

Research on green university operation mode based on "Mercedes-benz models"

Kaiyuan Zhao^{1, a} and Hong Zhao^{1, b,*}

¹School of Tianjin, Polytechnic University, Tianjin 300387, China.

^a1132876995@qq.com, ^bzhaohong300160@126.com

Abstract: Great progress has been made in the construction of green university in China, but there is still no efficient operation mode. This paper has conducted a survey on the current situation of building green campus in Colleges and universities of China, through the analysis of the current situation and problems, it wants to build a "four in one" model of Mercedes-benz, consisting of school, college, student organization and individual (in this article are including staff and students). "Four in one" model of Mercedes-benz is aimed at forming an effective green university operation mode, and strive for achieving comprehensive decision-making on ideas and mechanisms.

Keywords: Green university, operation mode, four in one, Mercedes-benz models

1. Introduction

The sign of green university is green, energy saving, environmental protection, low carbon and low emissions. The aim of building green university is to establish a green education system and a low-carbon energy support system. The core of green university is to increase new energy technology in the college of energy support system application, to innovative energy-saving management system, mechanism and new ideas of environmental protection and development^[1]. Since 1998, Tsinghua University had carried out the construction of green campus in China. In 2007, Tongji University became the first demonstration of conservation oriented campus, leading a batch of universities to promote the sustainable development of green university construction in China. As of April, 2017, the construction of green university in China has been extended to all colleges and universities, and more than 300 demonstration green university have been constructed. Chinese universities have established two green campus organizations: China Green University Network and China Green Campus Alliance Network.

Although the study on the green campus construction in colleges and universities in China have made big progress, it still no efficient operation mode. Some students are vague in their understanding of the concept of a green campus, and green practice in colleges and universities is relatively lacking. As the four-dimensional main body of the university operation: school, college, student organization and individual have not formed good linkage.

This paper have investigated the current situation of green university construction in colleges and universities in China. And this paper constructed a Mercedes-benz model for school, college, student organization and individual based on the results of the study. Research objects include college faculty and university students and graduates who have just entered the position. Among them, university teachers (including experimental teachers) and students in the study are the main object of this investigation. In this survey, a total of 977 questionnaires were issued. Among them, 400 questionnaires were issued to college staff and universities, and 392 valid questionnaires were collected. 577 questionnaires were issued to college students, and 529 valid questionnaires were collected.

2. The construction of green university in our country

2.1 The construction of green university in China

For nearly half a century, the construction of green university has attracted more and more attention. Starting from France, green university construction spread throughout the world: such as

the University of Washington has launched the "green university program", University of Waterloo launched the "green campus action" and so on^[2]. Compared with foreign countries, China's colleges and universities started late in the green concept research, but in practice, the construction of green campus in China is relatively large and targeted, and has achieved encouraging results.

The construction of green university in China can be divided into three stages. First of all, in 1998, Tsinghua University put forward the concept of "Green University" for the first time. Secondly, from 2006 to 2011, China Green University Network was established, and the construction of green university in China was mainly based on the energy conservation and emission reduction of campus construction. Finally, since the China Green Campus Alliance Network establishment in November, 2016, The construction of green campus in our university puts forward the purpose of "green campus, green leader and green future", through the integration of resources and build a platform, to carry out activities in the green campus, green theme of practical innovation entrepreneurship and employment counseling, leadership training camp, green green media and international exchanges and other fields, and promote the construction of green campus in Colleges and universities of China's soft power development. The main development process is as follows in Table 1:

Table 1 General situation of green campus construction in China

Time	The development of green universities construction in China
In 1998	Tsinghua University has put forward the idea of "Green University" for the first time.
In 2006	The Ministry of Education issued "the Ministry of education Circular on the construction of conservation oriented schools".
In 2007	The Ministry of Education issued "the notice of the Ministry of education on school action on energy conservation and emission reduction".
In 2008	"College economical campus construction management and technical guidelines (Trial)" was been promulgated to promote the economical campus construction of high schools, the construction of green university campus from theory into practice.
In 2011	<i>China Green University Network</i> (CGUN) was established in June.
In 2013	<i>Evaluation standard for green campus</i> (CSUS/GBC04-2013) was put into effect .
In 2016	<i>China Green Campus Alliance Network</i> (CGCAN) was formally established in November.

As can be seen from Table 1, the construction of green campus in universities has become a hot topic in our country, and all colleges and universities are actively promoting the construction of green campus. The construction of green campus has adapted to the trend of the times, and has become an important part of China's ecological civilization construction.

2.2 The problems existing in the construction of green universities

Although the achievements of green campus construction in our universities are outstanding, the problems in the process of construction can not be ignored. Based on the analysis of the questionnaire results, summed up the construction of green campus in our country, the main problems are as follows:

2.2.1 Teachers and students have high awareness of environmental protection, but not deep understanding of environmental protection expertise

The environmental awareness and daily behavior of teachers and students in universities are investigated. The results show that, on the one hand, most people are able to economize on environmental protection and have higher awareness of environmental protection. In the classroom garbage disposal, 99.97% of teachers (including experimental teachers) and 97.92% of students take away rubbish or throw it into the dustbin after class; In energy saving, 99.34% teachers and 98.67% students said they would turn off the light when they leave the classroom and dormitory; In terms of paper savings, only 2% of teachers and 10.7% of students do not agree that waste paper will bring pressure to the environment. On the other hand, college teachers and students do not know much about environmental protection expertise. For example, when classifying garbage, there are 20% teachers said that because they don't know the relevant knowledge about garbage classification, so

choose not to classify, and this phenomenon accounts for the proportion of students is as high as 33.27%.

2.2.2 Schools and colleges have poor publicity for green campuses

Although most domestic universities have promoted and promoted the concept of "green campus", some green campus construction only stay at the school or college level, and individuals do not understand the connotation of green campus deeply. Only 2% of college teachers know more about the meaning of "green campus", while only 4.35% of students can do it. The statistical results are shown in the following Fig. 1:

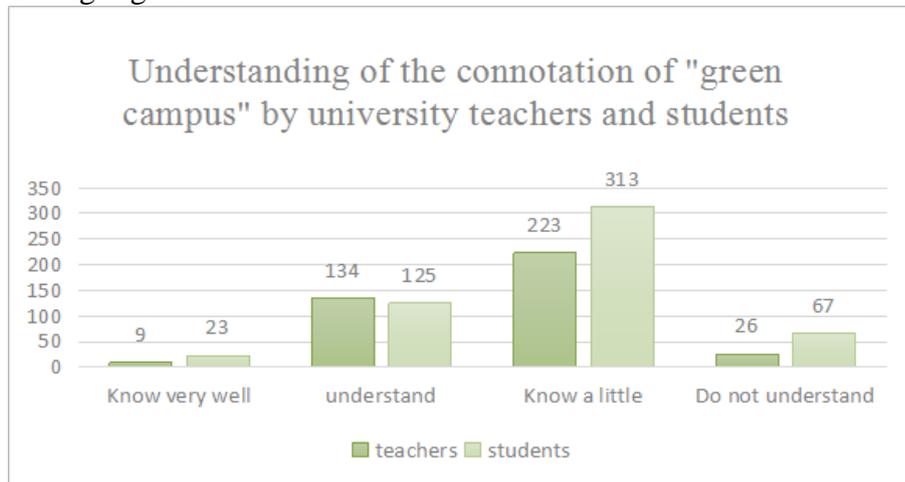


Fig. 1 Understanding of the connotation of "green campus" by university teachers and students

2.2.3 The operation system is not perfect and the execution is insufficient

In recent years, the construction of green universities in our country has made great achievements in hardware facilities, and many school buildings embody the concept of energy saving and environmental protection, and the campus environment is beautiful. According to the survey, 71.42% of the teachers and 69.80% of the students were satisfied with or satisfied with the overall environment of their colleges and universities. But in the construction of green campus culture, especially the system and the implementation of some deficiencies. For example, 88.20% of the teaching staff and 97.10% of the students showed that there was a wasting of water resources in their schools; nearly half of the teachers and students think that the campus setting mark protection of vegetation is invalid or the effect is not good; only 20.15% staff and 13.26% of the students said resolutely do not use foam lunch boxes and disposable chopsticks.



Fig. 2 Satisfaction degree of teaching staff and students to the whole campus environment

2.2.4 Green university construction activities are inadequate, teachers and students are not actively involved

The construction of green campus in Colleges and universities in China has been dominated by posters and lectures, while other campus green activities are very few. According to the survey,

nearly 65% of teachers and students are reluctant to participate in a series of activities such as green lectures. Although the old green activities can spread the concept of green campus construction to a certain extent, it is too boring and dull, and it will discourage the enthusiasm of teachers and students to participate in green campus activities. The analysis shows that 50.26% of the teaching staffs and 58.03% of the students think that the school organization and related associations should play a greater role in the construction of green campus.

To sum up, there are some problems existing in the construction of green campus in our universities: College students and teachers of basic knowledge is not deep, green campus publicity effect, construction of green campus operation system is not perfect, lack of execution, green campus construction activities, teachers and students active participation is not enough etc. Although the main body of building green campus in Chinese Universities: school, college, student organization and individual are actively involved in the construction of green campus, but there is no effective contact between them, without the formation of efficient operation mode, which leads to the emergence of the above problems.

3. The green campus running model based on "Mercedes-benz model"

3.1 Model building

Based on the above mentioned problems of green campus construction in Universities in China, this paper argues that in the construction of green campus, schools, colleges, students organizations and individuals should not only play their main role, but also to play out the interaction between the main bodies, scientific coordination of the interaction between the various subjects, to play a holistic effect. Therefore, this paper constructs the "Mercedes-benz model" of green campus construction in University . (as shown in Fig. 3)

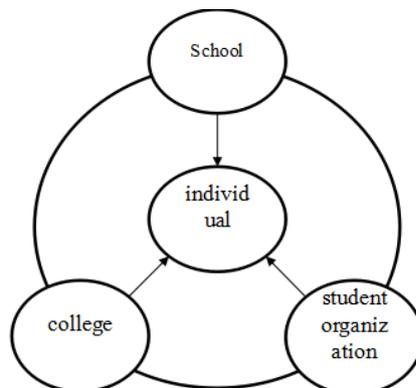


Fig. 3 Mercedes-benz model

The Mercedes-benz model built in this paper consists of four main bodies: school, college, student organization and individual. From the view of main bodies of the model , as a key decision to build a green campus in colleges and universities, school should actively explore the scientific and reasonable construction method, and policies should be made by relevant departments of the school; as "micro campus" institutions,college should implement policy recommendations made by the school departments,bring green ideas into class and research; as the initiator and carrier of green campus activities, student organizations should strive to explore innovative forms of activities to attract teachers and students to participate actively; finally,as the main groups of campus life, Individuals should closely link the spiritual connotation of the green campus with their daily life, and achieve "green life" and "green scientific research".

From the interaction of each main bodies in the model, we should pay attention to the contact among the them. School should not only carry out green research, guidance and encouragement, but also strengthen the management of students organization and conduct personal conduct, and coordinate with each other. In addition, the college and student organizations also conduct individual education, guidance and awareness guidance, so as to make the green concept popular among the people and be reflected in their daily life.

3.2 The green university operation mode based on "Mercedes-benz model"

The research shows that there is no efficient green campus running mode in our country, and the establishment of "Mercedes-benz model" will help to explore an efficient green university operation mode. Based on the model, the following will start from the main bodies of the model, respectively, to explain the interaction between the various subjects, so as to form a practical and effective campus green university operation mode:

3.2.1 School

As the key effect of building green university subject, school plays an important role in the campus environment planning, operation management and policy education, plays a regulatory role for college, students organization and individual in the leading position in the model. Therefore:

First of all, establish corresponding rules and regulations, and strengthen supervision to ensure the smooth implementation of environmental protection policies. Strengthen the supervision system can help to maintain green campus system construction, and avoid environmental protection behavior. At the same time, instruction can be made by the relevant departments of the school, and student organizations initiate initiatives to attract the majority of teachers and students to join the green supervision in the process of policy implementation, strengthen the guidance of green behavior consciousness at the same time, to ensure the effective implementation of the policy.

Secondly, incentive measures should be worked out. As the construction of campus environment, school should also formulate effective incentives, be sure of the environmental contributions made by school, department and college, and awarded them with the honor of "green scientific" or "low carbon sector", to encourage and guide college and department to make improvements. For example, encourage school canteens to increase the number of recyclable tableware, limiting the daily canteen disposable lunch boxes and sanitary chopsticks supply, reduce white waste on campus.

Finally, green teaching should be carried out, and green courses should be carefully organized. Green teaching contributes to the cultivation of individual green awareness and exerts influence on teachers and students in a subtle way. In the teaching process, the use of energy-saving environmental protection equipment, such as the promotion of dust-free chalk, energy-saving lamps, etc., can be a far-reaching impact on students from the details.

3.2.2 College

As an intermediary between schools and individuals, colleges play an important role in promoting the green campus.

First of all, college should follow the schools' policy, follow green policy in daily scientific research, and integrate resources while campus conditions permit. Through the use of green environmental protection equipment to pass the green concept to teachers and students, encourage them from the green environmental protection.

Secondly, college can be united with student organizations to jointly organize green environmental protection activities, expand the influence of the activities, and then have an impact on the daily life of teachers and students, encourage teachers and students to integrate the green concept into daily life, and help them form a habit. Such as college can work with student organizations to organize saving education activities, to encourage college teaching building installation of energy-saving lamps, and according to the school of the geographical environment, develop a reasonable power supply mode.

Finally, resources can be integrated and utilized between colleges to set up green education courses, invite relevant professional teachers to teach together. Make effective use of educational resources and increase the students' green literacy.

3.2.3 Student organization

Student organization is the product of self management, independent education and self-service development in school education. It plays an important role in dealing with students' daily affairs, and provides a broad platform for the practice of students, it is the main sponsor of student activities. In the construction of green campus, student organizations often conduct strong guidance on personal behavior by holding green activities.

First of all, student organizations should ensure that the activities are green and environmentally. Green campus activities not only require the theme of "green", but also include the greening of the process. Therefore, when the relevant departments of the school approve the activities of student organizations, they should strictly control the greening of the activities.

Secondly, student organizations may also consult with relevant departments of the college, take a class as a unit to carry out green theme activities, and participate in the activities of the class evaluation selection. Through the "green campus construction, outstanding League branch" and other honorary awarded, to mobilize the class to join the green campus construction enthusiasm, further promote the campus green concept of promotion.

Finally, interest is the best teacher. In the form of activities, student organizations should use various resources to increase diversity of activities to mobilize the enthusiasm of individual participation, and guide individuals to cultivate green campus as an interest. In carrying out propaganda activities, the student organizations must break the previous form of propaganda, not only to the use posters and campus broadcasting propaganda, but also to use the Internet, WeChat and other multimedia tools.

3.2.4 Individual

Individual is the most important part of green university construction, and also is the most important subject in the model. This model is constructed to promote personal green awareness.

Firstly, school conducts green behavior to individuals. Individuals should keep school rules and quasi school related departments of the formulation of the relevant rules and regulations of green campus construction. As a body of the model, individuals should take the initiative to make suggestions for the formulation of school rules and regulations, and resolutely resist the destruction of green environmental behavior, help and guide individuals who lack green ideas.

Secondly, as the subject of direct personal influence, the institute conducts education and guidance for individuals. College mainly arranges personal curriculum and research, and adds green elements in the course of teaching and research, which can exert a subtle influence on individuals, and promote the transformation of individual ideas and ideas by education. Through the feedback of the teaching and scientific research arrangement of the college, the college green education has been improved.

Finally, as an important subject of personal influence, student organizations recognize and guide individuals. Through various forms of propaganda of environmental protection, student organizations have given individuals a better understanding of green knowledge. By holding green activities, it can help individuals to participate in green practice, and have an irreplaceable role in promoting the formation of personal green campus awareness.

4. Acknowledgments

This work was financially supported by Research project on green development of the Ministry of Education -- Research on the evaluation of green campus (key) (LZFFZ1601) fund.

5. References

- [1] Jianjun Shi, "Building a low carbon campus with the idea of Green University", *J.China Higher Education*. (2010) 21-22. (In Chinese)
- [2] Hongwei Tan, *China Green University Network: promoting green campus construction*, *J. Construction Science and Technology*, pp. 12-15. (2013) (In Chinese)
- [3] Hao Tai, "Research on the construction of green campus in Universities", *D. Northeast Normal University*. (2014) (In Chinese)
- [4] Minyan Lu, Jian Ge, Shuqin Chen etc, "Relevant policy analysis on promoting green campus construction in China", *J. Architecture Technology*. (2016)873-875. (In Chinese)
- [5] Yi Lv, Ying Xu, *Analysis of financial problems in conservation oriented Colleges* [J]. *Communication of Finance and Accounting*, pp.68-69. (2012) (In Chinese)

[6] Pei Yao, Research and practice of economical campus construction. *J. Construction Science and Technology*, pp. 42-44. (2009) (In Chinese)