The Influence Of Green Transportation And Gen Z Consumer Behavior On The Selection Of Biskita Trans Pakuan Transportation Mode

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Abstract - Concern over sustainable transportation is growing as the demand for environmentally friendly alternatives increases. This study examines the impact of green transportation and Gen Z consumer behaviour as independent variables on the choice of transportation mode. The findings correspond with other studies, emphasizing the importance of green transportation and consumer behaviour in affecting the mode of transportation chosen. The purpose is to examine the direct correlation between green transport and the behaviour of Gen Z consumers, considering them as independent variables that impact the choice of transportation mode as the dependent variable. The sample comprised participants who had utilised Biskita transport on at least one occasion. They were residents of Bogor city, born between 1996 and 2010. The study aimed to investigate the influence of green transportation and Gen Z consumer behaviour on mode choice. Path analysis was conducted in order to understand the direct effects of relationship between variables. Data analysis was carried out using Smart PLS software. This study is constrained by the limited amount of available data and a small sample size of participants. The results is green transportation and gen z consumer behaviour have a significant direct influence on transport mode choice. Green transportation is critical in providing information that increases consumer awareness of environmental issues and enables consumer behaviour to better respond to external pressures and encourages consideration of environmental issues when making decisions on the mode of transport used and implementing actions that increase the likelihood of achieving optimal mode choice.

Keywords: Path Analysis; Green Transportation; Gen Z Consumer Behaviour; Transportation Mode Choice

INTRODUCTION

The transport sector is a crucial means of contributing to the success of development, particularly in supporting the economic activities of the community. Adequate transportation can increase efficiency in resource allocation, increase accessibility, support economic activities and can optimise time (Maryanta, 2005).

Along with the development of the level of competition for transport modes, aside from having a good impact on the economic sector by facilitating the mobilisation of economic activities and opening up new jobs, on the other hand, this development has a negative impact on the environment because the increasing number of transport modes has the potential to increase air pollution in an area, the level of congestion on the highway, and the threat of supply of transport modes that exceed the capacity of consumer demand. Increased air pollution can negatively affect public health, including economic stakeholders within the market.

Diminished public health can be an obstacle to economic growth and mobility in Indonesia. Health is a crucial component of human capital, driving economic development and growth. However, improving health is a prerequisite for increasing economic productivity

(Aurelya, 2022). The critical challenge that must be addressed without delay is to achieve 'radical emissions reductions' in all sectors of the economy and in all aspects of society. The climate crisis that demands the transformation of our lives and societies (Higham, 2013), Furthermore, the promotion of public transit systems and the encouragement of active transportation modes like bus, cycling and walking contribute to the reduction of carbon emissions by decreasing the reliance on individual car usage. By providing efficient and sustainable alternatives to private vehicle travel, green transportation initiatives help alleviate traffic congestion and air pollution, leading to improved air quality and reduced greenhouse gas emissions.

Consumer behaviour in the selection of transport modes is influenced by a variety of psychological factors. These factors play a crucial role in determining why individuals choose certain transport modes over others. Understanding the psychological aspects of consumer behaviour can provide valuable insights for promoting the adoption of more sustainable and environmentally friendly transport options (Higham, et al. 2013).

One of the strategies is to reduce the use of private cars and increase the use of public transport through Transport Demand Management (TDM), and to increase the efficiency of fossil fuel use through improved public transport systems (BRT and transit systems). The two strategies are interlinked, as improvements to the public transport system as a form of providing alternative modes is part of the implementation of TDM (Ferguson et al., 2000). The implementation of the BRT system as a form of public transport improvement in Bogor City is the development of a green infrastructure-based transport sector, which refers to the concept of green transport that emphasises sustainable transport as an effort to minimise the negative impact of the development of the transport sector at present and in the future. The implementation of the BRT system in Bogor City was first carried out through the operation of Trans Pakuan in 2007 (Palupiningtyas, 2015).

Biskita Trans Pakuan is a public transport that each bus is the result of the conversion of three urban transport cars that are no longer suitable for operation, this bus was launched by the Bogor City Government based on Bus Rapid Transit and carries a cashless payment system in the form of an electronic card. Biskita started its trial operation by using fuel made from waste cooking oil and offering free fares for a certain period. The public's enthusiasm unconsciously influenced their behaviour in choosing a mode of transport. As can be seen in the table below, the number of biskita load factors has increased significantly in the period January to May 2022, which is in line with the implementation of free fares.

Table 1
Load Factor of Trans Pakuan Biskita Users Period January to May 2022

No.	Description	Load Factors
1	January	43,8%
2	February	47,37%
3	March	60,78 %
4	April	61,33%
5	May	77,19%

Source: BPTJ, 2022

The significant increase in May 2022 is certainly consistent with a return to pre-pandemic levels of community activity and mobility. The phenomenon in this study is whether BISKITA users choose transport modes because of the concept of green transport and whether there are changes in consumer behaviour when paid tariffs are implemented.

Research objectives

The purpose of this study is to test and find out if there is a significant influence between the independent variable model, which is green transportation and Gen Z consumer behaviour, on the dependent variable, the selection of transportation mode.

Literature Review

Green Transportation

According to Bjorklund (2011), green transport is defined as a service that has less or reduced negative impacts on human health and the natural environment compared to competing transport services serving the same destination. There are five consumer indicators in the choice of transport based on green transport (Anwar, et al, 2022) which are:

1. Affordability; public transport provides an economical means of travel at affordable prices (Donald, et al., 2014).

2. Regulatory environment; a set of regulatory policies, initiatives and measurable actions taken by governments or agencies to plan, develop and improve the use of public resources (Sajjad, Chu et al., 2020).

3. Green Self-Identity; a measure of the extent to which individuals describe themselves as people who care about the environment and are internally motivated to take environmentally friendly actions, such as switching to public transport (Trivedi et al., 2015).

4. Hygiene Concerns; actions taken by public transport providers to ensure the health of their users. For example, cleaning and spraying disinfectants on vehicles and setting rules for the use of masks on public transport.

5. Uncertainty of choice; the act of making choices from many options that are uncertain and tend to change in certain situations.

Gen Z Consumer Behaviour

According to the American Marketing Association (Kotler, 2000) (in Setiadi, 2003), consumer behaviour is defined as follows:

"Consumer behaviour is the dynamic interaction between emotion and cognition, behaviour and the environment in which people engage in exchange activities in their lives...".

The Generation Z according to McKinsey (2023) is made up of people born between 1996 and 2010. This generation's identity has been shaped by the digital age, climate anxiety, a changing financial landscape and Covid-19. Generation Z came of age in the midst of climate change and economic collapse.

There are three indicators of consumer behaviour according to Kotler (2018). The indicators of consumer behaviour are as follows:

1. Cognitive component ; the consumer's beliefs and perceptions about objects. The object in question is an attribute of the product, the more positive the belief in a brand or product, the entire cognitive component will support the overall attitude by emphasising that cognitive as a belief in the will formed by knowledge, because it will go through the process of knowing its characteristics and benefits that affect consumer confidence.

2. Affective component; a form of emotion that reflects a person's feelings towards an object, whether the object is desirable, preferred or undesirable, disliked. Affective describes a person's motivation from an emotional and physiological perspective.

3. Conative component; conative reflects the actual behaviour and tendency of a person towards an object, where this component shows an action in the form of a desire to behave.

Transportation mode selection

Mode choice means that all consumer actions and behaviours are based on the desires generated when consumers consciously choose one of the available modes of transport, in this case the chosen mode of transport is the result of considering the shortest, fastest and cheapest route, or it may be a combination of the three (Tamin, 2000).

Based on Sangadji and Sopiah (2013), there are three main factors that influence consumers to make decisions, which are:

1. Psychological factors; Psychological factors include perception, motivation, learning, attitude and personality. Attitudes and beliefs are psychological factors that influence consumer purchase decisions.

2. Influence of situational factors; This factor includes the state of facilities and infrastructure of the place, the time of purchase of a product/service, the use of the product and the conditions at the time of purchase.

3. Influence of social factors; Social factors include laws or regulations, family, peer groups, social class and culture.

The indicators that need to be determined in assessing the performance of public transport services in terms of passengers, according to Abubakar (1997) in Putra (2020), include:

1. Length of route and operating time, is the number of ranks of each public transport route, which is not the same influenced by the length of the route and the operating time of transport.
2. Headway and waiting time, good public transport is a fairly high headway during peak hours and off-peak hours, and short waiting times according to the hours of provision.
3. Travel time and speed, the speed of public transport is important especially for community mobilisation especially during peak hours, short travel time is also an additional value for consumers to consider.
4. Load factor, a calculation determined by the capacity and number of passengers available.
5. Temporary stops, which are temporary stops either for transit or to continue by other public transport.

METHOD

This study uses quantitative methodology, which means using numerical data that is analysed using statistical tools to draw conclusions related to the research question (Sugiyono, 2018: 13). The research focuses on Generation Z consumers, which consists of individuals born between 1996 and 2010 who use Biskita Trans Pakuan public transportation and live in Bogor City, although the exact size of the population remains unknown. A purposive sampling technique using a non-probability approach was used to select the sample for this study. The inclusion criteria were as follows: Participants born between 1996 and 2010, users of Biskita Trans Pakuan transport services, and residents of Bogor City. In calculating the sample size in SEM-PLS, it is recommended to use a sample size 5 to 10 times the indicator number with 5% alpha significance level (Abdillah and Hartono, 2021:18). In this study, there were 13 indicators and in order to obtain the findings compatible with the above criterion, the sample size in this study was 91 respondents. A structural equation model (SEM) approach based on partial least squares (PLS) was used in this study to test the hypotheses. According to Lahmoller (1989) as cited in Haryono (2016: 381), the parameters in PLS consist of three stages: (1) generating latent variable scores from weight estimates, (2) determining the path coefficients linking the latent variables and estimating the loading factors (measurement model coefficients) linking the latent variables to their corresponding indicators, and (3) estimating the location parameters.

Table 2: General Guidelines Evaluation of Measurement and Structural Models

No.	Criteria	Parameters	Rule of thumbs
1	Convergent validity	Loading Factor	>0.70
		Average Variance Extracted (AVE)	>0.50
2	Discriminant Validity	Cross Loading	>0.70
3	Reliability	Cronbach's Alpha	>0.70
		Composite Reliability	>0.70
4	R-Square	Strong	>0.75
		Moderate	>0.50
		Weak	>0.25
5	Significance (two-tailed)	P-value significant level 5% (0.05)	>1.96

Source: Ghozali (2021: 67-71)

RESULTS AND DISCUSSION

In this study, the data of the participants were categorised according to gender, age, occupation and the most frequently used routes.

Table 3: Characteristics of Respondents

No.	Criteria	Characteristics	Frequency	Percentage
1	Gender	Female	64	70,3%
		Male	27	29,7%
2	Age	13-17 y.o	27	6,6%
		18-22 y.o	58	63,7%
		23-27 y.o	6	29,7%
3	Occupation	School students	6	6,6%
		University student	33	36,3%
		Employee	36	39,6%
		Unemployed	7	7,7%
		Others	9	9,8%
4	Frequently used corridors routes	K1 (Cidangiang - Terminal Bubulak)	10	11%
		K2 (Ciawi - Terminal Bubulak)	62	68,1%
		K5 - (Terminal Ciparigi)	14	15,4%
		K6 - (Terminal Parung Banteng- Air Mancur Bogor)	5	5,5%

The survey shows female participants made up 70.3 per cent of the respondents compared to male participants. This is most likely because women use public transportation more frequently than men for mobility. Moreover, when selecting a mode of transport, females are considered to be more selective, taking into account several factors before deciding to use a particular mode of transport.

In addition, respondents between the ages of 18 and 22 represented a majority of 63.7 per cent compared to other age groups. The reason for the higher usage of Biskita as a mode of transport for mobility choices among 18-22 year-olds is due to the fact that this age group represents Generation Z, the target market for public transport, which is always following the

evolution of the needs of the community. In terms of occupation, respondents who work dominate (39. 66%), followed by respondents who are students (36. 3%). This is because respondents who work and those who are students tend to use Biskita more often as a mode of transport for their mobility choices. The Biskita corridor K2 (Ciawi - Bubulak Terminal) is the most frequently used route with 68.1% compared to other corridors. This was explained by the fact that the K2 route (Ciawi-Terminal Bubulak) is longer, has a wider number of transits and crosses strategic public service areas.

Evaluation of the Measurement Model (Outer Model)

The outer model is utilised for evaluating the relationship between latent variables and their indicators with the aim of assessing validity and reliability, as stated by Ghozali (2021:67).

Validity Test

Construct validity can be determined by the Loading Factor (LF) value, which is generally considered valid if the indicator LF value is ≥ 0.7. However, when developing new models or indicators, an LF value between 0.5-0.6 is also considered acceptable. Outer models fitted with reflective indicators are evaluated using the convergent validity of indicators that form latent constructs, as well as composite reliability and Cronbach's alpha for each block of indicators. This research includes 13 (thirteen) constructs with 37 (thirty-seven) statement indicators. The results of the outer loading can be observed in the figure below.

Figure 1: Outer Loading
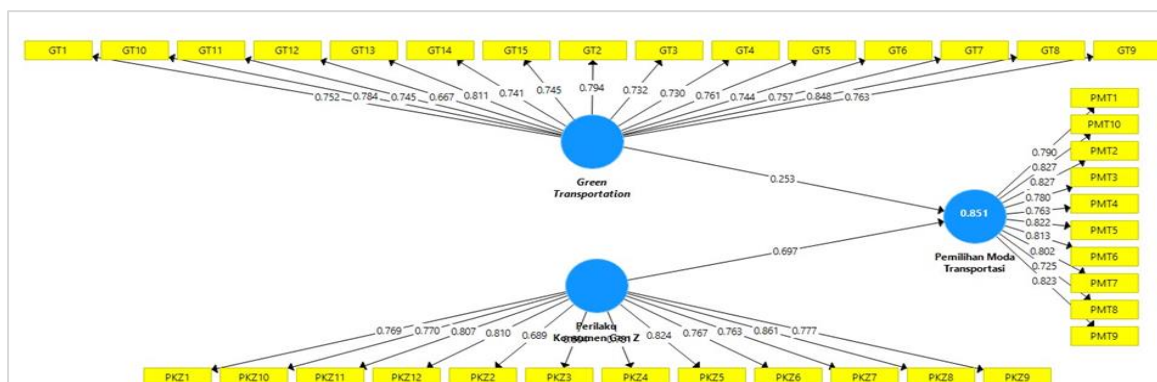
Based on the figure 1, it can be seen that each statement indicator for each variable has a value for the loading factor that is in line with the accepted measurements. Therefore, each statement indicator used in each variable can be considered valid.

Reliability Test

Reliability testing is conducted to determine the accuracy, consistency and stability of the instrument in its measurement structure.

Table 4: The result of reliability test

No.	Variable	Composite Reliability	Cronbach's Alpha	Description
1	Green Transportation	0.953	0.947	Reliable
2	Gen Z Consumer Behaviour	0.951	0.944	Reliable
3	Transport Mode Selection	0.946	0.936	Reliable

Based on the data collected, the Cronbach's alpha and composite reliability values exceed 0.7. Therefore, it can be concluded that all variables examined in this research are reliable.

Evaluation of Structural Model (Inner Model)

Structural model (inner model) is a model used to estimate the cause-and-effect relationship between latent variables.

R-Square Test

The R-Squared value explains the significant effect of certain independent latent variables on the dependent latent variable. A higher R-Squared value means that the prediction model and the proposed research model are better.

Table 5: R-Square Test Results

No.	Variable	R-Square	R-Square Adjusted	Description
1	Transport Mode Selection	0.854	0.851	Strong

The study shows an adjusted R-squared value of 0.851 or 85.1 per cent, indicating that the selection of transport mode is significantly influenced by green transport and Gen Z consumer behaviour. This indicates that green transport and Gen Z consumer behaviour can explain the strong influence on transport mode selection, while the remaining 14.9 per cent can be explained by the influence of other factors that were not examined in this study.

Hypothesis Test

Hypothesis testing was conducted using the bootstrapping method. The model was evaluated by examining the significance between variables. In this study, a significance level of 0.05 (5%) and a t-statistic > 1.96 were applied. The figure below displays the results of hypothesis testing.

Figure 2: Results of Hypothesis Test
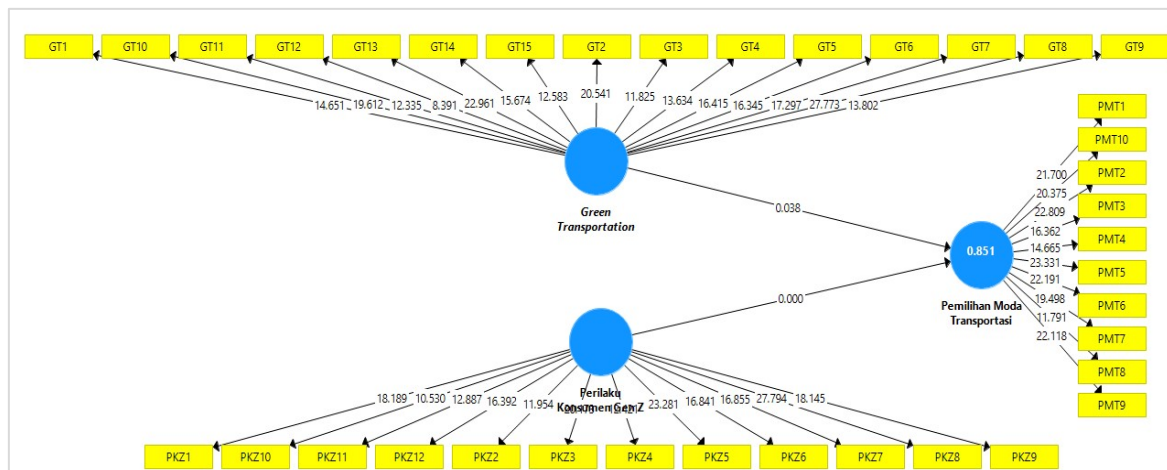
According to Figure 2, the t-value of the green transportation variable for transportation mode selection is 2.078 and the t-value of the gen z consumer behaviour variable for transportation mode selection is 5.862.

Table 6: Hypothesis Test

No.	Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics (|O/STDEV|)	P-Values	Description
1	GT → TMS	0.253	0.252	0.122	2.078	0.038	Accepted
2	GZCB → TMS	0.697	0.702	0.119	5.862	0.000	Accepted

Based on the results of Table 5, each hypothesised correlation is examined using PLS by bootstrapping techniques on the sample. The results of the hypothesis testing are as follows.

1. **Hypotesis Test (H1)**

   Table 5 indicates that the beta coefficient value of green transportation on the selection of transport mode is 0.253 and the t-statistic value is 2.078, with a significance value of p-value is 0.038. Hence, the t-statistic value is 2.078 > 1.96 and the p-value is 0.038 < 0.05. This implies that hypothesis 1 is accepted, that green transport has a positive and significant effect on the selection of transport mode.

2. **Hypotesis Test (H2)**

   Table 5 indicates that the beta coefficient value of gen z consumer behaviour on the selection of transport mode is 0.697 and the t-statistic value is 5.862, with a significance value of p-value is 0.000. Hence, the t-statistic value is 5.862 > 1.96 and the p-value is 0.000 < 0.05. This implies that hypothesis 2 is accepted, that gen z consumer behaviour has a positive and significant effect on the selection of transport mode.

CONCLUSIONS

This study revealed that environmentally friendly transportation and the consumer behaviour of Gen Z had a positive and significant impact on the selection of Biskita Trans Pakuan as a mode of transport. This aligns with efforts to raise public awareness of the importance of the green transition through the use of green transport and paying attention to changes in consumer behaviour for mobilisation needs and providing alternative solutions that can overcome problems often complained about by Biskita Trans Pakuan users.

Therefore, the development of Trans Pakuan Bogor public transport needs to accelerate the implementation of the planned corridors. In addition, it is necessary to consider Trans Pakuan routes that overlap with public transport, resulting in inefficiencies in public transport services.

The influence of green transportation and Gen Z consumer behavior is reshaping the selection of transportation modes, with a growing emphasis on sustainability, innovation, and social consciousness. This trend is likely to have a lasting impact on the transportation industry, as it adapts to meet the evolving preferences of the next generation of consumers, driving the development of eco-friendly solutions and influencing the broader societal approach to mobility and environmental responsibility.

In future studies, researchers can enhance and broaden the scope of this research by implementing research objects that are applicable to other modes of transportation. Various factors that influence the choice of transportation mode may be substituted by future researchers, thereby increasing the generalizability of the results.

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