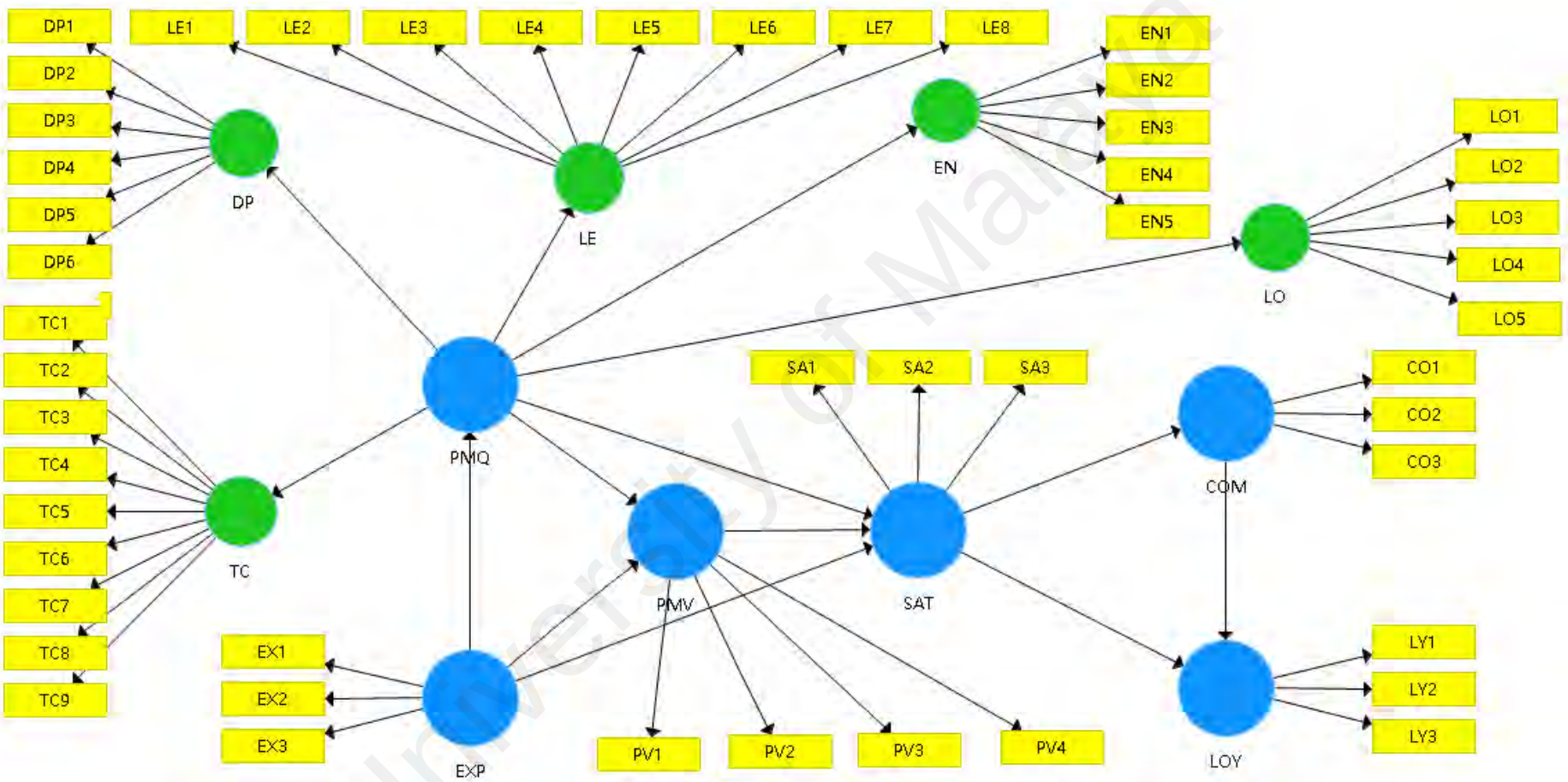


Figure 5.3: High-level Athletes Management System Satisfaction Index Model in Universities in Sichuan Province

Note: EXP=Expectation of High-level Athletes, PMQ=Perceived Management Quality, DP=Development Planning, EN=Enrollment Management, TC=Training and Competition Management, LE=Learning Management, LO=Logistics Management, GE=Graduate and Employment Management, PMV=Perceived Management Value, SAT=Satisfaction of High-level Athletes, COM=Complaints of High-level Athletes, LOY=Loyalty of High-level Athletes

Five sub-constructions of perceived management quality of the model constructed in this study include the main aspects of Chinese scholarly research on high-level sports team management systems. For example, Liu and He (2006) summarized the management practices of high-level sports team at Peking University from the perspectives of: management of student status, training management, life management, enrollment system and procedure management, coaching team construction management, scientific research, and logistics support management. Zeng (2012) believed that training of high-level athletes in universities should: strengthen enrollment management, student status management, training management, build a training platform for excellent coaches, and improve the competition system.

Liao and Zheng (2013) used wuli-shili-renli (WSR) theory to analyze management of enrollment, study management, training and competition management, daily life management, ideological education management, and employment management of high-level sports teams, and they later established a WSR management model. However, Huang and Peng (2018) explored the differences between Chinese high-level sports team management systems and those of the United States from three perspectives: student athlete recruitment, student athlete training competition, and student athlete culture education. Therefore, this may demonstrate that the five sub-constructions of perceived management quality in the model may be used to reflect the perceived management quality of high-level athletes.

5.2.3 Reliability and Validity

The questionnaire that was designed and utilized in this study was proven to have good reliability and validity. In the pilot study, through analysis of questionnaire reliability, Cronbach's alpha for each latent variable in the model ranged from 0.84 to 0.93, all of which exceed the standard of 0.7, indicating that the questionnaire has good

reliability. Output of exploratory factor analysis of measurement variables of each construction showed that the cumulative of each construction ranged from 76.47% to 88.39%, meaning that the range of structural validity was 0.76 to 0.88, indicating that the constructed questionnaire had good structural validity. In the formal study, the structural equation model was used to carry out confirmatory factor analysis on the questionnaire, and it was found that the Cronbach's Alpha value of the questionnaire ranged from 0.73 to 0.98, and the Composite Reliability value ranged from 0.85 to 0.98. All of them were greater than the requirement of 0.7, indicating that the questionnaire had good reliability. The value of AVE is ranged from 0.57 to 0.72, which is higher than 0.5, indicating a good convergent validity. The results of Cross loading and Fornell-Larcker criteria indicate that the questionnaire has good discriminate validity.

5.2.4 Hypotheses and Effects

Following the ACSI model, this study sets out to design a satisfaction index model for management systems of high-level athletes in Sichuan Province universities. The model contains six latent variables. Predicated on the relationships between variables, a total of nine hypotheses were put forward as shown in figure 5.4.

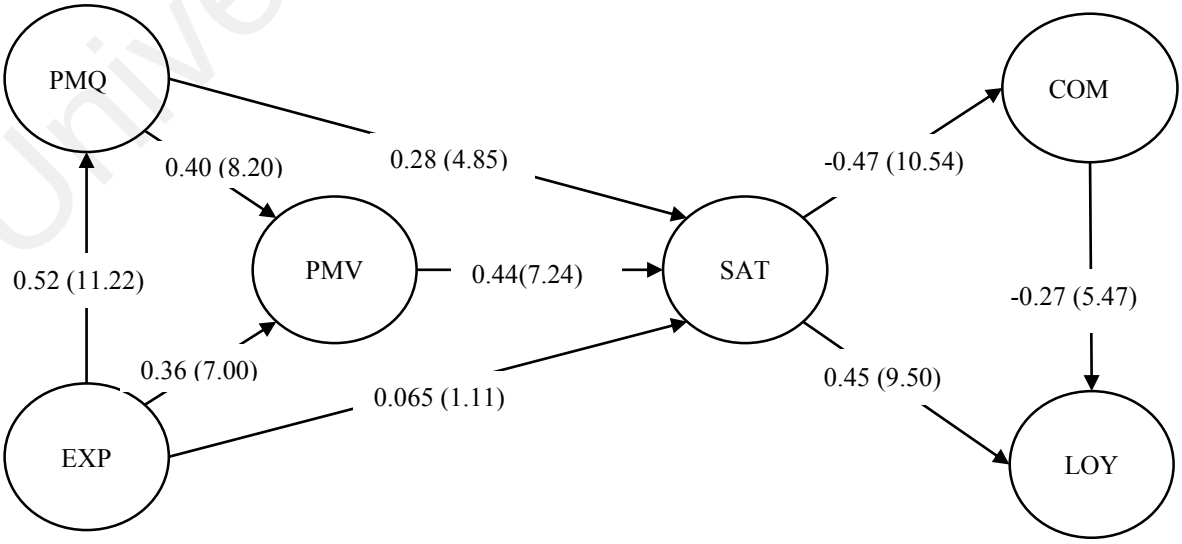


Figure 5.4: The Hypotheses and The Path Coefficient of The Model

Note: EXP=Expectation of High-level Athletes, PMQ=Perceived Management Quality, PMV=Perceived Management Value, SAT=Satisfaction of High-level Athletes, COM=Complaints of High-level Athletes, LOY=Loyalty of High-level Athletes

Since Chinese scholars have carried out very little research on satisfaction of high-level athletes, we draw on customer satisfaction and student satisfaction research to discuss the hypotheses found here.

5.2.4.1 Expectations of high-level athletes do not significantly affect satisfaction of high-level athletes.

The expectation of high-level athletes is a type of expectation of studying and training in universities, that arises after obtaining information about high-level sports teams in universities from publicity materials, coaches, relatives, friends, and other sources. This study discovered despite no direct or significant influence between expectations of high-level athletes and satisfaction, expectations of high-level athletes indirectly and positively affect their satisfaction through two mediator variables: perceived management quality and perceived management value. The effect between expectation of high-level athletes (EXP) and satisfaction of high-level athletes (SAT) is shown in table 5.1.

Table 5.1: Effect Between Expectation of High-level Athletes and Satisfaction of High-level Athletes

Path	Direct effect	Indirect effect	Total effect
EXP→SAT	0.00	0.42	0.42

This matches studies by Dan, Wang, and Liu (2018) and Sun, Yang, and Jiang (2016), who maintained that there was no direct effect between expectations of students and their satisfaction, but that students expectation has indirect effect on students satisfaction through other mediator variables. Research by Lankton, McKnight, and Thatcher (2014) also supports this view, they found that technology trusting expectations do not have a significant influence.

However, the results of this study do not match the research of Joo, Park, and Shin (2017), and, Wijaya, Rai, and Hariguna (2019). In the study of Joo et al. (2017), expectation had a positive effect on influencing satisfaction, with regard to digital books in digital textbook-integrated classes. Wijaya et al. (2019) argued that customer expectations are an inseparable experience that occurs in the social media business process and which is a fundamental part of customer satisfaction. The reason for this may be that the effects of different dimensions in the research model are neutralized, resulting in high-level athletes' expectations that have no direct impact on their satisfaction, and are mediated by other variables.

5.2.4.2 Expectations of high-level athletes significantly positively effect perceived management quality and perceived management value.

In some studies it is believed that higher expectations will lead to lower quality perception (Xu, Cui, & Ji, 2017). However, it was determined here that there was a significant positive relationship between expectations of high-level athletes and perceived management quality, indicating that expectations bear a positive impact on perceived management quality. The effect between expectation of high-level athletes (EXP) and perceived management quality (PMQ) is shown in table 5.2.

Table 5.2: Effect Between Expectation of High-level Athletes and Perceived Management Quality

Path	Direct effect	Indirect effect	Total effect
EXP→PMQ	0.52	0.00	0.52

The research by Yu and Wang (2017) supports this view, they found that perceived service quality of an organization (Green IT Services) positively influenced user satisfaction. The research group of 'China Education Satisfaction Degree Evaluation Research' conducted a survey of basic education satisfaction of more than 60,000 children, primary and secondary school students, and parents and front-line teachers in 31

provinces of China. It revealed that people with high expectations tended to perceive higher education quality (Tian et al., 2016).

Expectations of high-level athletes (EXP) also significantly positively impacts perceived management value (PMV) as shown in table 5.3.

Table 5.3: Effect Between Expectation of High-level Athletes and Perceived Management Value

Path	Direct effect	Indirect effect	Total effect
EXP→PMV	0.36	0.21	0.57

Research by Peng et al. (2016) supports this view in finding that customer expectation significantly positively impacts quality perception and value perception. Dachyar and Rusydina (2015) found that customer expectations significantly positively impacts perceived value, having studied satisfaction with taxi services in Jakarta. The reason for this might be that when the expectations of high-level athletes are higher, they are more willing to cooperate and support the work of school management, possibly resulting in a benign relationship, thus creating in high management quality perception and management value perception.

5.2.4.3 Perceived management quality of high-level athletes positively affects perceived management value and satisfaction.

Quality perception refers to the effectiveness of products or services that a customer actually experiences after purchasing or using the product or service. Quality perception of high-level athlete management systems in universities refers to the management performance perception felt by high-level athletes in their learning, training, and daily life. Current research determines a significant relationship between perceived management quality and perceived management value, emphasizing that perceived management quality has a positive impact on perceived management value. The effects

between perceived management quality (PMQ) and perceived management value (PMV) are shown in table 5.4.

Table 5.4: Effects Between Perceived Management Quality and Perceived Management Value

Path	Direct effect	Indirect effect	Total effect
PMQ→PMV	0.40	0.00	0.40

Other studies have yielded similar results. For example, García-Fernández et al. (2018) found a direct positive correlation between perceived quality and perceived value of low-cost fitness centers. Joung, Choi, and Wang (2016) found that there is a direct positive correlation between perceived quality and perceived value through research on campus catering services. In this study, high-level athletes who perceived high quality of management in universities had more specific experience on university management and were more likely to feel improvements in their own capabilities under their own efforts in conjunction with the school management.

In addition, this study found that perceived management quality of high-level athletes not only positively affects perceived value, but also positively affects satisfaction of high-level athletes. The effects between perceived management quality (PMQ) and satisfaction of high-level athletes (SAT) are shown in table 5.5.

Table 5.5: Effects Between Perceived Management Quality and Satisfaction of High-level Athletes

Path	Direct effect	Indirect effect	Total effect
PMQ→SAT	0.30	0.19	0.49

This is consistent with the research of Hussain, Al Nasser, and Hussain (2015) and with Jin, Lee, and Lee (2015). Hussain et al. (2015) found that service quality had a significant positive impact on customer satisfaction through studying Dubai Airlines

service satisfaction. Research of Jin et al. (2015) on water park customers found that the quality of participant experience significantly affected customer satisfaction.

Here, it was discovered that the better the perceived management quality of high-level athletes was, it appeared to indicate more sense of management system perfection, and the more perfect the management system, the greater the possibility of high-level athletes higher perception, thus generating a higher degree of satisfaction.

5.2.4.4 Perceived management value of high-level athletes positively affects satisfaction.

Liu (2011) believed that value perception of higher education services involves a comprehensive evaluation by higher education customers of the overall utility of higher education services, based on their quality and price. This study found that perceived management value referred to the comprehensive evaluation by high-level athletes of the overall utility of high-level athlete management systems based on management quality. The objective behind adding perceived management value variables to the model was to measure high-level athlete subjective feelings about improvement of their human capital and overall general ability, after they had comprehensively considered how they were managed. This study finds that perceived management value positively affects satisfaction of high-level athletes. The effect between perceived management value (PMV) and satisfaction of high-level athletes (SAT) is shown in table 5.6.

Table 5.6: Effects Between Perceived Management Value and Satisfaction of High-level Athletes

Path	Direct effect	Indirect effect	Total effect
PMV→SAT	0.46	0.00	0.46

This is consistent with the research of Ramseook-Munhurrun, Seebaluck, and Naidoo (2015), and Hsu and Lin (2015). In the study of Ramseook-Munhurrun et al. (2015), perceived value played an important role influencing the level of tourist satisfaction. Hsu and Lin (2015) also found that perceived value was positively correlated with satisfaction, having studied factors affecting purchasing of paid mobile apps. Therefore, there is an implication that if high-level athletes think that university management can improve their overall general ability, then their satisfaction will be higher.

5.2.4.5 Satisfaction of high-level athletes negatively affects complaints, but positively affects loyalty, while complaints are negatively correlated with loyalty.

Customer satisfaction is a type of psychological reaction that satisfies the needs of customers. It is characterized by the outcome of customers assessment of the nature of products and services or the extent to which they meet their needs (Oliver, 1997). Complaints are actions taken by customers to convey negative information about products or services to enterprises (Jacoby & Jaccard, 1981). Customer loyalty is the combination of behavior loyalty and attitude loyalty. Loyal customers are those who not only really like the enterprise products and services, but also make repeated purchases (Dick & Basu, 1994).

Satisfaction of high-level athletes in this study mainly refers to their overall satisfaction with their university management system, particularly the psychological state persisting once their own learning and training needs are satisfied. Through research, it was found that satisfaction of high-level athletes negatively affects their complaints. The effects between satisfaction of high-level athletes (SAT) and complaints of high-level athletes (COM) are shown in table 5.7.

Table 5.7: The Effects Between Satisfaction of High-level Athletes and Complaints of High-level Athletes

Path	Direct effect	Indirect effect	Total effect
SAT→COM	-0.47	0.00	-0.47

This is consistent with existing research results such as: Liu, Chen, Zha, Ling, and Wang (2018) which found through research that customer satisfaction had a negative effect on complaints. Zhang and Wen (2014) found through research on postgraduate education satisfaction in research universities, that where postgraduate education satisfaction was negative significantly affected graduate complaints.

In addition, it was found that satisfaction of high-level athletes positively affects their loyalty. The effects between satisfaction of high-level athletes (SAT) and loyalty of high-level athletes (LOY) are shown in table 5.8.

Table 5.8: The Effects Between Satisfaction of High-level Athletes and Loyalty of High-level Athletes

Path	Direct effect	Indirect effect	Total effect
SAT→LOY	0.45	0.13	0.58

This is consistent with the researches of Ahrholdt, Gudergan, and Ringle (2017), Khuong and Dai (2016) and Schirmer, Ringle, Gudergan, and Feistel (2018), which found that customer satisfaction is positively correlated with customer loyalty.

Finally, this study also found that complaints of high-level athletes had a negative effect on the loyalty of high-level athletes. The effect between complaints of high-level athletes (COM) and the loyalty of high-level athletes (LOY) is shown in table 5.9.

Table 5.9: The effects Between Complaints of High-level Athletes and Loyalty of High-level Athletes

Path	Direct effect	Indirect effect	Total effect
COM→LOY	-0.27	0.00	-0.27

This is consistent with the researches of Li and Sun (2008); Shen (2011b); Zhou and Dai (2013), which found that customer complaints is negative significantly correlated with customer loyalty. It appears to show that high-level athletes having higher satisfaction with university management, had less complaints and greater loyalty.

5.2.5 Importance-Performance Map Analysis (IPMA)

The importance-performance map analysis (IPMA) takes the output of PLS-SEM and broadens it by additionally allowing for the performance of each construct. Because of this, it is possible to derive conclusions based on two dimensions, importance and performance. This is critical in prioritizing managerial actions. So, it is more logical to focus initially on enhancing those constructs whose importance is high, in respect of their ability to explicate a certain target construct, while at the same time, having a relatively low performance (SmartPLS GmbH, 2018).

If IPMA is not used, conducting the importance-satisfaction analysis requires participants to perform importance and satisfaction scores separately, however, this lengthens the time to answer questions, increases the burden on participants, and may affect the accuracy of the data. When conducting IPMA, Smart PLS 3 uses the total effect of each measurement variable on satisfaction as the importance score, therefore, only the satisfaction score is needed, thus shortening the time for filling in the questionnaire and lightening the burden on participants. IPMA can graphically represent problems that universities should focus on in future management and provide a basis for the university to set practical goals. Through using IPMA, we can determine which aspects improve university management quality, thus leading to improving satisfaction of high-level athletes with their management systems.

IPMA of second-order latent variables reveals that perceived management quality (PMQ) is an important factor affecting satisfaction, however PMQ has the lowest satisfaction score. Therefore, from an overall perspective and as a priority, measures should first be taken to improve the satisfaction of high-level athletes on PMQ. Later, IPMA of first-order latent variable of PMQ, showed that training and competition management (TC) and learning management (LE) were important factors affecting satisfaction, and that their satisfaction scores were amongst the lowest. Since this is the case, among first-order latent variables, the variables of TC and LE should be improved first to raise satisfaction of high-level athletes with TC and LE. Finally, after analysis of 33 measurement variables of perceived management quality, it was found that 15 items had higher importance scores, but lower satisfaction as shown in figure 5.5. Therefore, initial steps should aim to improve these 15 aspects so as to raise high-level athlete satisfaction with their management systems.

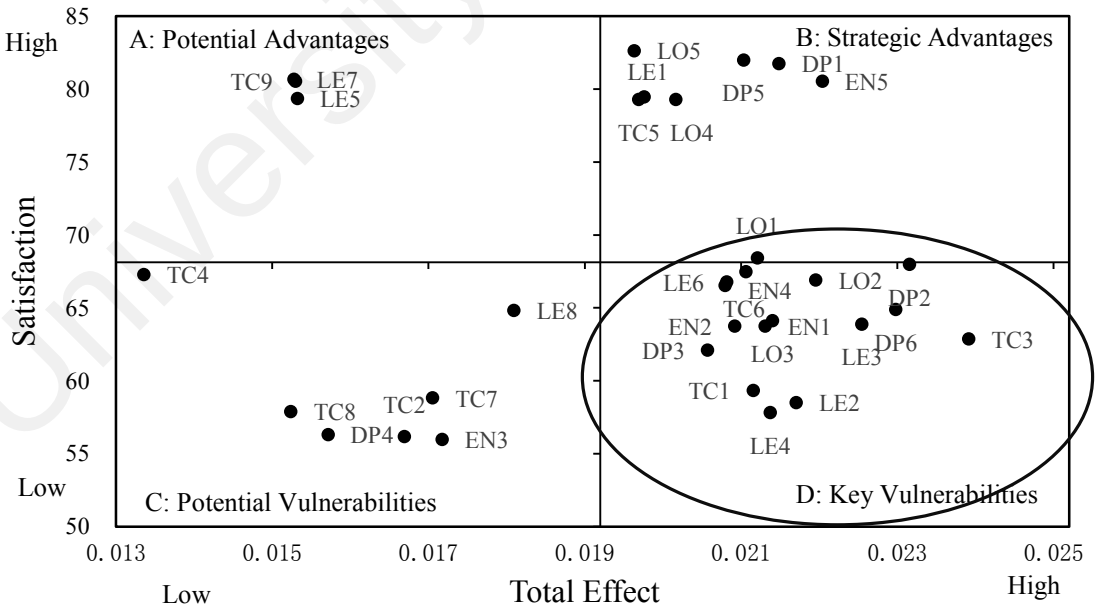


Figure 5.5: IPMA for Measurement Variables of Perceived Management Quality

Of the 15 indicators that first need improvement, three belong to sub-construction Development Planning (DP), namely DP2, DP3 and DP6. DP2 is the learning goal. This shows that high-level athletes think learning goals are most important, but colleges and universities seem not to have set appropriate learning goals. Currently, Sichuan Province colleges and universities have reduced the number of general knowledge course hours, reduced general knowledge courses examination difficulty, and exchanged competition rankings for credits, thus ensuring that high-level athletes can successfully graduate and obtain certificates (Li, 2014). Therefore, Sichuan Province colleges and universities ought to change their learning goal from obtaining graduation certificates for high-level athletes, to truly improving their cultural quality.

Regarding DP3, competition goals, it indicates that high-level athletes believe that Sichuan Province colleges and universities have not set appropriate competition goals. Currently, Sichuan province colleges and university competition goals are to achieve excellent results in competitions and win honor for the country and the school, and that is also the purpose behind setting up high-level sports teams. However, most high-level athletes athletic ability does not reach requirements for completing competition goals set by the universities. Therefore, Sichuan Province colleges and universities should set alternative competitive goals for high-level athletes, according to the different competition levels, as well as promote improving high-level athlete competitive levels.

In respect of DP6, Management regulations, it seems that high-level athletes believe that Sichuan Province universities have not formulated sufficiently adequate management regulations. Cultivating high-level athletes is a complex project requiring mutual support from universities and society in general. Although all colleges and universities have formulated management regulations, they are not adequate enough. Therefore, colleges

and universities need to continue to improve management regulations for high-level athletes.

Of the 15 indicators that first need improvement, three belong to sub-construction Enrollment Management (EN). EN1 involves the major that high-level athletes can choose to study. At present, colleges and universities in Sichuan province generally designate several majors for high-level athletes to choose from, liberal arts majors are considered relatively easy to graduate. High-level athletes cannot choose their favorite majors according to their own interests. Therefore, Sichuan Province colleges and universities should allow high-level athletes the right to choose their own majors.

EN2 is the number of enrollments, and although the number of high-level athletes admitted to Sichuan province universities is currently within the scope stipulated by the state, limitations of venue resources and relatively consistent training time have resulted in shortages of per capita venue resources. Therefore, universities should properly plan what number of students they can accommodate so that they can guarantee the quality of high-level athlete training.

EN4 is a special setting for high-level sports teams. Currently organisations with the highest number of sports events in Sichuan Province run up to five sports events each, but in four universities only one sports event is run. In addition, sports events are not balanced, and are concentrated on basketball, football and tennis. There are six sports that are only carried out in one school and these do not have competitions. Therefore, Sichuan Province colleges and universities should reconsider how they plan the distribution of sports programs, while simultaneously increasing competition among universities.

Of the 15 indicators that first need improvement, four belong to sub-construction Learning Management (LE). High-level athletes are not satisfied with LE2-teaching plan,

LE3-teaching content, LE4-teaching schedule or LE6 requirements of graduation. This shows that Sichuan Province has not formulated adequate teaching plans or content for high-level athletes. High-level athletes attend classes with ordinary students. Teaching time arrangements conflict with high-level athlete training time, resulting in high-level athletes missing out on some courses. Therefore, having the same graduation requirements as other students becomes very difficult for high-level athletes. Thus, Sichuan Province colleges and universities should formulate teaching contents, teaching plans and graduation requirements that conform to the actual situational needs of high-level athletes.

Of the 15 indicators that first need improvement, three belong to sub-construction Training and Competition Management (TC). High-level athletes are not satisfied with TC1-Training and Competition plan, TC3- Training quality control, or TC6-Competition level. This shows that colleges and universities have not comprehensively considered overall arrangements for high-level athlete training and competition plans. Along with large numbers of sports trainings and competitions, high-level athletes must also attend classes and exams just as ordinary students do. Their learning burden and its consequent pressure is significantly higher than standard students doing the same major, and this obviously affects their training quality. High-level athletes are dissatisfied with their participation levels in competitions as they are limited by their low level of sports skills. Therefore, colleges and universities should make better training and competition plans to allow for an improvement in the quality of training.

Of the 15 indicators that first need improvement, two belong to sub-construction Logistics management (LO), LO2 is Medical care. At present, medical care for high-level sports teams in Sichuan Province universities is not sufficient. Therefore, colleges and universities should set up special sports rehabilitation treatment to meet high-level athlete

needs. LO3 is Field equipment, and it can be seen that Sichuan Province colleges and universities field equipment cannot fully meet the needs of high-level athletes. Therefore, colleges and universities should improve the construction of venue facilities to meet the requirements of high-level sports teams.

5. 3 Research Contribution

5.3.1 Theoretical contribution

In the current literature, there is a paucity of research on satisfaction of high-level athletes with their university management systems. In this study, structural equation modelling is used to develop a satisfaction index model for high-level athlete management systems in Sichuan Province universities. The model comprises factors that influence high-level athlete satisfaction, along with results from carrying out the mechanism of the model itself. It is believed that this is the first time that customer satisfaction theory, student satisfaction theory and theories of high-level athlete management in universities have been linked.

In addition, this study sets out evaluation indexes of management systems for high-level athletes in universities. Regarding existing research on evaluation index systems for the management of high-level sports teams, evaluation personnel were experts or university administrators. These systems were found to be unsuitable for high-level athletes to make direct evaluation, therefore, the indicators were reorganized.

Following exploratory factor analysis, it was confirmed that the perceived management quality dimension found in the model contained the main aspects of high-level athlete university management systems. Further, the measurement variables were discovered to be suitable for high-level athletes to make direct evaluations (Refer to Table 3.32, page 99). Therefore, it is believed that the satisfaction index model of high-level

athlete management systems proposed in this study can enrich continuing theoretical research not only on the creation of high-level sports squads, but also on the management of high-level athletes in universities.

5.3.2 Practical contributions

The results of this study may assist Sichuan Provincial Education Bureau and the Sichuan Province universities in improving management systems of high-level athletes, while promoting healthy development of high-level sports teams. At present, government evaluation of the creation of these teams in universities is binary, either they are qualified or they are not, and no improvement suggestions are involved. Based on this empirical study of high-level Sichuan Provinces athletes and IPMA of its indicators, this study outlines and prioritizes the order which indicators need improvement, thus enabling universities to selectively improve one or several of their management systems in cases where resources are limited. This may lead to maximizing satisfaction of high-level athletes.

In addition, the satisfaction evaluation of university management systems may also provide reference for high-level athlete candidates themselves, when choosing schools. At present, prospective high-level athlete candidates have little access to university information, mainly getting it through coaches or university publicity. Because of this, there will be some candidates who do not know for which university it is best for them to apply. If there is a ranking of satisfaction levels of high-level athlete management systems in each university, candidates may use it as a reference for their application. With otherwise similar enrollment requirements, universities with higher satisfaction will inevitably attract more high-level athlete candidates to apply for entrance exams, so it is likely that it will also encourage management of high-level sports teams to aim higher and achieve better.

5.3.3 Methodological contribution

In this study, a new structural equation method is proposed for the study of satisfaction of high-level athlete universities management systems. Currently, research on evaluation index systems of high-level sports teams is mainly carried out from the perspective of experts, using analytic hierarchy process, Delphi method, and others. However, this study uses structural equation method and software Smart PLS 3 from the perspective of high-level athletes themselves, to study relationships between high-level athlete expectations, perceived management quality, perceived management value, high-level athlete satisfaction, high-level athlete complaints, and high-level athlete loyalty, while analyzing direct and indirect effects of various latent variables in the model.

In order to confirm that the proposed theoretical model matched the collected data, this study used descriptive statistical analysis, reliability and validity tests, exploratory factor analysis, confirmatory factor analysis, and other statistical analysis methods to carry out an empirical study on it. It was found that the model was effective and reliable. Therefore, the structural equation modeling method proposed in this study would appear to be a novel and effective method for studying high-level athlete management systems in universities.

5.4 Conclusions and recommendations

5.4.1 Conclusions

Based on ACSI and China Higher Education Student Satisfaction Index Model (CHESSI), a satisfaction index model for Sichuan Province high-level athlete management systems was constructed. The model has six latent variables: expectations of high-level athletes, perceived management quality, perceived management value, satisfaction of high-level athletes, complaints of high-level athletes, and loyalty of high-

level athletes. There are nine causal relationships among the six latent variables of the initially designed model, but empirical analysis showed that there was no significant effect between expectation and satisfaction of high-level athletes, so the path EXP → SAT was deleted. The resulting model includes six latent variables and eight causal relationships.

The initial design of the high-level athlete satisfaction index model for universities in Sichuan Province included a total of 58 measured variables. However, after analyzing reliability and validity of the questionnaire and exploratory factor analysis for each latent variable, it was finally determined that the high-level athlete management system satisfaction index model could be composed of six latent variables, and perceived management quality reflected by five second-level latent variables. It was possible to explain the whole model with a total of 49 measured variables. The revised model was found to have good reliability and validity, as well as sufficient explanatory and predictive power.

It was confirmed in the research that: expectations of high-level athletes have a direct impact on perceived management quality and have a direct and indirect impact on perceived management value. Expectations of high-level athletes have no direct impact on satisfaction but have a positive impact on satisfaction through the mediator variables of perceived management quality and perceived management value.

In the effect analysis of the model, the biggest direct impact was the impact of high-level athlete expectations on perceived management quality (0.52). The biggest indirect impact was the impact of high-level athlete expectations on their satisfaction (0.42). Among the factors that affected satisfaction of high-level athletes, the greatest overall impact was perceived management quality (0.49), followed by perceived management

value (0.46), and then expectation (0.42). The most important factor affecting loyalty of high-level athletes is their satisfaction (0.58) (Refer to Table 4.16, page 124).

Through IPMA of measurement variables of perceived management quality (Refer to Figure 4.13, page 140), it was found that at present, high-level athletes believe that the most satisfactory aspects of university management performance are leadership attention, ideological and moral education, employment guidance, and safety. The most unsatisfactory aspects are the setting of cultivating objectives for high-level athletes, the formulation of cultivating plans, and the sources of enrollment. In addition, for high-level athletes, the management of learning and training occupies an absolutely important position in their perception of the quality of the management system, reflecting the importance of training and competition management and learning management.

5.4.2 Recommendations

Taken from the perspective of high-level athletes themselves, this study used satisfaction surveys as tools to understand various problems in the management of high-level sports teams. Through analyzing the satisfaction of high-level athletes with their management systems, and by understanding factors that were influencing athletes, reasons behind the need to seek changes were discovered. These reasons provide the basis for universities, based on the expressed needs of high-level athletes, to broaden the oversight of their decision-making. In order to improve the management of high-level athletes, the following suggestions are proposed according to the analysis results.

5.4.2.1 There is rather a necessity to improve the evaluation index systems for high-level sports team management and to establish an environment that emphasizes their satisfactory evaluation.

Evaluation of the construction of high-level sports teams in universities carried out by the Chinese Ministry of Education is mainly carried out across the aspects of

organization and leadership, sports team management, construction of coaches, guarantee of conditions, team performance, and construction of campus sports culture. Thus, it is lacking indicators to judge from the perspective of high-level athletes themselves. Therefore, the index of satisfaction of high-level athletes can be combined with the existing evaluation index system for creating high-level sports teams in ordinary universities.

Evaluating management quality of high-level sports teams in universities from the perspective of high-level athletes can alter the index system into a dynamic and open state. This is likely to gradually change the current situation where universities attach more importance to training than to teaching, and more importance to results than to process. It might persuade universities to truly realize the concept of 'student-oriented'.

5.4.2.2 Universities should pay attention to improving perception of high-level athlete management quality.

Through empirical analysis, it was found that perceived management quality is an important factor affecting perceived management value of high-level athletes, as well as satisfaction and loyalty. The importance of high-level athlete perception of management quality is critical. It is believed that universities should try hard to improve perception of management quality of high-level athletes, since it is the most direct and effective method of cultivating satisfaction and loyalty. In view of the analysis results, there appears to be many problems in high-level sports team management in Sichuan Province universities.

Therefore, this study suggests that universities devise policies and management models for high-level sports teams that are suited to the characteristics of their own schools and teams. Universities should constantly carry out high-level athlete management innovation, to continuously improve satisfaction and loyalty and enhance competitiveness of their high-level sports teams.

Firstly, universities should conduct in-depth research and develop a training plan that meets the expectations of high-level athletes. They should formulate public documents setting out the purpose, training plan and curriculum system of high-level sports teams of the school, according to the needs and expectations of high-level athletes. Further, they should take into account the ability and conditions for their creation in schools, not than only from the perspective of school administrators, but also of the high-level athletes, to ensure that satisfactory management services are provided.

Secondly, the Chinese state should establish a unified enrollment standard, and universities should use it to strengthen their enrollment management. At present, universities have certain autonomy in enrolling students and there is no uniform enrollment standard in the country. There are many unfair factors in the enrollment process. In order to resolve this, there is an urgent need for a unified admissions standard (Zhai, 2019).

Universities should establish and regularly guide their own reserve talent bases according to the characteristics of the school. A 'one-stop' competitive sports development plan that runs from primary to secondary school, and continues on to university should be drawn up, so as to ensure sustainable development as well as good cultural foundation for enrolled student athletes. Universities should formulate reasonable enrollment plans to ensure the quality of learning and training for high-level athletes.

Thirdly, universities should strengthen high-level athlete learning management. Managers of these teams in Chinese universities should raise their awareness of cultural learning of high-level athletes. It is necessary to recognize that the identity of high-level athletes is first and foremost as a student. There should be no difference in the academic requirements compared with other students. High-level athletes participating in training and competition is just a special form of education (Lu, Liu, & Chen, 2014).

Therefore, in order to improve academic levels of high-level athletes, strict management of credit system measures should be established, uniform academic standards for high-level athletes should be formulated, while competition qualification restriction policies should be introduced to restrict athletes who cannot meet academic standards from participating in competitions.

Universities should also adopt various methods to support the learning of high-level athletes, such as: provide scholarships to university athletes to stimulate their interest and enthusiasm in learning, use ordinary student volunteers to guide the learning of high-level athletes, develop online courses to facilitate distance learning for athletes, and appropriately extend the learning period of high-level athletes so that they can truly meet the standards of university education and learn more professional knowledge.

Fourthly, Universities should develop reasonable training and competition plans. At present, training and learning plans of high-level athletes lack reasonable balance, which makes it more difficult for high-level athletes to learn while training, highlighting the tension between learning and training. Therefore, universities should develop reasonable training and teaching plans, strictly control the training time of high-level athletes, and balance the time allocation of both. They should strengthen the construction of coaches and improve the scientific level of training.

The education system should simultaneously establish a complete competition system, increasing the number of competitions, and providing channels and opportunities for high-level athletes to participate in high-level competitions. Coaches should scientifically formulate annual training plans according to the characteristics of sports events and competition plans. This will enable training to proceed according to a pre-determined plan, while increasing the scientific nature of the training.

Fifthly, universities should establish a sound logistics support system. To improve the training level of high-level athletes, universities must provide a high-quality, all-round guarantee. This study found the following problems in the logistical support of Sichuan Province universities: insufficient funding, inadequate medical support, serious lack of scientific research support, and inability of venues and facilities to meet training needs. Therefore, universities should value the construction of high-level sports teams more, by increasing investment and better managing their funding. At the same time, a marketing mechanism should be introduced, social forces fully mobilized, social resources integrated and utilized, social funds attracted, and an atmosphere formed whereby all of society supports universities in running high-level sports teams.

Universities should also strengthen scientific research, continuously improve the scientific training level of high-level sports teams, continuously strengthen the construction of sports venues in universities, and ensure they demand additional sports training venues. In addition, universities should provide high-level athletes with nutritious meals and reasonable dietary allowances. They should increase medical insurance for high-level sports teams and provide scientific sports recovery and rehabilitation methods in the event of sports injuries.

5.4.2.3 Universities should strengthen publicity on the construction of high-level sports teams to improve goal orientation and expectations of high-level athletes.

At present, goal orientation of high-level athletes in Chinese universities is generally low. In the research of Yan (2014) around various high-level athlete choices selected for applying to universities, 53.67% of the participants agreed that it was easy to go to university because of the drop in scores, while 36.1% agreed they went to university in order to find a good job in the future. However, only 14.70% of the participants agreed

they wanted to enter a professional team in the future and, 8.95% agreed they wanted to become famous athletes.

It was found that most high-level athletes intended to aim to enter a relatively good university, but once these high-level athletes achieved the goal of entering university, their motivation for hard training seemed to disappear, resulting in no improvement or even a reduction in their athletic performance. Therefore, it seems apparent that it is very important to improve goal orientation of high-level athletes while they participate in training.

The Chinese Ministry of Education should strengthen public perception regarding the significance of constructing high-level sports teams in universities and should also clarify that the primary drive behind creating high-level sports teams is to train high-level sports talents for the all-round development and benefit of the country. While simultaneously completing the tasks of participation in the Universiade and other major international and domestic sports competitions, so as to fully display the mental outlook of Chinese university students and provide a platform that enables future high-level athlete candidates aim towards participation in China University Games or the Universiade.

At the same time, universities should strengthen their part in relation to team creation, improve their quality of construction, and, strengthen publicity about their professional setup, their past achievements, their existing coached teams, and the logistics support of their training venues and facilities, amongst others. All of these should be done to increase the awareness of high-level athlete candidates regarding the construction of high-level sports teams, in order to raise their expectations about learning and training in universities.

5.5 Limitations of research and recommendations for future research

5.5.1 Limitations of research

Although this study puts forward some new academic viewpoints, there are still the following limitations:

Based on existing theories and research, this study hypothesized the potential relationships between variables of a high-level athlete management systems satisfaction model, and went on to construct, explore and verify this conceptual model. However, research on high-level athlete management systems is still at a preliminary stage, and there is not yet a unified conclusion on the indicators included here. The model described in this study includes the main aspects of management systems. Therefore, the indexes constructed in this study are not flawless, and there may be additional suitable choices for the measurement items found in it.

The conceptual model proposed here is based on a solid theoretical foundation. The process of exploratory research and empirical analysis is also standardized and scientific. However, due to limitations of research time and funding, this study collected cross-sectional data at the same time point and did not track the entire management process of universities. Therefore, it is not possible to make a completely positive judgment on causal relationships in the conceptual model, but only to determine whether there are significant correlations between latent variables.

In this study, sampling was achieved by stratified random sampling in each Sichuan Province university, to ensure representativeness. During research, the samples from each school were not stratified by sports events or gender, which may possibly lead to lower representation of the samples at sports event and gender level. In addition, due to the high-level athlete specialties, the entire cohort of high-level athletes in Sichuan Province is

relaitively small. The pilot study was implemented in respect of a 10% proportion of the total sample (Connelly, 2008), which resulted in a small sample size in exploratory factor analysis, possibly affecting accuracy.

The impact of quality perception of high-level athlete management system on value perception and satisfaction is a dynamic process. This study did not encompass this dynamic process and did not track the dynamic changes of satisfaction level of high-level athletes in the high-level athlete management system from the time of enrollment to graduation.

5.5.2 Recommendations for future research

Management systems of high-level athletes in universities are studied here, featuring high-level athlete satisfaction, it has achieved some innovative results and achieved the expected research goals. However, research on management of this university cohort is just beginning in China, and more in-depth theoretical research and scientific empirical research are required. Based on theoretical and empirical analysis of this study, it is considered that further research should be carried out with a view to these prospects:

(a) The applicability of the model must be further studied in subsequent studies. This study only studies management systems of high-level athletes in universities in Sichuan Province. Due to imbalances in the development of high-level sports in China, management satisfaction of high-level athletes in universities in different regions should be evaluated, and the general applicability of the model should be deeply studied, to reasonably evaluate satisfaction levels of management system in universities in different regions.

(b) Subsequent research should aim to conduct long-term follow-up surveys, use longitudinal data to conduct research, and conduct sequential and dynamic studies to further throw light on what is behind causality in the relationships that operates across latent variables in the conceptual model.

(c) The influence of demographic variables is not the focus of this study. This study makes a composition analysis of demographic variables as the basis for sample selection quality. However, such variables are of great significance for the universality of the model and the guiding role of management practice and should be further analyzed in subsequent studies.

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