ISSN 2616-5902 Vol. 4, Issue 9: 1-9, DOI: 10.25236/AJBM.2022.040901

A study on the Low Carbon Consumption Behavior of College Students

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Abstract: *In recent years, the rapid development of the global economy has led to problems such as resource depletion and environmental degradation. For the sustainability of our development, this requires us to develop low-carbon consumption while developing a low-carbon economy. Therefore, this article takes Ludong University's student groups at all levels as the research object, analyzes which factors affect the low-carbon consumption behavior of college students, and then puts forward suggestions for the problems that college students have in low-carbon consumption, so that it can regulate and lead the society The group's low-carbon consumption behavior accelerates the construction of China's low-carbon consumption model.This paper first clarifies the definition of low-carbon economy and low-carbon consumption; secondly, it carries out a questionnaire on the consumption behavior of students at all levels in Ludong University, and analyzes the current consumption situation of college students through the data obtained from the questionnaire; finally, it establishes the return model of low-carbon consumption behavior of College Students and obtains the disposable income, gender, herd mentality, social responsibility and individual every month The six factors of consumption view and low-carbon consumption have a positive and significant impact on College Students' low-carbon consumption behavior.Finally, according to the problems of College Students' low-carbon consumption behavior, this paper puts forward several methods: first, to cultivate college students' sense of social responsibility; second, to create a good low-carbon consumption environment atmosphere; third, to carry out low-carbon consumption education activities; fourth, to carry out low-carbon environmental protection extracurricular activities.*

Keywords: *Low-carbon economy; Low-carbon consumption behavior; Countermeasures and suggestions*

1. Introduction

With the rapid development of science and technology, human beings have gained great material wealth, while the environment is deteriorating day by day. For this reason, the international community has been looking for a sustainable economic development model and a model that can make the economy develop green. Later, they took low-carbon as the core, changed production and consumption patterns, reduced carbon dioxide emissions, and achieved the harmonious development of man, nature and social environment. The ultimate goal is "the developed countries need to reduce carbon dioxide emissions to 25-40% by 2020" [1]. Based on China's huge population base, there are many groups among different age groups, and the consumption concepts of different strata are quite different. Among the numerous consumer groups, college students are a very special group, with a large number and high cultural quality. Most of them will receive high-level scientific and cultural knowledge, be more receptive to information and new things, and have a good sense of morality and responsibility. When they enter the society after graduation, they are more likely to form a low-carbon consumption group with demonstration and calling functions, and their consumption concepts and behaviors are more likely to play a huge role in promoting environmental problems.

2. The relevant theories of low-carbon consumption

2.1 The meaning of the low-carbon economy

Low-carbon economy is based on the theory of sustainable development, which can reduce carbon emissions, rebuild harmony with nature, mend fences with the earth, improve energy utilization

ISSN 2616-5902 Vol. 4, Issue 9: 1-9, DOI: 10.25236/AJBM.2022.040901

efficiency, vigorously develop renewable resources, and then protect the environment[2].

2.2 The meaning of low-carbon consumption

Low-carbon consumption is a healthy consumption pattern, and it is the responsibility of contemporary consumers to nature, society and future generations.

3. Status quo of college students' consumption behavior and analysis of influencing factors

The research on college students' consumption behavior needs some data support. The following article first conducts a questionnaire on college students' consumption behavior, then analyzes its current situation according to the obtained data, and finally makes a theoretical analysis of its influencing factors with the knowledge of various disciplines.

3.1 The design of the questionnaire

(a) The purpose of the investigation

By issuing a questionnaire, we can learn about college students' understanding of low-carbon consumption through the results of the questionnaire. The survey data is helpful to analyze students' low-carbon consumption behavior, find out the factors that mainly affect students' low-carbon consumption, and the problems in their low-carbon consumption behavior, and put forward some suggestions on promoting low-carbon consumption patterns in the whole country.

(b) The object of investigation

This questionnaire survey takes all the students of all grades in ludong university as the survey object.

(c) Composition of survey samples

This questionnaire survey takes all college students in ludong university as the survey object. Due to the special situation of COVID-19 epidemic this year, the questionnaire was mainly distributed in the form of online survey. A total of 150 questionnaires were distributed and 140 were collected.

3.2 College students' understanding of low-carbon consumption

Most college students are familiar with the concept of low-carbon consumption.They may have noticed low-carbon consumption in their daily life, while a small number of students may not know the concept of low-carbon consumption because they are usually busy participating in community activities or studying.

3.3 College students' recognition of low-carbon consumption behavior

According to the current survey results, most students in ludong university agree with low-carbon consumption behavior, and most of them think that it is necessary to do so. If everyone can do low-carbon consumption, then a good ecological environment can be maintained. A few students think that low-carbon consumption behavior is not very important, because low-carbon consumption may make their quality of life worse.

3.4 The main ways for college students to understand low-carbon consumption

The vast majority of college students learned about the concept of low-carbon consumption pattern through electronic devices in their hands, probably because college students surf the Internet more in their daily lives, while a few other students learned about it through classroom study and mutual communication among friends. Schools can publicize it more so that more students can understand it.

4. Empirical analysis of influencing factors of college students' low-carbon consumption behavior

On the basis of analyzing the current situation and influencing factors of college students' consumption behavior, this paper quantitatively analyzes the influencing factors of college students' low-carbon consumption behavior, so as to put forward targeted countermeasures and suggestions to solve

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the problems of college students' low-carbon consumption [3].

4.1 Selection of indicators

Based on the results of the questionnaire, this paper selects six indicators to analyze how they affect college students' low-carbon consumption.

(A) Low-carbon consumption knowledge variable (x_1). Low-carbon consumption knowledge refers to the degree of understanding of the concept of "low carbon". The more low-carbon knowledge you know, the more people tend to consume low carbon.

(B) The social responsibility variable (x_2). Social responsibility refers to a person's care for others and society. When a person has a sense of social responsibility, he will pay more attention to caring for the social environment, and it is easier for him to conduct low-carbon consumption.

(C) Conformity psychological variable (x_3). Conformity psychology refers to people's behavior or belief changes according to others [7]. When a person's herd mentality is more serious, the easier it is to follow in the footsteps of others for blind consumption, etc., the more unfavorable it is for low-carbon consumption.

(D) The variable of personal consumption view (x_4). In recent years, with the development of global economic integration, western consumers have begun to pay attention to collective interests and social interests, emphasizing environmental protection and resource conservation. When personal values are more inclined to the values of collectivism, they will pay more attention to the protection of the environment, and they will be more inclined to low-carbon consumption.

(E) Monthly disposable income variable (z_1). In general, the less disposable income a person has, the more he will tend to low-carbon consumption.

(F) Gender variable (z_2). Some people think that men have a strong environmental protection attitude towards the environment, and they rarely do anything harmful to the environment, while others think that women are more willing to buy environmentally-friendly products, because women are more involved in family daily life.

(G) Low-carbon behavior variables (y). The essence of low-carbon consumption is to reduce the emission of "carbon" content, reduce the damage to the environment while meeting its own needs, improve the quality of life and maintain sustainable economic development [4].

4.2 Model construction of college students' low-carbon consumption behavior

4.2.1 Model Construction

The main factors that affect college students' low-carbon consumption are herd mentality, social responsibility, personal consumption view, low-carbon consumption knowledge, gender and monthly disposable income. In order to quantitatively analyze the influence of various factors on low-carbon consumption behavior, linear regression models can be constructed respectively [5]:

$$y = k_0 + k_1x_1 + k_2x_2 + k_3x_3 + k_4x_4 + \mu$$

$$y = b_0 + b_1z_1 + b_2z_2 + \mu$$

Among x_1、x_2、x_3、x_4 are low-carbon consumption knowledge, social responsibility, conformity psychology and personal consumption view; z_1、$z_2$are monthly disposable income and gender; b、k represent the coefficient of each variable estimated from the data;μ representative error term.

Before analyzing the model, we should first test the correlation and collinearity of the regression model to ensure that a reasonable model is constructed.

4.2.2 Correlation test

Before verifying the model variables, we should first test the correlation of each variable. Only when there is correlation among each variable, it is necessary to conduct research. In this paper, the person correlation coefficient is used to test. The closer R is to 1, the better the correlation is. The collected data are tested for correlation, and the results are shown in Table 1 below.

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Table 1: Correlation analysis

Low carbon consumption behavior	Low carbon consumption knowledge	Social responsibility	group psychology	Personal consumption view	Gender	Monthly disposable income
	0.869	0.775	0.881	0.919	0.712	0.624

4.2.3 Collinearity test

According to the investigation of college students, we can get data, and then use SPSS22.0 to make collinearity analysis on the data. See Table 2 for the results.

Table 2: Collinearity analysis of personal characteristic factors

Model		Collinearity statistics	
		allow	VIF
1	(constant)		
	Zscore: Low carbon consumption knowledge	0.854	1.171
	Zscore: Social responsibility	0.875	1.143
	Zscore: group psychology	0.838	1.194
	Zscore: Personal consumption view	0.866	1.155

a. dependent variable: Zscore: Low carbon consumption behavior

Table 3: Collinearity analysis of demographic factors

Coefficient

Model		Collinearity statistics	
		allow	VIF
1	(constant)		
	Zscore: Gender	0.995	1.005
	Zscore: Monthly disposable income	0.995	1.005

a. dependent variable: Zscore: Low carbon consumption behavior

As shown in the table above, the tolerance of gender, monthly disposable income, social responsibility, personal consumption view, low-carbon consumption knowledge and herd mentality are 0.995, 0.995, 0.854, 0.875, 0.838 and 0.866 respectively; VIF values are 1.005, 1.005, 1.171, 1.143, 1.194 and 1.155 respectively. According to the criterion of multicollinearity, it can be seen that there is basically no multicollinearity among variables.

4.3 Regression model analysis of influencing factors

4.3.1 Model Analysis of Demographic Factors

Regression method is used to analyze the influence of the following two factors on college students' low-carbon consumption behavior, as shown in the following table.

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Table 4: Regression coefficient of demographic factors

	Coefficient of non standardization		Standardization coefficient	t	p	R^2
	B	Standard error	Beta			
constant	2.021	0.679	-	2.978	0.005**	
Gender	0.026	0.302	-0.013	-0.087	0.001	
Monthly disposable income	0.002	0.191	0.002	0.012	0.002	0.971
Dependent variable: low carbon consumption behavior D-W value:2.046						

It can be seen from the above table that the regression equation can be obtained as follows:

$$y=2.021+0.026z_1—0.002z_2+\mu$$

Among them, $z_1$is gender, $z_2$is monthly disposable income and μ is error term.

From the linear equation of demographic variables, it can be seen that gender factors and monthly disposable income factors have a significant impact on college students' low-carbon consumption behavior, which also shows that women are more aware of environmental protection than men, and the less monthly disposable income, the more inclined they are to low-carbon consumption. Among them, the R square is 0.971, which indicates that the equation fits well, and the D-W value is 2.046, which is close to 2. It is once again verified that there is no collinearity among the variables, which indicates that the regression model of demographic factors is reasonable.

4.3.2 Analysis of Personal Characteristics Factor Model

Using regression method to analyze the influence of various factors on college students' low-carbon consumption behavior, the following table can be obtained:

Table 5: Regression coefficient of personal characteristic factors

	Coefficient of non standardization		Standardization coefficient	t	p	R^2
	B	Standard error	Beta			
constant	2.527	0.659	-	3.835	0.000**	
Low carbon consumption knowledge	0.408	0.171	-0.336	-2.381	0.022**	
Social responsibility	0.383	0.157	0.345	2.44	0.019**	0.713
Group psychology	0.416	0.25	0.236	1.661	0.104	
Personal consumption view	0.529	0.25	-0.298	-2.118	0.040*	
Dependent variable: low carbon consumption behavior D-W value: 2.046						

From the above table, we can get the regression equation of the influence of personal characteristics on college students' low-carbon consumption behavior as follows:

$$y=2.527+0.408x_1+0.383x_2—0.416x_3+0.529x_4+\mu$$

Among them,$x_1$is low-carbon consumption knowledge, $x_2$is social responsibility, $x_3$is conformity psychology and x_4 is personal consumption view ,μ is the error terms.It can be seen from the formula that the above four factors significantly affect the low-carbon consumption behavior of college students. Among them, personal consumption concept has the greatest influence, with a coefficient of 0.529, followed by herd mentality, low-carbon consumption knowledge and social responsibility. This can strengthen the education of college students from these aspects; Among them, the R square is larger, close to 1, which indicates that the goodness of fit of the equation is good, and a linear model can be established. If the D-W value is 2.193, close to 2, the autocorrelation problem of the model can be ignored.

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4.4 Main conclusions

From the results of model analysis, it is concluded that the six factors analyzed above all have great or small influences on college students' low-carbon consumption behavior. Statistical analysis shows that, generally speaking, most college students have a good awareness of low-carbon consumption, paying more attention to environmental protection and low-carbon consumption, but there are also a few college students who have high-carbon consumption behaviors, such as herd mentality. Schools should educate and guide students to solve such problems, which can effectively enhance college students' low-carbon consumption behaviors. The specific analysis is as follows:

a. Low-carbon consumption knowledge is positively correlated with low-carbon consumption behavior, and the influence coefficient is small. It shows that the more college students know about low-carbon consumption, the more they will know how to make low-carbon consumption, and the easier it is to make behaviors beneficial to the environment.

b. From the regression equation, the contribution of social responsibility to low-carbon consumption behavior is 0.383, which is positively correlated. That is, if a person has a stronger sense of social responsibility, the more he will standardize his behavior and be responsible for the environment.

c. Conformity psychology has a great influence on low-carbon consumption behavior, which shows that the stronger conformity psychology is, the more college students tend to behave towards high-carbon behavior. In life, college students with weak independence and willpower usually use a certain object as a reference to evaluate their quality of life and consumption level, which will unconsciously lead to all kinds of bad high-carbon consumption habits, regardless of whether their behavior has caused environmental pollution.

e. If college students have a correct consumption view, they will make reasonable consumption in their daily life, and will not easily make impulsive consumption, which will form the habit of low-carbon consumption behavior.

f. The monthly disposable income affects the low-carbon consumption behavior of college students. The less the monthly disposable income, the less the unnecessary items purchased, and the more in line with the low-carbon consumption pattern.

g. Gender also affects college students' low-carbon consumption behavior to a certain extent.

5. Suggestions on college students' low-carbon consumption behavior

5.1 Cultivate college students' sense of social responsibility

Social responsibility has a great influence on college students' low-carbon consumption behavior. Schools should hold more activities to enhance college students' awareness of social environmental responsibility[6]. On the one hand, schools can give full play to the auxiliary role of university associations, set up work-study positions, and cultivate college students' sense of social responsibility; On the other hand, it explains to the students what impact unreasonable consumption behavior will have on the environment through knowledge lectures or broadcasts, so that the students can consciously regulate and restrain their own behavior.

5.2 Create a good low-carbon consumption environment.

The school can create a good environment for college students' low-carbon consumption, and can ban disposable products in canteens. To achieve the purpose of recycling discarded items, we can donate unused books, magazines or clothes to children in remote mountainous areas, and we can also set up sorting bins on campus, so that students can develop a good habit of consciously sorting garbage. By creating a good low-carbon consumption environment for college students, college students will be more encouraged to conduct low-carbon consumption behavior.

5.3 Carry out low-carbon consumption education activities

This group of college students is the future and hope of the motherland, and they play a leading role in low-carbon consumption. In view of the current situation and problems of low-carbon consumption among college students, schools should strengthen the education of low-carbon consumption concept

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among college students[7]. Schools should strive to actively promote the education of low-carbon consumption concept among college students, cultivate their awareness of social environmental responsibility, create an atmosphere of low-carbon consumption concept, and let the cultural atmosphere of low-carbon consumption spread from campus to society, thus laying a solid foundation for the rapid construction of low-carbon consumption mode in China.

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Appendix

Questionnaire on low carbon consumption behavior of College Students

1. Your gender: [single choice question]*

○ male ○ female

2. What grade are you in now [single choice question]*

○ freshman ○ sophomore

○ junior ○ senior

3. What is your average monthly consumption expenditure [single choice question]

○800-1000

○1000-1500

○1500-2000

○ above 2000

4. Your understanding of low carbon consumption [single choice]

○ very familiar

○ better understanding

○ I've heard of it but I don't know much about it

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○ do not understand

5. How much do you agree with low-carbon consumption behavior [single choice]

○ very necessary

○ necessary

○ general

○ not necessary

○ totally unnecessary

6. What are the main ways you learned about low-carbon consumption [single choice]

○ classroom learning

○ spread among friends

○ periodicals and magazines

○ multimedia, Internet and other electronic forms

○ others

7. Do you bring your own shopping bag when shopping [single choice]

○ yes

○ no

8. Will you buy over packaged products [single choice]

○ yes

○ no

9. Do you often use disposable products (such as water cups, bowls, chopsticks, etc.) [single choice]

○ use every day

○ often

○ less use

○ never use

10. Will you collect old newspapers and magazines to sell [single choice]

○ often

○ general

○ very few

○ never

11. Do you pay attention to material consumption [single choice]

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○ yes

○ no

12. Are you willing to sacrifice some personal interests for low carbon and energy conservation [single choice]

○ consent

○ basic agreement

○ general agreement

○ disagree

○ disagree