




Evaluating Willingness to Pay for E-Waste Recycling in Vietnam

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Abstract

E-waste is generating rapidly, potentially causing risks to the environment and public health. Formal collection and recycling are necessary to reduce risk and exploit the value of e-waste. This study was conducted to assess factors affecting the willingness to hand over (WTH) and the willingness to pay (WTP) for the recycling e-waste cost of young consumers in Vietnam. The methods of descriptive statistics, regression analysis, and ANOVA were used to analyze the data of 403 interviewed students. The research results show that a high percentage of students were willing to hand over and willing to pay the cost of recycling. According to the results of the regression analysis, WTH was mainly influenced by the attitude towards recycling. Students highly assessed the importance of environmental considerations, recycling costs, convenience, and information security. Meanwhile, students seriously lack knowledge about policies, legal regulations, and information about e-waste collection and treatment programs. This knowledge factor had a major impact on students' willingness to pay for recycling costs. This study makes a meaningful contribution to the scarce data source on electronic waste in Vietnam. Dissemination of information and establishment of e-waste collection points are essential solutions that need to be taken to promote participation in e-waste recycling.

Keywords: E-waste Recycling; Willingness to Hand Over; Willingness to Pay.

1. Introduction

E-waste is one of the fastest-generating urban waste streams in the world [1, 2], increasing by 4.5–10% per year on average [3, 4]. Unlike other types of waste, e-waste is considered a profitable urban area as it contains many valuable materials [5]. Especially information and communication technology devices such as laptops, desktop computers, mobile phones, etc. [6]. In recent years, many efforts to collect and recycle e-waste have been recorded in both the formal and informal sectors. In which the informal recycling sector dominates [7, 8]. This activity has potential risks of heavy metal accumulation in soil and groundwater [9–11]. More serious are the effects on human health, including changes in thyroid and lung functions, symptoms related to endocrine and neurological disorders, and the risk of cancer [9, 12]. Meanwhile, despite ensuring enough environmental safety conditions, the formal recycling area does not attract the willingness of consumers to hand over unused equipment. In fact, the percentage of consumers willing to hand over old equipment (WTH) and willing to pay the cost of recycling (WTP) is very low [13, 14]. Most of the equipment will be kept at home, given to relatives, or sold to scrap collectors [15, 16]. Thereby, there is a shortage of e-waste for operations at many formal recycling facilities [7, 8]. According to Koshta et al. [17], the end user is responsible for handing waste equipment over to collection organizations and is encouraged to pay the cost of recycling to ensure the operability of the e-waste system.

In Vietnam, the management of e-waste also has many limitations. Formal e-waste collection and treatment programs have not achieved significant effectiveness due to a lack of community support [7, 8]. Vietnamese people also have the habit of keeping old equipment as keepsakes or selling it to scrap collectors for a small refund [18–20]. To improve the

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effectiveness of formal e-waste recovery and disposal programs, it is necessary to identify the factors that influence consumer participation intentions [14, 21]. In which young consumers are identified as potential research subjects. Because young consumers have easy access to electronic devices and have frequent use of devices [5, 22]. At the same time, the young generation has always been an active participant in movements and activities for the sake of environmental protection [23–25]. In particular, for the issue of e-waste recycling, young and high-level academics were also identified as having a higher level of acceptability to pay for recycling costs than other groups [26, 27]. However, previous studies on e-waste in Vietnam were mainly conducted with households with a low willingness to participate [7, 18, 19].

Meanwhile, there have not been any studies on young consumers' intentions to participate in e-waste recycling. Therefore, this study was conducted to evaluate the factors affecting the willingness to hand over and willingness to pay for e-waste recycling activities of young consumers with the expectation of helping to improve the efficiency of formal recovery and treatment e-waste programs in Vietnam. The subjects of this study are students of Can Tho University (CTU). This is one of the key universities in Vietnam, with about 40,000 students being trained every year [28]. In particular, Can Tho University has specialized training in environmental and natural resource management. At the same time, CTU is also a place to organize propaganda activities and raise awareness of environmental protection [29, 30]. The activities were well responded by the students. These are strengths that can promote the implementation of an e-waste collection program. The objectives of this study are (i) to assess the current status of students' awareness, attitude, and intention to participate in the e-waste collection and treatment program, and (ii) to determine the factors affecting the WTH and WTP of students. The results of this study not only help improve students' perceptions of e-waste recycling, but they also serve as a useful basis for establishing an e-waste collection system at the university.

2. Research Methodology

The theoretical basis of the study was built through a literature review. The steps of data collection and analysis were conducted according to the procedure shown in Figure 1.

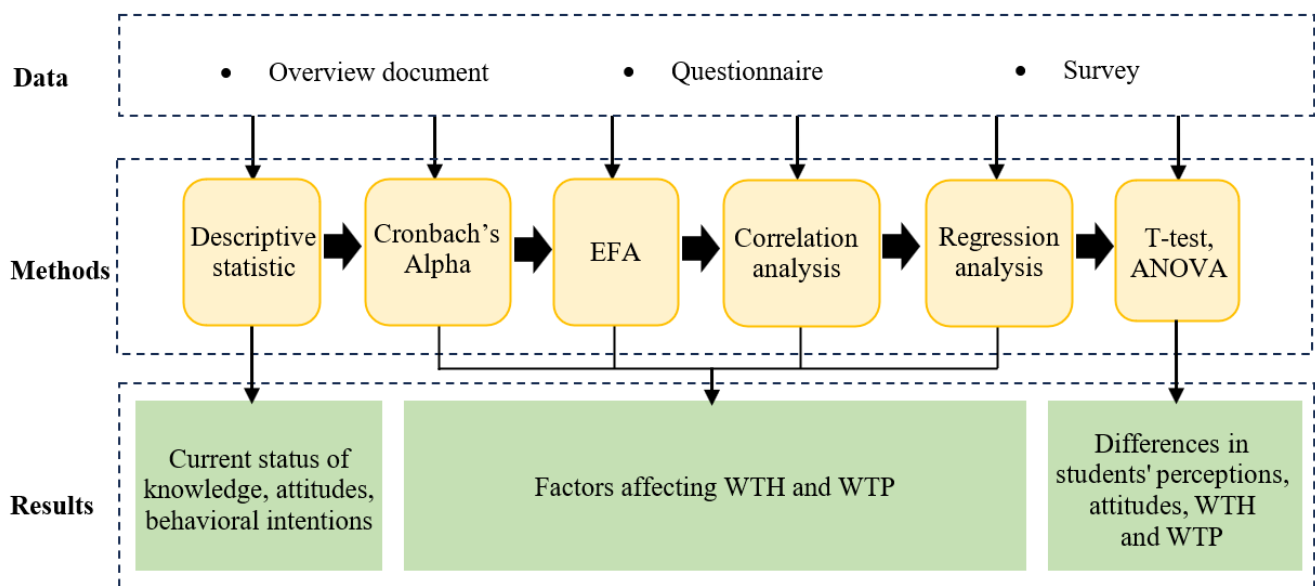


Figure 1. Methodology framework

2.1. Data collection

The study used a pre-designed questionnaire to collect information from students at Can Tho University. The questionnaire was built based on the theoretical basis synthesized by the document review method. A pilot study was conducted with 30 students to determine the appropriateness of the questionnaire. After adjustment, the content of the official questionnaire has four parts, including (1) students' knowledge of e-waste, (2) students' attitudes towards e-waste recycling, (3) WTH and WTP for e-waste recycling, and (4) general student information (see Appendix I).

According to statistics at the time of the study, Can Tho University had 34,365 full-time undergraduates [28]. Given this population size, the study had to survey a minimum of 396 students to ensure the representativeness of the population. This sample size is determined by the following formula:

$$n = \frac{N}{1 + N * e^2} \quad (1)$$

where n is the sample size to be determined, N is the population size and e is the allowable error (5%).

After 2 months of conducting the survey (from February to April 2023), the research has collected information on 412 students. In total, there are 403 answer sheets that meet the requirements for analysis. The sample size of this study is consistent with the overall population size of over 5000 people [15, 31].

2.2. Data Analysis

All analyses in this study were performed using IBM SPSS Statistics 26 software. First, the study carried out descriptive statistics to assess the overall status of students' awareness, attitude, and intention to recycle e-waste. At the same time, the characteristics of the students' gender, major, and number of years of training are also descriptive statistics. Next, to assess the factors affecting the students' willingness to hand over and willingness to pay the cost of recycling e-waste, the study takes steps to check the reliability and suitability of the factors in the regression model.

The analysis results show that the Cronbach's alpha coefficient of the variables of knowledge and attitudes in this study is 0.898 and 0.880, respectively (Table 1). This result is consistent with the value of >0.70 , which is widely accepted in studies of psychology and behavioral intention [32]. Besides, the Exploratory Factor Analysis (EFA) also showed appropriateness because the KMO value = $0.875 > 0.5$ and the sig. Barlett's test = $0.000 < 0.5$. There are 2 factors extracted with an eigenvalue value greater than 1 and a total cumulative variance of 62.723%. All variables have good and very good statistical significance, as the factor loading coefficient is 0.675–0.864 [33]. Thus, 13 observed variables are included in the analysis, which could be distinguished into two independent factors and are completely suitable for regression analysis. The survey variables and scales are presented in detail in Table 2.

Table 1. Results of reliability and suitability of the scale

Variables	Items	Cronbach's Alpha Analysis		EFA Analysis
		Cronbach's Alpha	Cronbach's Alpha if Item Deleted	Factor Loading
Knowledge and awareness	K1	0.898	0.895	0.675
	K2		0.886	0.761
	K3		0.884	0.796
	K4		0.876	0.838
	K5		0.874	0.850
	K6		0.871	0.864
	K7		0.892	0.723
Attitude	A1	0.880	0.873	0.714
	A2		0.865	0.761
	A3		0.856	0.800
	A4		0.848	0.834
	A5		0.848	0.834
	A6		0.860	0.787

Table 2. Survey variables of the study

Variables	Name	Sign	Scale
Knowledge and awareness	- The concept of e-waste	K1	1 = Total lack of comprehension 2 = Low level 3 = Moderate 4 = High 5 = Very high
	- Recycling status	K2	
	- Locations for collection and recycling	K3	
	- Recycling methods	K4	
	- Policies and laws	K5	
	- Responsibility for recycling	K6	
	- Potential environment impact	K7	
Attitude	- Environmental consideration	A1	1 = Not important 2 = Less important 3 = Average 4 = Important 5 = Very important
	- Recycling price	A2	
	- Recycling experience	A3	
	- Satisfaction	A4	
	- Convenience	A5	
	- Personal information security	A6	
Behavioral intention	- Willingness to hand over	WTH	1 = Very unwillingness 2 = Unwillingness 3 = Distraction 4 = Willingness 5 = Very willingness
	- Willingness to pay	WTP	0 = Unwillingness 1 = Willingness

Factors affecting WTH and WTP were evaluated by multiple linear regression and binary regression models, respectively (Figure 2). In which, the WTH model was evaluated with 02 independent factors, including knowledge and attitude. The WTP model was established with 03 factors, including knowledge, attitude and WTH.

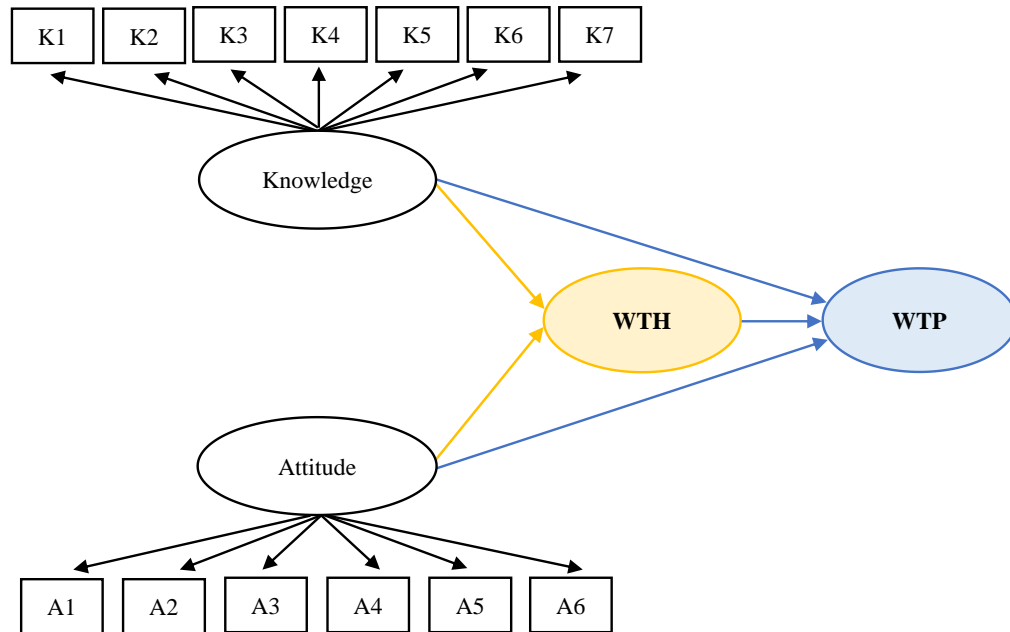


Figure 2. Variables in the regression analysis

3. Results and Discussion

3.1. Information of Students Participating in the Survey

3.1.1. Demographic Characteristics

In this study, the gender distribution of data was equally distributed. The proportions of male and female participating in the survey were 50.4% and 49.6%, respectively. The grouping of students between environmental majors and other majors aims to examine the differences in awareness and attitudes towards e-waste recycling [15]. This is the basis for designing appropriate educational programs. The survey results recorded that 39.7% of students majored in environment. Among these 403 students, the highest proportion are senior (31.3%), followed by sophomore (25.8%) and junior (24.3%) (Table 3).

Table 3. Survey sample size by group

Variables	n	Percentage (%)
Gender		
• Male	203	50.4
• Female	200	49.6
Specialized sector is trained		
• Environment and Natural Resources	160	39.7
• Other majors	243	60.3
Number of years of training		
• Freshman	64	15.9
• Sophomore	104	25.8
• Junior	98	24.3
• Senior	126	31.3
• Graduated	11	2.7

3.1.2. Information about Personal Devices being Owned

The survey results show that mobile phones and laptops are the two most used devices by students (Figure 3). Except for the two students who are not willing to provide details of the devices they have all the remaining 401 students own at least one mobile phone. Meanwhile, printers and tablets are used the least.

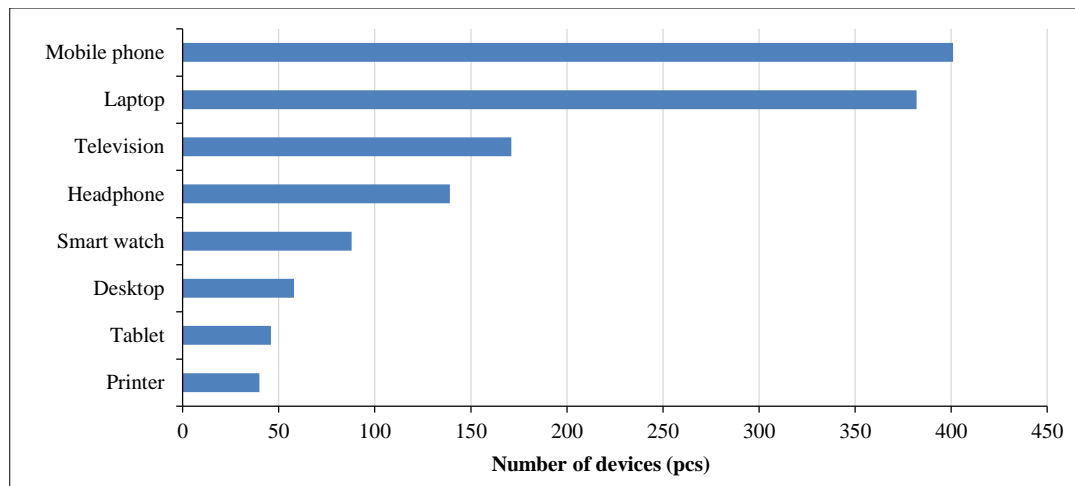


Figure 3. Number of students' personal electronic devices

Previous research results also show that mobile phones and laptops are widely used devices at universities for students' learning and research purposes. In which, laptop was the most commonly used device by students in Sydney [15]. Besides laptops, students in Bangladesh also used a number of other devices such as tablets, printers, scanners, etc. [14]. The research of Kumar [34] also indicated that mobile phones and laptops are the two most commonly used devices by Chinese and Indian students. Specifically, Chinese students own 4 - 6 electronic devices, including mobile phones (old and new), laptops (old and new), tablets and kindle. Indian students own an average of 2-3 devices (laptops, mobile phones and tablets).

3.2. Students' Knowledge and Attitudes about e-Waste

Most young consumers have a good comprehension of the concept of e-waste. The research at Can Tho University, Vietnam recorded that 91.3% of students had knowledge about this type of waste, of which 25.6% had high knowledge and 4.2% had very high knowledge (Figure 4). Other studies in Lithuania [35] and Australia [15] also recorded that 81.3% and 79% were aware of the concept of e-waste, respectively. This rate is much higher than the 46.67% recorded in households in Vietnam [19]. Although there is a fairly high aware of the concept of e-waste (mean = 2.90) and the impact of e-waste (mean = 3.14), most students have a rather low aware of issues related to the end-of-life treatment of e-waste. Specifically, the survey results showed that 21.6 - 35.7% of students were completely unaware of the status of recycling, collection/disposal locations, recycling methods, policies and laws, responsibility for treatment e-waste (range about 2.10-2.60). Similar results were also recorded in the study of Ananno et al. [14], there were 62-68% of students who did not know the difference between formal and informal recycling as well as completely unaware of laws, policies, regulations on e-waste treatment. Most of the respondents lacked knowledge about the collection and recycling program [15]. The analysis results of this study did not find any difference between the groups of students in the awareness related to e-waste (see Appendix II). Most notably, the understanding of e-waste of students majoring in the environment was similar to that of other majors. That shows that e-waste is not yet popular in the environmental education program. Therefore, it is necessary to widely communicate knowledge about the impact and responsibility in the end-of-life treatment of discarded electronic devices to students majoring in the environment in particular and all students in general.

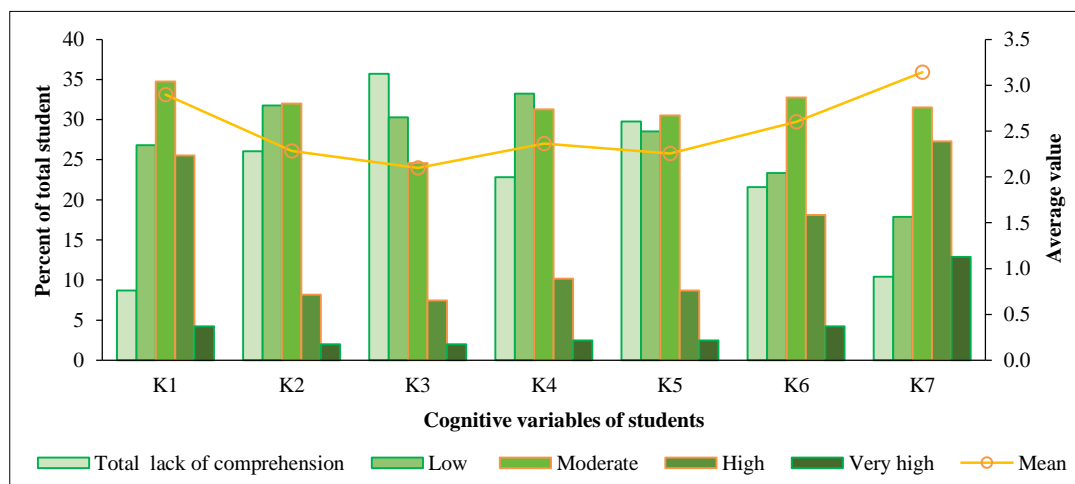


Figure 4. Knowledge levels of the respondents about e-waste

According to the statistical results, most students appreciate the importance of factors in deciding to participate in the e-waste recycling program (Figure 5). All these factors were rated as less important by a very small percentage of students (about 10%). In which, "environmental considerations" was rated the most important (mean = 4.08). In addition, the factors of recycling cost (A2), recycling experience (A3), convenience (A5), and information security (A6) were also assessed as important (3.77–3.87). Female students rate the importance of convenience and information security higher than male students. The importance of personal information security also differs significantly between students in different courses (see Appendix II). The average value of A6 assessed by graduates was 2.91, lower than freshmen (4.0), sophomores (3.75), juniors (4.02), and seniors (3.88). Previous studies have suggested that the decision to recycle e-waste is influenced by many factors, including recycling costs, incentives/rewards, distance to the collection site, and knowledge of the location and ways to recycle e-waste [36]. According to de Oliveira Neto et al. [16], ease of access is an important contributing factor to participating in the program.

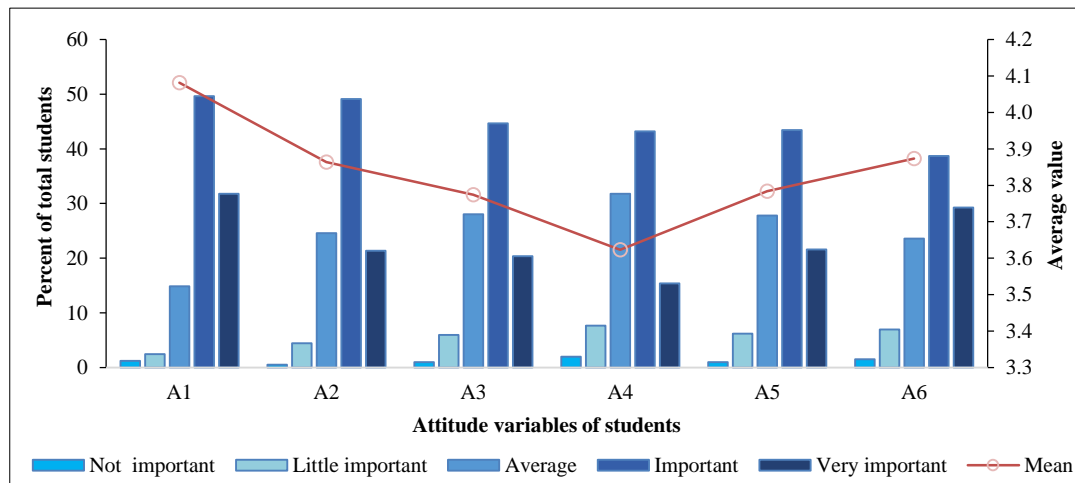


Figure 5. Attitude levels of the respondents about e-waste

3.3. Factors affecting WTH and WTP

3.3.1. Willingness to Hand Over

In this study, students' willingness to participate in recycling was indicated by their willingness to hand over discarded electronic devices to formal recycling channels. Survey results show that up to 83.7% of students are completely willing to participate (Figure 6). In which, the rates of willing and very willing to hand over are 51.4% and 32.3%, respectively. The reasons why 16.4% of students are still hesitant or unwilling to hand over are concerns about information security (60.6%) and the residual value of old equipment. They believe that equipment can be used as a backup device or given to others (53.0%). In terms of the popularity of the recycling program, 43.9% of students said that they did not have access to information about the formal recycling channel. That leads to skeptic about the recycling efficiency of this e-waste treatment service (31.8%). It shows that the propagation of information about formal recycling programs and ensuring information security should be prioritized in the coming time to attract more students to participate in this activity.

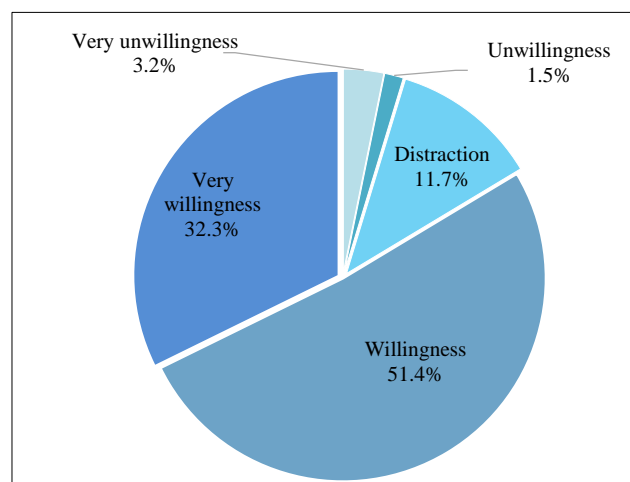


Figure 6. Willingness to hand over

The results of the regression analysis show that the attitude towards recycling is the main influencing factor in the students' willingness to hand over the device to the e-waste collection and recycling program (Table 4). The items of cost, convenience, information security, environmental concerns, experience, and satisfaction all made significant contributions. The knowledge variable has no impact on WTH as it is not statistically significant in the regression model (sig. = 0.056 > 0.05).

Table 4. The results of regression analysis

Variables	WTH		WTP	
	B	p-value	B	p-value
Knowledge	0.099	0.056	0.496	0.002
Attitude	0.257	0.000	0.283	0.112
WTH	-	-	0.529	0.000

E-waste collection programs in households were also promoted by ease of access to disposal sites and financial rewards [15, 16, 37]. Therefore, door-to-door collection is an effective solution to help people feel comfortable handing in their old electronic devices [14]. In this study, students at Can Tho University also prioritized home collection service (159 students) over bringing the device to the collection site/recycling facility (74 students). Besides, the remaining 102 students are willing to hand over the device by both methods. In addition, the lack of data security when handing over old equipment is also a major concern for consumers [14]. Therefore, electronic waste collection programs need to provide information to guide and support participants in actively processing the data contained in the device before handing it over to the collection unit. The meaning of this study was confirmed by determining the factor affecting willingness to hand over e-waste of students. However, further studies need to expand the evaluation model with other factors such as ethical norms, social norms, behavioral control, etc. Several studies have shown that consumers' intention to participate in recycling is not only influenced by their attitudes but also by other factors such as habits and knowledge [21, 36, 38]. According to Ananno et al. [14] and Yadav et al. [39], ethical norms, social norms, and behavioral control also significantly impact consumer recycling behavior.

3.3.2. Willingness to Pay the Cost of Recycling

The survey results of this study are completely consistent with the previously confirmed results that young and highly educated people have a high ability to accept payment for e-waste recycling [26, 27]. The research at Can Tho University found that 77.7% of students were willingness to pay the recycling cost for e-waste (Figure 7). The remaining students were unwilling to pay as they did not want to lose any fees (68.9%) and did not have enough confidence in the formal recycling program (28.9%). In particular, 31.1% of students said that they do not have any responsibility to pay the recycling fee. This further confirms the importance of propaganda to raise people's awareness about the collection and treatment program as well as the responsibility of consumers in the management of e-waste. The results of the study showed that statistically significant differences in WTP were recorded between students of different genders and courses (see Appendix II). Specifically, the WTP of male students was lower than that of female students. Freshmen students had the highest willingness to pay for e-waste recycling costs. Compared with another study in Vietnam, the payment acceptance rate of students at CTU (77.7%) is higher than the rate surveyed in households in Da Nang city (52.5%) [20]. In some other countries, the willingness of households to pay for recycling e-waste was also recorded at a low level, only 20–40% [8, 36, 40]. According to Ananno et al. [14], people aged 25–35 and with a university degree or higher are the most willing to pay the cost of recycling. A study in Switzerland found that consumers had to pay an additional e-waste recycling fee when purchasing electronic devices. However, this is forecast to be difficult to accept in developing countries [21]. The survey results show that 26.5% of students at CTU choose this form of payment. They accept to pay for the recycling fee as soon as they buy a new product (the product price includes the recycling fee). However, students prefer to choose to pay a higher monthly fee, like a domestic solid waste or wastewater treatment fee (29.7%). In addition, 26.5% of students chose to pay a refundable deposit, which means a surcharge is added to the purchase of the product and then a discount/return of the fee when returning the old device. Another option chosen by 21.1% of students was to pay a pre-disposal fee (pay a recycling fee when disposing of the device).

Regression analysis results show that students' willingness to pay the cost of recycling e-waste is influenced by awareness and WTH factors without being affected by attitude (Table 4). Several other studies have also recorded the relationship between awareness of e-waste and willingness to pay for recycling costs [13, 14]. Therefore, to promote the intention to pay, it is necessary to improve the effectiveness of communication through social media such as social networks, the internet, and television [16, 41]. Besides analyzing the factors affecting WTP, the binary regression method is also a fairly popular model to estimate the probability that an event will occur. Table 5 shows the classification of students willing to pay and unwilling to pay according to two criteria: actual observation and prediction. For the 90 surveyed cases of unwillingness to pay, it is predicted that 21 will actually not pay, with a correct prediction rate of 23.3%. For 313 cases willing to pay, 301 cases were predicted, with a correct prediction rate of 96.2%. Thus, out of a total of 403 students surveyed, up to 370 students have the potential to pay the cost of recycling.

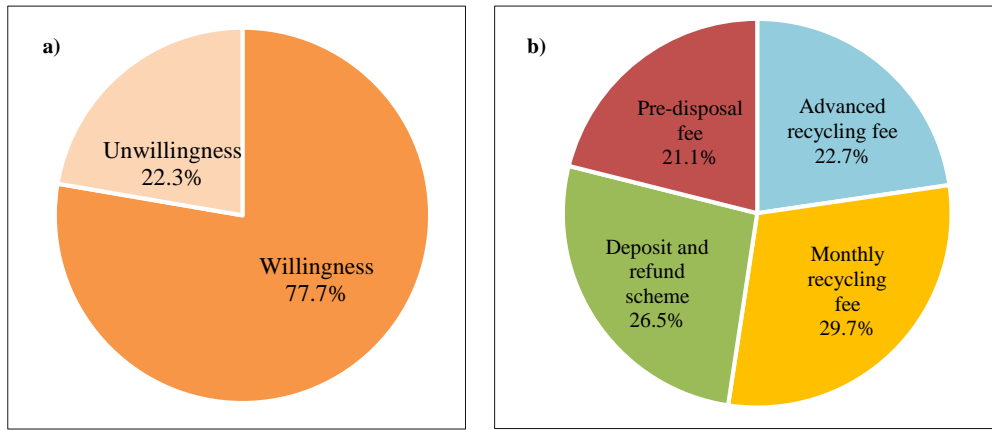


Figure 7. Willingness to pay the recycling fee: a) Rate and, b) Payment form

Table 5. Classification Table in regression analysis of WTP

		WTP		Percentage Correct	
		Unwillingness	Willingness		
Step 1	WTP	Unwillingness	21	69	23.3
		Willingness	12	301	96.2
	Overall Percentage				79.9

a. The cut value is 0.500.

4. Conclusion

This study has assessed the situation and factors affecting the willingness to hand over the equipment and the willingness to pay for recycling e-waste costs of students at Can Tho University. Although students are well aware of the concept of e-waste, they lack knowledge of legal policies, e-waste collection, and treatment programs. Most students determined that environmental considerations, recycling costs, recycling experience, information security, convenience, and satisfaction all have important and very important contributions to their recycling decisions. There is no significant difference in awareness and attitude towards e-waste recycling among student groups. The percentage of students willing to hand over and willing to pay the recycling cost was 83.7% and 77.7%, respectively. Regression analysis results show that WTH was mainly affected by attitude, while WTP was influenced by knowledge and willingness to participate. The reasons why students are still not willing to participate in formal recycling were identified as lack of information about the program, concerns about the privacy of personal information, desire for convenience, and financial rewards. Therefore, in order to promote students' WTH and WTP, it is necessary to implement solutions such as improving communication activities and disseminating information about the official e-waste collection and recycling program for students. At the same time, ensuring information security and convenience in collection. The results of this study are a useful basis for developing and implementing an e-waste collection program for students.

5. Declarations

5.1. Author Contributions

Conceptualization, N.T.G. and L.T.K.T.; methodology, N.T.G. and L.T.K.T.; software, N.T.G. and L.T.K.T.; validation, N.T.G. and L.T.K.T.; formal analysis, N.T.G. and L.T.K.T.; investigation, N.T.G. and L.T.K.T.; resources, N.T.G. and L.T.K.T.; writing—original draft preparation, L.T.K.T.; writing—review and editing, N.T.G.; visualization, N.T.G. and L.T.K.T.; supervision, N.T.G.; project administration, N.T.G. All authors have read and agreed to the published version of the manuscript.

5.2. Data Availability Statement

The data presented in this study are available in the article.

5.3. Funding

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5.4. Acknowledgements

None.

5.5. Conflicts of Interest

The authors declare no conflict of interest.

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Appendix I: Questionnaire

Items	Question	Responses				
Knowledge and awareness		Not aware [1]	Low [2]	Moderate [3]	High [4]	Very high [5]
K1	How aware are you of the concept of e-waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K2	Are you aware of e-waste recycling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K3	Are you aware of any collection schemes or recycling programs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K4	Are you aware of e-waste recycling method?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K5	Are you aware of any policies, rules, or regulations related to e-waste recycling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K6	Do you know what is the consumer's responsibility in e-waste recycling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
K7	Are you aware of environment impact caused by e-waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attitude		Not Important [1]	Less Important [2]	Average [3]	Important [4]	Very Important [5]
A1	Is environmental pollution important to you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A2	Is the cost of recycling important to you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A3	Did your past handling habits affect your intention to participate in formal recycling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A4	Does your satisfaction with the current state of e-waste treatment affect your intention to participate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A5	Does the convenience of a formal recycling program (distance, collection time, type of collection) affect your intention to participate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A6	Is information security important to you?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Behavioral intention						
WTH	Are you willing to hand over your electronic devices for collector?	<input type="checkbox"/> Very unwillingness <input type="checkbox"/> Distraction <input type="checkbox"/> Willingness <input type="checkbox"/> Unwillingness <input type="checkbox"/> Very willingness <input type="checkbox"/> Concerned about information security <input type="checkbox"/> Value of equipment (can be sold, donated or reserved)				
	The reason why you are not willing to hand over the equipment?	<input type="checkbox"/> Don't know about the program yet <input type="checkbox"/> Not enough confidence in the formal recycling <input type="checkbox"/> Other:				
	If you choose "Willingness" and "Very willingness" How would you like to participate?	<input type="checkbox"/> Pick up at home <input type="checkbox"/> Directly bring to the collection point <input type="checkbox"/> Both <input type="checkbox"/> Other:				
	Are you willing to pay for e-waste recycling?	<input type="checkbox"/> Unwillingness <input type="checkbox"/> Willingness				
	If you choose "Unwillingness"	<input type="checkbox"/> Don't want to pay any extra fees <input type="checkbox"/> No liability to pay				
	The reason why you are not willing to pay for e-waste recycling?	<input type="checkbox"/> Not enough faith in the program <input type="checkbox"/> Other:				
WTP	If you choose "Willingness"	<input type="checkbox"/> Advanced recycling fee <input type="checkbox"/> Monthly fee				
	Which payment method will you choose?	<input type="checkbox"/> Deposit and refund scheme <input type="checkbox"/> Pre-disposal fee				
Gender:		Major:		Course:		

Appendix II

Differences in Awareness, Attitudes, and Behavioral Intentions between Student Groups

Characteristic	K1	K2	K3	K4	K5	K6	K7	A1	A2	A3	A4	A5	A6	WTH	WTP
<i>Gender⁽¹⁾</i>															
<i>Sig.</i>	0.721	0.213	0.479	0.887	0.304	0.937	0.851	0.058	0.374	0.106	0.003	0.023	0.005	0.054	0.000
Male (n=203)	2.92	2.34	2.13	2.37	2.20	2.60	3.13	4.00	3.83	3.70	3.49	3.68	3.74	4.00	0.70
Female (n=200)	2.88	2.22	2.06	2.36	2.31	2.61	3.16	4.16	3.90	3.85	3.76	3.89	4.01	4.17	0.85
<i>Specialized sector is trained⁽¹⁾</i>															
<i>Sig.</i>	0.083	0.742	0.882	0.923	0.243	0.375	0.604	0.220	0.633	0.158	0.244	0.603	0.161	0.341	0.052
Environment and Natural Resources (n=160)	3.01	2.26	2.11	2.36	2.33	2.66	3.18	4.14	3.89	3.85	3.69	3.81	3.96	4.13	0.83
Other major (n=243)	2.83	2.30	2.09	2.37	2.21	2.56	3.12	4.04	3.85	3.72	3.58	3.77	3.82	4.05	0.74
<i>Number of years of training⁽²⁾</i>															
<i>Sig.</i>	0.144	0.261	0.613	0.255	0.952	0.215	0.328	0.865	0.969	0.296	0.098	0.371	0.002	0.889	0.014
Freshman (n=64)	2.59	2.08	2.11	2.39	2.36	2.73	2.92	4.06	3.86	3.83	3.55	3.70	4.00	4.08	0.88
Sophomore (n=104)	2.93	2.38	2.13	2.37	2.23	2.64	3.26	4.03	3.83	3.71	3.54	3.67	3.75	4.02	0.67
Junior (n=98)	2.88	2.19	2.01	2.17	2.22	2.50	3.08	4.16	3.89	3.84	3.82	3.91	4.02	4.14	0.79
Senior (n=126)	3.04	2.37	2.10	2.46	2.25	2.52	3.28	4.07	3.89	3.78	3.62	3.83	3.88	4.07	0.82
Graduated (n=11)	2.91	2.36	2.55	2.73	2.27	3.18	3.45	4.09	3.73	3.45	3.18	3.64	2.91	4.18	0.64

Note: ⁽¹⁾ Using Independent Sample T-Test; ⁽²⁾ Using One Way ANOVA.