

# Research on low-carbon lifestyle of college students in Hubei University and promotion strategies

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**Abstract:** College students, as high-quality talents for China's future social construction, are the main force for practicing low-carbon life. Through investigating the cognition, willingness, behavior and motivation of low-carbon life among college students in Hubei universities, it is found that most college students do not have a sound low-carbon cognitive concept, and their awareness of responsibility for low carbon and the subjective motivation to spread it are not strong, so it is difficult to change their low-carbon behavior in the short term. Accordingly, countermeasures to promote low-carbon lifestyle of college students are proposed in terms of raising responsibility awareness, visualizing "low-carbon", creating a good campus low-carbon atmosphere, cultivating "low-carbon" models, and promoting low-carbon ideological innovation.

**Keywords:** low carbon living; promotion strategy; carbon peaking and carbon neutrality goals; college students

## 1. Introduction

On September 22, 2020, President announced at the 75th session of the United Nations General Assembly that China will strive to peak its carbon dioxide emissions by 2030 and work towards achieving the goal of carbon neutrality by 2060. As the main force of the future development of the new era, university students should keep in mind the carbon peaking and carbon neutrality goals and practice low-carbon life. As a major province of science and education, Hubei has the highest number of university students in China. Therefore, by analyzing these students' understanding of low carbon, low-carbon life, motivations to choose a low-carbon lifestyle, and the factors influencing their low-carbon behavior, we can get some certain representative survey results.

Wang<sup>[1]</sup> et al. analyzed the changes brought by low-carbon life, explained the transformation of green design, and proposed design consciousness such as energy interconstruction and recycling openness; Yao<sup>[2]</sup> used the critical theory of daily life to explain the importance of green life, and emphasized that low-carbon life is the "Archimedean point" for the construction of the market life world; Huang<sup>[3]</sup> et al. summarized the residents' attitudinal tendencies toward low carbon living and the internal and external factors that influence the residents' low carbon living, and pointed out the future development direction.; Li<sup>[4]</sup> and others sorted out the international development of carbon labeling and explored the carbon labeling system in China, which provided a theoretical basis for China's sustainable development. Xu<sup>[5]</sup> et al. explored the urban low-carbon life path, analyzed the current problems in China's cities, and explored and proposed five development paths; Liu<sup>[6]</sup> et al. integrated the existing concepts of low-carbon economy, explored the relationship between low-carbon economy and circular economy, and explored the relationship between the threat of climate change and low-carbon economy; Liao<sup>[7]</sup> explored the new model of low-carbon development in agriculture, and detailed The concept of each part of the low-carbon agricultural development model and specific implementation measures were elaborated; Zhang<sup>[8]</sup> and others explored the relationship between low carbon living and ecological civilization and proposed specific countermeasures to create a livable environment; Hu<sup>[9]</sup> investigated and analyzed the low-carbon lifestyle of a specific group of college students and publicized the severity of climate change in order to improve the awareness of energy conservation and emission reduction among college students; Wu<sup>[10]</sup> emphasized the need for low carbon living, which is a major measure to combat global warming.

The above-mentioned scholars have made detailed studies on low-carbon life, low-carbon economy, and the combination of low-carbon life with various aspects. This paper mainly focuses on the low-carbon lifestyle of college students, and investigates and analyzes the lifestyle of college students from four

aspects: low-carbon life cognition, low-carbon life intention, low-carbon life behavior, and low-carbon life motivation, and gives relevant suggestions at the end of the paper.

## 2. Survey on the status of low-carbon lifestyle of college students in Hubei

In this study, undergraduates and postgraduates in Hubei universities were used as the research subjects, and a random sample survey was conducted using the self-designed Questionnaire on Low Carbon Awareness and Low Carbon Lifestyle Choice among College Students. The questionnaire was designed with 31 items, including 30 objective items and 1 subjective item. The objective items were divided into five parts: the first part was the basic personal information and background; the second part was the survey of college students' cognition of low-carbon life; the third part was the survey of college students' low-carbon behavior; the fourth part was the survey of college students' low-carbon intention; the fifth part was the survey of college students' low-carbon motivation and evaluation of current situation. The survey collected 161 questionnaires through online channels, excluding 2 invalid questionnaires, the actual valid questionnaires 159, the effective recovery rate is 98.76%; 141 undergraduates participated in this survey, accounting for 88.68% of the total number, and 18 postgraduates, accounting for 11.32% of the total number; according to the survey results, the specific factors affecting the choice of low-carbon lifestyle of college students and According to the results of the survey, we analyzed the specific factors affecting the choice of low-carbon lifestyle of college students and their awareness and willingness to act at the present stage, and focused on exploring the influence mechanism of each factor on the choice of low-carbon behavior of college students, which provided a scientific basis for promoting the proposal of low carbon living strategies for college students in Hubei Province.

### 2.1 Low carbon living awareness

A correct low carbon understanding determines a low-carbon lifestyle, and a low-carbon lifestyle is the behavioral manifestation of a correct low-carbon understanding. The Chinese National Meteorological Administration defines low carbon as: low carbon means lower emissions of greenhouse gases (mainly carbon dioxide). The term "carbon" here mainly refers to carbon dioxide gas. The survey results show that college students have a certain understanding of the concept of low carbon, but the understanding is not comprehensive. In the question of understanding the concept of low carbon, 32.3% of the respondents think that low carbon means reducing the use and emission of carbon-containing materials, while 46.58% think that low carbon means reducing the use and emission of harmful carbon-containing materials, as shown in Figure 1.

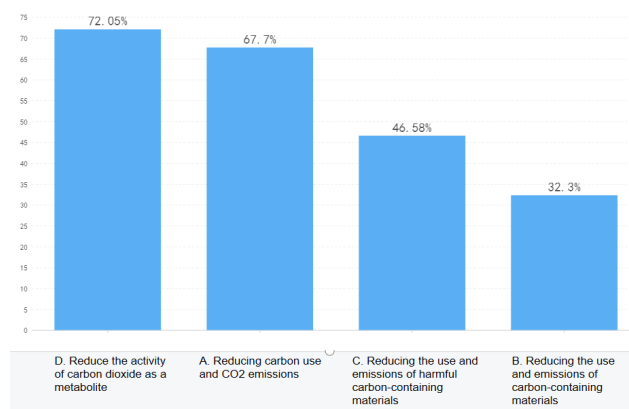


Figure 1: Understanding the concept of low carbon

It can be seen that the current cognition and understanding of low carbon among college students still remain in the literal sense, and most of them do not have a sound concept of low-carbon cognition, and their correct understanding in actual life is low compared with their self-cognition.

Regarding the distribution of the sources of low-carbon policies, the survey results show that 94.41% of the respondents obtain low-carbon policies and resources mainly from TV, radio, Internet and other media propaganda, which is attributed to the rapid development of information flow media in recent years, and this channel has become the primary channel for college students to obtain low-carbon policies. In addition, college students also use various types of propaganda and education in school and reading

newspapers and books as a means to assist in understanding low-carbon environmental protection knowledge. It can be found that in recent years, various schools have made effective efforts to promote low-carbon environmental protection concepts, and more and more students have obtained more low-carbon environmental protection concepts and related knowledge through school channels. In addition, 33.54% of the respondents chose to obtain low-carbon environmental protection knowledge through discussions with their parents, relatives, friends and classmates, which shows that low-carbon environmental protection topics are gradually becoming common topics in people's daily communication, and low-carbon environmental protection policies and ideas are coming from books to people's daily life, but at this stage, the frequency of dissemination of low-carbon environmental protection topics among college students is at a low level. However, the frequency of dissemination of low-carbon environmental protection topics among college students is low, and the initiative of dissemination is not strong. 34.16% of the respondents chose to learn about low-carbon environmental protection through the publicity and education of professional environmental protection institutions, as shown in Figure 2.

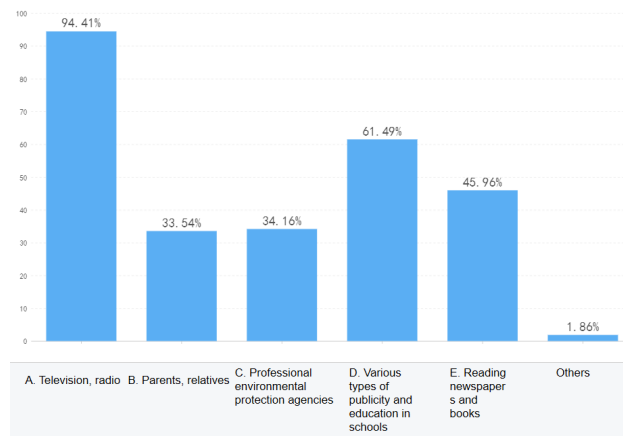


Figure 2: Percentage of access to low carbon knowledge

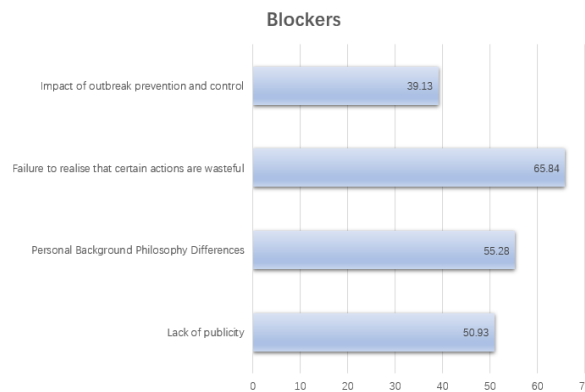


Figure 3: Barriers to low carbon implementation

In general, the propaganda of low-carbon environmental protection concept still needs to be strengthened at this stage. The increase of information flow makes more low-carbon ideas enter the view of college students through streaming media, but the publicity at this stage mostly stays at the level of literal meaning, and as practitioners of low-carbon life, college students lack the guidance of relevant specific behaviors, and the blind pursuit of unreasonable emission reduction and carbon reduction becomes the mainstream. In addition, colleges and universities, as the cultivators of college students' personality and behavioral awareness, fail to play a good role, and the publicity of the meaning and content of low-carbon life is still weak, resulting in unsatisfactory publicity effects. Colleges and universities should play a good role in coordinating the content, meaning and value of low-carbon behavior in their daily teaching activities, so that students can experience the value of low-carbon life through their eyes and ears. At the same time, at the social level, we should take advantage of the diversity of modern society to let the concept of low-carbon behavior be rooted in the hearts of college students from different media and different environments, so as to effectively cultivate the attitude of low-carbon life among college students from the conceptual level and the behavioral level to practice.

The 161 questionnaires were used to explore the reasons that prevented university students from implementing low carbon, and the results of the survey were obtained as shown in Fig 3. The main reasons were that university students were less aware of low carbon and did not realise that some of their actions were wasteful in their lives, and secondly, their personal philosophy and the environment they lived in attached importance to the promotion of low carbon were also bigger impediments to implementing low carbon.

## 2.2 Willingness to live a low-carbon life

In the scale of low-carbon willingness survey, various quantitative questions were used to analyze the respondents' willingness to live a low-carbon life, including the subjective willingness of the respondents to face the innovative lifestyle of low carbon living in terms of government policies, changes in social life philosophy, and the development of personal behavior, focusing on the correlation between the respondents' willingness to live a low-carbon life under different benefits. In this analysis, three matrix scale questions were designed to investigate users' willingness to live a low-carbon lifestyle, and the relationship between the items was obtained by calculating the correlation coefficients to conduct correlation analysis. There are two common correlation coefficients, Pearson and Spearman, and the former is used in this analysis. The correlation coefficient between "satisfaction with low carbon living" and "willingness to live a low-carbon life with incentives" is significant ( $p < 0.05$ ) and the value of the correlation coefficient is  $> 0.2$ , indicating that there is a general positive correlation between "satisfaction with low carbon living" and "willingness to live a low-carbon life with incentives". There is a general positive correlation between "satisfaction with low-carbon life" and "willingness to live low-carbon life with incentives"; there is a significant correlation between "satisfaction with low-carbon life" and "willingness to reject low-carbon life with low environmental benefits". The correlation between "satisfaction with low-carbon life" and "willingness to reject low-carbon life with low environmental benefits" is significant ( $p < 0.01$ ) and the correlation coefficient is  $> 0.4$ , which indicates that there is a strong positive correlation between "satisfaction with low-carbon life" and "willingness to reject low-carbon life with low environmental benefits". According to the analysis of the data, the willingness of college students to live a low-carbon life at the present stage is more related to the benefit factor. In actual life, government policy makers should fully consider the personal and environmental benefit factors, enhance people's subjective willingness to live a low-carbon life, and increase the publicity of environmental benefit to make college students correctly understand that low-carbon life is of great significance to the protection and recovery of ecological, as shown in Table 1.

Table 1: Related analysis table

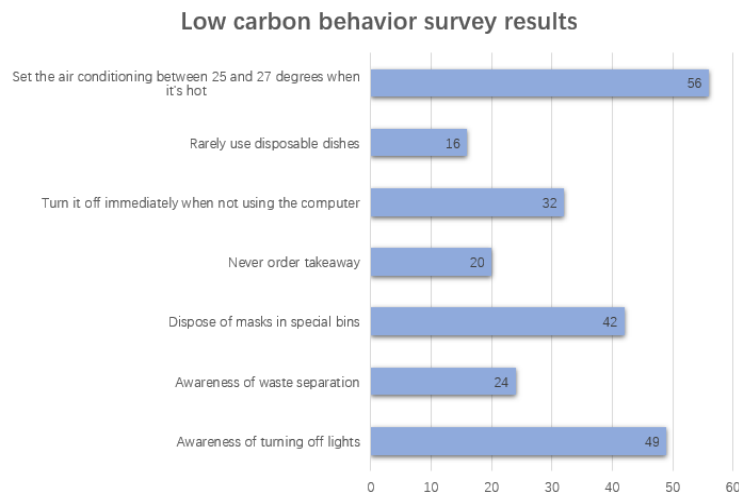
Related analysis table					
Projects	Average value	Standard deviation	Willingness to live a low-carbon life under the incentive mechanism	Rejecting the will to live a low-carbon life with low environmental benefits	Satisfaction with low carbon living
Willingness to live a low-carbon life under the incentive mechanism	4.02	1.00	1		
Rejecting the will to live a low-carbon life with low environmental benefits	3.37	1.23	0.18	1	
Satisfaction with low carbon living	3.10	1.08	0.28*	0.42**	1
* $p < 0.05$ ** $p < 0.01$					

## 2.3 Low carbon living behavior

In the design of the question items of the low-carbon living behavior survey, the research referred to the "Implementation Opinions of the Provincial People's Government on Accelerating the Establishment

of a Sound Green Low-Carbon Circular Development Economic System" (E Zhengfa [2021] No. 25) issued by the Hubei Provincial People's Government in October 2021. The document clearly points out that a sound green low-carbon cyclic development consumption system must advocate a green low-carbon lifestyle. The content covers the consumption of green products, the promotion of waste classification and reduction of resources in accordance with local conditions, strengthening the treatment of plastic waste, resisting restaurant waste and other guiding contents that are closely related to low-carbon life. The survey questionnaire covers a variety of low-carbon behaviors common in life, and the prevalence rate of low carbon living behaviors among college students at this stage is judged according to the subjective choices of the respondents. Based on the collected data, we know that most college students can fulfill their environmental protection obligations and do basic low-carbon environmental protection behaviors at this stage, including but not limited to using environmental protection bags instead of plastic bags, and choosing public transportation to travel when time allows.

In this paper, the implementation rate of low-carbon behaviours was investigated through a questionnaire and a comprehensive analysis of the low-carbon behaviours of university students. The low-carbon behaviours in the questionnaire were switching off lights when leaving separating rubbish, disposable masks, frequency of takeaway, standby time when computers are idle, disposable chopsticks usage rate and air conditioning setting temperature. The survey results show that 49% of university students have the awareness of turning off lights when leaving, 24% pay attention to waste separation, 42% dispose of their masks in special bins, 20% never order takeaway in a week, 32% turn off their computers immediately when they are not in use, 16% rarely use disposable chopsticks and 56% set their air conditioners between 25° and 27° in the hot summer. The results of the survey are shown in Fig 4.



*Figure 4: Low carbon living behavior choices*

The results of the survey show that most low-carbon behaviours are not implemented by individual university students, such as turning off the lights and setting the air conditioner to a reasonable temperature. The results of the above graph show that the acceptance rate of disposable dishware and turning on the computer for long days, which are very convenient for them, is very high. The results of the survey show that the implementation rate of low-carbon behaviors among university students is very low, and there are some important behaviors that university students do not have a sense of practice.

#### **2.4 Motivation for low carbon living and expected benefits**

As shown in Fig 5, 87.58% of the respondents believed that the concept of low-carbon life was established for physical and mental health motivation, in order to create a better living environment, improve the quality of life and protect the ecological environment. However, 32.92% of the respondents still choose to live a low-carbon life because of the herd mentality and because they see that people around them are participating in it.

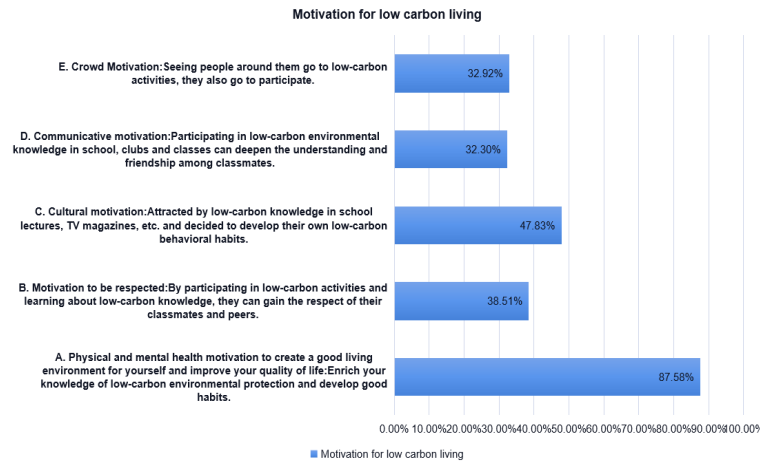


Figure 5: Motivation for Low Carbon Living

In the process of formulating low-carbon strategies, it is necessary to take this part of the group into consideration, strengthen education and values cultivation, strive to penetrate the low-carbon concept into people's hearts, and fundamentally make the college student group accept the concept of low-carbon life.

As shown in Figure 6, in the scale question of expected benefits after the implementation of low carbon living, most college students believe that this lifestyle will bring positive and positive value benefits, including the social level of life attitude change and environmental level of getting a better living environment. However, it should not be overlooked that some respondents think that the change of behavior will bring conceptual impact to the existing lifestyle and it is difficult to change in the short term. This requires decision makers to promote a low-carbon lifestyle in a gradual manner, systematically starting from the conceptual level and promoting the popularity of low carbon living in phases.

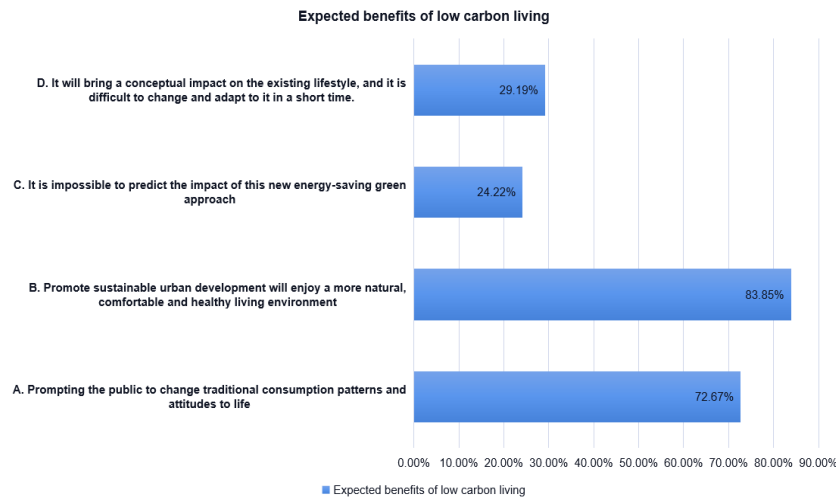


Figure 6: Expected benefits of low carbon living

### 3. Strategies to promote low-carbon lifestyles among college students

Through the analysis of the above questionnaire, the following conclusions are drawn: At present, college students' knowledge and understanding of low-carbon still remain in the literal sense, and most of them do not have a sound concept of low-carbon cognition, and their correct understanding in actual life is low compared with their self-perception. Although college students have a high voice for low carbon, the phenomenon of "not caring about oneself" is serious and the sense of responsibility is not strong. At the same time, the frequency of dissemination of low-carbon topics among college students is low, and the initiative of dissemination is not strong among college students as disseminators. In terms of low-carbon intention, the survey shows that there is a strong positive relationship between low-carbon behavior of college students and college students' income factors. Some respondents believe that the change of low-carbon behavior will bring conceptual impact to the existing lifestyle, which is difficult to change in the short term. In addition, the vast majority of respondents establish low-carbon concepts for physical and

mental health motives, and there are still many who are motivated by herd mentality. In view of this, the following recommendations are made.

(1) Widely disseminate the concept of green low-carbon and raise awareness of responsibility. University students are the participants and promoters of the great process of "carbon peaking" and "carbon neutral", and it is unrealistic to think that they can stay out of it. The government should use the "head goose" effect nationwide to recognize colleges and universities that have achieved significant results in low-carbon environmental protection and call on other colleges and universities to learn from them. The government should not only make low-carbon consciousness deep in people's hearts, but also make students deeply aware that they are the builders of the future, and that the instructions of General Secretary at the national key meetings should be deeply implemented into students' hearts. In addition, colleges and universities are also an important channel to deliver fresh organization members to the country, giving full play to the pioneering role of organization organizations and all organization members to raise their own awareness of responsibility and promote the cause of low carbon on campus.

(2) Visualize "low carbon". According to the survey, the willingness of college students to live a low-carbon life at this stage is more related to the income factor, so visualizing the low-carbon related income can effectively enhance the willingness of college students to live a low-carbon life. Schools can establish a standardized reward and punishment mechanism and carry out recognition activities to motivate and guide students to correct their attitudes and practice low-carbon life in spiritual or material aspects. Campus innovation and entrepreneurship bases can also incubate or strongly support some low-carbon-related startups and provide welfare policies for student entrepreneurs.

(3) Create a good low-carbon atmosphere on campus. Let students immerse themselves in a good low-carbon environment and change their low-carbon concepts implicitly. The school introduces solar or wind energy streetlights. Set up inspectors in the school to supervise the reduction of electricity use during the day, and turn off unused power after class in time. Reduce the use of disposable utensils in the cafeteria and encourage students to bring their own utensils. Annual "1 hour power outage" lights out event. We require the separation of garbage and recycling of used items. Widely carry out competitions and public service activities related to low carbon and energy saving. Mobilize students to participate in low-carbon related social practice activities, and bring low-carbon environmental protection to the whole country through social practice in their hometowns, so as to reach a wider area.

(4) Cultivate "low-carbon" models. The school makes use of the people and events around us to carry out typical demonstration and leading education, cultivate "leaders", vigorously commend "low-carbon" youth models, and promote the spirit of low-carbon, so that the majority of students feel more deeply and directly, and the ideological construction of more obvious results, and ultimately let the students' practice of low-carbon will be changed from passive to active.

(5) Promote the innovation of low-carbon mindset. The innovation of low-carbon mindset is easier to achieve than the research and development of technology. If everyone can practice low carbon, it is not only low cost but also high benefit, so the change of mindset is more important. With the innovation of the concept, people's actions will be more proactive. In short, to make the low-carbon lifestyle implemented and rooted in the consciousness and behavior of college students, it is necessary for the state, society, schools, individuals and other dimensions to work together to promote, so that the pressure and cost to achieve the goal of "double carbon" will be lower.

#### 4. Conclusion

Low-carbon life is a way of life that people should abide by. Low-carbon life is closely related to human beings and is the main measure to solve global warming, and this paper takes college students as the main body to investigate their low-carbon lifestyle. The investigation is carried out from four aspects and a strategy is proposed to promote low-carbon life for college students. This paper aims at pointing out the obstacles to the implementation of low carbon, emphasising the importance and necessity of low carbon living, and that low carbon living should be the mainstream lifestyle at present. This paper presents a comprehensive analysis of low carbon living among university students through a questionnaire and a large number of data surveys, but a more reasonable analysis method is still needed.

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