Understanding Relationship Green Entrepreneurship And Circular Economy

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Abstract: Align with the economy developing progress, the study investigates the relationship among some constructs, namely green entrepreneurship education (GEE), Environmental citizenship behaviour (ECB), Green entrepreneurial intention (GEI), and perceived circular economy (PCE). These relationships involve some direct and mediating effects among constructs in understanding the circular economy. It involves 123 students from some business management schools and economic faculty in Jakarta. Smart-PLS is a tool for running data with the following results: GEE influences ECB with a contribution of 26.38 percent. ECB contributes 40.45 percent while GEE supports 11.25 percent toward GEI. In this case, ECB mediates the relation between green entrepreneurship education and green entrepreneurship intention. When associated with the circular economy, the role of GEI mediates ECB to PCE. However, ECB only impacts 6 percent. Meanwhile, GEI is 32.72 percent in forming students' perception of the circular economy. It shows the ECB has not been able to develop an understanding of the circular economy. Hence, It needs a literacy of circular economy as a mechanism to enrich knowledge in entrepreneurship education programs.

Keywords: circular economy, ECB, entrepreneurial intention, green entrepreneurship.

Abstrak: Sejalan dengan kemajuan ekonomi yang berkembang, studi ini menyelidiki hubungan antara beberapa konstruk, yaitu pendidikan kewirausahaan hijau (GEE), perilaku warga lingkungan (ECB), niat wirausaha hijau (GEI), dan persepsi ekonomi sirkular (PCE). Hubungan ini melibatkan beberapa efek langsung dan mediasi antara konstruk dalam memahami ekonomi sirkular. Melibatkan 123 mahasiswa dari beberapa sekolah manajemen bisnis dan fakultas ekonomi di Jakarta. Smart-PLS adalah alat untuk mengolah data dengan hasil sebagai berikut: GEE mempengaruhi ECB dengan kontribusi sebesar 26,38 persen. ECB berkontribusi 40,45 persen sementara GEE mendukung 11,25 persen terhadap GEI. Pada kasus ini, ECB memediasi hubungan antara pendidikan kewirausahaan hijau dan niat kewirausahaan hijau. Jika dikaitkan dengan ekonomi sirkular, peran GEI memediasi ECB ke PCE. Namun, ECB hanya berdampak 6 persen. Sementara itu, GEI sebesar 32,72 persen dalam membentuk persepsi mahasiswa tentang ekonomi sirkular. Ini menunjukkan ECB belum mampu mengembangkan pemahaman tentang ekonomi sirkular. Oleh karena itu, diperlukan literasi ekonomi sirkular sebagai mekanisme untuk memperkaya pengetahuan dalam program pendidikan kewirausahaan.

Keywords: circular economy, ECB. entrepreneurial intention, green entrepreneurship

INTRODUCTION

Nowadays, inlining the growth economic orientation, the world community is facing environmental problems that impact the prosperity of future generations. Required an economic development model that is committed to environmental sustainability. Economic growth is expected to increase simultaneously with social welfare and environmental sustainability, so recycling behavior must be a commitment for among entrepreneurs. Based on this reason, the development of an economic model must accommodate this behavior for sustaining the ecological side in achieving the economic goals. To meet the era of achieving SDGs in 2030, it needs a strategy to involve the 3R behavior in the business behavior which is relevant as the Circular Economy (CE) (Heshmati, 2015). The principles of reducing, reusing, and recycling are part of the business policy in saving resources and fostering zero waste practices. Other statements from (Lahti, Wincent, & Parida, 2018) under the CE's model, a company can reinforce the values of biodiversity conservation, responsible with social equity, and be responsive to its stakeholders. Moreover, the study of (Pla-Julián & Guevara, 2019) highlighted CE to turn the economic activity into a circle of concern between humans and the environment. Thereby driving a significant increase in research in recent years which was proved on the bibliometric analysis (Ruiz-Real, Uribe-Toril, Valenciano, & Gázquez-Abad, 2018). This shows the interest among economists, environmentalists, and other researchers to appreciate CE as the new approach for pursuing SDGs agenda.

Connecting to the environmental solution, the goal of CE prevents pollution, supports recycling, and reduce waste so that in long term can protect "environmental degradation and resource scarcity". It aligns with a greening economy which previously emphasized the balance between the use of capital nature and minimalizing of environmental risks(Nuringsih, Nuryasman, & Jenifer, 2020). Hence, developing the entrepreneurial business model needs to accommodate the pro-environmental approach for the sake of sharing sustainability for future generations. The specific model applies to Green Entrepreneurship or GE so having the closed relationship between GE and CE in supporting SDGs. With this model, an entrepreneur must drive the entrepreneurial process in creating ecological values to meet the needs of the green market. By considering this value. entrepreneurs can contribute to maintaining sustainability in the future.

Regarding environmental sustainability, Indonesia is one of the countries with the world's largest biodiversity and as an agricultural society which relates to food security. Meanwhile, this country is facing a pandemic as well as natural disasters that never last. Many areas experience natural disasters such as floods, landslides, forest fires, and droughts (Sudyasjayanti, 2017). Even, according to the World Resources Institute in 2015. Indonesia is predicted as one of the countries that will face water stress in 2040. The phenomenon of heatwaves can disturb the productivity of the agricultural sector as well as the economic and human health sectors (Suparta & Yatim, 2019). Even now, natural disasters such as earthquakes, volcanoes, and high waves along the coast of the island of Java are increasingly exacerbating the risks to the sustainability of human welfare in the future. Not only that, Indonesia as one of the largest plastic garbage contributor countries in the world, destroys marine diversity or disrupts other terrestrial ecosystems. Therefore, wisdom is needed in addressing sustainability issues by implementing it in the

entrepreneurial aspect. Thus, protecting natural resources and anticipating disasters should be a trigger for entrepreneurs. All parties must concentrate on environmental sustainability (Dong & Hauschild, 2017), including business practices that must be aligned with sustainability values without neglecting social welfare and maintaining natural resources.

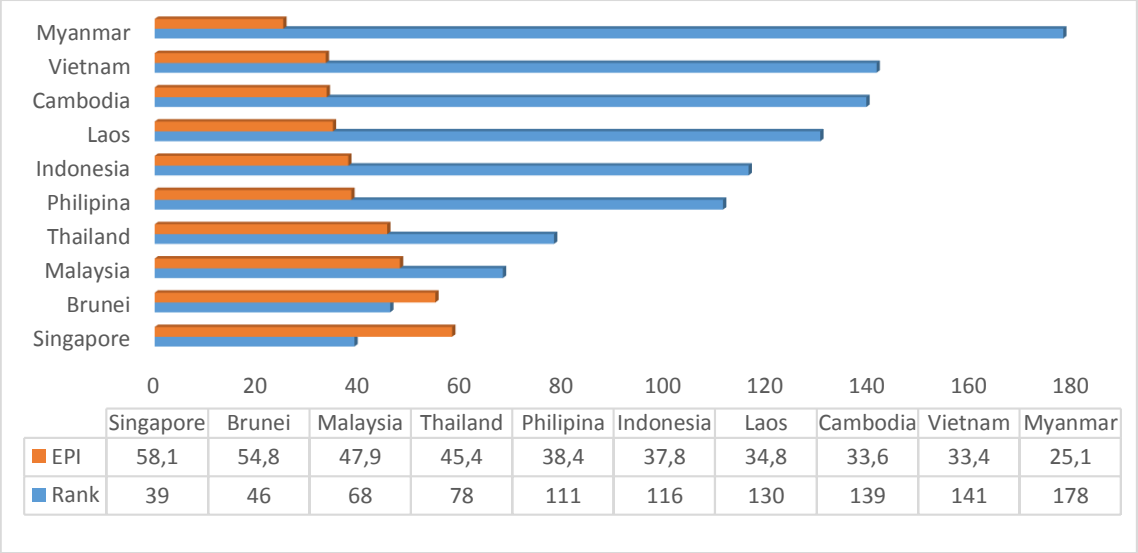
Therefore, awareness of ecosystem sustainability must be understood by the nascent stage entrepreneurs through an educational approach. Hoped students are interested in developing green entrepreneurial models. Based on this reason, green entrepreneurship intention is placed as media for understanding SDGs (Nuringsih, Nuryasman, et al., 2020; Nuringsih & Nuryasman, 2021a; 2021b) to think about the circular economy. The entrepreneurial education system is expected to encourage students' awareness toward environmental sustainability so will impact their behavior (Amartha, Hamzah, & Herdiansyah, 2019; Mei, Wai, & Ahamad, 2016) or environmental attitudes (Atav, Altunoğlu, & Sönmez, 2015). Relevant to the prior studies and the newest environmental conditions, the study investigates the relationship between entrepreneurial education and environmental behavior in shaping a person's intention in green entrepreneurship and perceiving a circular economy.

For the first stage building long term business comitment is required an intention. Study emphasizes a model to encourage interest in green entrepreneurship through green entrepreneurial education and environment citizenship behaviors (ECBs) so that through this approach a circular economy introduction mechanism can be genereted for the entrepreneurial students. This is important because the future of Indonesia lies with the younger generation in ensuring sustainability. The choice of the term "Green" in this study is in line with the Green Economy as in previous studies e.g., (Nuringsih, Nuryasman, et al., (2020); Lotfi, Yousefi, & Jafari, (2018); Nuringsih & Nuryasman, (2021a; 2021b); Romanowski & Gnusowski, (2019); Uslu, Hancıoğlu, & Demir, (2015)) or word of "eco" e.g., Abina, Oyeniran, & Onikosi-Alliyu, (2015); McEwen, (2013); Nuringsih & Puspitowati, (2017), so both are used interchangeably in this study.

However, it is not easy to change conventional management into a green business that is in line with environmental issues, so many behaviors which are unsustained to ecological practices e.g., in saving natural resources, preserving biodiversity, recycling waste, and reducing degradation. Hence, the role of education becomes important in building knowledge of GE to form a positive perception of an eco-friendly business. This perception supports environmental citizenship behavior (ECB) among students so that one day they will be interested in GE. In the same connection, it is not impossible to motivate economic actors in preventing environmental degradation and resource scarcity. The implementation will synergize with the circular economy to support the green economy and contribute to sustainable development programs that are oriented towards balance in the triple bottom line or maybe still limited to the double bottom line.

These problems can be captured through performance index of ecology management in Figure 1. According the report of Environmental Performance Index (EPI) depicted the ranking of countries in Southeast Asia where the best is ranked 39th by Singapore. Brunei is ranked 46th with an index of 54.8. Meanwhile, Indonesia has ranked 116th with an index of 37.8 or slightly adrift from the Philippines, while Myanmar has the lowest environmental performance. The ranking is based on various indicators from 180 countries including the availability of clean water, waste/pollution problems, climate change, and

other environmental issues. Indonesia's ranking compared to countries in Southeast Asia is still below Singapore, Brunei, Malaysia, Thailand, and the Philippines. However, there was a leap compared to 2010 at rank 134 with an index of 44.6 (Wendling et al., 2020). Therefore, it is necessary to build a positive attitude towards the environment to encourage environmental performance. It is as important think in order to grow the ecological value in the entrepreneur's mindset so they will behave suitable with environmental protection.



	Singapore	Brunei	Malaysia	Thailand	Philipina	Indonesia	Laos	Cambodia	Vietnam	Myanmar
EPI	58,1	54,8	47,9	45,4	38,4	37,8	34,8	33,6	33,4	25,1
Rank	39	46	68	78	111	116	130	139	141	178

Figure 1. EPI Ranking at Southeast Asia level
(Source: analyzed from Wendling et al., 2020)

Eco-friendly behavior is an important aspect to familiarize people with preserving the environment. When it comes to sustainable development goals or SDGs, there are at least four important dimensions that need to be achieved, namely: (1) clean water and sanitation, (2) climate action, (3) life below water, and (4) life on land. Community participation in environmental issues will have a positive impact on environmental performance so that it is in line with the goals of the global community as stated in the SDGs. Therefore, education at GE is a window of knowledge for students to trigger their ECBs which can later grow interested in GE and form a positive perception of the circular economy through awareness of the potential for environmental damage and scarcity of natural resources. The link between the circular economy and the SDGs is an important issue for students to understand, where it is through this "Responsible Production & Consumption" (SDG-12) that encourages responsibility on the side of producers (entrepreneurs) and consumers. The role of green entrepreneurs at this stage is to realize SDGs-12 so that their business behavior can be in line with the "green and circular economy". This hope shape business behavior and consumer behavior that prioritizes conservation and saves natural resources to support environmental performance.

Aligning with entrepreneurial learning programs in the educational institutions and harmonizing with implementing the curriculum of "Merdeka Belajar Kampus Merdeka" or MBKM so this study points to the surrounding issues from the education of green

entrepreneurship until building a good perception of the circular economy among students. Based on these reasons, the question of the study is as follows: Is there a relationship between green entrepreneurial education and ECBs to shape student intentions on green entrepreneurship and foster perceptions of the circular economy?. Hence, the goal of the study is to understand the impact of green entrepreneurial education in shaping ECBs among entrepreneurial students and its effect on the student intention in green entrepreneurship and perception of the circular economy.

Eventually, this early study has an urgency to encourage literacy and the relevance of entrepreneurship to economic development. First: at least as information in synergizing between SDGs, green economy, and circular economy in the entrepreneurship learning process. The orientation of entrepreneurship learning is not limited to the achievement of economic performance but in harmony with the development of the approach expected by the global community. Second: if it is aligned with the "Merdeka Belajar Kampus Merdeka", the research approach can be synergized with the curriculum. Because it is related to environmental behavior aspects, it is necessary to introduce a collaboration with environmental psychology and environmental technology to provide insight into green technology as well as with law faculties related to green regulation or the environmental law. Lastly, improve collaborations between domestic and overseas universities and industrial collaborations that have a vision of sustainability and the implementation of a circular economy in business practices. Implementation can be provided through internships, seminars, or student exchanges so that through this approach students will get more informations, knowledges, experiences, and skills to support decisions as entrepreneurs. In line with the benefit for entrepreneurial development, the novelty of the study connects to a circular economy as an approach to prevent environmental damages. It is a mechanism to understand the role of the economic development approach in growing the entrepreneurial intention among young adults.

THEORETICAL REVIEW

Green Entrepreneurship and Circular Economy. As the basis for the definition of Green Entrepreneurship (GE) in this study, we refer to some studies. Relevant to (Gevrenova, 2015) the literature being green is associated with the ecological and social engagement of entrepreneurs in their business. Defined “the green entrepreneurship is an economic activity whose products, services, methods of production or organization have a positive effect on the environment”. It shows the implementation of “green” inherent in the overall aspects of the business so that can be concluded that these aspects are relevant to sustainability in managing entrepreneurship. Priorly, the opinion of Farinelli, Bottini, Akkoyunlu, & Aerni, (2011) stated that the existence of green entrepreneurs mitigates human impacts on the environment and contributes to overcoming global problems. The next definition provides an alternative way to deal with climate change, as explained by Uslu et al., (2015) that green entrepreneurship prevents adverse effects on the environment by recycling products, using renewable energy sources, and making organic agriculture and animal husbandry. Then, study of Mathur & Tandon, (2016) stated “green entrepreneurship is a worldwide phenomenon to realize the knowledge and measures as a solution to environmental issues. global warming, and the crisis of resources”. Various

definitions show the contribution of green entrepreneurship in environmental conservation. This entrepreneurial model is an idea to solve problems in realizing sustainable development and understanding CE. Hence, it needs to collaborate with some stakeholders like the idea of Romanowski & Gnusowski, (2019) by introducing the term "Quintuple Helix Model" in developing GE. For these reasons, this stakeholder's collaboration aligns with the opinions (Lahti et al., 2018) and (Pla-Julián & Guevara, 2019) in harmonizing concerns between humans and the environment.

Perceived of Circular Economy. A circular economy is an economic model that enhances economic growth in the era of green business by placing environmental programs as a program to overcome ecological problems. Based on the definition from (Heshmati, 2015) stated "Circular economy is a sustainable development strategy that is being proposed to tackle urgent problems of environmental degradation and resource scarcity, CE's 3R principles are to reduce. reuse and recycle materials." Moreover, another study improved the statement of CE through giving respond quickly to stakeholders (Lahti et al., 2018). Therefore, the model transforms economic activities into a circle of concern for humans and the environment (Pla-Julián & Guevara, 2019). It involves the shifting of activity e.g., recycling projects, saving resources, producing the longevity of product duration, and focusing on zero waste projects. Moreover, in marketing project is relevant to empower people and customers in the green campagne programs. It is hoped that a positive perception of the circular economy will be formed through awareness of the potential for environmental damage and the scarcity of natural resources. Through the circular concept, it can help accelerate the expectations of sustainable development, although not all aspects of sustainability can be covered through this circular economic approach. Only environmental aspects can be addressed sustainably through the circular economy model. It aligns with the SDGs 12th about responsible consumption and production so that these behavior changes decrease the ecological risks and overcome nature resources scarcity. The newest wisdom for ensuring the ability of future generations to meet their own needs is in line with the green economy to drive SDGs.

Green Entrepreneurial Education. In general, some studies such as Denanyoh. Adjei, & Nyemekye, (2015); Maresch, Harms, Kailer, & Wimmer-Wurm, (2016) concluded that entrepreneurship education is positively related to student interest in entrepreneurship. Furthermore, Masri, Abdullah, Asimiran, & Zaremohzzabieh, (2021); Othman & Othman, (2019) noted entrepreneurial education is needed to support student entrepreneurs which can improve student's engagement and intention in the entrepreneurial activity. An entrepreneurship educatioal supporting forms a passion for entrepreneurship (Mayoshe & Nuringsih, 2021) so it is certain to provide an atmosphere in the form of entrepreneurial skills and knowledge so that students are interested in building businesses. The effect of this support is like social norms in the formation of intentions in the theory of planned behavior. This relationship is following previous studies (Kaijun & Sholihah, 2015). Related to green entrepreneurship, it allows the role of entrepreneurship education to increase students' intentions for this type of entrepreneurship (Nuringsih & Nuryasman, 2021a; 2021b; Valenrie & Nuringsih, 2021) although in other studies it is not necessarily the same effect (e.g., Abina et al., (2015); Nuringsih & Puspitowati, (2017). Through green

entrepreneurship education, it is hoped that it can introduce excellence, competency requirements and identify opportunities from the green entrepreneurship model to students so that in addition to preparing student resilience. this choice becomes a solution for environmental demages (Masjud, 2020; McEwen, 2013).

In fact, along with the transformation of the MDGs to SDGs. it is necessary to early encourage the eco-entrepreneurship spirit to students (Nuringsih & Hapsari, 2016). Moreover, it is in line with the application of the green economy so that through an education system or entrepreneurship learning, students can form attitudes, thoughts, self-confidence, and skills in the business model. The role of education has a relationship with the formation of behavior towards the environment so the formulation of the first hypothesis (H1) emphasizes the direct relationship between green entrepreneurship education and environmental citizenship behaviors. While the second hypothesis (H2) emphasizes the relationship with student intentions in green entrepreneurship.

Environmental Citizenship Behavior (ECB). In line with the goals of the global community in achieving sustainable development. the form of behavior implemented by the community is pro-environmental behavior. In line with the Millennium Development Goals (MDGs) in 2000 came the behavior model from many researchers in measuring dimensions of pro-environment behavior. One of the researcher, Markle, (2013) places some dimensions in the form of "conservation, environmental citizenship, food, and transportation" while Bamberg & Rees, (2015), improved the shopping behavior. On another side, (Mi et al., 2019) stated that the motivation of the employee in the (ECB) is a key factor in facilitating the low-carbon transition of enterprises, it is relevant to the green economy. This dimension is an illustration of measuring the construct of pro-environmental behavior. However, in this study adjusting the dimensions that are suitable for students as an approach to building eco-friendly behavior through environmental citizenship behaviors.

This is inherent with environmental citizenship where people must be responsible for nature. According to Dobson noted it involves “changes in the behavior of individuals, institutions, and organizations are a requirement for realizing sustainable development” (Nuringsih & Nuryasman, 2021a). Then, Meerah, Halim, & Nadeson, (2010) explain the concept of environmental citizenship “as a form of the human relationship with nature with an emphasis that environmental conservation is everyone's responsibility to minimize the ecological impact on the earth”. The results of the research conclude that environmental citizenship is influenced by some factors, namely knowledge, attitudes, skills, and student participation so that efforts to improve environmental citizenship can affect lifestyles that have positive and negative impacts on the environment. Further, Blankenberg & Alhusen, (2019) used environmental citizenship behaviors with some indicators as a measure.

In the context of education, a significant influence of environmental education has been identified on ECBs (Nuringsih & Nuryasman, 2021a; 2021b). Furthermore, when it is associated with the formation of student perceptions of the circular economy, through the opinion of Dobson, a hypothesis can be framed that the formation of ECBs can shape people's behavior to accelerate the achievement of sustainable development. Thus, ECBs have a role in growing student intentions on green entrepreneurship intention as developed in the third hypothesis (H3). In addition, the presence of ECBs allows mediating the

relationship between green entrepreneurial education and green entrepreneurial intention among students so this mechanism was developed in the sixth hypothesis (H6). Furthermore, if it is related to the circular economy, it is emphasized that the model is an acceleration of the transformation of the SDGs (Pla-Julián & Guevara, 2019). Thus, ECBs can also build student perceptions of the circular economy so that this direct influence mechanism is built through the fourth hypothesis (H4). However, ECBs are hypothesized to mediate relationship between green entrepreneurship education and the perceived circular economy as formulated in the seventh hypothesis (H7). This mechanism illustrates the importance of ECBs in this study.

Green Entrepreneurship Intention. Along with the implementation of sustainable development in various aspects of development, one of which is entrepreneurship. To maintain the sustainability of economic potential in the future. it is necessary to be aware of maintaining a balance so that every business decision does not harm the interests of future generations. This commitment by Elkington, (2013) was introduced into a triple bottom line covering three domains, namely: economy, society, and ecology which has a long-term orientation towards the sustainability of profit, people, and the planet. Although it consists of three domains, the implementation can be carried out in stages where according to Belz & Binder, (2017) it is carried out in a double bottom line including economic and social orientation, then developing the economy into the environment or in harmony with green entrepreneurship.

The application of the system in entrepreneurship development is relevant to green entrepreneurship. An entrepreneur has the vision to see innovation and maintain the ability to bring innovation to the market. In innovating and capturing the market, one must respect the environmental benefits so that through this system entrepreneurs contribute to maintaining environmental sustainability in the future. This study uses "intention" although previous studies used the term propensity. Intention is synonymous with propensity so that it becomes propensity for sustainable entrepreneurship (e.g., Koe, Omar, & Majid, (2014); Koe, Omar, & Sa'ari, (2015), including the prior our studies such as Nuringsih & Nuryasman, (2020); Nuringsih, Nuryasman, & Amelinda, (2020). However, the selection of the term in this study uses GE intention as an interpretation of the interest in starting a new business-oriented environment in the future.

Basically, the intention is defined by Ajzen with pointing "intention as the indication of how hard people are willing to try or how much an effort they are planning to exert, to perform a behavior" (Nuringsih, Nuryasman, Prasodjo, & Amelinda, 2019). In the nature of entrepreneurial intention has a meaning as a person's tendency or interest in starting a new venture or creating new values in line with aspects of maintaining environmental sustainability in the future. It was previously mentioned that GE involves collaboration with stakeholders (Lahti et al., 2018) and is related to the harmonization of concerns between humans and the environment (Pla-Julián & Guevara, 2019). In line with the both, it is revealed by the fifth hypothesis (H5) that there is a direct effect of green entrepreneurship intention with the perceived circular economy. In addition, the final hypothesis (H8) was developed regarding the possibility of a mediating effect of ECBs with a perceived circular economy.

Theory of Planned Behavior. As a basis for studying entrepreneurial intentions. the Theory of Planned Behavior or TPB is a continuation of the Theory of Reasoned Action in which individual behavior is generally determined by intention, while the intention is determined by attitude toward the behavior and subjective norms. This theory was adopted from the field of psychology to explain the relationship between individual intention and behavior in the entrepreneurial sphere. Inlining with picturing of TPB that behavior is determined by intention while the intention is determined by attitude toward the behavior, subjective norms, and perceived behavioral control (Nuringsih et al., 2019). The theory examines intentions in general with the implementation of various professions or activities so that adjustments are made to the concept of green entrepreneurial intention. In testing the entrepreneurial model. TPB has been proven by some studies with different countries or cultural backgrounds. Aligning with the TPB, the green entrepreneurial education relates to the formation of attitudes towards green entrepreneurship, while environmetal citizenship behavior is positioned to shape the perceived behavior control that both supports intentions in entrepreneurship. Based on this mechanism is expected to form perceptions about circular economy among students so that the modeling in this study is expected to support the theory of planned behavior.

Hypothesis Development. In line with this theory of intention and refers to the some prior studies so creating model is as follows. The green entrepreneurship education is placed as an independent variable which effects to the environmental citizenship behavior (ECB), while this behavior also is as a mediating variable that links entrepreneurial education to the entrepreneurship intention and perceived circular economy. Besides that, the green entrepreneurship intention is also a mediating variable that links green entrepreneurship education with the perceived circular economy. Based on this relationships, the perceived circular economy is focused to be as dependen variable in this study. The basis for developing the theory refers to a circular economy that contributes to sustainable development. Five hypotheses are formulated as direct effects and three hypotheses as mediation effects on environmental citizenship behavior and the green entrepreneurship intention. The next description of the hypotheses is as follows:

H1: There is a significant relationship between Green Entrepreneurship Education and Environmental Citizenship Behaviors.
H2: There is a significant relationship between Green Entrepreneurship Education and Green Entrepreneurship Intention.
H3: There is a significant relationship between Environmental Citizenship Behavior and Green Entrepreneurship Intention.
H4: There is a significant relationship between Environmental Citizenship Behavior and Perceived of Circular Economy.
H5: There is a significant relationship between Green Entrepreneurship Intention and Perceived of Circular Economy.
H6: Environmental Citizenship Behavior significantly mediates the relationship between Green Entrepreneurship Education and Green Entrepreneurship Intention.
H7: Environmental Citizenship Behavior significantly mediates the relationship between Green Entrepreneurship Education and Perceived Circular Economy.

H8: Green Entrepreneurship Intention significantly mediates the relationship between Environmental Citizenship Behavior and Perceived of Circular Economy.

METHODS

Research Design. This study is a quantitative study that emphasizes causality testing on four variables including green entrepreneurship education, environmental citizenship behavior, green entrepreneurship intention, and perceived circular economy which is then built as a research hypothesis. In addition, descriptive analysis was carried out to strengthen the results of the quantitative analysis. The relationship between constructs in this model is still being explored from various previous studies.

Population and Sampling Techniques. The population is taken from a cluster of students specifically some of the economics & business faculty or business management school in Jakarta with a random selection technique, as a millennial, this cluster of respondents is considered to be understanding entrepreneurial knowledge and have the mindset of entrepreneurship which aligns with an eco-friendly business. A total of 123 respondents responded to the questionnaire given through the google form.

Variable Definition and Measurement. A total of four variables are involved in this research model, namely: "Green Entrepreneurship Education (GEE), Environmental Citizenship Behavior (ECB), Green Entrepreneurship Intention (GEI), and Perceived Circular Economy (PCE)". Several studies are considered to identify indicators are (1) Green Entrepreneurship Education (Abina et al., 2015; Denanyoh et al., 2015; Nuringsih & Nuryasman, 2021a; 2021b; Nuringsih & Puspitowati, 2017). Based on these studies are taken three indicators for measuring GEE. (2) Environmental Citizenship Behavior (ECBs): Blankenberg & Alhusen, (2019); Meerah et al., (2010); Nuringsih & Nuryasman, (2021a; 2021b). Hence, it was developed six items to measure ECBs. (3) Green Entrepreneurship Intention (GEI): Nuringsih et al., (2019); Koe et al., (2014, 2015); Nuringsih & Puspitowati, (2017). Therefore, these studies are used to arrange five items as instruments for GEI. (4) Perceived of Circular Economy (PCE) considers the study (Pla-Julián & Guevara, 2019) to develop six indicators of PCE. All indicators were converted as a questionnaire with a Likert scale of 1 (strongly dissagree) to 4 (strongly agree). then distributed to respondents in November 2021 by online system.

Data Analysis Method. Structural regression analysis was used to examine the direct linkages and mediating effects between constructs e.g., green entrepreneurship education, environmental citizenship behavior, green entrepreneurship intention, and perceived circular economy. Data processing uses Smart-PLS to test the outer feasibility and inner suitability of the model. Reliability testing uses composite reliability while validity uses cross-loading each indicator. The bootstrapping is used to test the acceptance or rejection of the hypothesis with a significance level of 5 percent or equivalent to 1.96 at one tailed.

RESULTS

Respondent Profiles. This study involves as many as 123 students from the faculty of economics & business or business management schools from several campuses in Jakarta. Covering 53 percent male and 47 percent female respondents. As many as 17 percent are starting a business while 15 percent already have businesses such as cafes, culinary, fashion, sports equipment, food & beverage, and others. However, most of the respondents do not have a business. When asked to fill in their opinion on involvement in social activities, only 29 percent have participated in social or environmental activities, while most have never participated in similar activities. These activities include eco-friendly education, tree planting, waste sorting education, cooperation around the residence, and other social activities. Furthermore, when they were asked whether they had ever heard of the circular economy, only 26 percent stated that they had heard or knew of the term, while 74 percent were not familiar with the circular economy. This is because it is new information so it is necessary to develop further literacy about the circular economy for students.

Respondent Mapping. Green Entrepreneurship Education consists of 3 statements showing most of the respondents responded agree and strongly agree. Shown in Table 1 some respondents gave the opposite response, especially on indicators 1-3.

Table 1. Respondent Mapping on Green Entrepreneurship Education

Indicator	Respondent response scale (percent)			
	1	2	3	4
"Institution provides the facilities for developing the personal and social skill based on green business"	1.60	13.80	57.00	27.600
"Institution encourages the developing of creative ideas become a green entrepreneur"	0.80	8.00	53.00	38.20
"The education system supports the knowledge for business startups with orientating on the green entrepreneurship"	1.60	12.20	50.40	35.80

Source: Processed by the author

Environmental Citizenship Behavior consists of 6 statements which show that most of the respondents responded agree and strongly agree. Table 2 shows some respondents gave a choice of disagreeing with indicators 1, 2, 4, and 6. It needs to collaborate with stakeholders to foster young people in the social-environmental campagne.

Table 2. Respondent Mapping on Environmental Citizenship Behavior

Indicator	Respondent response scale (percent)			
	1	2	3	4
"Participate in events or meetings that discuss environmental care activities"	5.70	31.70	42.30	20.30
"Engage in spreading knowledge about	1.60	17.90	52.00	28.50

environmental conservation to others"				
"Protecting natural activities"	0.80	1.60	53.70	43.90
"Read articles about the environment"	0.80	17.90	56.90	24.40
"Educate yourself to care about the environment"	0.80	5.70	56.10	37.40
"Following discussions on environmental topics through social media: YouTube, Facebook, or others"	6.50	26.00	47.20	20.30

Source: Processed by the author

Green Entrepreneurship Intention consists of 5 statements where most of the respondents give a response agree and strongly agree. Suitable with Table 3 some respondents disagreed with the effort to think of green entrepreneurship. It may be caused by limited knowledge and behavior so less interest in the green enterprises.

Table 3. Respondent Mapping on Green Entrepreneurship Intention

Indicator	**Respondent response scale (percent)**			
	1	**2**	**3**	**4**
"I am willing to become an entrepreneur who cares about the economic and environmental aspects"	0.80	2.40	50.40	46.30
"My goal is to become an entrepreneur who protects the equality between economic, socio-cultural, and environmental aspects"	0.80	4.10	54.50	40.70
"I will try to start and run a business with a focus on socio-cultural and environmental sustainability"	0.80	4.90	63.40	30.90
"I am seriously thinking about being able to contribute to environmental conservation programs"	0.80	4.10	64.20	30.90
"Some day, I will start a business with a focus on eco-friendly business"	0.80	6.50	52.80	39.80

Source: Processed by the author

The Perceived of Circular Economy consists of 6 statements where the majority of respondents are agreeing and strongly agree. Suitable in Table 4 there are a small number of respondents who give the opposite statement, including the 4th indicator. However. it proves students need the literation of circular economy for the future.

Table 4. Respondent Mapping on Perceived of Circular Economy

Indicator	**Respondent response scale (percent)**			
	1	**2**	**3**	**4**
"CE promotes industry or companies to recycle to save materials and reduce waste"	1.60	0.80	47.20	50.40
"CE encourages industry or companies to use eco-friendly raw materials"	1.60	2.40	48.00	48.80
"CE encourages industry or companies to use eco-friendly packaging"	1.60	0.80	48.80	48.80
"CE encourages industries or companies to create products with long lasting duration"	0.80	5.70	54.50	39.00
"CE pushes industries or companies to reduce pollution or zero waste"	1.60	2.40	47.20	48.80

"CE involves the community and customers in green programs e.g., buying green products, using green packaging, and getting used to reducing, reusing, or recycling"	0.80	1.60	48.80	48.80

Source: Processed by the author

Result of Validity and Reliability Testing. Table 5 illustrates the entire items of validity are over 0.70. The lowest loading value is 0.70726 at ECB-3, while the highest value is 0.91120 at PCE-5. Likewise, the t-statistic value provides information in line with the loading value where the lowest t-statistic value is 9.70873 while the largest score is 32.34660. The 20 indicators are declared valid and acceptable for the next analysis.

Table 5. Results of Validity Testing

Indicator	Validity Item	Discriminant Validity	T-Statistic	Status
ECB1	0.71734	Valid	12.30974	Acceptable
ECB2	0.78372	Valid	18.19025	Acceptable
ECB3	0.70726	Valid	9.70873	Acceptable
ECB4	0.72935	Valid	11.84531	Acceptable
ECB5	0.76487	Valid	12.56333	Acceptable
ECB6	0.79804	Valid	15.16234	Acceptable
GEE1	0.89230	Valid	32.29008	Acceptable
GEE2	0.86253	Valid	17.75185	Acceptable
GEE3	0.80300	Valid	13.45440	Acceptable
GEI1	0.83928	Valid	21.10438	Acceptable
GEI2	0.82063	Valid	21.75149	Acceptable
GEI3	0.85700	Valid	25.96865	Acceptable
GEI4	0.79660	Valid	10.56902	Acceptable
GEI5	0.85620	Valid	25.69539	Acceptable
PCE1	0.90798	Valid	30.09017	Acceptable
PCE2	0.86383	Valid	24.44820	Acceptable
PCE3	0.90879	Valid	32.34660	Acceptable
PCE4	0.72548	Valid	9.92828	Acceptable
PCE5	0.91120	Valid	31.91960	Acceptable
PCE6	0.87243	Valid	22.35875	Acceptable

Source: Processed by the author

Furthermore, reliability testing result identifies the score of composite reliability. These scores are as follows: green entrepreneurship education (0.889), environmental citizenship behavior (0.885), green entrepreneurship intention (0.910), and perceived of circular economy (0.945). Based on these scores are over than 0.70 so fourth contructs fulfills the creteria of reliability. The results of the validity test are in line with the results of bootstrapping where the test results of the inner and outer models show values according to the criteria so that significant and insignificant paths appear. The results are then clarified through the path coefficients.

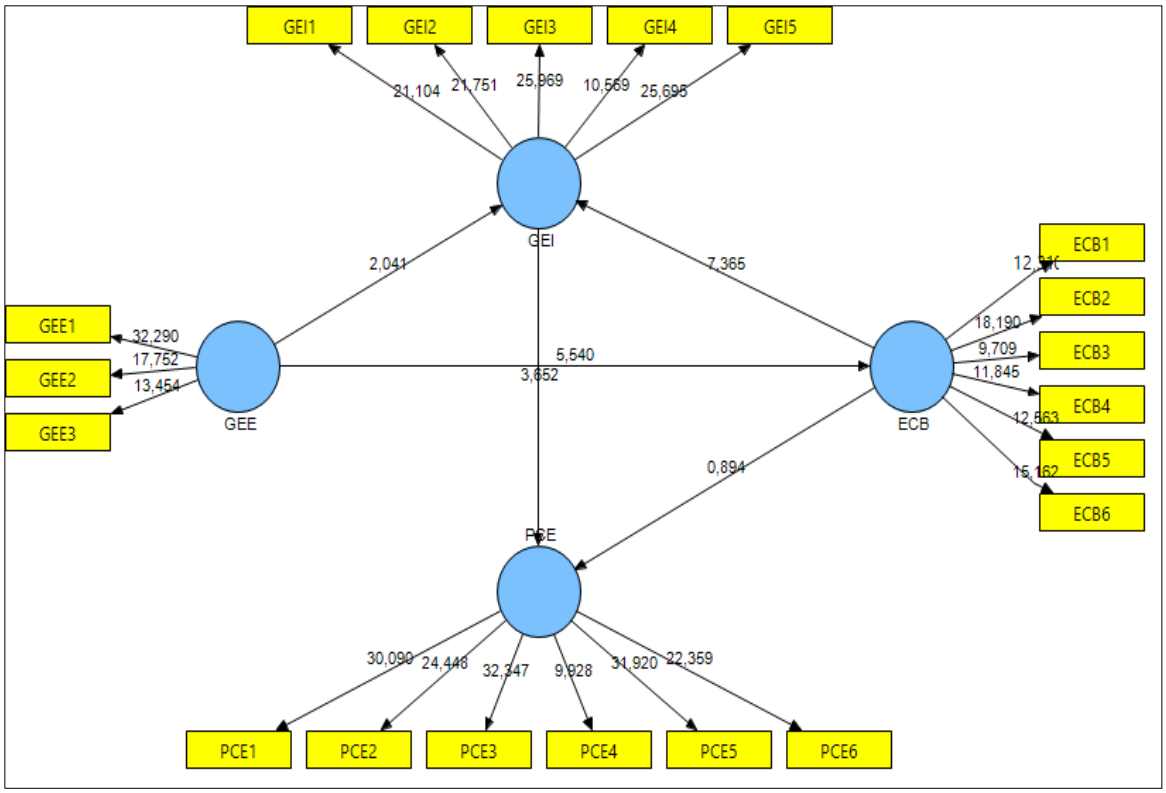


Figure 2. The Result of Bootstrapping
Source: Processed by the author

Figure 2 depicts the interrelation among indicators and constructs which indicates the feasibility of indicators in measuring their construct. Generally, there are similar to the information in Table 5. Besides that. the figure also shows a power to effect between constructs which relate to accepting or rejecting of hypotheses. Based on the value of t-statistics can be elaborated as follows: (1) The position of GEE is constructed by 3 items which are high loading of validity specified in the first indicator while the lowest is in last indicator. (2) The construction of ECB consists of 6 indicators that are valid, however, must take care of indicator number 4. It relates to provide the eco-literation involving campagne in social media about nature protection. (3) The structure of GEI consists of 5 indicators that have good validity. However, to maintain the student's thinking toward green business, indicator number 4 needs to care seriously. It is in order to support the design thinking of students to the eco-friendly business. (4) The study finds good validity among indicators of perceived circular economy with the highest score in the first indicator. Conversely, the lowest is an indicator number 4 so students need to be literated about the alongivity product duration as apart of the circular economy approach. Meanwhile, the figure also illustrates the coefficient between construct which majority resulting in a good score, except in the relationship between ECB and PCE. The formation of green behavior has not yet become a mechanism for understanding the circular economy among students. More information in the testing of the hypothesis is elaborated in the next section. It is as suggestions for further implementation of the mechanisms on understanding the

relationship between green entrepreneurship and circular economy.

Using indicators in measuring constructs align with prior studies such as (1) entrepreneurial education (Denanyoh et al., 2015; Nuringsih et al., 2019). (2) ECBs (Blankenberg & Alhusen, 2019), and (3) entrepreneurial intention (Nuringsih et al., 2019). Meanwhile, the constructing perceived circular economy is explored by authors based on Pla-Julián & Guevara, (2019) combined with other articles. It is a novelty in this study with the composite reliability being 0.945 or reliable.

Table 6 shows the path coefficient among constructs that are used to accept or reject a hypothesis. The results indicate the t-statistic value is 5.538 higher than 1.96 so that the first hypothesis (H1): "There is a significant relationship between Green Entrepreneurship Education and Environmental Citizenship Behavior" is accepted at the 5 percent level. Likewise, H2 produces a t-statistic of 2.040 over than 1.96 so that (H2): "There is a significant relationship between Green Entrepreneurship Education and Green Entrepreneurship Intention" is accepted at the 5 percent level. In H3 it produces a t-statistic of 7.364 higher than 1.96 so that (H3): "There is a significant relationship between Environmental Citizenship Behavior and Green Entrepreneurship Intention" is accepted at the 5 percent level. On the other hand, H4 produces a t-statistic of 0.894 lower than 1.96 so that (H4): "There is a significant relationship between Environmental Citizenship Behavior and the Perceived Circular Economy" cannot be accepted. Finally, the H5 test produces a t statistic of 3.65168 higher than 1.96 so that (H5): "There is a significant relationship between Green Entrepreneurship Intention and Perceived Circular Economy" is accepted at 5 percent. Based on the test results, there are 4 accepted hypotheses while one hypothesis has not been accepted.

Table 6. Path Coefficient of Regression

Path	Coefficient	Deviation Stand.	T-Statistic	Hypothesis
GEE >> ECB	0.51364	0.09272	5.53969	H1*
GEE >> GEI	0.21778	0.10673	2.04048	H2*
ECB >> GEI	0.58254	0.07910	7.36460	H3*
ECB >> PCE	0.12473	0.13952	0.89400	H4
GEI >> PCE	0.53037	0.14524	3.65168	H5*
GEE >> ECB >> GEI	0.29922	0.06799	4.40094	H6*
GEE >> ECB >> PCE	0.06407	0.07373	0.86898	H7
GEE >> GEI >> PCE	0.11550	0.06667	1.73241	H8**

Sign * sig. at 5 percent. ** sig. at 10 percent

Source: Processed by the author

Furthermore, the results of testing the mediation hypothesis are as follows: t-statistic value 4.40094 higher than 1.96 so that the sixth hypothesis (H6): "Environmental Citizenship Behavior significantly mediates the relationship between Green Entrepreneurship Education and Green Entrepreneurship Intention" is accepted at the 5 percent. These results prove that the formation of behavior (ECBs) is statistically able to mediate the relationship between entrepreneurial education and entrepreneurial intention.

Conversely, the mediating ability of ECBs is not like that of other mediators in the following hypothesis. The seventh hypothesis shows a t-statistic of 0.86898 lower than 1.96 so that (H7): "Environmental Citizenship Behavior significantly mediates the

relationship between Green Entrepreneurship Education and the Perceived Circular Economy" cannot be accepted at the 5 percent. This shows that the ECB is not statistically able to mediate the relationship between entrepreneurial education and circular economy.

Lastly, the results in testing of final hypothesis which produces a t-statistic of 1.73241 over 1.645 so that (H8): "Green Entrepreneurship Intention significantly mediates the relationship between Environmental Citizenship Behavior and Perceived Circular Economy" can be accepted at the 10 percent level. It means the entrepreneurship intention mediates the environment behavior and understanding of circular economy.

Concluded six hypotheses are accepted while two hypotheses cannot be accepted. The mechanism through environmental citizenship behavior is not able to influence the understanding circular economy so the existence of ECBs is also unable to mediate the relationship between green entrepreneurship education and the perceived circular economy. However, in the table below shows the magnitude of the correlation with the smallest value of 0.49 or close to 0.50 so it also forms the magnitude of the influence in the research model. More information is as follows.

Table 7. Influence Analysis Between Constructs

Path	Coefficient	Correlation	Impact (percent)
ECB >> GEI	0.58254	0.69441	0.40452 (40.452)
ECB >> PCE	0.12473	0.49302	0.06149 (6.149)
GEE >> ECB	0.51364	0.51364	0.26383 (26.383)
GEE >> GEI	0.21778	0.51700	0.11259 (11.259)
GEI >> PCE	0.53037	0.61698	0.32723 (32.723)

Source: Processed by the author

Based on information can be calculated the value of R^2 on both mediating variables and one dependent variable e.g., Environmental Citizenship Behavior (ECB), Green Entrepreneurship Intention (GEI), and Perceived Circular Economy (PCE). Three are targets of analysis in building a mechanism for the involvement of entrepreneurship learning programs in understanding circular economy. The calculation is as follows:

(1) ECB = f (GEE)	= 26.383 percent		(R^2_1)
(2) GEI = f (ECBs, GEE)	= 40.452 + 11.259	= 51.711 percent	(R^2_2)
(3) PCE = f (ECBs, GEI)	= 6.149 +32.723	= 38.872 percent	(R^2_3)

Following the calculation indicates the Green Entrepreneurship Education affects Environmental Citizenship Behavior with a contribution of 26.38 percent. This relationship generates an R^2 of 26.38 percent. Environmental Citizenship Behavior has the largest contribution of 40.45 percent in forming student intention in green entrepreneurship (GEI), while entrepreneurial education is only 11.25 percent. Therefore, both support R^2 of 51.71 percent. Lastly, when associated with the circular economy, ECBs only affect 6.15 percent while Green Entrepreneurship Education contributes an amount of 32.72 percent, so both supporting R^2 is 38.87 percent. Based on this result indicates that two mechanisms must be seriously considered, namely entrepreneurship education and the formation of eco-friendly behavior among community.

DISCUSSION

The model illustrades the pattern of relationships between variables, so that the majority of hypotheses can prove the relationship from the education system to the formation of a circular economy perception. In general, the pattern of the relationship between entrepreneurial education and entrepreneurial intentions is in line with previous studies in Austria, Ghana, Indonesia, China, and Malaysia e.g., Denanyoh et al., (2015); Kaijun & Sholihah, (2015); Maresch et al., (2016); Othman & Othman, (2019), and (Masri et al., 2021). Regarding green entrepreneurship. this result is the following previous study (Nuringsih & Nuryasman, 2021a. 2021b) which investigated the impact of education support in shaping students' perception of green entrepreneurship at Kulon Progo region, Daerah Istimewa Yogyakarta province. There is harmony between the green economy and the circular economy so that the pattern formed in green entrepreneurship in the previous study can still be analogized when understanding the circular economy among students in urban areas. Thus, entrepreneurial education have role in shaping the behavior of people who care about the environment.

In this case, entrepreneurial education has a big role in the formation of green behavior. Over 25 percent of behavior is affected by education support so pro-environment behavior is a new habit carried out by the community to support a circular economy. Various green campaign programs or socialization of circular economy practices carried out by large companies need to be known by entrepreneurial students. This can be built through industrial collaboration or internships initiated through the MBKM program. Through the way, educational institution also contributes to providing environmental solutions as previously referenced by McEwen, (2013) then also Nuringsih & Hapsari, (2016), and Masjud, (2020). This understanding will foster behaving greenly so generally, it can contribute to keeping the Indonesia of environmental performance index which has experienced an increase in rating compared to previous performance.

Further results also show the linkage in shaping student intentions in green entrepreneurship. Through education begin to form a positive attitude towards entrepreneurship so that it has a positive impact on intentions. The keywords for entrepreneurship are creativity and innovation so that the education process can consider Kainrath's model such as "green innovation, green opportunity, and green commitment" to be implemented in the entrepreneurship learning process. Students need the support of educational institutions in providing knowledge to support innovation capabilities in the green business sector. The expectation is in line with the growing interest in eco-entrepreneurship (Valenrie & Nuringsih, 2021). However, to upgrade the educational ecosystem as weel as green business orientation, the educational institution must improve through providing facilities, motivation or coaching services, and knowledge for preparing the green starup for students. It can be pushed through generating the green curriculum for aliging with the environmental solution.

Moreover, this process will foster an orientation towards green markets among entrepreneurs so that in the long term they can synergize in building environmental performance (Peris, Kamisah, Hasanat, & Hossain, 2020). Collaborating with NGOs such as "Wahana Lingkungan Hidup" (Walhi) can help to literate about environmental sustainability to the millennials or z-generation. It is not impossible to be a potential way

to improve the rating of Indonesia's environment performance index. Intention involves long-term commitment and hard efforts to achieve specific goals. In the intention, there is "a state of mind" so that education can shape the behavior and ways of thinking of students so that interest in green entrepreneurship is formed. Aligning with education the institution should motivate seriously to support the design thinking of students to the eco-friendly business.

The results of the mediation test show that ECB can mediate the relationship between Green Entrepreneurship Education and Green Entrepreneurship Intention. This shows that the ECB is the first target in the process of understanding the circular economy to entrepreneurial students. If this mechanism can be fostered consistently, it will have a good impact on the growth of environmental value among entrepreneurs so that this value can stimulate the growth of interest in building entrepreneurship in a sustainable manner (Peris et al., 2020). Based on these reasons, for boosting the green behavior among the community, stakeholders collaboration held green campagne through social media to involve young adults in nature protection projects. Along with trending nowadays, social media is used to power the sound or message the green behavior among entrepreneurs, educators, Societies, Governments, NGOs, and other practitioners in the related fields.

On the other hand, the second mediation shows that the ECB has not been able to mediate the relationship between Green entrepreneurial education and perceived circular economy. It can be understood that the idea of a circular economy is a new approach to efficient economic development with consideration to reducing the extraction of natural resources. Thus, it is time for entrepreneurial learning to involve the CE to provide insight into the long-term benefits when the circular economy is implemented at the enterprise level. Even with a low level of influence, it is proven that there is a mediating effect of GEI in linking GEE with PCE. This mechanism can be upgraded by giving literation new habits in the circular economy through creating products with long-lasting duration and recycling of the waste. By this moment will impact the saving of natural resources as raw materials and overcome waste problems. This means that it is necessary to culture green values among entrepreneurial students so that a green entrepreneurship mindset is formed so that they can understand how important green business is to achieving the SDGs. This is following (Nuringsih, Nuryasman, et al., 2020) so that from this stage it will have a positive impact on understanding the circular economy.

Low-cost production orientation to produce low-priced products tends to ignore the durability of a product so that they only pursue mass product sales and repurchase of these products. This condition triggers garbages and waste of raw materials so that from the consumer side as well as producers or entrepreneurs must understand the target of the 12th SDGs so that both have a responsibility in consumption and production activities. The wisdom in both will encourage "green and recycle philosophy" so that it will contribute to realizing the earth as a better place for human life and other living creatures created by God Almighty. For realizing this wisdom. green innovation is a medium for directing entrepreneurship to sustainable development. It aligns with study of Galindo-Martín. Castaño-Martínez, & Méndez-Picazo, (2020).

Thus shaping intention becomes the second target in the formation of the perceived circular economy. It shows that TPB is correct and relevant to explain the mechanism in shaping the behavior through attitude, subjective norms, and perceived behavior control.

Through the green curriculum, the education system contributes to encouraging environmental attitudes or awareness on environmental sustainability (Amartha et al., 2019; Atav et al., 2015; Mei et al., 2016), while practicing green activities can support the ability in controlling eco-friendly behavior, so finally the mechanism can motive to respect with green entrepreneurship. Moreover, the concept of CE relates to the pattern of responsible consumption & production so it is relevant to market behavior, (Chaudhary & Bisai, 2018) by using TPB specifically on attitude and perceived behavior control can direct environmental concern to form the purchasing intention then can impact the green buying behavior on the millennial segment. Moreover, this effect also can be analogized through the study of Rusyani, Lavuri, & Gunardi, (2021) in influencing the purchase of eco-sustainable products. Both come from the consumption side so another side needs to be shown by entrepreneurs. TPB facilities these factors so that institutional education needs to collaborate with stakeholders to commit to preserving earth in aligning with practicing startups.

In the end, two mechanisms have not been established in this study related to the influence of the ECB with PCE and the mediating effect of the ECB in linking entrepreneurship education with the PCE. Thus, it is necessary to provide literacy about the circular economy in entrepreneurship education. In line with entrepreneurship learning, an introduction to education about green entrepreneurship can be given as well as an understanding of the circular economy model so that this understanding shapes behavior and interest in green entrepreneurship so lastly can understand the circular economy. If the perceptions that are formed will be in line with (Lahti et al., 2018; Pla-Julián & Guevara, 2019) in concerning the harmony between humans and the environment. It is relevant to achieve the SDGs. therefore this support will efforts to pursue the achievement in 2030.

Finally, this result indicates that two mechanisms must be seriously considered through entrepreneurship education and shaping eco-friendly behavior. Strengthening of both will further foster interest in green entrepreneurship so that students as potential entrepreneurs have a mindset to implement activities in a circular economy including recycling, using environmentally friendly raw materials, saving resources, extending the duration of product utility, as well as collaborating with communities to promote a circular economy. The MBKM program can be synergized with efforts to encourage student experience and knowledge about the circular economy so that industrial cooperation and other collaborations can be utilized by students to find out industry best practices in implementing a circular economy to support the achievement of SDGs 2030.

In the simple explanation, the circular economy is defined as an economic approach with an orientation to "maximize the use and value of raw materials in the production process". This approach emphasizes efforts to extend the cycle of a product to reduce the extraction of natural resources so that the subsequent impact can reduce carbon emissions and waste. Indonesia is considering this approach so that it is possible to become the first country in Southeast Asia to adopt a national strategy on a circular economy that has five priority sectors including food and beverage, textiles, construction, electronics, and wholesale or retail trade. The application of a circular economy has the potential to generate additional gross domestic product, create new jobs, and reduce carbon dioxide (CO^2) emissions by targeting in 2030. Thus, it is not only an economic benefit but this transformation gives a positive impact on environmental preservation.

This is in line with the expectations of a green economy so one mechanism for entrepreneurship education is built through green entrepreneurial intention. Although this study is limited to capturing students' perceptions of the problem of maintaining new economic development based on green entrepreneurship, through this approach, they understand their perspective in overcoming environmental and social problems in society. Thus the education stakeholders can formulate a policy to encourage the student's perspective in real activities in green entrepreneurship.

CONCLUSION

In understanding the relation entrepreneurial education to perceive circular economy. this study finds direct and mediating effects among constructs. The results indicate are as follows: (1) Green entrepreneurship education can affect Environmental Citizenship Behavior (ECB) with a contribution of 26.38 percent so resulting in an R^2 of 26.38 percent. Thus, Green entrepreneurship education has a significant role in shaping the behavior of people who care about the environment. (2) Meanwhile, Environmental Citizenship Behavior has the largest contribution of 40.45 percent to encourage student interest in green entrepreneurship while Green Entrepreneurship Education is only 11.25 percent. resulting in an R^2 of 51.71 percent. Hence, the ECB can mediate the relationship between Green Entrepreneurship Education and Green Entrepreneurship Intention. (3) However, when associated with the circular economy. ECBs have an effect of 6 percent while Green Entrepreneurship Intention is 32.72 percent, so resulting in R^2 as many as 38.87 percent. However, ECB can not impact a perceived circular economy and can not mediate the relation between green entrepreneurial education and perceived circular economy. Therefore. it needs a literacy of circular economy as a mechanism to enrich knowledge in entrepreneurship education programs.

Limitation: The limitation of the research relates to the number of respondents who filled out the answers completely and fairly. Among the respondents filled out the google form in an original way in determining the answer so that it could only retain 123 respondents from 200 target respondents. Moreover, the circular economy is considered new among students so it has not fully become a part of learning in development economics courses for some students in the economics and business faculty. When asked if you've ever heard of a circular economy? It was recorded that only 26 percent of respondents stated that they had heard or knew the term while 74 percent stated that they were not familiar with this term. This is understandable because the circular economy is new information so it is necessary to develop literacy about the circular economy for students. In line with the more intensive socialization about the green economy and green entrepreneurship, it is hoped that it will foster curiosity about the circular economy to build awareness of seeking literacy about the economic model.

Managerial Implementation: This result only captures perceptions among students about the mechanism for growing society behavior towards the environment so that in the future it can encourage intentions for environmentally friendly businesses and finally they will be more understanding the circular economy. This perception is built from the student's

lens. However, this information can be applied in entrepreneurship learning or as projects in the MBKM's programs such as real work lectures, rural area development programs, industrial internships, research with lecturers, student exchanges, or others. Through this approach, students gain new knowledge and experience related to green entrepreneurship and the circular economy, so at least they help the government socialize the SDGs to the community and participate in achieving of SGDs in 2030.

Further Research Suggestions: This modeling produces R^2 on ECBs of 26.38 percent then R^2 of 51.71 percent on green entrepreneurship intention and R^2 of 38.87 percent on the perceived circular economy. Thus, there are still many factors that influence the model above. so it is necessary to consider other factors that correlate with these three aspects, for example (1) involving role models or influencers in Indonesia who can inspire ECBs for Millennials or the next generation. It is an improvement of the elements from TPB in fostering intentions through social norms. (2) Adding circular economic literacy to increase positive perceptions of the circular economy. It will contribute to promoting the perceived behavior control in shaping the intention in green entrepreneurship.

REFERENCES

Abina, M., Oyeniran, I., & Onikosi-Alliyu, S. (2015). Determinants of Eco Entrepreneurial Intention among Students: A Case Study of University Students in Ilorin and Malete. *Ethiopian Journal of Environmental Studies and Management*, *8*(1), 107–112. https://doi.org/10.4314/ejesm.v8i1.10

Amartha, M. Y., Hamzah, U. S., & Herdiansyah, H. (2019). Application of Environmental Awareness and Environmental Management System towards Behavior at Palm Cooking Oil Company, Bekasi City. *Journal of Physics: Conference Series*, *1424*, 1–7. https://doi.org/10.1088/1742-6596/1424/1/012051

Atav, E., Altunoğlu, B. D., & Sönmez, S. (2015). The Determination Of The Environmental Attitudes Of Secondary Education Students. *Procedia - Social and Behavioral Sciences*, *174*, 1391–1396. https://doi.org/10.1016/j.sbspro.2015.01.765

Bamberg, S., & Rees, J. (2015). Environmental Attitudes And Behavior: Measurement. In J. D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences* (2nd ed., pp. 699–705). Oxford: Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.91066-3

Belz, F. M., & Binder, J. K. (2017). Sustainable Entrepreneurship: A Convergent Process Model. *Business Strategy and the Environment*, *26*(1), 1–17. https://doi.org/10.1002/bse.1887

Blankenberg, A.-K., & Alhusen, H. (2019). *On The Determinants of Pro-Environmental Behavior: A Literature Review and Guide for The Empirical Economist* (Center for European, Governance and Economic Development Research No. 350). Retrieved from https://www.econstor.eu/bitstream/10419/204821/1/DP350a.pdf

Chaudhary, R., & Bisai, S. (2018). Factors Influencing Green Purchase Behavior of Millennials In India. *Management of Environmental Quality: An International Journal*, *29*(5), 798–812. https://doi.org/10.1108/MEQ-02-2018-0023

Denanyoh, R., Adjei, K., & Nyemekye, G. E. (2015). Factors That Impact on

Entrepreneurial Intention of Tertiary Students in Ghana. *International Journal of Business and Social Research*, *5*(3), 19–29. Retrieved from https://thejournalofbusiness.org/index.php/site/article/view/693

Dong, Y., & Hauschild, M. Z. (2017). Indicators for Environmental Sustainability. *Procedia CIRP*, *61*, 697–702. https://doi.org/10.1016/j.procir.2016.11.173

Elkington, J. (2013). *The Triple Bottom Line*. (A. Henriques & J. Richardson, Eds.), *ES_TBL* (Vol. 7). Routledge. https://doi.org/10.4324/9781849773348

Farinelli, F., Bottini, M., Akkoyunlu, S., & Aerni, P. (2011). Green Entrepreneurship: The Missing Link Towards A Greener Economy. *ATDF Journal*, *8*(3/4), 42–48.

Galindo-Martín, M.-A., Castaño-Martínez, M.-S., & Méndez-Picazo, M.-T. (2020). The Relationship between Green Innovation, Social Entrepreneurship, and Sustainable Development. *Sustainability*, *12*(11), 4467. https://doi.org/10.3390/su12114467

Gevrenova, T. (2015). Nature and Characteristics of Green Entrepreneurship. *Trakia Journal of Science*, *13*(Suppl.2), 321–323. https://doi.org/10.15547/tjs.2015.s.02.068

Heshmati, A. (2015). *A Review of the Circular Economy and its Implementation*. *International Journal of Green Economics* (Vol. 9611). Born. https://doi.org/10.1504/IJGE.2017.10010876

Kaijun, Y., & Sholihah, P. I. (2015). A Comparative Study of The Indonesia and Chinese Educative Systems Concerning The Dominant Incentives to Entrepreneurial Spirit (Desire for A New Venturing) of Business School Students. *Journal of Innovation and Entrepreneurship*, *4*(1), 1. https://doi.org/10.1186/s13731-014-0014-0

Kainrath, D. (2009). *Ecopreneurship in Theory and Practice - A Proposed Emerging Framework for Ecopreneurship*. *Student Umeå School of Business*. Student Umea School of Business.

Koe, W.-L., Omar, R., & Majid, I. A. (2014). Factors Associated With Propensity For Sustainable Entrepreneurship. *Procedia - Social and Behavioral Sciences*, *130*, 65–74. https://doi.org/10.1016/j.sbspro.2014.04.009

Koe, W.-L., Omar, R., & Sa'ari, J. R. (2015). Factors Influencing Propensity to Sustainable Entrepreneurship of SMEs in Malaysia. *Procedia - Social and Behavioral Sciences*, *172*, 570–577. https://doi.org/10.1016/j.sbspro.2015.01.404

Kotchen, M. J. (2009). Some Microeconomics of Eco-Entrepreneurship. In G. D. Libecap (Ed.), *Frontiers in Eco-Entrepreneurship Research* (20th ed., pp. 25–37). Emerald Books.

Lahti, T., Wincent, J., & Parida, V. (2018). A Definition and Theoretical Review of the Circular Economy, Value Creation, and Sustainable Business Models: Where Are We Now and Where Should Research Move in the Future? *Sustainability*, *10*(8), 2799. https://doi.org/10.3390/su10082799

Lotfi, M., Yousefi, A., & Jafari, S. (2018). The Effect Of Emerging Green Market On Green Entrepreneurship And Sustainable Development In Knowledge-Based Companies. *Sustainability*, *10*(7), 2308–2325. https://doi.org/10.3390/su10072308

Maresch, D., Harms, R., Kailer, N., & Wimmer-Wurm, B. (2016). The Impact of Entrepreneurship Education on The Entrepreneurial Intention of Students in Science and Engineering Versus Business Studies University Programs. *Technological Forecasting and Social Change*, *104*, 172–179. https://doi.org/10.1016/j.techfore.2015.11.006

Markle, G. L. (2013). Pro-Environmental Behavior: Does It Matter How It's Measured? Development and Validation of the Pro-Environmental Behavior Scale (PEBS). *Human Ecology*, *41*(6), 905–914. https://doi.org/10.1007/s10745-013-9614-8

Masjud, Y. I. (2020). Ecopreneurship as A Solution to Environmental Problems: Implications for University Entrepreneurship Education. *Journal of Environmental Scinece and Sustainable Development*, *3*(1), 97–113. https://doi.org/10.7454/jessd.v3i1.1041

Masri, N., Abdullah, A., Asimiran, S., & Zaremohzzabieh, Z. (2021). Relationship between Engagement in Learning Entrepreneurship Education and Entrepreneurial Intention among Vocational College Students. *Pertanika Journal of Science and Technology*, *29*(S1), 19–38. https://doi.org/10.47836/pjssh.29.s1.02

Mathur, S., & Tandon, N. (2016). Green Entrepreneurship: The Emerging Paradigm For Sustainable Growth And Development In India- A Study Of the Millennials. *Indian Journal of Science and Technology*, *9*(45), 1–11. https://doi.org/10.17485/ijst/2015/v8i1/106753

Mayoshe, B., & Nuringsih, K. (2021). Understanding Entrepreneurial Passion Among New Entrepreneurs. In *Proceedings of the International Conference on Economics, Business, Social, and Humanities (ICEBSH 2021)* (Vol. 570, pp. 251–257). Atlantis Press. https://doi.org/10.2991/assehr.k.210805.040

McEwen, T. (2013). Ecopreneurship As A Solution To Environmental Problems: Implications For College Level Entrepreneurship Education. *International Journal of Academic Research in Business and Social Sciences*, *3*(5), 264–288.

Meerah, T. S. M., Halim, L., & Nadeson, T. (2010). Environmental Citizenship: What Level Of Knowledge, Attitude, Skill And Participation The Students Own? *Procedia - Social and Behavioral Sciences*, *2*, 5715–5719. https://doi.org/10.1016/j.sbspro.2010.03.933

Mei, N. S., Wai, C. W., & Ahamad, R. (2016). Environmental Awareness and Behaviour Index for Malaysia. *Procedia - Social and Behavioral Sciences*, *222*, 668–675. https://doi.org/10.1016/j.sbspro.2016.05.223

Mi, L., Xu, T., Gan, X., Chen, H., Qiao, L., & Zhu, H. (2019). How to Motivate Employees' Environmental Citizenship Behavior through Perceived Interpersonal Circle Power? A New Perspective from Chinese Circle Culture. *Sustainability*, *11*(17), 4549–4564. https://doi.org/10.3390/su11174549

Nuringsih, K., & Hapsari, C. G. (2016). Mendorong Spirit Eco Entrepreneurship Di Kalangan Mahasiswa. In *Seminar Nasional Kewirausahaan & Inovasi Bisnis* (pp. 407–418). Fakultas Ekonomi Universitas Tarumanagara.

Nuringsih, K., & Nuryasman., M.N. (2020). Propensity For Sustainable Entrepreneurship of MSEs Owner In Yogyakarta, Indonesia. In W. Suparta (Ed.), *Urban Development and Lifestyle* (pp. 131–140). New York: Nova Science Publisher.

Nuringsih, K., & Nuryasman, M.N. (2021a). The Role of Education in Sustaining Environmental Sustainability at Rural Region in Yogyakarta. In *Proceedings of the International Conference on Economics, Business, Social, and Humanities (ICEBSH 2021)* (Vol. 570, pp. 16–22). Atlantis Press. https://doi.org/10.2991/assehr.k.210805.003

Nuringsih, K., & Nuryasman, M.N. (2021b). The Role of Green Entrepreneurship in

Understanding Indonesia Economy Development Sustainability among Young Adults. *Studies of Applied Economics*, *39*(12), 1–14. https://doi.org/10.25115/eea.v39i12.6021

Nuringsih, K., Nuryasman, M.N., & Amelinda, R. (2020). The Propensity for Social Entrepreneurship During the Coronavirus Outbreak. *Jurnal Manajemen*, *24*(2), 174–193. https://doi.org/10.24912/jm.v24i2.637

Nuringsih, K., Nuryasman, M.N., Prasodjo, I., & Amelinda, R. (2019). Sustainable Entrepreneurial Intention: The Perceived of Triple Bottom Line among Female Students. *Jurnal Manajemen*, *23*(2), 168–190. https://doi.org/10.24912/jm.v23i2.472

Nuringsih, K., Nuryasman, M.N., & Jenifer. (2020). Role of Green Entrepreneurship in Raising the Effect of Green Value Toward Sustainable Development. *International Journal of Economics, Business, and Entrepreneurship*, *3*(2), 29–46. https://doi.org/10.23960/ijebe.v3i2.69

Nuringsih, K., & Puspitowati, I. (2017). Determinants of Eco Entrepreneurial Intention Among Students: Study in the Entrepreneurial Education Practices. *Advanced Science Letters*, *23*(8), 7281–7284. https://doi.org/10.1166/asl.2017.9351

Othman, N. H., & Othman, N. (2019). A Systematic Review on Entrepreneurship Education in Higher Learning Institutions in Southeast Asia. *Universal Journal of Educational Research*, *7*(11), 2406–2416. https://doi.org/10.13189/ujer.2019.071118

Peris, S. F., Kamisah, S., Hasanat, M. W., & Hossain, M. N. (2020). A Mediating Effect of Green Market Orientation on the Environmental Performance: From a Literature Review to a Conceptual Framework. *Journal of Management Info*, *7*(2), 92–118. https://doi.org/10.31580/jmi.v7i2.1421

Pla-Julián, I., & Guevara, S. (2019). Is Circular Economy The Key To Transitioning Towards Sustainable Development? Challenges from The Perspective of Care Ethics. *Futures*, *105*, 67–77. https://doi.org/10.1016/j.futures.2018.09.001

Romanowski, R., & Gnusowski, M. (2019). Green Entrepreneurship in The Quintaple Helix Model. In R. Romanowski (Ed.), *Managing Economic Innovations – Ideas and Institutions* (pp. 103–118). Poznan: Bogucki Wydawnictwo Naukowe. https://doi.org/10.12657/9788379862764-7

Ruiz-Real, J. L., Uribe-Toril, J., Valenciano, J. D. P., & Gázquez-Abad, J. C. (2018). Worldwide Research on Circular Economy and Environment: A Bibliometric Analysis. *International Journal of Environmental Research and Public Health*, *15*(12), 2699. https://doi.org/10.3390/ijerph15122699

Rusyani, E., Lavuri, R., & Gunardi, A. (2021). Purchasing Eco-Sustainable Products: Interrelationship Between Environmental Knowledge, Environmental Concern, Green Attitude, And Perceived Behavior. *Sustainability*, *13*(9), 46014612. https://doi.org/10.3390/su13094601

Sudyasjayanti, C. (2017). The Green Behavior Differences Of Green Entrepreneur Intentions Among Male And Female Students. *International Journal of Academic Research in Business and Social Sciences*, *7*(12), 1326–1335. https://doi.org/10.6007/IJARBSS/v7-i12/3786

Suparta, W., & Yatim, A. N. M. (2019). Characterization of Heat Waves: A Case Study for Peninsular Malaysia. *Geographia Technica*, *14*(1), 146–155. https://doi.org/10.21163/GT_2019.141.11

Uslu, Y. D., Hancıoğlu, Y., & Demir, E. (2015). Applicability To Green Entrepreneurship In Turkey: A Situation Analysis. *Procedia - Social and Behavioral Sciences*, *195*, 1238–1245. https://doi.org/10.1016/j.sbspro.2015.06.266

Valenrie, V., & Nuringsih, K. (2021). Fostering Eco-Entrepreneurial Intention Among Students. In *Proceedings of the International Conference on Economics, Business, Social, and Humanities (ICEBSH 2021)* (Vol. 570, pp. 985–992). Jakarta: Atlantis Press. https://doi.org/10.2991/assehr.k.210805.155

Wendling, Z. ., Emerson, J. ., Esty, D. C., Levy, M. A., Kim, C. H., de Sherbinin, A., … Jaiteh, M. (2020). *Global Metrics for The Environment: Ranking Country Performance on Sustainability Issues*. (W. E. Dornbos, Ed.), *Environmental Performance Index 2020*. Yale Center for Environmental Law & Policy.

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