

# team2020

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# Environmental Concern, Attitude and Willingness to Pay of Green Products: Case Study in Private Universities in Surabaya, Indonesia

**Abstract**—The purpose of this study is to determine the perceptions and awareness towards green products. This study uses a 7-point Likert scale from the sample and population of students from university in Surabaya. Distribution of questionnaires was carried out and obtained 257 respondents. This research model uses Partial Least Square (PLS) as part of Structural Equation Modeling (SEM). The results show positive influence between variables. There are also interesting findings from variance of the influence of gender towards some variables.

**Keywords**—Environmental Concern, Attitudes, Purchase Intention, Purchase Behavior, Willingness to Pay, Green Product.

## I. INTRODUCTION

As one of the largest country in population, Indonesian market consumption will impact global business growth. Following recent health pandemic that impact almost every corner of the world, Indonesian citizen consideration on green product will increase since it is related to healthier product. The pandemic is a global health crisis, but it is also showing us just how closely our economy and lifestyles are linked to the overall health of the planet [47]. This consideration will lead to what usually called as green product which minimizes and even eliminates harmful synthetic chemicals in a product.

Over time, people have realized the importance of protecting our environment. Individuals that were born between early 1980s to mid-1990s or early 2000s are generally known as the millennial generation or often called the generation Y. They are very diverse and tech-savvy. Previous research has stated that this group of individuals is most aware of the environment around them [61]. This concern on environmental issues leads to people's behavior on buying green products. In addition to environment concern, [6] found that a person's attitude towards a product can influence a person's buying decision for a brand, that also supported by other studies [11][3] [18].

Green Products or environmentally friendly products are products that are biodegradable and can be recycled. According to [35], a green product (Green Product) is a product / service produced or offered by producers that creates a sense of security for humans and the environment. Consumers usually buy non-environmental products based on consideration of short term needs-fulfilling. But usually long-term use of these products damage the environment without realizing it. [48] states that the concept of Green Product can last a long time because it is made from materials that are friendly to the environment and can be reused after recycling.

An example of a Green Product in everyday life is the Tupperware branded lunch box. Not only food boxes, Tupperware is also available for drinking bottles. Tupperware has the characteristic of being Eco Green Design. Tupperware lunch-boxes are environmentally friendly products because they are made of the best quality plastic, are hygienic, and do not contain chemicals that can harm the environment. Tupperware that has been damaged can be recycled into other products such as plant pots, trash cans, and plastic benches. Tupperware does have a higher price, but it can be used multiple times and can save us money for not buying disposable food containers.

Most companies in Indonesia have applied the green product concept to their products. These companies compete to produce environmentally friendly products to attract consumer buying interest. The company applies the concept of marketing products made from environmentally friendly materials known as green marketing. Mathur [44] states that consumers tend to respond better to companies with an environmentally conscious profile. Many positive responses have been received from consumers, but it is possible that there will be no negative responses. There are negative responses from consumers who do not want to buy green products because they are more expensive than ordinary products. Consumers and producers should pay more attention to the price of green products.

Green products are more expensive because they are made from natural materials, can be recycled for reuse, do not contain toxins or substances that are harmful to living things and the environment. Companies need to pay attention to aspects in Green Products such as companies must be able to introduce green products to consumers as products that are not harmful to the environment. Companies must explain that recycled materials can only be used to a certain extent but can minimize environmental damage [21]. From this aspect, consumers will see the importance of using green products even though they are relatively expensive. This study aims to determine how much influence these variables have on students' perceptions and awareness of using environmentally friendly products.

## II. LITERATURE REVIEW

### A. Theory of Planned Behavior

Human behavior is a complex concept and difficult to explain. The most useful and frequently used model is the Theory of Planned Behavior (TPB) model. TPB is an expanded

version of Theory of Reasoned Actions (TRA) [24]. TPB has been used in many studies to explain human behavior [20][50][46][19][59][11]. They also use TPB in the research to explain green consumer behavior. TPB describes behavioral intentions in terms of attitudes toward behavior, subjective norms, and behavior control. Ajzen [1] asserts that in some cases just one variable can have a significant impact on intention and behavior. This study uses one variable from the TPB model, namely attitude. This study also tries to expand the TPB model by adding two additional variables, namely environmental concern (EC) and willingness to pay (WTP).

### B. Attitude

Attitude is said to be an action that affects a person's response to all related objects [57] conditions [15]. Attitudes towards purchasing behavior for environmentally friendly products/services have been reported to be positively related to purchase intention for environmentally friendly products/services in research from various countries on various environmentally friendly products/services such as organic food products [69], green hotels [29], beverages [9] and tourism [7].

The researchers concluded that someone who has a positive attitude towards the surrounding environment tends to participate in buying and consuming environmentally friendly products/services [38][6][45][13]. Paul, Modi & Patel [50] and [65] show a positive relationship between attitudes towards environmentally friendly products/services and purchase intention of environmentally friendly products/services.

### C. Purchase Intention

Theory of Reasoned Actions (TRA) shows that individual attitudes generally affect a person's behavior, but are mediated by intention [42][41][34][2]. Someone who has a good character towards a brand triggers purchase intention, mediates positive intention by generating a purchase of a product/service and negative intention by reducing the possibility of purchase [53].

### D. Purchase behavior

The purchasing behavior of environmentally friendly products/services is considered as behavior that has social awareness of the environment and can provide benefits and satisfaction for green consumers [37]. Knowledge of the environment significantly influences attitudes towards green purchasing [27]. Furthermore, attitudes influence the intention to buy and then the intention influences one's buying behavior [58].

### E. Willingness to Pay

Environmentally friendly products generally have a higher price than ordinary products because of the high expenditure used in the production process [43]. Especially for young consumers who are limited by their purchasing power, price plays an important role in making purchasing decisions. Several international studies state that individuals who care about the environment are not too concerned about prices and

prices do not have a relevant influence on purchasing environmentally friendly products [26] [17].

### F. Environmental Concern

Environmental Concern refers to people's understanding of environmental problems and their willingness and participation to overcome them [32]. Public concern for the environment has led to the emergence of new types of consumers who show concern in their product choices [10]. International research studies also state that environmental problems cause consumers to gradually change their buying tendencies and reconsider the products they decide to buy [49].

Green products are products that have advantages that are beneficial to the environment [39]. Indeed, these products have been designed in such a way as not to pollute the earth, requiring less natural resources to be used as other products [36]. In other words, green products refer to a recycling strategy with recycled content, reducing packaging or using less toxic materials to reduce the impact on the environment [15].

### G. Gender Differences

Many studies have found differences in gender towards environmental friendly behavior [62][22][64]. Perryman, Fernando & Tripathy [51] argued that gender is an important personal characteristic that influences individuals' decisions and behaviors. There are some differences in results from various studies for example [67] conduct a literature review on gender differences in attitudes and behavior towards the environment and conclude that women show stronger pro-environmental attitudes and behavior than men. While [22] found that men participate higher in environmental behavior.

### H. Hypotheses Development

Chen and Tung [14] identified EC as an important variable influencing PI with its effect on attitudes, SN and PBC. Hartmann and Apaolaza-Ibáñez [30] reported that EC influences PI directly and indirectly through the development of positive attitudes towards green products. Prakash and Pathak [52] also show the significant impact of EC on PI on environmentally friendly packaging products. Based on the argument that EC is a component of attitude, [50] [52] show a direct relationship between EC and PI.

H1: Environmental Concern (EC) has a positive effect on Attitudes (ATT)

H2: Environmental Concern (EC) has a positive effect on Purchase Intention (PI) for environmentally friendly products

Zhang and Kim [68] suggest that in the process of determining consumer choices, attitudes toward behavior have a direct impact on behavioral intention. According to TPB, the general attitude of consumers towards certain products can also influence product purchase intentions [31] [56]. Attitude is usually considered as a factor that directly influences behavioral intention [28]. In fact, more and more consumers who care about the environment and think that they are

environmentally responsible, buy products that have less impact on the environment [66].

H3: Attitudes (ATT) have a positive effect on Purchase Intention (PI)

Some researchers agree that there is a causal relationship between attitudes and behaviors that are mediated by intention. After attitude influences intention, intention influences one's buying behavior [4] [8]. According to TPB, when someone behaves voluntarily it will produce an intention. Intention is thought to reflect motivation to perform certain types of behavior. Intention also increases a person's level of effort to perform behavior and the willingness to try [1]. Yadav and Pathak [65] find support for a positive relationship between behavioral intention and green buying behavior.

H4: Purchase Intention (PI) for environmentally friendly products/services has a positive effect on Purchase Behavior (PB) for environmentally friendly products / services

Yadav & Pathak [65] and Prakash & Pathak [52] state that consumers have a willingness to pay a premium price for environmentally friendly products. This study proposes to test the willingness to pay the premium as a mediator of the relationship between environmentally friendly PI and PB.

H5: Willingness to Pay moderates the relationship between Purchase Intention (PI) and Purchase Behavior (PB)

When specifically discuss about differences in Gender influence towards Environmental Concern, [63] found that men have more concern than women. This finding is said as opposite to most western context research on these variables. Shields & Zeng [57] also found similar result that compared to the women, Chinese men show greater concern about environmental problem and mentioned that this result is reversed compared to research conducted in the west.

H6: There are significant differences in Gender influence on Environmental Concern (EC)

Gender could lead to differences in someone's behavior on purchasing or consuming green products. Studies from [62][22] and [64] have found differences in gender towards environmental friendly behavior. While there is many western society context research have found female generally higher in green product purchase behavior, some research in eastern and Asian context result conversely. Mostafa [46] study in Egyptian context and [54] study in Malaysian context have found that male tend to purchase more on green product than female.

H7: There are significant differences in Gender influence on Purchase Behavior (PB)

### III. RESEARCH METHOD

The population and sample used in this study were students at 3 universities in Surabaya, Indonesia. The sample in this study used a purposive sampling method. The sampling technique in this study uses non-probability techniques. Non-

probability techniques are elements that do not have the same opportunity to be selected as sample subjects because there are several criteria that must be met [55].

The measurement scale used in this study is a Likert scale. Likert scale is a statement of agreeing or disagreeing with a certain subject, object, or condition. The Likert scale was first developed by Rensis Likert [33]. The details of the Likert scale in this study use a scale of 1-7.

Data analysis techniques involve reducing data so that it can be managed, developing conclusions, looking for structures, and applying statistical techniques [16]. Avoiding misinterpretation of data can be done in several stages, namely testing the validity, reliability, and hypothesis using PLS. The analysis will be carried out with the help of the WarpPLS version 5.0 software. Partial Least Square (PLS) is part of structural equation modeling (SEM). In general, PLS is used for small data samples. If the data sample is large, it is likely that the effect size value will be relatively weak, which is below 0.02 [40].

### IV. RESULT AND DISCUSSION

The data collection process was carried out through distributing questionnaires to students at universities in Surabaya. This study distributed 300 questionnaires to students. A total of 275 questionnaires were responded to and 257 were selected that met the criteria. The criteria are for active students who have bought environmentally friendly products/services.

#### A. Result

Respondents in this study were active students. Questionnaires were distributed in 3 private universities in Surabaya.

TABLE I. RESPONDENT DATA BASED ON GENDER

Gender	Frequency	Percentage (%)
Male	100	38.91%
Female	157	61.09%
Total	257	100%

It can be seen from table 1 that the majority of respondents based on gender are women with a percentage of 61.09%. Total female gender is 157 people, while male gender is 100 people with a percentage of 38.91% of the total

TABLE II. RESPONDENT DATA BASED ON SEMESTER

Semester	Frequency	Percentage (%)
Semester 1-2	46	17.90%
Semester 3-4	105	40.86%

Semester 5-6	43	16.73%
Semester 7-8	52	20.23%
Semester 9 & Above	11	4.28%
Total	257	100%

It can be seen from table 2 that the majority of respondents based on the semester are students in semesters 3-4, amounting to 105 people with a percentage of 40.86%. While students above semester 8 are a minority because there are 11 people with a percentage of 4.28%. Next semester 1-2 students total 46 people (17.90%), semester 5-6 students total 43 people (16.73%), semester 7-8 students total 52 people (20.23%).

TABLE III. MEAN AND STANDARD DEVIATION

Code	Indicators	Mean	Standard Deviation
EC1	I will really care about the environment	5.75	1.11
EC2	I will be willing to reduce the consumption of products / services that damage the environment to help protect the environment	5.63	1.13
EC3	Major social changes are needed to protect nature	6.21	1.03
EC4	Anti-pollution laws must be enforced more strongly	6.06	1.10
ATT1	I like the idea of buying products / services that are environmentally friendly (green product)	5.85	1.15
ATT2	Purchasing a green product / service is a good idea	6.07	1.07
ATT3	I have a good response to the purchase of environmentally friendly products / services (green product)	5.86	1.12
PI1	I will consider buying products / services that are environmentally friendly (green product) to prevent potential environmental pollution	5.54	1.13
PI2	I will consider switching to green products to support future conservation	5.57	1.16
PI3	I plan to use more environmentally friendly products / services (green products) than ordinary products	5.41	1.18
PI4	I plan to buy green products / services in the future because they have a positive contribution to the environment	5.60	1.12
PI5	I definitely want to buy green	5.01	1.41

	products / services in the near future		
PB1	I have been purchasing green products / services regularly	4.29	1.64
PB2	I have an environmentally friendly purchasing behavior (green product) for my daily needs products	4.39	1.56
PB3	I have had a green product buying behavior for the past 6 months	4.41	1.57
WTP1	I am willing to pay more to get green products / services	4.94	1.33
WTP2	I don't mind paying more for environmentally friendly products / services (green products) to support the organization's efforts to maintain sustainability	4.98	1.36
WTP3	I feel proud to have environmentally friendly products / services (green products) in my house even though they are more expensive than ordinary products	5.19	1.43

TABLE IV. OUTER LOADING AND CROSS LOADING

	EC	ATT	WTP	PI	PB	WTP*PI
EC1	(0.821)	0.067	0.101	-0.089	0.052	-0.011
EC2	(0.831)	-0.107	0.093	0.312	-0.074	0.043
EC3	(0.800)	0.161	-0.104	-0.222	0.010	-0.016
EC4	(0.866)	-0.110	-0.090	-0.010	0.013	-0.015
ATT1	-0.103	(0.918)	0.091	-0.111	0.022	0.007
ATT2	0.144	(0.926)	-0.070	0.112	-0.080	-0.051
ATT3	-0.042	(0.919)	-0.020	-0.002	0.059	0.044
WTP1	-0.052	0.000	(0.937)	-0.034	-0.034	0.002
WTP2	0.004	-0.008	(0.946)	0.012	-0.028	0.031
WTP3	0.051	0.009	(0.895)	0.022	0.066	-0.035
PI1	-0.044	0.087	-0.119	(0.821)	-0.074	0.075
PI2	-0.168	0.168	-0.136	(0.860)	-0.137	0.082
PI3	0.023	0.015	0.000	(0.911)	-0.019	-0.036
PI4	0.129	-0.079	0.069	(0.880)	-0.198	-0.078
PI5	0.059	-0.203	0.196	(0.787)	0.471	-0.040
PB1	0.038	-0.029	0.022	-0.040	(0.936)	0.007
PB2	-0.005	-0.045	0.086	-0.012	(0.945)	-0.014
PB3	-0.034	0.077	-0.113	0.053	(0.908)	0.007
WTP1*PI1	0.051	0.072	0.214	-0.337	0.135	(0.879)
WTP1*PI2	0.360	-0.172	0.236	-0.435	0.147	(0.739)
WTP1*PI3	0.065	-0.155	0.071	-0.035	0.018	(0.919)
WTP1*PI4	-0.130	-0.015	0.058	0.023	-0.029	(0.927)
WTP1*PI5	0.016	0.082	-0.459	0.523	-0.192	(0.776)
WTP2*PI1	-0.100	0.130	0.285	-0.257	0.044	(0.876)
WTP2*PI2	0.294	-0.173	0.297	-0.449	0.135	(0.806)
WTP2*PI3	0.016	-0.145	0.100	0.000	-0.015	(0.921)
WTP2*PI4	-0.198	0.010	0.073	0.037	-0.024	(0.904)
WTP2*PI5	-0.047	0.089	-0.457	0.586	-0.212	(0.767)
WTP3*PI1	-0.112	0.165	0.024	-0.128	0.169	(0.847)
WTP3*PI2	0.170	-0.018	0.096	-0.236	0.101	(0.819)
WTP3*PI3	-0.056	-0.033	-0.046	0.139	-0.090	(0.906)
WTP3*PI4	-0.272	0.094	-0.030	0.124	-0.072	(0.891)
WTP3*PI5	0.000	0.103	-0.630	0.576	-0.149	(0.756)

Based on the outer loading and cross loading tables above, it can be concluded that each indicator in a latent variable has a difference with indicators in other variables which are indicated by their higher loading points in their own construct. Thus, the model has good discriminant validity.

TABLE V. COMPOSITE RELIABILITY

	Composite Reliability	Cronbach's Alpha	Value limits	Remarks
EC	0.898	0.849	> 0.7	Reliable
ATT	0.944	0.911	> 0.7	Reliable
WTP	0.948	0.917	> 0.7	Reliable
PI	0.930	0.905	> 0.7	Reliable
PB	0.950	0.921	> 0.7	Reliable
WTP*PI	0.977	0.974	> 0.7	Reliable

Based on tables 5 and 6 above, the two tables show that all the numbers have met the rule of thumb. All values of composite reliability and Cronbach's alpha have been above 0.7, which indicates that this research model is reliable, which means that the results can be trusted.

B. Hypotheses Testing

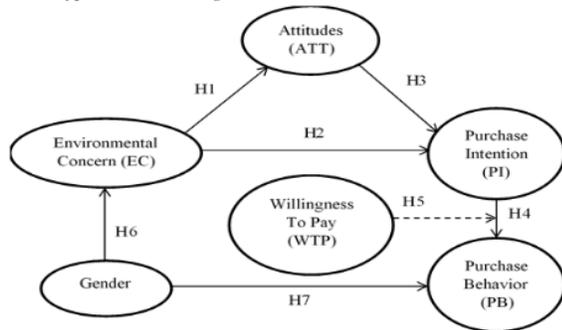


Fig. 1. Research Model Hypotheses

TABLE VI. KOLMOGOROV-SMIRNOV TEST ON ENVIRONMENTAL CONCERN

	EC1	EC2	EC3	EC4
N	257	257	257	257

Normal Parameters <sup>a,b</sup>	Mean	5.7471	5.6265	6.2140	6.0623
	Std. Deviation	1.10849	1.12871	1.02932	1.10221
Most Extreme Differences	Absolute	.205	.217	.279	.254
	Positive	.135	.125	.223	.197
	Negative	-.205	-.217	-.279	-.254
Kolmogorov-Smirnov Z		3.287	3.482	4.479	4.071
Asymp. Sig. (2-tailed)		0.000	0.000	0.000	0.000

TABLE VII. KOLMOGOROV-SMIRNOV TEST ON PURCHASE BEHAVIOR

		PB1	PB2	PB3
N		257	257	257
Normal Parameters <sup>a,b</sup>	Mean	4.2879	4.3852	4.4125
	Std. Deviation	1.64256	1.55732	1.56909
Most Extreme Differences	Absolute	.139	.136	.159
	Positive	.130	.115	.097
	Negative	-.139	-.136	-.159
Kolmogorov-Smirnov Z		2.222	2.180	2.549
Asymp. Sig. (2-tailed)		.000	.000	.000

The results of the asymp.sig from Kolmogorov-Smirnov show the number 0.000 (<0.05), which means that the data is not normally distributed so that the difference test must be done using a non-parametric method.

TABLE VIII. MANN-WHITNEY U TEST ON ENVIRONMENT CONCERN

	EC1	EC2	EC3	EC4
Mann-Whitney U	6552.000	7358.500	7445.000	7800.500
Wilcoxon W	18955.000	19761.500	19848.000	20203.500
Z	-2.327	-.879	-.759	-.091
Asymp. Sig. (2-tailed)	.020	.380	.448	.928

TABLE IX. MANN-WHITNEY U TEST ON PURCHASE BEHAVIOR

	PB1	PB2	PB3
Mann-Whitney U	6962.500	6752.500	7422.000
Wilcoxon W	19365.500	19155.500	19825.000
Z	-1.554	-1.923	-.752
Asymp. Sig. (2-tailed)	.120	.054	.452

The Z probability values from the Mann-Whitney U show the numbers 0.020, 0.380, 0.448 and 0.928 for components EC1 through EC4 and 0.120, 0.054, and 0.452 for components PB1 to PB3. Significant values were obtained for the EC1 (0.020 <0.1) and PB2 (0.054 <0.1) variables. EC2 to EC4, PB1

and PB3 are not significant because the probability number is more than 0.1.

TABLE X. MEAN RANK ON EC1 AND PB2

Gender		N	Mean Rank	Sum of Ranks
Environmental Concern1	Female	157	120.73	18955.00
	Male	100	141.98	14198.00
	Total	257		
Purchased Behaviour2	Female	157	122.01	19155.50
	Male	100	139.98	13997.50
	Total	257		

The mean rank indicates that males have a higher perception of EC1 with 141.98 than females with 120.73. This result shows that male is more concerned with the environment than female. From the EC1 indicator statement we can indicate that male is more caring for environmental issues than female. Meanwhile, the mean rank PB2 also shows that male is higher than female with 139.98 and 122.01 respectively. This result shows that male has a higher buying behavior towards daily green products than female.

TABLE XI. INNER MODEL

	Direct Effect	Indirect Effect	Total Effect
EC-ATT	0.763 P < 0.001		0.763 P < 0.001
EC-PI	0.400 P < 0.001	EC → ATT → PI 0.300 P < 0.001	0.700 P < 0.001
ATT-PI	0.393 P < 0.001		0.393 P < 0.001
PI-PB	0.599 P < 0.001		0.599 P < 0.001
WTP*PI-PB	0.141 P = 0.011		0.141 P = 0.011

The direct effect relationship between the EC variable on ATT results a number of 0.763 and has a probability number of <0.001. These results indicate that the EC variable has a significant positive effect on ATT.

The results of the direct effect between the EC variable on the PI produce a number of 0.400 and have a probability value of <0.001. This indicates that the EC variable has a significant positive effect on the PI variable. Between the EC variable on the PI there is an indirect effect relationship between the EC variable on the PI through the ATT variable. The result of the indirect effect relationship between the EC variable on ATT on the PI is 0.300 and has a probability number of <0.001. This shows that the EC variable has a significant positive effect on PI through the ATT variable.

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The direct effect relationship between the ATT variable and the PI variable results in a number of 0.393 and has a probability value <0.001. This indicates that the ATT variable has a significant positive effect on the PI variable. The results explain that students have attitudes that will result in the desire to buy and use environmentally friendly products / services.

The direct effect on the PI variable on PB variable is 0.599 and has a probability value of <0.001. These results indicate that the PI variable has a significant positive effect on the PB variable. These results indicate that students will spend more money to buy environmentally friendly products / services.

The direct effect result on the WTP variable on the PI and PB variables is 0.141 and has a probability number equal to 0.011. This explains that the WTP variable has a significant positive effect on the PI variable and PB variable. These results indicate that students will spend more money to buy environmentally friendly products / services even though they are not used for their daily needs.

### C. Discussion

In this study, students at three universities in Surabaya have knowledge of their current environment. They know and realize that they have to protect the environment by using environmentally friendly products/services. It can be proven from table 3 that the EC variable has an average of 5.91 for each indicator. It can be said that students have knowledge about environmentally friendly products/services because they agree to make changes to themselves in order to protect the surrounding environment. They hope everyone will also make changes in order to save the environment.

Students agree on an understanding of purchasing eco-friendly products/services is a good idea. They respond well to the purchase of environmentally friendly products/services. Students already have a positive attitude towards environmentally friendly products/services. Because they like the idea of purchasing environmental products/services.

With knowledge about environmentally friendly products/services and self-awareness of the environment, students have the desire to purchase environmentally friendly products/services. The students have the intention to buy environmentally friendly products/services because they want to contribute directly to prevent environmental pollution. A positive attitude can generate positive intentions as well to support the preservation of nature by using environmentally friendly materials.

The desire to buy environmentally friendly products/services produces a buying behavior. Students gave positive responses to each PB indicator. They have the intention to buy environmentally friendly products/services for their daily needs. Gradually, students want to switch to using environmentally friendly products/services from ordinary products even though they are not regularly used.

Even though the price of environmentally friendly products/services is more expensive than ordinary products, students still want to spend money to pay this price. They feel proud of themselves for using environmentally friendly

products/services because they can support the efforts of eco-friendly organizations that maintain ecological balance.

The knowledge of students about the importance of protecting the environment results in a positive attitude towards them. Students feel happy and proud to use environmentally friendly products/services. This proves if H1 is accepted. Environmental concern also generates an intention or desire to buy environmentally friendly products/services, either directly or indirectly. The results of this study support the research conducted by [30]. They found that the EC variable had a positive effect on PI either directly or indirectly. There is an indirect effect relationship between the EC variable on the PI through the influence of ATT of 0.300. This value is included in the reliable category and indicates that H2 is accepted. But the results of the direct effect relationship in this study are not in accordance with the research conducted by [12]. In their research, the EC variable did not have a significant positive effect on PI.

Attitude has an important role in behavior. Students who care about the environment will certainly have a positive attitude towards using environmentally friendly products/services. From that attitude it will produce intention. The results of this study are consistent with research conducted by [68]. They provide advice in the consumer decision-making process, attitudes have a direct impact on intention. The explanation shows that H3 is accepted.

This study is an attempt to test the application of TPB in predicting PI and PB in university students. This research produces research findings that are in accordance with previous research [12] which conducted PI and PB research from Indian millennials who were educated on environmentally friendly products/services using the TPB model. In this study using the PLS-SEM model which produces a direct effect relationship on the PI variable to PB of 0.599. These results explain that the PI variable has a positive influence on the PB variable.

Attitude-driven intention produces a behavior for action. Intention is seen as motivation to perform certain types of behavior. Students who have the intention to buy environmentally friendly products/services will certainly have the buying behavior. This is in line with research conducted by [65]. They found positive support for the relationship between intention and behavior. This explanation indicates that H4 is accepted.

Environmentally friendly products/services have a higher price than ordinary products. But students have a willingness to pay more or pay a premium price for these environmentally friendly products/services. This is in accordance with research conducted by [12]. They propose to test WTP as a moderator on the relationship between PI and PB. The test was carried out because they thought that the relationship between PI and PB would be stronger if consumers had the willingness to pay a premium price for environmentally friendly products/services.

This study shows that male is more concerned with the environment than female. The Environmental Concern indicator states that male shows more caring commitment for environmental issues than female. This result is contrast to western context research as concluded by [63] which generally

find that female shows more concern on environment. At the other hand, this result is consistent with eastern or Asian context research such as [46] and [63] which find that male shows more concern in environmental issues. Male not only shows more concern in environmental issues but also implement it in the daily life product usage. This study shows that male has a higher buying behavior towards daily green products than female. This result support study from [46] in Egyptian context and [54] in Malaysian context which found that male tend to purchase more on green product than female.

Both results in environment concern and green purchase behavior are in contrast with general result in western research. The possible explanation can be due to men usually has higher level of environmental knowledge and this clearly associated with higher level of environment concern as mention in the study from [63]. Men also has more opportunities to contribute in pro-environmental behavior as green product is now more diverse. This study is conducted on late millennial generations (90s born), and daily green products for men can be from food and beverages such as coffee cup, personal care such as soap, until sustainable fashion. Study from [70] and [63] which find female shows higher green purchase behavior was conducted on general public citizen that mostly included married women. It was argued that women's greater share of domestic duties inside of the home results in women were expected to more often participate in environmental behavior. This is different with this study that take the population in late millennial generation. This means that both millennial men and women have responsibility for their own life, and with diverse green products nowadays, and arguably higher environmental knowledge and concern, men will behave more pro-environmentally than women.

## V. CONCLUSION, LIMITATION, AND IMPLICATION

This research was made to study the perceptions and awareness of university students towards environmentally friendly products/services. The sample in this study were three universities in Surabaya, Indonesia. The results of this study indicate that hypothesis 1 is accepted because EC is proven to have a positive influence on ATT, hypothesis 2 is accepted because EC is proven to have a positive effect on PI, hypothesis 3 is accepted because ATT is proven to have a positive effect on PI, hypothesis 4 is accepted because PI is proven to have an effect on PB, hypothesis 5 is accepted because WTP is proven to have a positive effect on PI and PB, hypothesis 6 is accepted because Gender is proven to have a significant different impact on EC and hypothesis 7 is accepted because Gender is proven to have a significant different impact on PB.

In environmental concern variable, indicator with highest loading factor states that anti-pollution laws must be enforced more strongly. This means that law has highest significant impact to drive pro-environmental purchase intention and at the end purchase behavior. But in contrast, the pro-environmental law at the university and in Indonesia is weak. For example, when littering or smoking in the university is not given clear sanctions, it only gets a warning. Another example regarding trash disposal, some people still burn their trash and don't get

any sanction. Therefore, suggestions for the government and universities should further strengthen environmental laws.

The highest loading factor indicator of Attitude states that students respond to the purchase of environmentally friendly products/services is a good idea. The government can see that students already understand environmentally friendly products/services and have a good attitude towards environmentally friendly products/services.

The results of the loading factor for the variable PI, the highest in the PI3 indicator, namely (0.911), while the highest mean result is the PI4 indicator which explains that students have the desire to use environmentally friendly products/services in the future.

The highest mean value of PB variable is found in PB3 indicator of 4.41 which is considerably low for 7-point Likert scale. PB3 states that students have purchased environmentally friendly products/services in the last 6 months. This shows that that students do not necessarily apply direct practice of environmentally friendly purchase behavior. Students' intention is only an intention but does not encourage themselves to make purchases and use environmentally friendly products/services.

From the attitude, purchase intention, and purchase behavior discussion above we can conclude that this shows the need for a strong law to encourage consumers' desire to buy and use environmentally friendly products/services. Because if there is no strong law, a caring attitude towards the environment and the intention will not convert to the behavior to use environmentally friendly products. An upright law or intentional systemic movement is needed so that attitudes and intention that are formed due to environmental awareness and concern are not merely desire. Therefore, suggestions for the government and universities should be more enforced because if there is a law people are afraid to violate it because there will be sanctions received. For example, students are encouraged not to use plastic but to carry environmentally friendly bags that were initially distributed and are now being sold.

The highest mean value is found in the WTP3 indicator, namely 5.19, which is considerably low for 7-point Likert scale, states that students feel proud to have environmentally friendly products/services. This explains that students only feel proud of using environmentally friendly products/services but still object to paying more for environmentally friendly products/services.

Findings from this study regarding gender influence on environmental concern and purchase behavior can be useful for marketers and policy makers to think about effective strategies in order to encourage men and women to engage in pro-environmental behavior. The result shows that in millennial context, men has more concern and higher rate in pro-environmental purchasing behavior. Therefore, manufacturers, marketers and policy makers may think about strategies to produce and promote pro-environmental products for both male and female segments. This give a hint that pro-environmental products should not only designed, campaigned, and promoted their products for female and following western context research, but in Indonesian millennials context men can also be a good or even a better segment.

Combined with the strong purchase intention and attitude towards pro-environmental products, manufacturers and marketers can come up with strategy to bridge this desire into behavior. Literature review study of 14 years green purchase behavior research from [71] conclude that there are two groups as factor that influence green purchase behavior which are individual factor and situational factor. Individual factors include environmental knowledge and concern, personal value and attitude, while situational factors include product price, availability, social norm, brand image and product quality or attribute. From our study, millennials already have the strong individual factor. Manufacturers and marketers can work on situational factors that most fit to millennials' context and individual factor so that it will result in purchase behavior.

The limitation in this study is the ability of the EC variable to affect ATT is 58%. There are still 42% other variables besides EC that can increase ATT. The ability of EC and ATT variables to affect PI was 55%. There are still 45% other variables besides EC and ATT that can influence PI. The ability of the PI variable to affect PB with WTP moderation was 34%. There are still 66% other variables that can influence PB. With the limitation of these results, the next study can consider adding other variables that have a relationship with the ATT, PI and PB variables.

The results of this study are limited to students from 3 private universities in Surabaya, Indonesia. Because this study analyzes students' perceptions, when the research objects are different, the results obtained from the same model can also be different. In addition, the development of the use of environmentally friendly products/services is also moving, dynamic in nature. So that further research can test the same model in different time frames.

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