APPLICATION OF QUADRUPLE BOTTOM APPROACH ON THE ADOPTION OF ECO-DESIGN

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Abstract

One of the key drivers of the Indonesian economy is small and medium-sized enterprises (SMEs). Especially in overcoming the crisis caused by COVID-19. However, SMEs also need a competitive advantage to be able to compete with larger companies. One of the competitive advantages can be obtained through innovation in eco-design (Vihma & Moora, 2020). This study examines the factors which influence *SMEs' intention to adopt eco-design*. The quadruple bottom line (QBL) method forms the foundation for these elements (Simons et al., 2017). It is the evolution of the triple bottom line (TBL) with the additional factor of purpose, besides three existing factors: *people*, *planet*, and *profit*. In addition, using the theoretical framework of planned behavior and social cognitive theory, we also investigate the variables that affect purpose. In this work, structural equation modeling partial least squares is used as a quantitative method. A questionnaire is used to gather the primary data, SMART PLS 3 software is used for data processing, and SME entrepreneurs are selected as respondents. According to the findings, *attitude*, and *self-efficacy* significantly influenced *purpose. People, planet,* and *purpose* influence *SMEs' intention to adopt eco-design.*

Keywords: Quadruple Bottom Line, SME, Intention, Eco-Design, Sustainability, Purpose

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1. INTRODUCTION

The ongoing global disaster of the COVID-19 pandemic has succeeded in slowing down the wheels of the Indonesian economy. In fact, losses were incurred across several commercial sectors, particularly in the early stages of the epidemic. In actuality, many are compelled to close their doors. There is, however, always a chance amid adversity. In reality, the innovation that fuels activity in the sector of micro, small, and medium-sized businesses is one reason why the wheels of the Indonesian economy might start to turn up.

The growth of the small and medium-sized enterprises (SMEs) sector has the potential to influence and hasten Indonesia's economic recovery. As is well known, this industry has evolved into the foundation of the nation. The Ministry of Cooperatives and SMEs estimates that by 2021, there would be 19 million SMEs operating in Indonesia, contributing 61.97% of the country's gross domestic product (GDP), or 8,6 trillion IDR (Hartono &

Ardini, 2022). The capacity of the SME business sector to absorb 97% of the workforce and integrate investment by 60.4% demonstrates its contribution to the improvement of Indonesia's economy. There are many SME business people and they are spread out in urban, rural, and remote areas. SMEs must have quality and creativity in order to open up job opportunities and increase income for SME business actors.

The fact is that in the field, many SMEs are unable to compete with big entrepreneurs and international importers. SMEs assess those various agreements made by the government, from the Associations of Southeast Asian Nations (ASEAN) Economic Community (MEA) to free trade agreements (FTAs) plus digital markets through e-commerce have made them unable to compete (Alexandri & Anjani, 2014). Domestic products are dominated by imports, and imported goods flood Indonesia with low prices and good quality.

SMEs must have a competitive advantage to be able to compete and survive. Employing an eco-design strategy is one way to create a competitive edge. In order to produce a hospitable and sustainable environment, eco-design stresses the use of recycled materials and uses as little raw material as possible. (Vihma & Moora, 2020). To produce a hospitable and sustainable environment, eco-design stresses the use of recycled materials and uses as little raw material as possible (Monteiro et al., 2019). Eco-design makes SMEs' products innovative, and unique and has added value and innovation, so that they can compete with imported products, and SMEs can survive.

The eco-design concept is a pro-nature, pro-life, pro-togetherness, flexible, adaptive, local organic material, and local skill/craftsmanship. Nature is designed regularly without anything wasted. If there is waste, then the waste from nature will be useful for the continuation of the cycle (Zeng & Durif, 2020). However, SMEs' awareness of eco-design is still lacking. SMEs don't require a high degree of education, allowing Indonesians with modest levels of education to start their own businesses. But of course, in terms of business knowledge and creativity may be less than those with higher education. The research gap in our research is how to increase the awareness of SMEs to adopt the eco-design. With the aid of the quadruple bottom line (QBL) theory, we attempt to investigate the elements that influence SMEs' willingness to embrace eco-design. The triple bottom line (TBL) technique has evolved into the QBL approach, which consists of *people, planet*, and *profit*. Then the three factors are added to the fourth factor, namely *purpose*. The uniqueness or difference between our research with previous research is that we also examine the factors that drive the *purpose*. These elements are combined with elements of the idea of planned behavior (Ajzen, 1985), as well as social cognitive theory (Bandura, 1991). Based on preliminary research, it is suspected that these factors are what move *people* to do a good job. Variables of *attitude*, *subjective norm*, and *perceived behavior control* are taken from the theory of planned behavior, as well as from social cognitive theory, and *self-efficacy* variables are used.

We conducted this research because of the pressing need for solutions to the challenge of how to provide SMEs with a competitive advantage. This study is being carried out in Indonesia's capital city of Jakarta. We want to examine whether the factors in the theory of planned behavior and social cognition can have an impact on small and medium businesses' intentions to include eco-design in their operations. Our research result hopefully will empower the SMEs in order to enhance their competitiveness.

The structure of this paper is as follows. Section 1 introduces the research subject. Section 2 reviews the literature and preliminary studies. Section 3 explains the methodology used to conduct data analytics. Section 4 provides research data analytics result and discussion. Section 5 contains the conclusion and suggestions for further research

2. LITERATURE REVIEW

2.1. Sustainability theory

Sustainability theory was first put forward by Meadows et al. (1972) Which explains society's effort to prioritize social responses to environmental and economic problems. The demands of both the present generation and those to come should be met with this social reaction. Currently, the idea of sustainability is expanding and being used in relation to business sustainability (Artiach et al., 2010). Mustapha et al. (2020) discusses the backdrop of corporate sustainability as an investment and business strategy that may balance the requirements of current and future stakeholders using a balanced scorecard to enhance company processes. By achieving a balance between the economic, social, and environmental aspects of firm performance, this idea highlights the interests of stakeholders.

The TBL is typically used to assess corporate sustainability; this idea was established by Jeurissen (2000). TBL has three different aspects: economic, social, and environmental. Alhaddi (2015) states that companies can move towards sustainable development by integrating TBL into their management strategy. Hussain et al. (2018) and Hammer and Pivo (2017) prove that TBL-focused organizations can increase a company's competitive advantage.

In its development, TBL is felt to be lacking, namely, there is no reason or impetus, why humans want to preserve the *planet* and respect other *people* in addition to pursuing *profit*. So, to fill this gap, TBL evolved into the fourth bottom line or better known as the QBL (Sood & Tulchin, 2014). QBL offers tools for measuring, valuing, and evaluating the contribution of culture, spirituality, and religion reporting. *People, planet, profit*, and *purpose* are some ways to put this into words.

2.2. Performance theory

Performance is the outcome of work that can be completed by an individual or group of individuals within an organization, in accordance with their respective rights and obligations, to accomplish the objectives of the organization in question legally, without breaking the law, and in line with morals and ethics. High skill levels, a willingness to work because he is compensated or rewarded under the agreement, and aspirations for a brighter future are all indicators of an employee's performance being good. The company's performance (corporate

performance) will likely be stronger if the employee's performance (individual performance) is good (Richards et al., 2019). Having high employee performance is crucial to meet corporate goals. Employee performance can be said to be good if employees can complete their duties effectively and efficiently. If a certain goal can finally be achieved, it can be said that the activity is effective. It is said to be efficient if it is satisfactory as a driver to achieve goals, regardless of whether it is effective or not (Hörisch et al., 2020). Employee performance can be seen in the resulting productivity. Several factors can affect employee productivity, namely: training, workers' physical and mental capabilities, and the dynamic between superiors and subordinates (Djibran & Riyanto, 2020).

Employee productivity is important for companies because increasing employee productivity means employee performance also increases and company performance automatically increases. To measure work productivity, an indicator is needed as follows: ability, increasing the results achieved, morale, self-development, quality, and efficiency (Daniel, 2019). This is in line with QBL, where several factors QBL namely *people, profit*, and spirituality exist in this performance theory. The performance of employees who are *people* who drive and strive for organizational success, and have a spiritual life which is the reason they want to do something, even working and having a good performance is also considered as worship.

2.3. Eco-design

Eco-design is a design concept with environmentally friendly aspects in mind. Currently, environmentally friendly designs are attracting public attention, the reasons range from global warming, and rising energy costs, to concerns about our limited water supply (Monteiro et al., 2019).

Eco-design is basically not just for savings and trends that are momentary in nature, but the thought of reducing the burden of nature due to human activities or lifestyles. Eco-design is the acceptance of nature without the distance to complement each other as well as the culture and traditions that coexist with nature (Micheaux & Aggeri, 2021). Eco-design is pro-nature, pro-life, pro-togetherness, flexible, adaptive, local organic, and local material skills/craftsmanship. Pro-nature is in harmony with the climate, wind direction, water flow direction, and so on. Pro-life is concerned with continuity for togetherness. Flexibility is being ready to change the atmosphere. Meanwhile, the adapter is adjusting to functioning. Local, organic, and local skills are using local materials with local skills. Eco-design is also called local wisdom because it is a continuous learning process (Syabana & Park, 2020).

Eco-design is a development of sustainable design which is a broad ideology that considers social, economic, and environmental implications. This concept optimizes design by reducing negative impacts and improving quality of life without depleting natural resources. The main goal of sustainable design is not to build structures but to build the future (Burch & Di Bella, 2021). Product design with consideration of the influence on the environment during the composting process or life cycle is one example of how eco-design is used in the commercial sector.

2.4. Theory of planned behavior

In order to overcome difficulties that are not entirely under the control of a person who is not yet fully versed in the theory of reasoned action, the theory of planned behavior is a development of the theory of reasoned action (Ajzen, 1991). The behavioral intention element still forms the basis of the Theory of planned behavior, but other factors such as perceptions of behavior control as well as subjective attitudes and social conventions also play a role in determining intention. However, perceived behavioral control has significance for predicting SMEs' behavior, either directly or indirectly. The interaction between the three factors *attitudes*, *subjective norms*, and *perceived behavior control* becomes an indicator of interest, which in turn determines whether or not the targeted activity will be carried out.

According to Fang et al. (2017), the following elements make up the theory of planned behavior:

1. *Attitudes.* The initial component of conduct is regarded to be *attitude*. Positive or negative *attitudes* can influence how someone behaves. Behavioural beliefs are trusting beliefs. When a person favorably assesses a behavior, they will intend to exhibit it. Individual perceptions about the effects of engaging in an action determine *attitude* (behavioral beliefs) and are weighted in accordance with the findings of the assessment of the effects (outcome evaluation). These *attitudes*, which are linked to subjective standards and a sense of behavioral control, are thought to have a direct impact on behavior.

2. *Subjective norms. Subjective norms* are thought to be a result of a person's agreement or disagreement with certain views on how to behave. Trust is part of *subjective norms* (normative beliefs). If a person believes that other people are significant and that he should have done something, he will plan to act in that way.

3. *Perceived behavior control.* When there are no barriers or anything to demonstrate a behavior, one has total control. On the other hand, there may be zero chance of regulating a behavior due to a lack of opportunity, opportunity, money, or expertise. The degree to which a person believes that behavior is either under his control or not is referred to as behavioral control. Despite being optimistic and assuming that other people who matter to them will concur, people tend not to have strong intentions to exhibit a specific behavior when given the chance to do so. When perceptions of a person's real control and control over behavior are in sync, a direct connection between perceived behavioral control and conduct is anticipated to emerge.

2.5. Social cognitive theory

This theory is originally from Bandura (1991). The core idea behind this theory is that human beings pick up modeling skills through observation and imitation, which they may subsequently utilize while acting or behaving. Humans use their ability to think, symbolize, and anticipate to react (outcome

reaction). These presumptions serve as the foundation for this idea:

• consider people inherently not as good or bad, but as the product of experience with the capacity for any form of conduct;

• people have the capacity to understand and regulate their actions;

• humans may learn new behaviors;

• people can affect other people's conduct because other people can affect how they act.

Bandura (1991) offers four key components to his explanation of this theory: reciprocal determinism, self-regulation, self-efficacy, and observational learning (modeling).

2.6. Effect of *planned behavior* on *purpose*

Stepchenkova and Park (2021) asserts that *attitude* is a measure of attachment, both positive and negative, toward psychologically significant items, including symbols, phrases, slogans, individuals, institutions, ideals, and ideas (Abulrub et al., 2012) Said that competent business people are individuals who possess the information, abilities, and personal qualities such as attitudes, motives, personal beliefs, and behaviors necessary to carry out tasks or activities. This remark implies that a person in the commercial or working environment needs more than just education. Skills must be combined with knowledge. These abilities can take the shape of managerial skills, conceptual skills, comprehension, relational and communication abilities, problem-solving methods and behaviors, time management and usage abilities, and other specialized technical abilities. Being knowledgeable and skilled alone is insufficient. Someone who is in the business world or the world of work, of course, must also have honesty, be responsible, keep promises, be disciplined, obey the law, be helpful, committed, and respectful, and pursue achievement.

Preliminary research by Vamvaka et al. (2020) highlights the importance of emotions in the entrepreneurial process by stating that emotional *attitude* and perceived *self-efficacy* are by far the best determinants of intention. Where entrepreneurs seek to experiment with new ideas to boost innovation, such as eco-design. Another research (Sia & Jose, 2019) asserts that an entrepreneur's aim to build environmentally friendly homes is significantly impacted by *attitude*. Using this viewpoint as a foundation, we propose the following hypothesis:

H1: Attitude has a significant effect on purpose.

Subjective norms are the desire to carry out or refrain from carrying out the activity under consideration that will be influenced by a person's perspective or view of the beliefs of others. The degree to which the pertinent person or individual supports or does not support the execution of a given conduct is referred to as the subjectivity of the norm. When measuring *subjective norms* in research, it is common to ask participants how much they believe their closest relatives, friends, or coworkers would encourage them to pursue entrepreneurial endeavors, such as picking an eco-design as a new invention.

Usually, individuals tend to experience social pressure to engage in conduct the more they believe their social referents support them in doing so, and vice versa, the more they believe their social referents disapprove of their behavior, the more they feel pressure not to engage in that behavior.

The study by Liñán and Chen (2009) stated that *subjective norm* has a strong impact on entrepreneurial intention. Another study by Wan et al. (2017) discovered that people's interest in recycling was significantly influenced by the *subjective norm*. Recycling is an important element of sustainability which is also the basis of eco-design. Similar studies also get the same results (White & Hyde, 2012) Stating that *subjective norms* affect recycling behavior. On the basis of the theory and early research, we construct the following second hypothesis:

H2: Subjective norm has a significant effect on purpose.

Perceived behavior control is an individual's perception regarding the control that the individual has with respect to certain behaviors. A notion regarding the existence or absence of elements that enable or inhibit someone from engaging in an activity is known as *perceived behavior control*. The way that a person perceives their ability to manage their behavior is influenced by both their prior experiences and their perceptions of how difficult or simple an activity is to do. Then, knowledge gleaned from others, such as from the experiences of well-known persons like relatives, lovers, and friends, might impact an individual's conduct. Ajzen (2002) illustrates how a person's conduct is not just under his own control, but also depends on other factors, such as the availability of resources, opportunities, and even certain abilities. A person's thoughts about how simple it is for them to display a behavior are represented by their perception of behavioral control. When individuals believe that they lack a source or do not have the opportunity to exhibit a behavior, (behavior control low) the individual will not have a strong intention to show behavior (van Nes & Cramer, 2005).

Research conducted by Simons et al. (2017) describing how corporate social responsibility in green office buildings influences *behavior control* and *purpose*. Another study by Mbebeb (2012) found that the *purpose* of an entrepreneur wanting to become an ecological entrepreneur stems from the entrepreneurial attitudes and actions and behavioral control they have. Research on *purpose* in life conducted by Ishida and Okada (2011) explains that behavior and control affect *purpose. Purpose* in life is the fourth factor forming the QBL, research by White and Hyde (2012) states otherwise that *behavioral control* has no effect. Based on the theory and differences of opinion from some of these preliminary studies, we formulate our hypothesis as follows:

H3: Perceived behavior control has a significant effect on the purpose.

2.7. Effect of *self-efficacy* on *purpose*

Self-efficacy is the belief in one's capacity to perform successfully under particular conditions. *Self-efficacy* is a positive perspective on our abilities and effectiveness. In short, *self-efficacy* is the extent to which we are able to achieve something. *Self-efficacy* grows from the successes that one has been done. Success is also included in the *purpose* that someone

wants to achieve. There are two components in *self-efficacy*, namely:

• efficacy expectations — the belief that he can do it or not;

• outcome expectations — the individual's estimate that a certain outcome will arise and knowledge of what to do.

Self-efficacy is very influential in a person's behavior. Every behavior, whether at work, in academics, recreationally, or socially, is influenced by *self-efficacy*. Beliefs in *self-efficacy* affect the actions chosen, the effort is given to certain activities, the persistence to overcome obstacles and failures, and the ability to adapt after experiencing failure.

Research by Efendi (2013) discovered that *self-efficacy* influences life objectives, which include well-being, get satisfaction, and comfort in life. Another research by Kreitler et al. (2007) and Tarhini et al. (2015) found that *self-efficacy* has an impact on the quality of work and quality of life. Based on theory and findings from the previous study, we put up our theory as follows:

H4: Self-efficacy has a significant effect on purpose.

2.8. Effect of QBL on SMEs' *adoption of eco-design*

People are suspected to be one of the main factors that make SMEs want to adopt eco-design. As we all know that *people* are one of the factors in the TBL concept which later evolved into a QBL. That's why we need a sustainable design movement, namely the ability to do something continuously so that the existing quality human resources are always available and strive not to be damaged or exhausted. This can be done by paying attention to how to maintain and improve the quality of human life by having the ability to maintain ecosystems. It can be said that at this time, a sustainable design is urgently needed, namely a design that has the ability to carry out its functions continuously, increasing the standard of living of the *people* or users. An example of sustainability for *people* is how a design affects and brings benefits to workers, laborers, and society. For example, by providing fair wages to workers (community), a humane-working system, and empowerment by teaching skills, and others.

Research conducted by Roy et al. (2007) found that eco-design must be people-centred. They conduct research on *people* and sustainability in relation to eco-design. Similar results were found by Zeng and Durif (2019). Successful transformation of eco-design depends on *people*'s response. Research by Sarkar et al. (2019) was said that consumers strive to use items and services to fulfill a variety of requirements. Products should benefit consumers or society as a whole. Therefore, a sustainable product is one that benefits consumers or provides value. In light of the aforementioned theory and earlier research, we construct the following hypothesis:

H5: People have a significant effect on SMEs' intention to adopt eco-design.

Planet refers to the environment. We know that the major environmental issues facing the world, namely: climate change, depletion of the ozone layer, pollution of land and water surfaces, pollution and air quality degradation, waste management (garbage, waste), urban issues, declining groundwater resources, coastal zones, and seawater, risk management (both human-caused and disaster), and reduced soil surface quality and biodiversity (Carroll et al., 2017).

As this new century unfolds, two developments that will have a profound impact on humanity, namely global capitalism, and eco-design for sustainable societies will be set on colliding paths. Therefore, a balanced understanding and concrete effort are needed between the two. Designers or planners are responsible for almost all products, equipment, and environmental faults.

A previous study by Padmalalitha and Rajeswari (2020) claimed that environmental factors lead to the company adopting green practices, this opinion is strengthened by Swami and Shah (2011) which states that corporate environmental drivers intensify normative, coercive, and mimetic forces that force businesses to embrace green practices. A similar related study by Padmalalitha and Rajeswari (2020) examines environmental drivers for green supply chain practice. Another study by Saumi and Zolkepli (2017) found that this factor is able to create value-added for customers in the tourism business. Based on the above theory and previous study, we formulate our hypothesis as follows:

H6: Planet has a significant effect on SMEs' intention to adopt eco-design.

The term "eco-design" is a synonym for "green design", "design for the environment", "sustainable design", etc. (Choi & Hwang, 2015). Green et al. (2012) demonstrate the connection between greater financial and environmental *profits* and the use of green supply chain management. The technique of using eco-design is very useful in accordance with the research of Choi and Hwang (2015) which states that eco-design is recognized as a cutting-edge tool to increase company *profits* and performance. The innovations contained in eco-design are not only able to improve the image or good name of the company but also lead to the development of greater sales (Choi & Hwang, 2015).

There are several advantages of eco-design which are indirectly related to lower production costs (Choi & Hwang, 2015). Based on this description, it is clear that combining eco-design with green supply chain management helps businesses improve their environmental management skills and results in improved performance. The performance of the organization improves with greater eco-design use. The following hypothesis is created because, according to the findings of a prior study, eco-design has an impact on business performance and profitability.

H7: Profit has a significant effect on SMEs' intention to adopt eco-design.

A new component has been introduced to the QBL is *purpose*. In the past, the TBL, there were three elements, namely: *people, planet*, and *profit*. Life *purpose* is very important to find because it is the main motivation in doing something well to achieve our goals. In addition, life *purpose* can guide us to make life decisions, influencing behavior and even creating meaning in life, work, and in business. *Purpose* makes people strong. For example, in carrying out eco-design, if from the beginning you have planned to make products that are environmentally friendly and can help raise living standards, then this *purpose* will be a strong driving force so that the eco-design is realized.

Previous research by Bovea and Gallardo (2006) Stated that goal and scope definition are the determining factors that drive eco-design. Goal and scope are part of the *purpose.* Similarly, research by Navajas et al. (2017) also talks about the importance of goal and scope definition plus objectives. According to our understanding of and assessment of the prior research, we make the following hypothesis:

H8: Purpose has a significant effect on SMEs' intention to adopt eco-design.

3. RESEARCH METHODOLOGY

3.1. Research type and sample size

Researchers used quantitative methods. According to Creswell (2014) quantitative research, which is an experimental style of study, demands researchers to explain how one variable impacts other factors. According to Roscoe (1975) the minimal sample size for multivariate research is 10 times the number of variables being investigated. There are 9 (nine) variables in this study, hence at least 90 samples are required. The researcher utilized a sample of 200 respondents for this study. When viewed from the criteria above, this study has met one of the categories of sample size suggestions expressed by Roscoe (1975).

3.2. Data type and sampling techniques

Primary data sources were employed to compile the study's data. While the questionnaire method of data collecting is employed in this study and will be thereafter provided to respondents. The questionnaires are distributed to SME entrepreneurs utilizing a Google Forms that is carried out online.

The sampling strategy employed in this study involves using a straightforward random sampling methodology with a number of criteria, such as SMEs that have been permanent, SMEs that have a business license, and at least a proprietary company.

Researchers employed a Likert scale in this investigation. As stated by Sugiyono (2013) the Likert scale is used to create instruments that gauge how one or more people or groups feel about a possible issue. In this study, the researcher made 5 choices that the respondent could choose to answer the questionnaire that the researcher made. The Likert scale ranges from 1 to 5, with 1 being strongly disagreed and 5 strongly agree.

3.3. Operation of variables

We create operationalization variables for the latent variables in our research in order to make them quantifiable.

Table 1 below shows the operationalization of variables.

Table 1. Operation of variables

Variable	Indicators	Reference
SMEs' intention to adopt eco-design	– significantly reduced overall operational costs; – significantly reduced lead times; – significantly improved product quality; – helped your company design/develop better products; – significantly reduced waste within the production process;	Melynk et al. (2003)
Attitude	– confidence; – consequence evaluation;	Kuo et al. (2018)
Subjective norm	– normative belief; – motivation;	Kuo et al. (2018)
Perceived behavior control	– control belief over an action; – perceived ease of an attribute;	Kuo et al. (2018)
Self-efficacy	– mastery experience; – vicarious learning; – verbal persuasion; – psychological states;	Bacanli (2006)
People	– improvement in overall stakeholder welfare or betterment; – improvement in community health and safety; – reduction in environmental impacts and risks to the general public; – improvement in occupational health and safety of employees; – improved awareness and protection of the claims and rights of people in the community;	Paulraj (2011)
Planet	– reduction in air emission; – reduction in waste (water and/or solid); – decrease in consumption of hazardous/harmful/toxic materials; – decrease in frequency of environmental accidents; – increase in energy saved due to conservation and efficiency improvements;	Paulraj (2011)
Profit	– reduction in air emission; – reduction in waste (water and/or solid); – decrease in consumption of hazardous/harmful/toxic materials; – decrease in frequency of environmental accidents; – increase in energy saved due to conservation and efficiency improvements;	Paulraj (2011)
Purpose	– value creation; – cultural continuity and development of cultural well-being; – spiritual life; – faith and relationship with God.	Pizzirani et al. (2018), Budsaratragoon and Jitmaneeroj (2019)

4. RESEARCH RESULTS AND DISCUSSION

4.1. Identity of respondents

Based on the responses provided by the 200 respondents that completed the survey using the Google Forms medium. The distribution of respondents to our survey is described in the information below. The response data is attached in Table 2.

Table 2. Identity of respondents

Characteristics	Amount
Gender	
Male	84
Female	116
Experience	
Under 5 years	56
5–10 years	66
11–15 years	31
> 15 years	47
Industry	
Service	55
Trading	113
Manufacture	32
Education	
High school	92
Diploma	41
Bachelor/Master	67

Based on Table 2, it can be concluded that the majority of our respondents are female, with slightly more numbers than males. The SMEs business field is in the trading field, with 5–10 years of experience, and has a high school education. It can be said that SMEs that are the object of research are SMEs with sufficient experience.

4.2. Convergent validity

The degree to which a measure is positively linked with other measures of the same construct is known as convergent validity. To evaluate the convergent validity of the reflective construct, the researcher considers the outer loading indicator and the average variance extracted (AVE). The high outer loadings on the construct show the related indicators have a lot in common, which is captured by the construct (Ghozali & Latan, 2015). At a minimum, the outer loadings of all indicators should be statistically significant. The default outer loadings should be 0.7 or greater, as a general rule of thumb. The construct often accounts for more than half of the indicator variable when the AVE value is 0.50 or higher. AVE of less than 0.50, however, denotes that, on average, more variance remains in the item error than in the variance described by the construct. Convergent validity is presented in Table 3.

Table 3. Outer loading

Indicator	Outer loading	Indicator	Outer loading	Indicator	Outer loading
ATT.1	0.995	PE.3	0.949	PR.5	0.944
ATT.2	0.993	PE.4	0.896	PU.1	0.845
SN.1	0.997	PE.5	0.812	PU.2	0.930
SN.2	0.997	PL.1	0.813	PU.3	0.950
PBC.1	0.960	PL.2	0.834	PU.4	0.845
PBC.2	0.970	PL.3	0.890	INT.1	0.868
SE.1	0.823	PL.4	0.865	INT.2	0.951
SE.2	0.919	PL.5	0.856	INT.3	0.949
SE.3	0.928	PR.1	0.980	INT.4	0.896
SE.4	0.864	PR.2	0.988	INT.5	0.812
PE.1	0.868	PR.3	0.990		
PE.2	0.951	PR.4	0.980		

The data presented in Table 3 allow for the conclusion that every variable's indicator all have values higher than 0.7, which means that all of them have passed the convergent validity test. In addition to using outer loading, we also use the AVE value. Our AVE value is presented in Table 4.

Table 4. AVE value

Variable	AVE
Attitude	0.988
Subjective norm	0.994
Perceived behavior control	0.932
Self-efficacy	0.783
People	0.813
Planet	0.726
Profit	0.954
Purpose	0.821
SMEs' intention to adopt eco-design	0.804

Table 4 shows that every variable in this study has an AVE value greater than 0.5, indicating that every variable has passed the convergent validity test.

4.3. Discriminant validity

The next validity test is discriminant validity using the Fornell-Larcker criterion which shows variable validity when a variable has a greater correlation than with correlations between different variables (Ghozali & Latan, 2015). The result of the discriminant validity test is presented in Table 5.

Table 5. Fornell-Larcker criterion

	ATT	PE	PBC	PL	PR	PU	INT	SE	SN
ATT	0.994								
PE	0.327	0.901							
PBC	0.895	0.297	0.965						
PL	0.480	0.683	0.442	0.852					
PR	0.504	0.250	0.498	0.268	0.977				
PU	0.220	0.312	0.263	0.218	0.682	0.906			
INT	0.091	0.445	0.082	0.326	0.400	0.610	0.897		
SE	0.504	0.551	0.628	0.406	0.353	0.534	0.199	0.885	
SN	0.984	0.320	0.902	0.479	0.500	0.211	0.083	0.499	0.997

Table 5 demonstrates that the association construct has a greater correlation value than the other constructs, indicating that this study model has strong discriminant validity.

4.4. Reliability test

The methodology by Ghozali and Latan (2015) is a means of measuring a survey that serves as a predictor of a variable or concept. If a respondent's response to a question remains consistent/stable throughout time, a questionnaire is considered to be dependable or reliable. Similarly, this study, also expects the consistency of the dimensions and research variables so that they can be continued to the next test stage. If the composite reliability score is 0.7 and Cronbach's alpha is more than 0.6, data dependability can be deemed dependable. If it is below this value, it is considered poor (Sekaran & Bougie, 2016). Table 6 presents the reliability test.

Table 6. Cronbach's alpha and composite reliability

Variable	Cronbach's alpha	Composite reliability
Attitude	0.988	0.994
People	0.941	0.956
Perceived behavior control	0.927	0.965
Planet	0.907	0.930
Profit	0.988	0.990
Purpose	0.928	0.948
SMEs' intention to adopt eco-design	0.941	0.953
Self-efficacy	0.907	0.935
Subjective norm	0.994	0.997

Table 6 demonstrates that each variable has a Cronbach's alpha value of more than 0.6 and a composite reliability value greater than 0.7. All of the study's variables may be inferred to be trustworthy.

4.5. Effect size test

Effect size (f^2) is a metric used to quantify the magnitude of the external latent variable's contribution to the endogenous latent variable R^2 (Wong, 2013). The value of f^2 is obtained by accounting for the difference in R^2 when a certain construct is dropped from the research model. The results of f^2 can be 0.02, 0.15, and 0.35, each of which denotes a little, medium, and large effect (Sawilowsky, 2009). The dependent variable's independent variables' respective f^2 values are listed below.

Table 7. Effect size test

Exogenous variable	Endogenous variable	Effect size (f^2)
Attitude	*Purpose*	0.021
Perceived behavior control	*Purpose*	0.092
Subjective norm	*Purpose*	0.011
Self-efficacy	*Purpose*	0.314
People	*SMEs' intention to adopt eco-design*	0.058
Planet	*SMEs' intention to adopt eco-design*	0.024
Profit	*SMEs' intention to adopt eco-design*	0.036
Purpose	*SMEs' intention to adopt eco-design*	0.288

Table 7 displays the results of the effect size test. According to Table 7, the factors *purpose* and *self-efficacy* have a significant impact, whilst the other variables have a negligible impact.

4.6. Predictive relevant test

The test of predictive relevance or cross-validated another element that may be measured in the structural model is redundancy (Q^2) (inner model). Exogenous latent variables' predictive relevance to endogenous latent variables was tested using this technique (Hair et al., 2014). If the answer to Q^2 is larger than 0, it means that the external latent variable is relevant for predicting the endogenous latent variable. The result of the predictive relevance test is shown in Table 8.

Table 8. Predictive relevance test

Endogenous variable	Q^2 (1-SSE/SSO)
Purpose	0.226
SMEs' intention to adopt eco-design	0.305

The test results presented in Table 8 show that all variables' Q^2 values have predictive significance, with *purpose*'s Q^2 value being 0.226 and Q^2 of the *SMEs' intention to adopt eco-design* variable of 0.305. Thus, these results have met the test requirements that exceed the measurement limit above 0.

4.7. Multicollinearity test

In structural equation modeling, the multicollinearity test determines whether or not the model detects a strong or perfect connection between exogenous components. An appropriate model is one that does not have problems with multicollinearity. If the model's variance inflation factors (VIF) value is less than 10, it is said to be multicollinearity-free. Table 9 displays the results of the multicollinearity test for this model. In Table 9 we can conclude that no multicollinearity is found in this model since all the constructs each have a VIF less than 10.

Table 9. Multicollinearity test

Exogenous variable	Endogenous variable	Inner VIF value
Attitude	*Purpose*	2.531
Perceived behavior control	*Purpose*	3.445
Subjective norm	*Purpose*	2.391
Self-efficacy	*Purpose*	2.234
People	*SMEs' intention to adopt eco-design*	3.228
Planet	*SMEs' intention to adopt eco-design*	2.012
Profit	*SMEs' intention to adopt eco-design*	2.212
Purpose	*SMEs' intention to adopt eco-design*	2.056

4.8. Coefficient of determination

This type of multivariate model has two coefficients of determination. That represents the proportion of *self-efficacy* toward *purpose, subjective norm, perceived behavioral control*, and *attitude*. The impact that *people, planet, profit*, and *purpose* have on *SMEs' intentions to adopt eco-design* is the second coefficient of determination. Table 10 displays the coefficient determination outcome.

Table 10. Coefficient of determination

Endogenous variable	R-squared	Adj. R-squared
Purpose	0.296	0.282
SMEs' intention to adopt eco-design	0.447	0.435

The values of R-squared and adjusted R-squared are displayed in Table 10. We choose to utilize the adjusted R-squared value because our model involves several variables. Therefore, it may be said that *attitude, perceived behavior control, subjective norm*, and *self-efficacy* affect *purpose* by 28.2%, while *people, planet, profit*, and *purpose* can influence *SMEs' intention to adopt eco-design* by 43.5%. Additional elements not covered in this study have an impact on the remaining 56.5%, such as other factors outside the QBL. These factors include: knowledge of entrepreneurs, availability of capital, government support, and others.

4.9. Structural model and hypothesis testing result

In this study, the statistical t-test was used to decide if the made tentative hypothesis may be accepted or rejected. The t-test conditions are disregarded, but the hypothesis is accepted if the t-statistic (see Table 11) is greater than 1.98, indicating that there is a significant link. The rule is that if the t-statistic is less than 1.98, the hypothesis is rejected or does not have a significant relationship, and if it is greater than 1.98, the hypothesis is accepted or has a significant link. Table 11 displays the results of the hypothesis testing.

Table 11. Hypothesis testing

Hypothesis	Path coefficient	t-test	p-value	Conclusion
Attitude → Purpose	0.212	2.815	0.005	Accepted
Subjective norm → Purpose	-0.120	0.337	0.736	Rejected
Perceived behavior control → Purpose	-0.206	1.463	0.144	Rejected
Self-efficacy → Purpose	0.616	7.954	0.000	Accepted
People → SMEs' intention to adopt eco-design	0.252	2.928	0.004	Accepted
Planet → SMEs' intention to adopt eco-design	0.047	2.368	0.022	Accepted
Profit → SMEs' intention to adopt eco-design	-0.059	0.887	0.376	Rejected
Purpose → SMEs' intention to adopt eco-design	0.561	7.960	0.000	Accepted

Based on Table 11, it can be seen that five hypotheses have a significant effect, namely: the influence of *attitude* towards *purpose*, *self-efficacy* towards *purpose*, *people* towards *SMEs' intention to adopt eco-design*, *planet* towards *SMEs' intention to adopt eco-design*, and *purpose* to *SMEs' intention to adopt eco-design*. While the other three hypotheses, namely the effect of *subjective norms* on *purpose*, *perceived behavior control* on *purpose* and *profit* on *SMEs' intention to adopt eco-design*, have no significant effect. Figure 1 presents the structural model and path coefficient result.

Figure 1. Structural model and path coefficient
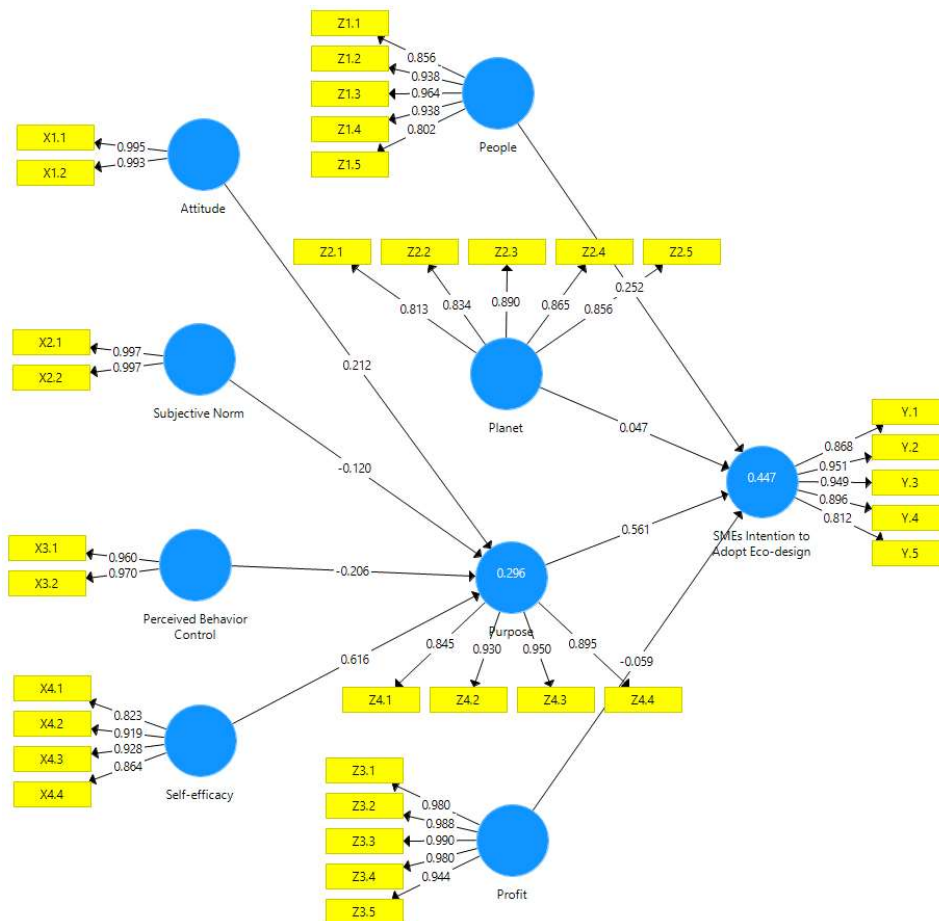
4.10. Discussion

Table 11 demonstrates that *attitude* affects *purpose*. This is because *attitude* is an affective aspect that determines a person's actions because the willingness or willingness to act determines someone to act according to the character of the *attitude* he/she has. Confidence and the consequences of action create a person's *purpose* for doing something. This is in line with research by Xue et al. (2011).

Subjective behavior norms and perceived behavioral control have no discernible impact on

intent. It is suspected because the *purpose* is not a normative belief, but the *purpose* is specific. It is the opposite of the result from (Lewandowska & Matuszak-Flejszman, 2014). In addition, the *purpose* is clearly controllable so that it is no longer perceived but a certainty. The findings of this study are at odds with those of earlier investigations (White & Hyde, 2012; Chiou, 1998).

Self-efficacy has an effect on *purpose* because with *self-efficacy*, especially from experience, a person can better prepare for future goal setting. This is in line with research by Neuville et al. (2007), Hastings and West (2011), and Ritchie et al. (2021) which are stated in goals and *self-efficacy* beliefs.

People significantly influence whether SMEs plan to implement eco-design. This outcome is consistent with those attained by MacDonald and She (2015), and also Beard and Hartmann (1997) who stated that a larger number of *people* involve will produce more varied ideas. This is because the concept of eco-design is also made to pay attention to and prosper *people*. Consider a small business where the welfare of its employees is still a priority. Continue to provide benefits such as health benefits, holiday allowances, and so on.

The *planet* significantly influences whether or not SMEs plan to adopt eco-design. These results support the results obtained by previous researchers (Vallet et al., 2012; Knight & Jenkins, 2009). The *planet* is influential because the concept of eco-design is closely related to recycling, which aims to reduce pollution and preserve the environment. So that SMEs entrepreneur who cares about the environment will be easier to accept and adopt the concept of eco-design than those who don't care about the environment.

Profit in our study has no significant effect on *SMEs' intention to adopt eco-design*. This is contrary to the previous preliminary research by Pazoki and Samarghandi (2020) and Dace et al. (2014). This is because SME entrepreneurs in our research are not profit-oriented but who try to use the eco-design concept to create added value and unique selling points for their business. Some SMEs think that it is difficult to *profit* from eco-design, this is similar to research findings (Paulson & Sundin, 2015).

The ambition of SMEs to embrace eco-design is significantly influenced by *purpose*. The *purpose* of this study comes from spiritual values, beliefs, culture, and relationship with God. These factors are proven to be able to increase the interest of SMEs to adopt eco-design. SME entrepreneurs who have strong spiritual values, culture, and beliefs are able to increase their desire to adopt eco-design. Our findings support the findings of another research by Karamova et al. (2019) and Chun (2012).

5. CONCLUSION

Attitude and self-efficacy affect purpose. Based on these findings, we can imply that if small and medium-sized businesses are invited to develop eco-designs, it is necessary to improve their attitude and self-efficacy. Attitude can be increased awareness, namely by providing counseling and guidance on the importance of eco-design. Meanwhile, self-efficacy can be increased by using experience. So, it is necessary to involve these small and medium-sized entrepreneurs in activities related to eco-design. Either through activities initiated by the government, educational institutions, or by other institutions.

People, planet, and purpose have a significant influence on SMEs' intention to adopt eco-design. The implication is that we should increase the awareness of SME entrepreneurs regarding their concern for the surrounding community, and the mutual prosperity between employees and business owners. They are concerned about the preservation of nature and also strengthen their spiritual life to increase the purpose of life.

Our suggestion for further research in the future is that the next researcher can conduct research on similar topics, using different samples, with different conditions. For example, regarding the phenomenon of eco-design in other countries such as in Europe and the US. So that it may be compared to our study and improve the assessment of the literature in the field of sustainability and eco-design.

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