

2014

BioTechnology

An Indian Journal

FULL PAPER

BTAIJ, 10(7), 2014 [2072-2080]

Strategy research on mathematical statistics-based roller skating development in university

Qingguo Chen

Institute of Physical Education, Jilin Normal University, Siping 136000, Jilin,
(CHINA)

ABSTRACT

The paper applies documents literature, interview, questionnaire survey and other methods to investigate and study universities roller skating development status, analyzes universities roller skating development problems, and makes corresponding suggestions. The paper studies roller skating values and current situation, puts forward current universities' roller skating problems of ubiquity of students' being less interested in roller skating, roller skating event being relative single, students' exercise time is insufficient, lacking of sports field and technical guiding, roller skating development tending to shrink and so on, and makes suggestions as strengthen advertising, strengthen universities roller skating stadiums, faculty suggestions, optimize roller skating coaches structure, pay attention to training and so on.

KEYWORDS

Roller skating; Statistical analysis; Development prospects; Teaching reform; Influence factor; Fitness value.



INTRODUCTION

Roller skating was later carried out in China, up to now it was just thirty years, but due to skating possessed entertainment, environmental protection property, fitness nature, instrumental, security, economical efficiency and conveniences so on, which let its development in China is rapid, and figures of roller skating enthusiasts are everywhere in square, street and community so on. However, in Chinese partial universities, roller skating has started to shrink after rapidly expanded development period, and all kinds of problems in roller skating development has also started to gradually expose.

For Chinese universities roller skating development and its exposed problems as well as how to better propel to roller skating and roller skating teaching development in Chinese universities, lots of scholars have made a great deal of researches on them, and made corresponding suggestions. Among them, Zhao Zhen-Hao

(2013) applied documents literature and questionnaire survey to study Chinese universities roller skating teaching status and teaching effects, analyzed Chinese universities roller skating teaching problems, and made corresponding suggestions^[1]; Ji Wen-Qing, Xu Hai-huan (2014) carried out analysis and research on University of Shanxi Datong sports communities included roller skating community by questionnaire survey, mathematical statistics and logic analysis methods, analyzed problems in communities, and made suggestions for developing roller skating community^[2]; Zhao Zhen-Hao (2013) applied documents literature, expert interview and others to study Jilin province general universities roller skating teaching status, analyzed universities roller skating existing problems and counter measures^[3]; Li Wei (2013) researched on Hunan University of Technology roller skating exercise group and roller skating course status, put forward constructive opinions as strengthen roller skating association construction, enlarge establishment of sports fields and so on^[4]; Zhao Guo-Qiang (2013) Analyzed by researching on roller skating course unsmooth organization in universities, provided that hobbies and interests were main causes that affected students participating in roller skating, and strengthen cultivating students' learning interests and positivity in roller skating such suggestion^[5].

The paper on the basis of previous research, applies documents literature, questionnaire survey and other methods to analyze and study Tangshan partial universities roller skating slow development even shrinkage, in the hope of providing references for roller skating development in Chinese universities.

SUMMARY OF ROLLER SKATING VALUES

Roller skating is also called as roller-blading or blading, its sport event can be divided into: extreme roller skating, speed skating, artistic skating, rollerball, recreational skating and freestyle skating. Roller skating has certain social and cultural values, roller skating fitness, entertainment, competitiveness, economic values cannot be replaced by other sports events, which also let roller skating to be very popular among students, its development in universities is very fast. The paper makes brief introduction of roller skating values from its fitness function, improvements of students' psychological quality and tool value these three aspects.

Fitness value analysis

Now due to suffer internal and external environment each kind of influences, Chinese universities lots of students by far have been in the status of sub-health, spirit and adaptive capacity are reduced. Roller skating is a kind of general movement, it can propel to respiratory system and cardiovascular and cerebrovascular system functions improvement as well as metabolism reinforcement, activates long-term closed blood capillary, alveoli, muscle fiber and nerve cells when it is quiet, introduce body function system into positive state, speed up internal self-cycling, strengthen myocardial contraction ability, let each organ blood to get sufficient oxygen and nutrient substance and so on. Roller

skating also trains students' balanced capacity. Roller skating requires higher balanced capacity; it needs coordination and cooperation of all fours and trunk. In training process, it suffered constant stimulation can let sportsmen body reaction capacity to be more and more sensitive, they can well master balance, muscle endurance is greatly improved, it strengthen sportsmen physique.

Meanwhile, roller skating can exercise human body each kind of functions, as test roller skating learning students before and after training in middle-distance race, lung capacity, grip, standing long jump, walk straight with eyes closed and one foot standing with eyes closed such six items, and make data quantitative comparison, obtained conclusion is that students with roller skating learning each kind of body functions are obviously superior to students without carrying out roller skating learning, which shows roller skating training has greatly improved students each body function that learn roller skating^[1].

Psychological training values analysis

To university students, learning, employment and society all aspect bring pressure to them, which also let university students to be prone to appear all kinds of psychological problems. As many university students, they tend to show spiritless cannot concentrate, depressed and decadent, poor psychological endurance, cannot endure blows and setbacks. In the emotion aspect, then it presents not optimistic and positive enough in life and close their heart. Strengthen cultivation on students' psychological quality is demand of social development, is also the necessity of deepening school sports reformation.

Roller skating is a kind of event with static and dynamic, accompanying by music rhythm, roller skaters received not only the entertainment, but also the experience of the beauty of art during roller skating dynamic beauty and style beauty. Meanwhile, roller skating is a kind of sports that needs tacit cooperation; it also has larger promotion to university students' communicative ability and adaptive capacity, and can cultivate university students open and optimistic mental state. While roller skating itself requires very high technology, it let roller skating training and learning not to be simple, which also let university students to constantly challenge themselves in roller skating training and learning, form into quality of not being afraid of difficulties, setbacks and never say die^[6].

Tool values analysis

With respect to many sports events, roller skating has an advantage that is it can be used as vehicle. Roller skating volume is small, sports form is flexible, economical and practical, can free pass through crowds, it is very fit for university students getting round, in general, as long as in flat road, roller skating can be used as vehicle. Nowadays, university students' participation quantity of sports get fewer, traffic increasingly jam and other aspects causes lead to roller skating becomes a kind of increasingly popular vehicle among university students.

UNIVERSITY ROLLER SKATING STATUS ANALYSIS

In order to better research on university roller skating development status, the paper consults and sorts relative documents, and according to the paper researched contents, objects and purposes, it plans a set of roller skating questionnaire, and ask experts to check the formulated questionnaire. The paper carries out relative comprehensive interviewing in squares, sports fields that some universities and university students regular take roller skating, randomly releases 800 pieces of questionnaires, and meanwhile adopts retesting method of 80 pieces of them to do reliability detection on released questionnaires. Finally acquire 715 pieces of questionnaires, return ratio is 89.4%, from which questionnaire reliability is 90.1% that obtained by retesting method, make statistics of questionnaire results, and study university roller skating development status.

University students' roller skating exercising motivation

The survey makes investigation and studies on university students' exercising motivation by established questionnaire. By consulting documents, established questionnaire divides students' roller skating exercising motivations into six cases that are getting academic credit, body building and heart building, fashion and entertainment, seek the stimulus, competition performance and others. In returned questionnaires, many students select multiple items of them, the paper counts questionnaire each item motivation selected quantity to do statistical analysis, its statistical result is as TABLE 1 shows.

TABLE 1 : University students' roller skating exercising motivation investigation

Exercising motivation	Getting academic credit	Body building and heart building	Fashion and entertainment	Seek the stimulus	Competition performance	Others
Proportion	20.3%	55.2%	44.1%	35.0%	12.1%	9.3%

By TABLE 1, it is clear that partial students participate in roller skating, declare for roller skating sports course are just for getting academic credit, the proportion is 20.3%, the part students don't take roller skating exercise at ordinary times, just learn roller skating in physical education course, even partial students don't know what roller skating is when declare it. Body building and heart building such motivation occupies the largest proportion, it accounts for 55.2% of total number of people that fill in questionnaire. Secondly is fashion and entertainment as well as seek the stimulus, which respectively accounts for 44.1% and 35.0%. Thereupon, body building and heart building as well as fashion and entertainment are main motivations of university students' participating in roller skating. Meanwhile, partial university students participate in roller skating is to participate corresponding competitions and performances, achieve honor for themselves while also gain popularity for themselves. There is also 9.3% students select other options, by interviewing, these students participate in roller skating have purposes of communicating, abstracting classmates, while are only for accompanying classmates and then participate in roller skating.

Students' interests in roller skating

By questionnaire surveying on universities students that participate in roller skating, it finds that university students participate in and learn roller skating are not all fond of roller skating but participating in roller skating for all kinds of reasons. Make statistics on university students attitudes toward roller skating, its statistical result is as TABLE 2 show.

TABLE 2 : Investigation of University students' interests in roller skating

Interests	Favorite	General	Dislike
Percentage	61.3%	33.4%	5.3%

By TABLE 2, it is clear that among university students that participate in roller skating, students that love roller skating only account for 61.3%, these students often participate in roller skating at ordinary times. Students have general interests in roller skating account for 33.4%, these students only regard roller skating as sports of body building and hear building as well as others, or participate in roller skating by classmates, friends influence or other causes. University students that dislike roller skating only account for 5.3%, these students participate in roller skating course learning for getting physical education course credits, and except for learning and exercising in physical education course, they basically don't participate in roller skating at ordinary times. Different roller skaters participate in roller skating exercises time in every time are also different, its statistical data is as TABLE 3 shows.

TABLE 3: University students every time roller skating exercising time investigation table

Exercising time	Above 90 minutes	Above 60 minutes	Above 30 minutes	Below 30 minutes
Percentage	10.8%	37.5%	40.5%	11.2%

By consulting document, it gets that roller skating exercising time as around 60 minutes is best exercising time for roller skating, excessive long or short time has no good effects on fitness. By TABLE 3, it is clear number of people that roller skating exercising time above 90 minutes or less than 30 minutes only account for 22.0% of total number of people, which shows most of university students can well grasp roller skating exercising time.

University students' roller skating events selection

Roller skating events have a variety of kinds; each kind of roller skating event has its own features, which also has different demands on exercisers' techniques and movement field apparatus. Roller skating events can be divided into speed skating, recreational skating, freestyle skating, artistic skating, rollerball and extreme roller skating. Due to causes that different university students select roller skating are different, which also leads to different university students selecting different roller skating events. By questionnaire surveying, make statistics of number of students that select different roller skating events occupied proportion in total number of people as TABLE 4 shows.

TABLE 4: Proportion of university students participate in each kind of roller skating event

Roller skating event	Speed skating	Recreational skating	Freestyle skating	Artistic skating	Rollerball	Extreme roller skating
Number of participants	237	266	139	0	50	23
Proportion of number of people	33.1%	37.2%	19.5%	0%	7.1%	3.1%

By TABLE 4, it is clear that university students mostly participated roller skating event is speed skating, questionnaire statistic number of people is 237 people that accounts for 33.1% of totals, secondly is recreational skating and freestyle skating, their occupied proportions are respectively 37.2% and 19.5%. Rollerball and extreme roller skating proportions are lower that are respectively 7.1% and 3.1%. For artistic skating event, no university students attend it.

By TABLE 4, it is clear that university students participate in roller skating are mainly for fitness and entertainment, partial university students participate in roller skating are for getting academic credits, only 21.4% university students are for competition performances or other causes. Speed skating, recreational skating and freestyle skating development has profound history, their development potentials are great, requirements on roller skating apparatus, fields and techniques are not high, therefore number of university students that participate the three are most that account for 89.8% of totals. Artistic skating needs professional technical guidance, its requirements on apparatus, fields, expense and sportsmen each aspect are high, university students don't have conditions to carry out artistic skating. Similarly, rollerball and extreme roller skating also have very high requirements on each aspect of students; its organization goes against the purpose of most university students' fitness and entertainment, therefore participants' numbers are little that only account for 10.2% of totals.

Roller skaters' grades distribution

Due to suffer each kind of environment influence, different grades students' roller skating participants' numbers are also different. By questionnaire surveying, the paper makes statistics of university roller skating participating different grades students' percentage, as Figure 1 shows.

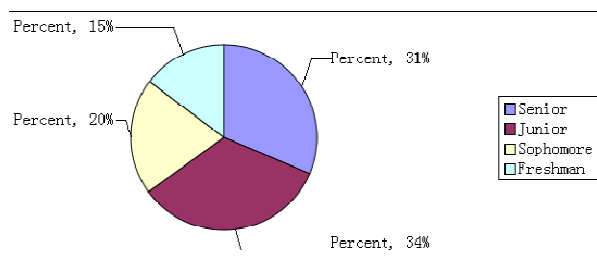


Figure 1 : Each grade roller skating participants' numbers proportions graph

By Figure 1, it is clear that in university students, most roller skating exercising participants numbers are grade ten and grade eleven, which are respectively 325 people and 240 people, their number of people occupied proportions are respectively 31.4% and 33.6%. Grade twelve roller skating participated university students are 145 people, the number of people account for 20.3 % of totals, grade thirteen university students roller skating participants are even fewer that only have 105 people, which account for 14.7% of totals. Grade ten students face graduation, employment and other aspects pressures, grade eleven students learning and postgraduate entrance examination as other pressures are also bigger, but their numbers occupied proportions are larger than that of grade twelve and grade thirteen university students. Meanwhile, by interviewing, it is clear that grade ten university students' roller skating participation scale is far smaller than graduated grade 08 and grade 09 students by comparing, which shows roller skating organization is gradually shrinking in university, university students interests in roller skating is gradually diminishing.

ROLLER SKATING DEVELOPMENT INFLUENCE FACTORS

There are many factors affect university students' participating in roller skating, these factors directly affect roller skating development in universities, the paper makes statistics of university students' roller skating engagement and students influential causes, and analyzes universities' roller skating development status from roller skating sports fields, roller skating sports safety, roller skating coaches these three aspects.

University students' roller skating influence analysis

There are many causes for university students carrying on roller skating and learning, according to paper relative students' questionnaire survey result, the paper mainly summarizes causes into time problem, economic condition problem, field problem, lacking of technical guiding and other problems such five aspects. By making statistics of questionnaire result, it gets university students attitudes towards university students' roller skating influences, as TABLE 5 shows.

TABLE 5 : University students' roller skating influence factors schematics

Influence factor	Insufficient time	Economic conditions restriction	Field restriction	Lack of technical guiding	Others
Number of people	237	62	172	217	27
Percentage	33.2%	8.7%	24.1%	30.4%	3.6%

In questionnaire survey, 237 university students think that roller skating engagement main influence is time problem that accounts for 33.2% of totals. Though university students have much spare time, spare time is relative concentrate, and students mainly take roller skating in the time after supper. Secondly is lacking of technical guiding, totally 217 people fill in such item that accounts for 30.4% of totals. Students that fill in field factors restriction as main influence on students' roller skating have 172 people that account for 24.1% of totals. It is due to most of universities haven't established special roller

skating sports fields, fields that students take roller skating are mostly in campus playground, square and other places, it exist each kind of potential safety hazard, and also affects students' roller skating exercising. Number of students that fill in the three items factors account for 87.7% of totals. It is clear that improve the three items factors plays important roles in university health developing roller skating.

Students' roller skating sports fields

By questionnaire surveying, it is clear that university students' roller skating fields are mainly campus, square, park and Gym. Fields quantity, quality and others will directly affect university students' positivity in participating in roller skating.

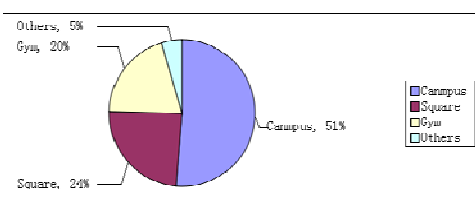


Figure 2 : University students' sports fields selection

By questionnaire survey, it finds that due to school location, school stadium scale and economic expense as well as other causes, universities students mainly take roller skating in campus and students' apartment, square and gym such three fields. By Figure 2, it is clear that number of university students that mainly take roller skating in campus and students' apartment relative open areas are most those are 367 people from investigated 715 people, the proportion that accounts for totals is as high as 51.33%, which mainly because most of campuses and students apartments have relative proper fields for students' roller skating, as playground and other places. University students that mainly take roller skating in square near to school are 172 people that account for 24.06% of totals, which is mainly because partial universities cannot provide abundant and free roller skating sports fields, let students to have to look for other places to take roller skating exercising. Students that mainly take roller skating in school gym or other gyms are 143 people, their proportions are 20.00%. These sports gyms environment is better and possesses flat fields, good music effects and other features. Especial for one student apartment gym, it provides roller skating sport apparatus and fields by charging which is convenient for university students roller skating exercising and also gains economic efficiency. In questionnaire survey, there are 33 people select to take sports training in other fields, these people are mainly taking exercises in universities nearby parks, streets and other places, and their proportion is short of 5%.

Meanwhile, the paper investigates on university roller skating students to sports fields' satisfaction degree, its investigation result is as TABLE 6 shows.

TABLE 6 : University students to roller skating fields' satisfaction degree

Satisfaction degree	Very satisfied	Relative satisfied	Dissatisfied	Very dissatisfied
Number of people	153	140	326	96
Percentage	21.4%	19.6%	45.6%	13.4%

By TABLE 5, it is clear that among questionnaire surveyed 715 university students, number of people that dissatisfied and very dissatisfied with roller skating fields is as high as 422 people that accounts for 59.0% of totals, only 153 people is very satisfied with fields that accounts for 21.4%, and these people mostly take roller skating mainly in school gym or other gyms. Therefore, it is clear that on a whole, university students are not satisfied with roller skating exercising fields, which directly affects roller skating development in universities.

Students' roller skating sports safety

Roller skating dressing mainly is wearing sports safety. University students recognition on roller skating potential risk is not enough, which tends to cause university students suffer accidental injury when could avoid in training. The paper makes statistics of university students roller skating injury status by questionnaire surveying, its statistical result is as TABLE 7 shows.

TABLE 7 : University students' roller skating injury status statistical table

Injury status	Often injured	Occasionally injured	Seldom injured	Never injured
Number of people	67	247	345	56
Percentage	9.4%	34.5%	48.3%	7.8%

By TABLE 7 statistical data, it is clear that among effective questionnaire survey 715 university students, most of university students that take roller skating are just occasional injured and seldom injured in training and entertainment process, and from which occasional injured university students have 247 people that accounts for 34.5% of totals. Seldom injured university students have 345 people that occupied proportion is 48.5%. Often injured and never injured university students are respectively 67 people and 56 people, their occupied proportions are respectively 9.4% and 7.8%. Thereupon, though when most of university students take roller skating, injury status is not serious, they should pay more attentions to safety during roller skating so as to reduce injury extent and injury rate. For roller skaters, especially for roller skating learners and high difficulty roller skaters, utilize gear to protect them is necessary, it can reduce university students unnecessary injuries when take roller skating. However, university students that take roller skating tend to be very insufficient in recognition of roller skating potential risk, emphasis on gear equipping is not enough.

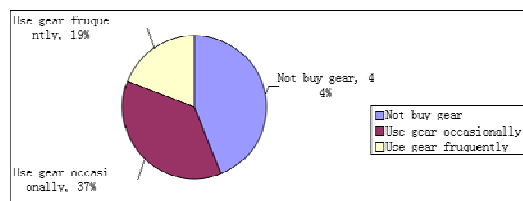


Figure 3 : University students' roller skating gear equipping investigation

The paper makes statistics on universities students equip with gear status that take roller skating, its statistical data is as Figure 3 shows. By statistics, it finds that just 314 people bought gear that only accounts for 43.9% of totals. And in 314 university students that bought gear, only 137 people often wear gear when take exercise that only accounts for 19.2% of totals, which is not equal to 1/2 of number of people that bought gear and not equal to 1/5 of total number of roller skating exercising people, other 177 people that bought gear only wear gear when it is necessary. Thereupon, university students that take roller skating sports injury prevention and self protection awareness are relative poor.

University students' roller skating coaches

By far, to universities roller skating sports course, coaches' personal quality, technical level, roller skating knowledge and others directly affect students' interests in roller skating and roller skating levels. An excellent roller skating coach can let students to improve their roller skating positivity and its overall level. The paper totally makes statistics of 80 university roller skating course and university roller skating club coaches, by statistical analysis of them, it finds their ages are mostly between thirty years old to forty years old, their number of people are 52 people, and occupied proportion is 65.0%. Coaches that below thirty years old are nine people, and occupied proportion is 11.2%. Coaches that above forty years old are 19 people, and occupied proportion is 24.8%. For outside school's roller skating clubs, their coaches are mostly below 25 years old, their number of coaches below 30 years old

occupied proportion in total coaches numbers gets closer to 80%. Compare to roller skating clubs outside school, universities roller skating clubs' coaches structure is more reasonable, their knowledge level, teaching experience, training ability and others have relatively more advantages.

Meanwhile, the paper makes statistics of these sixty coaches education background status, its statistical data is as Figure 4 shows.

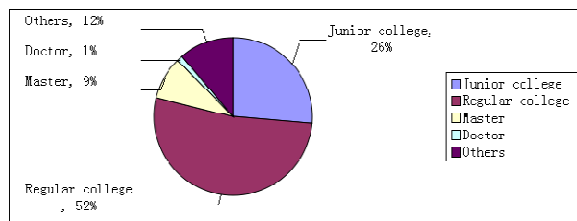


Figure 4 : University roller skating coaches' education background

University roller skating course and roller skating clubs coaches' education background and structure is criterion to evaluate universities roller skating coaches group comprehensive quality and teaching guiding ability. Education background for university roller skating coaches can be divided into junior college, regular college, master, doctor and others. Here, other staff refers to person that assist coaches to take roller skating course training, or students with better roller skating skills that teach in university roller skating clubs as well as others. By statistical investigation, it is clear that among statistical 80 university roller skating coaches, number of people with regular college education background are most that are 42 people, the proportion of totals is 52.5%. Secondly is junior college, there are 21 coaches with junior college education background, its proportion is 26.3%. Roller skating coaches with regular college and junior college education background total account for 78.8%. Master and doctor coaches are totally eight people that account for 10.0%. Coaches of other sources are nine people that account for 11.2%. Among them, master and doctor coaches as well as partial regular college coaches mainly teach universities roller skating courses. And coaches with partial regular college, junior college and other sources are mainly teaching in university clubs.

By above analysis, it is clear that university roller skating coaches overall level is not high, education background is lower, scientific research ability is relative poor, which is not beneficial to students' roller skating level improvement.

CONCLUSION

Roller skating organization in universities is very beneficial to university students in the aspect of body building and heart building, universities can adopt measures to develop universities roller skating, as establish school roller skating clubs and so on; school should strengthen roller skating publicity, improve university students interests in roller skating, positive explore and develop course resources, expand roller skating events, and develop roller skating; school should improve faculty, improve roller skating facilities, make job training or continuing learning on teachers that go in for roller skating teaching, in the structure of faculty, more develop masters and doctors such high education backgrounds' roller skating coaches; focus on training effects, strengthen safety awareness, carry on roller skating knowledge education on students, propel to students to form into wearing roller skating gear and others sports habits, improve students' training effects, and pay attention to students' technology grasping.

REFERENCES

- [1] Liu Bao, Hu Shan-lian, Xu Hai-xia, Gao Jian-hui; Indices of the equality of essential public health services in China. Chinese Journal of Health Policy, **2(6)**, 13-17 (2009).
- [2] Zhang Da-chao, Li Min; Studies on Evaluation Index System of Public Sports Facilities Development Level in China. China Sport Science, **33(4)**, 3-23 (2013).

- [3] Cai Jing-tai, Fan Bing-you, Wang Ji-shuai; A Survey of Residents' Satisfaction Degree for Urban Public Sport Services. *Journal of Beijing Sport University*, **6**, (2009).
- [4] Wang Guo-hong, Zhang Wen-hui; Construction of the Evaluation Index System of City Community Sports-Taking Shanghai as an Example. *Journal of Chengdu Physical Education Institute*, **36(2)**, (2010).
- [5] Zhang Jie, Wu Ying; The Evaluation Index System of Extracurricular Sports Activities in Secondary Schools in Shanghai under the Background of "Sunshine Sports". *Journal of Shanghai Physical Education Institute*, **6**, 80-82 (2012).
- [6] He Ying, Xu Ming; Study on Evaluating System of Sports Consciousness of Community Residents in Southwest Cities. *Journal of Chengdu Physical Education Institute*, **33(2)**, 43-45 (2007).
- [7] He Ying, Xu Ming; Theoretical and empirical study on evaluation mode of sports service satisfaction degree in city community. *Journal of Wuhan Institute of Physical Education*, **41(11)**, 40-42 (2007).
- [8] Chen Yang, Ma Ge-sheng; An Empirical Study on Community Sports Service Residents' Satisfaction Index Model. *China Sport Science and Technology*, **45(4)**, (2009).
- [9] He Ying, Xu Ming; Theoretical and empirical study on evaluation mode of sports service satisfaction degree in city community. *Journal of Wuhan Institute of Physical Education*, **41(11)**, 40-42 (2007).