Investigation and Analysis of College Students' Awareness of Garbage Classification —— Survey Against the Background of Pilot Policies for Garbage Classification

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Abstract. To understand the current status and influencing factors of garbage classification awareness among college students, a questionnaire survey was conducted on current college students in Nanjing and Guiyang. The results showed that the average score of awareness among the surveyed college students was 69.4 points, and only 35.27% of the survey population had awareness of garbage classification, which is still at a moderate level overall. The level of garbage classification awareness among college students of different genders, grades, and sources varies. In terms of knowledge and awareness level of garbage classification, male college students are significantly higher than female college students, lower grade college students are higher than higher grade college students, and college students from pilot cities are significantly higher than those from non pilot cities.

Keywords: College students; Waste classification awareness; questionnaire survey.

1. Introduction

Garbage classification is not only a key small matter for people's livelihood, but also a major event for green development. More than 46 cities, including Shanghai, Beijing, Guangzhou, Jinan, Nanjing, Tianjin, and Guiyang, have started pilot projects for garbage classification, and household waste classification is being carried out in an orderly manner. In the context of nationwide garbage classification, it is worth noting that the effectiveness of garbage classification is still worrying. Environmental awareness reflects the mutual relationship between people and the surrounding environment. It is a gradually formed knowledge, experience, judgment concepts, emotional attitudes, and practical behavior about environmental protection during people's interaction with the natural environment [1]. As an important value, environmental awareness reflects the public's value orientation on environmental issues, and the essence of this value orientation is the degree of emphasis on environmental protection [2]. The article draws on the definition of environmental awareness to define the connotation of garbage classification awareness. Garbage classification awareness is people's understanding and evaluation of issues related to garbage classification, and it is the basic stance and attitude that people hold when facing the conflict between garbage classification and convenience of life. People's awareness of garbage classification can not only reflect the effectiveness of current garbage classification policies to a certain extent, but also affect the popularity of future garbage classification [3]. As a relatively high-quality group in society, college students' garbage classification awareness directly affects the smooth promotion of the country's future garbage classification work. Therefore, enriching the knowledge and awareness of garbage classification among college students has a certain promoting effect on improving existing garbage classification problems, and is of great significance for building a beautiful China.

In view of this, this study conducted a survey on garbage classification awareness among college students in Nanjing and Guiyang from December 2022 to January 2023 using the resources of our group. The aim was to investigate the current situation and influencing factors of garbage classification awareness among college students, preliminarily analyze the implementation effect of

garbage classification pilot policies, and discuss some phenomena and problems found in the survey and propose reasonable suggestions.

2. Survey objects and methods

This survey focuses on current college students from the provincial capitals of the group members' hometowns and the cities where they are currently studying: Guiyang and Nanjing. After conducting on-site visits to the scenic area through a group, a survey questionnaire was prepared and pre surveyed, and the questionnaire was modified multiple times before entering the formal distribution process. The investigator is composed of members of our scientific research group, and uses the Questionnaire Star platform to create online questionnaires. With the help of the group members' classmates, the online questionnaires are collected by the Questionnaire Star platform. Two contradictory questions are designed in the questionnaire, "Is garbage classification implemented in the location of this school?" and "How do you know that garbage classification has already been implemented in that location, If the respondent answers no or does not know in the previous question and then answers in the following question, it will be considered an invalid questionnaire, thus screening the invalid questionnaire and increasing the authenticity and credibility of the questionnaire results. A total of 323 online questionnaires were distributed and 280 were collected, with a questionnaire recovery rate of 86.69%. 258 valid questionnaires were collected, with a questionnaire recovery efficiency of 79.87%. Statistical analysis was conducted using SPSS software.

3. Preparation and testing of survey questionnaires

On the basis of reviewing relevant documents and literature, using the theoretical model of sports awareness structure by scholar Qiao Yucheng [4], the awareness of garbage classification in scenic areas is divided into four dimensions: garbage classification cognition, emotion, attitude, and identification. The survey questionnaire is designed with a total of 23 questions, divided into two parts. In the first part, there are 10 single choice questions, 2 multiple choice questions, 1 fill in the blank question, and in the second part, there are 10 connecting questions (mini test), To explore the awareness of scenic waste classification among college students. The reliability and validity of the questionnaire were tested using SPSS, and after testing, the total scale Cronbach's α the coefficient is 0.63, with acceptable reliability, and the measured data is suitable for statistical analysis. KMO test and Bartlett's sphericity test were used for structural reliability analysis. After testing, the KMO value was 0.749, indicating good structural validity of the questionnaire. In addition, the P-value of Bartlett's sphericity test was less than the significance level, indicating acceptable validity.

4. Data analysis

This survey used SPSS as a data statistical analysis tool to conduct statistical analysis on the obtained data. Descriptive analysis involves converting all indicators into categorical variables, calculating the scoring rate, mean ± standard deviation, and evaluating and analyzing the garbage classification awareness of college students using tabular, graphical, and numerical methods to understand the basic situation of current garbage classification awareness among college students; Comprehensive evaluation of college students' awareness of garbage classification in scenic areas using Analytic Hierarchy Process and Fuzzy Evaluation Method. We divide the questionnaire into four different levels: garbage classification cognition, garbage classification emotion, garbage classification attitude, and garbage classification identification. We assign weights to different levels and items (see Table 1), calculate the garbage classification awareness score of the survey sample, and convert the score into a standardized percentage score for evaluation. The calculation formula is as follows,

$$G=(x1w1/y1+x2w2/y2+\cdots+xnwn/yn)/\sum w_{i} \quad (1)$$

Note, where G represents the standardized score of garbage classification awareness; X represents the score of a certain question item, w represents the comprehensive weight of a certain question item, and y represents the highest score of a certain question item.

Table 1. List of questionnaire items and weight values.

Index	Weight(%)	Questionnaire items	Weight(%)	Comprehensive weight(%)
Cognition	0.29	B1Do you know the classification marks on the trash cans in scenic spots?	0.10	2.90
		B2 Whether your city is the first batch of pilot cities for garbage sorting?	0.35	10.15
		B3 Small test scores	0.55	15.95
Emotion	0.25	B1When you throw garbage in the scenic spot, will you pay attention to whether anyone nearby notices whether you sort garbage?	0.55	13.75
		B2 Have you seen other tourists not sorting garbage?	0.45	11.25
Attitude	0.34	B1Do you agree that it is normal for tourists not to sort garbage?	1.00	34
Identification	0.12	B1Do you feel satisfied with the garbage classification in the current scenic spot?	1.00	12

5. Survey results

5.1. Descriptive statistics

This survey adopts the method of online survey, with a total of 258 valid samples selected. This survey mainly focuses on undergraduate students. The article divides 2019 and 2020 undergraduate students into upper grades, and 2021 and 2022 undergraduate students into lower grades. Based on the first batch of garbage classification pilot policies, this article divides the regional factors in the demographic characteristics of the surveyed subjects into two different source areas based on whether their long-term residence is the first batch of garbage classification pilot cities, and then explores the implementation effect of the garbage classification pilot policies from a more superficial level. The demographic characteristics of the surveyed samples are shown in Table 2.

Table 2. List of demographic characteristics

Variable	Numble	Proportion (%)
	Gender	
Male	138	53.5
Female	120	46.5
	Grade	
Senior grade	120	46.5
Lower grade	138	53.5
	Origin	
Pilot city	76	29.5
Non pilot city	182	70.5

From the perspective of demographic characteristics, the distribution of grades among the surveyed population in this survey is relatively balanced, with a balanced gender ratio. In terms of grade distribution, the proportion of respondents in higher and lower grades is close to 1:1. Among the surveyed sample sources, there are a total of 22 cities belonging to the first batch of garbage

classification cities, and 74 cities not belonging to the first batch of garbage classification cities, which is more in line with the proportion of the first batch of garbage classification cities in China, The number of college students from pilot cities for garbage classification is less than that from non-pilot cities, which is basically in line with the current distribution of garbage classification pilot cities in China mainly concentrated in provincial capital cities, and universities mainly established in provincial capital cities.

5.2. Overall level of garbage classification awareness

The statistical results of this survey show (see Table 3) that the average standardized score of garbage classification awareness in the total sample is 69.4, which belongs to the lower middle level; Among the surveyed individuals, the highest score for classification awareness was 97.4, while the lowest score was 61.2, with a standard deviation of 13.9, indicating significant individual differences. Among them, only 12.2% of the respondents had a "strong" level of garbage classification awareness, 68.9% were at an "average" level, and 18.9% had a "weak" level of awareness. 81.8% of the surveyed students' awareness of garbage classification reached the "pass line" (60 points) level. Based on this, we have reason to believe that the current level of garbage classification awareness among college students is generally at a moderate level, and their garbage classification awareness needs further improvement.

Table 3. Overall level of classification awareness and proportion of each group.

Variable			N	Composite index score (`x±SD)	Grade proportion(%)		
					High	Medium	High
Gender	Male	Pilot cities	48	73.76±14.42	33.3	39.6	27.1
		Non pilot cities	90	68.63±13.84	14.4	44.4	41.1
		Total	138	70.41±14.23	21	42.8	36.2
	Female	Pilot cities	28	73.31±12.09	25	50	25
		Non pilot cities	92	66.74±13.40	8.7	43.5	47.8
		Total	120	68.27±13.40	12.5	45	42.5
Grade	Senior grade	Pilot cities	34	73.65±14.33	26.2	50	23.8
		Non pilot cities	86	66.22±11.34	17.7	40.6	41.7
		Total	120	68.32±12.71	24.6	47.1	39.1
	Lower grade	Pilot cities	42	73.54±13.00	35.3	35.3	29.4
		Non pilot cities	96	68.98±15.31	4.7	47.7	47.7
		Total	138	70.37±14.80	13.3	44.2	42.5
Origin	Pilot cities		76	73.6±13.6	30.2	58.3	11.5
	Non pilot cities		182	67.7±13.7	16	54.7	29.3
Total			258	69.4±13.9	18.9	68.9	12.2

5.3. Group Differences in the Awareness Level of Garbage Classification among College Students

According to the gender and grade of students, the questionnaire is divided into four groups. Based on this, each group is divided into two groups based on whether the source city is one of the first pilot cities for garbage classification. A total of eight groups are divided for comparative analysis (see Table 3).

From a gender perspective (Table 3), the average score of male college students' awareness is 70.41, while the average score of female college students' awareness is 68.27. Male college students have a higher awareness of garbage classification than female college students, and the proportion of "strong" and "average" levels of garbage classification awareness among college students also shows

a situation where males are higher than females. In addition, we can observe that the average scores of males and females on whether they come from the first batch of garbage classification pilot cities are 73.75 and 68.63, and 73.31 and 66.74, respectively. From the data, there is not much difference between male and female college students from pilot cities, while there is a significant difference between male and female students from non-pilot cities. In terms of the proportion of "strong" and "average" levels of garbage classification awareness among college students from pilot cities, the proportion of male and female students is also roughly the same, resulting in a difference in overall average scores due to the different proportion of students from non-pilot cities. Therefore, we can speculate that under the influence of group cognition, male and female college students regard them as members of the pilot city, recognize their own group, and under the influence of group infection, their awareness of classification is roughly the same, but in non-pilot cities, Male and female students have a relatively chaotic awareness of garbage classification, with most college students having a weak level of awareness. At this time, male students have a higher awareness of garbage classification than female students.

From the perspective of grade (Table 3), the average score of awareness among senior college students is 68.32, and the average score of awareness among junior students is 70.37. The awareness of garbage classification among junior students is higher than that of senior students. The proportion of "high" level of garbage classification awareness among college students from pilot cities in junior grades is 35.3%, which is significantly higher than the proportion of "high" level of garbage classification awareness among senior students from pilot cities, and the average awareness score of lower grade students from non-pilot cities is higher than that of higher-grade students.

It can be inferred that as the first batch of pilot cities for garbage classification in China, college students have continuously strengthened their awareness of garbage classification with the advance of garbage classification promotion work. With the determination of the first batch of pilot cities for garbage classification in China, active actions have been taken by various regions and departments, and the overall work of household garbage classification has started well. Although there are certain difficulties in the specific implementation process of garbage classification, urban garbage classification has improved to some extent compared to the past, and people's awareness of garbage classification has also been subtly improved.

5.4. The main reasons affecting the garbage classification of college students

For the question 'What do you think are the reasons why people did not classify their garbage?', as shown in Figure 1, The top three are uncertain how to classify, unaware that garbage needs to be classified, and unsupervised.

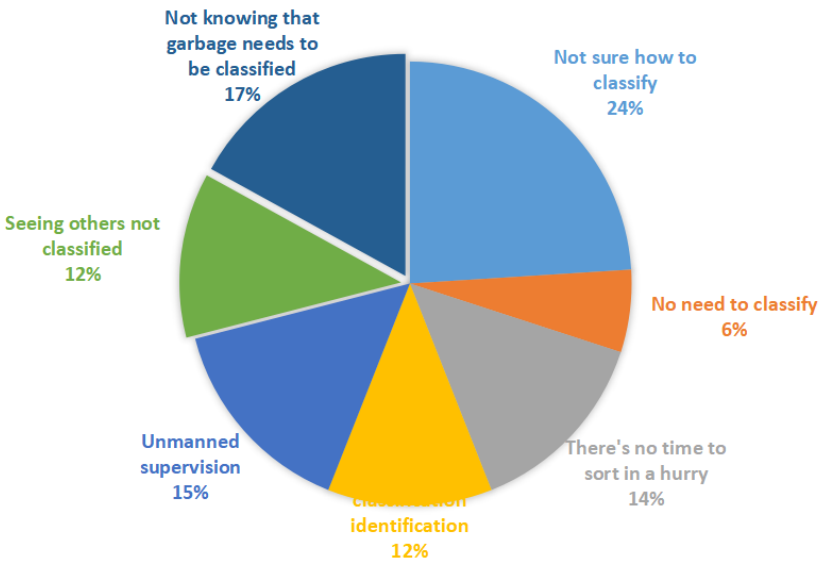

Fig 1. The main reasons affecting the classification of garbage in scenic areas

5.5. Recognition of waste classification

According to the survey results, only 5.43% of the respondents scored over 80 points in the small test on how to classify garbage, 17.05% scored between 60 and 80 points, and 77.52% failed. In addition, a survey and analysis on the question of "how many types of garbage classification labels can be divided" in the questionnaire found that the proportion of people who answered the question incorrectly and did not pay attention to the answer was nearly 68.99%. Overall, college students have a poor grasp of garbage classification knowledge and insufficient understanding of garbage classification. Therefore, it is necessary to further strengthen their own learning of garbage classification knowledge.

5.6. Waste classification behavior

Nowadays, household waste classification work is being carried out in most cities in China in an orderly manner, but the effective implementation of waste classification work is still something worth considering. Through our group's on-site visit and investigation, it was found that most university teaching buildings have only one trash bin placed inside, without a classification label. Although there is a classification trash bin outside the dormitory building, it has not been effectively placed, making it difficult for students to classify the garbage, resulting in mixed garbage inside the trash bin. But when it comes to whether students are willing to contribute to garbage sorting activities, they all express a strong willingness to contribute their own efforts.

6. Summary and suggestions

6.1. Summary

The average score of awareness among the surveyed college students is 69.4 points, with the highest proportion of "moderate" garbage among college students being 43.80%. Most of the classification awareness levels are "average" or "weak". Their understanding of garbage classification is not optimistic, and their awareness of ecological civilization needs to be strengthened. In terms of garbage classification awareness, male college students are higher than female college students, and lower grade college students are higher than higher grade college students. Through comparison of different groups, we found that regardless of gender or age, the average awareness scores of college students from the first batch of garbage classification pilot cities were higher than those from non first batch of garbage classification pilot cities. To some extent, the garbage classification pilot policy has played a certain promoting role in the effectiveness of garbage classification work.

6.2. Suggestions

6.2.1. University perspective

Nowadays, the pilot of garbage classification has not been popularized nationwide, and even in many cities where garbage classification is implemented, the management of garbage classification needs to be strengthened. Universities should comprehensively implement garbage classification, establish rules related to campus garbage classification, adopt scientific and effective measures for garbage classification and recycling, and further promote the effective implementation of campus garbage classification. In addition, the garbage classification supervision mechanism in various universities has not been implemented reasonably and effectively. Universities and corresponding departments should improve the system of campus garbage classification, which should be supervised by departments at all levels and relevant personnel. Standardize management and prioritize systems. Without a sound system, the standardization of garbage classification work cannot be discussed.

The correct return of garbage is not an easy task. To solve this problem, one must pass the consciousness barrier. This survey focuses on the college student population. Overall, the cultural level of this group is relatively high. However, according to the survey results, the awareness of garbage classification among college students still needs to be improved. Consciousness has a

reactive force on matter, and without good consciousness, there is no good garbage classification. Universities should strengthen the promotion and education of garbage classification among college students, actively carry out various forms of publicity, education, and advocacy work on garbage classification, so that college students understand the necessity of garbage classification, understand the serious harm that garbage classification can cause to the ecological environment, and call on college students and other groups to actively participate in the work of garbage classification.

6.2.2. Personal aspects

Although the cultural level of college students is higher than other groups, the previous research found that their overall level of mastery of garbage classification knowledge is still relatively low. College students should actively learn and master the standards of garbage classification and the value of garbage recycling, and cultivate their enthusiasm and initiative in garbage classification. They should actively respond to national garbage classification policies, actively participate in garbage classification activities organized by the school, and make garbage classification an indispensable part of their daily life when throwing garbage, thereby improving their awareness of garbage classification, Thus effectively promoting garbage classification work.

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