
Green Entrepreneurship: The Role of Sandwich Generation Intentions through Entrepreneurial Orientation and SDGs Literacy

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Abstract:

This study aims to analyse the role of the sandwich generation's intentions in shaping green entrepreneurship through entrepreneurial orientation and Sustainable Development Goals (SDGs) literacy in Deli Serdang Regency. The research approach used a quantitative method with a survey of the sandwich generation running micro and small businesses, and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The results showed that entrepreneurial orientation and SDGs literacy had a significant influence on the formation of green entrepreneurship, while entrepreneurial intention acted as a mediator in strengthening this relationship. These findings emphasise the importance of developing entrepreneurial orientation and understanding of SDGs as strategies to encourage environmentally friendly business practices among the sandwich generation. This study provides practical implications for the government, educational institutions, and business actors in designing training and education programmes that support sustainable entrepreneurship.

Keywords: *Green Entrepreneurship, Entrepreneurial Intentions, Entrepreneurial Orientation, SDGs Literacy, Sandwich Generation*

Submitted: September 24, 2025, Accepted: October 23, 2025, Published: November 1, 2025

1. Introduction

Entrepreneurship plays a vital role in economic growth and job creation (Akinsemolu, 2025; Alvarez-Risco et al., 2021). Globally, entrepreneurship is not only viewed as an economic activity but also as a strategic instrument for achieving social welfare and environmental sustainability (Akkuş & Çaliyurt, 2022; Aurellia & Nuringsih, 2023). In line with the Sustainable Development Goals (SDGs) 2030 agenda, environmental sustainability has become a priority alongside economic and social dimensions, as highlighted in the triple bottom line theory (Neumann, 2022). Entrepreneurs contribute to the realization of the SDGs by diversifying their roles beyond economic

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profit to include social and environmental objectives (Fathoni et al., 2022; Firman et al., 2023; Yanti, 2024).

Climate change poses a significant global challenge, triggering disasters such as droughts, heat waves, floods, and rising sea levels that threaten human welfare (Gunawan & Lubis, 2022; Habib et al., 2020; Hussain et al., 2021). Addressing these challenges requires cross-sectoral collaboration to mitigate environmental degradation and promote sustainable social welfare (Akinsemolu, 2025; Neumann, 2022; Wang et al., 2021). Implementing sustainability values through education, innovation, and green technology is therefore crucial to support the transition toward a green economy and environmentally responsible communities (Soomro et al., 2024; Ye et al., 2022).

Efforts to accelerate the 2030 SDGs are also reflected through the strengthening of the green economy and the incorporation of eco-entrepreneurship education within universities (Fanea-Ivanovici & Baber, 2022; Marchel & Nuringsih, 2020). Higher education institutions play a catalytic role in shaping young people's awareness of developing business models aligned with sustainability principles (Koe et al., 2020; United Nations, 2020). Integrating entrepreneurship curricula with SDGs literacy enables students to understand green entrepreneurship as a viable solution to environmental and social problems, thereby fostering their interest in sustainable entrepreneurship (Aurellia & Nuringsih, 2023; Mrkajic et al., 2019).

In the social context, the term "sandwich generation" refers to individuals who are financially responsible for both their parents and children. This dual financial burden limits their ability to save and invest for long-term stability (Nuryasman & Elizabeth, 2023; Yanti, 2020). Rising living costs, loan repayments, and financial obligations intensify the stress experienced by this generation. Therefore, empowering the sandwich generation through financial literacy and sustainable entrepreneurial orientation is essential for improving their economic resilience and independence (Akinsemolu, 2025; Rashid et al., 2019).

Behavioral change toward green entrepreneurship requires individuals to be proactive, innovative, and risk-aware in responding to environmental transitions (Hussain et al., 2021; Koe et al., 2020). Prior studies highlight that risk propensity and entrepreneurial orientation have mediating effects on sustainable development (Gunawan & Lubis, 2022; Neumann, 2022; Ye et al., 2022). The interconnection between these elements is crucial for fostering sustainable and environmentally conscious entrepreneurial intentions among younger generations (Aurellia & Nuringsih, 2023; Muangmee et al., 2021).

Literacy is a fundamental factor enabling individuals to comprehend the world around them, recognize environmental challenges, and actively participate in social and economic development (Fanea-Ivanovici & Baber, 2022; Firman et al., 2023). Communities with high literacy levels tend to enjoy better employment opportunities, healthier lives, and higher economic well-being (Akinsemolu, 2025; Wang et al., 2021). In this regard, SDGs literacy can promote ecological awareness and enhance

the motivation of young people to become Green Entrepreneurs who integrate sustainability into their business decisions (Rahman et al., 2021; Zhang et al., 2024). Entrepreneurs serve as agents of change who drive innovation and national progress by identifying opportunities and utilizing resources efficiently (Habib et al., 2020; Soomro et al., 2024). With technological advancement and digital transformation, the opportunities for entrepreneurship are expanding rapidly for individuals with the vision and capacity to identify and capitalize on environmentally friendly business opportunities (Aurellia & Nuringsih, 2023; Mrkajic et al., 2019). This emphasizes the importance of developing entrepreneurial competencies aligned with global sustainability goals.

Entrepreneurial literacy is equally important in shaping one's understanding of entrepreneurship through positive, creative, and innovative characteristics that transform opportunities into profitable ventures benefiting both individuals and society (Zuriani Ritonga et al., 2022). Adequate literacy enables individuals to contribute to the green economy by fostering innovation and creating new employment opportunities that support sustainable development (Akinsemolu, 2025; Neumann, 2022).

Based on these phenomena, this study focuses on two main issues: (1) the acceleration of the 2030 SDGs through the green economy, and (2) the limited number of young people, particularly those in the sandwich generation, engaging in green entrepreneurship. The urgency of this study lies in understanding how the entrepreneurial intentions of the sandwich generation can be directed through green entrepreneurship orientation and SDGs literacy (Fathoni et al., 2022; Rashid et al., 2019). The novelty of this research lies in its focus on students who belong to the sandwich generation and the use of SDGs literacy as a variable influencing sustainable green entrepreneurial intention. By maximizing the potential of the younger generation to become Green Entrepreneurs, this study aims to contribute to community economic development and the achievement of the Sustainable Development Goals (Zhang et al., 2024).

2. Theoretical Background

Green Entrepreneurship

Green entrepreneurship is a form of entrepreneurship that integrates environmental sustainability principles into all aspects of business operations, including planning, production, and marketing (Akinsemolu, 2025; Hameed et al., 2018). Green entrepreneurs do not solely focus on financial gain but also contribute to maintaining ecological balance and achieving the Sustainable Development Goals (SDGs) (Akkuş & Çaliyurt, 2022; Neumann, 2022). This approach aligns with the triple bottom line concept, which emphasizes the importance of balancing economic, environmental, and social dimensions (Fathoni et al., 2022; Rashid et al., 2019).

Empirical evidence demonstrates that the implementation of green entrepreneurship contributes significantly to environmentally friendly product innovation and enhances

a company's image in the eyes of consumers (Ye et al., 2022; Soomro et al., 2024; Zhang et al., 2024). Furthermore, studies indicate that green entrepreneurship fosters competitive advantage and sustainability performance among small and medium-sized enterprises (SMEs) (Habib et al., 2020; Wang et al., 2021). Green entrepreneurship is also viewed as an effective strategy for mitigating environmental degradation and promoting inclusive economic growth (Aurellia & Nuringsih, 2023; Mrkajic et al., 2019). Through innovation and the adoption of eco-friendly practices, green entrepreneurs help achieve global sustainability targets (United Nations, 2020).

The Sandwich Generation and Entrepreneurial Intention

The "sandwich generation" refers to adults who simultaneously bear financial and emotional responsibilities for their parents and children (Nuryasman & Elizabeth, 2023; Yanti, 2020). This dual burden often limits their capacity to save and invest, which can negatively impact financial stability and personal well-being (Rashid et al., 2019). However, this generation also possesses a strong motivation for entrepreneurship as a means of achieving financial independence and work-life balance (Akinsemolu, 2025).

Entrepreneurial intention serves as a primary psychological determinant that drives individuals to start and manage new ventures, including sustainability-oriented businesses (Ajzen, 1991; Koe et al., 2020). Research has shown that individuals with strong entrepreneurial intentions exhibit higher levels of commitment and perseverance in implementing green entrepreneurial practices (Hussain et al., 2021; Gunawan & Lubis, 2022). Moreover, environmental awareness and personal responsibility act as mediating factors that strengthen the relationship between entrepreneurial intention and sustainable business engagement (Aurellia & Nuringsih, 2023; Fanea-Ivanovici & Baber, 2022). Therefore, fostering entrepreneurial intentions within the sandwich generation can play a strategic role in supporting both household economic stability and sustainable development.

Entrepreneurial Orientation (EO)

Entrepreneurial Orientation (EO) describes the behavioral and strategic posture of entrepreneurs in terms of innovativeness, proactiveness, and risk-taking (Lumpkin & Dess, 1996; Hameed et al., 2018). EO reflects an entrepreneur's capacity to explore new opportunities, create value, and respond dynamically to market changes (Koe et al., 2020; Muangmee et al., 2021). A high level of EO enhances the ability to identify and exploit green business opportunities, resulting in environmentally friendly innovations and stronger competitive positioning (Ye et al., 2022; Zhang et al., 2024). Empirical studies suggest that EO positively influences green entrepreneurship, particularly when supported by sustainability literacy and organizational learning (Rahman et al., 2021; Soomro et al., 2024). Entrepreneurs with strong EO tend to incorporate sustainable innovation into their business models, improving both financial performance and ecological outcomes (Neumann, 2022; Wang et al., 2021). In the context of the sandwich generation, EO can empower individuals to transform financial and familial challenges into entrepreneurial opportunities that align with sustainability principles (Akinsemolu, 2025; Fathoni et al., 2022).

SDG Literacy

SDG literacy refers to an individual's understanding of the United Nations' Sustainable Development Goals (SDGs), encompassing environmental, social, and economic aspects (United Nations, 2020). It represents the ability to integrate sustainability concepts into personal, professional, and business practices (Akinsemolu, 2025; Fanea-Ivanovici & Baber, 2022). SDG literacy enables entrepreneurs to design business strategies that are not only profitable but also socially responsible and environmentally sustainable (Fathoni et al., 2022; Zhang et al., 2024). Research shows that SDG literacy enhances awareness and capacity to implement green entrepreneurial practices effectively (Rahman et al., 2021; Ye et al., 2022). Higher SDG literacy among entrepreneurs leads to greater innovation, ethical decision-making, and long-term sustainability commitment (Aurellia & Nuringsih, 2023; Neumann, 2022). Universities play a crucial role in cultivating SDG literacy through entrepreneurship education, as this promotes sustainable behavior and prepares students to become responsible green entrepreneurs (Fanea-Ivanovici & Baber, 2022; Marchel & Nuringsih, 2020).

3. Methodology

This study employed a mixed-method approach that combines quantitative and qualitative research within a single, integrated framework. The use of mixed methods allows for a comprehensive understanding of the research problem by collecting, analysing, and interpreting both numerical and descriptive data. This approach was designed to ensure that the results obtained are valid, reliable, and objective while providing a holistic perspective on the topic. The design adopted in this study was an explanatory sequential design, in which quantitative data collection and analysis were conducted first, followed by qualitative exploration to provide deeper insights into the quantitative findings.

The research respondents consisted of individuals belonging to the sandwich generation in Deli Serdang Regency. These respondents are economically responsible for two generations simultaneously—their parents and their children—and possess an interest or potential in entrepreneurial activities. The characteristics of the population included individuals of productive age (approximately 20–35 years), those who are micro-entrepreneurs or aspiring entrepreneurs, people who bear the financial burden of both upper and lower family members, and residents of the Deli Serdang Regency area.

The sampling technique used was purposive sampling, which involves selecting participants based on specific criteria relevant to the research objectives. The selected samples were micro, small, and medium enterprise (MSME) entrepreneurs in Medan City who had operated their businesses for at least two years, maintained either formal or simple financial records, and were female business owners. These criteria were established to ensure that the respondents had sufficient experience and contextual understanding of entrepreneurship and sustainability.

Data collection was conducted using both quantitative and qualitative methods. For the quantitative phase, data were obtained through a structured questionnaire designed to measure variables related to green entrepreneurship, entrepreneurial orientation, SDG literacy, and the entrepreneurial intentions of the sandwich generation in Deli Serdang Regency. The data collected were used to identify patterns, test hypotheses, and evaluate relationships among the research variables.

For the qualitative phase, in-depth interviews were conducted with selected participants to gain deeper insights into the factors influencing entrepreneurial intentions and sustainable business orientation. The qualitative data served to clarify and enrich the quantitative results, providing contextual understanding of the motivations and challenges experienced by the sandwich generation in pursuing green entrepreneurship.

The quantitative data were analysed using Partial Least Squares–Structural Equation Modelling (PLS-SEM). This analytical technique enables the testing of relationships between latent variables and the evaluation of complex causal models. PLS-SEM is particularly suitable for predictive and exploratory studies, as it can assess both measurement and structural models without requiring strict data distribution assumptions. The analysis was carried out using WarpPLS software, which allowed for simultaneous testing of the outer (measurement) model and the inner (structural) model.

Meanwhile, qualitative data were analysed through an iterative process involving data reduction, data display, and conclusion drawing or verification. These stages were carried out continuously and interactively until the data reached a point of saturation, ensuring that the findings accurately reflected the participants' experiences and perspectives. The integration of both quantitative and qualitative findings in this study provided a comprehensive understanding of how entrepreneurial orientation and SDG literacy influence the green entrepreneurship intentions of the sandwich generation.

4. Empirical Findings/Results

Outer Model Test

Convergent Validity

According to (1), predictors or items are considered valid if the factor loading value is > 0.7 . From the analysis results using the calculate-PLS algorithm, it was found that several indicators had a factor loading value < 0.7 , so they were eliminated. Having an Outer Loadings value < 0.7 means that the convergent validity requirement has not been met, so cleaning must be carried out by removing the indicator. After deleting the indicators with a loading factor < 0.7 , retesting was carried out. After testing until all indicator Outer Loadings values were > 0.7 .

Average Variance Extracted (AVE)

A construct can be considered valid if it has an AVE value > 0.5 .

Table 1. Composite Reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average Variance Extracted (AVE)
Entrepreneurial Orientation (EO)	0.896	0.904	0.914	0.542
Green Entrepreneurial	0.918	0.921	0.933	0.606
SDG Literacy	0.889	0.901	0.907	0.521
Entrepreneurial Intentions	0.914	0.925	0.930	0.603

Cronbach Alpha, Average Variance Extracted (AVE) Based on Table 1 above, it can be seen that all constructs have an AVE value > 0.5, which means that each indicator has a valid construct.

Discriminant Validity

Discriminant validity is a stage conducted to determine whether the variables or indicators in the study have unique values and are only related to their own variables or indicators, and not to variables or indicators outside of those expected. A study is said to have good discriminant validity if the Fornell-Larcker criterion value, which is the root of the AVE in the construct, is higher than the correlation of the construct with other latent variables.

Table 2. Fornell-Larcker Criterion Values

	Entrepreneurial Orientation (EO)	Green Entrepreneurial	SDG Literacy	Entrepreneurial Intentions
Entrepreneurial Orientation (EO)	0.737			
Green Entrepreneurship	0.720	0.779		
SDG Literacy	0.694	0.816	0.722	
Entrepreneurial Intentions	0.715	0.580	0.708	0.777

From Table 2, it can be seen that the AVE root for all variables is greater than its correlation with other variables. Therefore, it can be concluded that this study has good discriminant validity.

Composite Reliability

Composite Reliability is used to test the reliability of each indicator in the study. A variable can be said to be reliable if it has a composite reliability value > 0.7. Table 1 shows that all indicators in this study have good reliability because the Composite Reliability value is > 0.7.

Cronbach's Alpha

In addition to Composite Reliability, another way to determine reliability in research indicators is by looking at the Cronbach Alpha value. An instrument or questionnaire is

said to be reliable if the Cronbach's Alpha value is greater than 0.6. From Table 1, it can be seen that each construct has good reliability because the Cronbach's Alpha value is greater than 0.6.

Inner Model Test

R-Square

The R-Square value is used to see how much the independent variable can explain the dependent variable. Based on Table 10, it can be seen that the R-Square value of Green Entrepreneurial is 0.729 or 72.9% and the R-Square value of Entrepreneurial Intention is 0.511 or 51.1%. From these figures, it can be categorised that the dependent variable can be explained by the independent variable on a moderate scale.

Table 3. R-Square

	R-square	Adjusted R-square
Green Entrepreneurship	0.729	0.718
Entrepreneurial Intentions	0.511	0.506

F-Square

The F-Square value indicates the strength of the influence of exogenous latent variables on endogenous latent variables, where an F-Square value < 0.02 indicates no influence, a value between 0.02 and 0.15 indicates a small influence, a value between 0.15 and 0.35 indicates a medium influence, and a value > 0.35 indicates a large influence.

Table 4. F-Square

	f-square
Entrepreneurial Orientation (EO) $\rightarrow$ Green Entrepreneurial	0.193
Entrepreneurial Orientation (EO) $\rightarrow$ Entrepreneurial Intentions	1.044
SDG Literacy -> Green Entrepreneurial	0.591
Entrepreneurial Intent -> Green Entrepreneurial	0.049
SDGs Literacy x Entrepreneurial Orientation (EO) $\rightarrow$ Green Entrepreneurship	0.028

The F-Square value:

1. The Entrepreneurial Orientation (EO) variable has a medium effect on Green Entrepreneurship, with a value of 0.193.
2. The Entrepreneurial Orientation (EO) variable has a significant effect on Entrepreneurial Intentions, with a value of 1.044.
3. The SDGs Literacy variable has a significant effect on Green Entrepreneurship, with a value of 0.591.
4. The Entrepreneurial Intention variable has a small effect on Green Entrepreneurship, with a value of 0.049.
5. The SDGs Literacy x Entrepreneurial Orientation (EO) variable on Green Entrepreneurship is 0.028, indicating a small effect.

Hypothesis Testing

Hypothesis testing was conducted by examining the path coefficient and p-value obtained through the bootstrapping process with an alpha of 0.05 (see Table 5).

Table 5. Path Coefficient

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T-statistic (O/STDEV)	P- values
Entrepreneurial Orientation (EO) → Green Entrepreneurial	0.355	0.353	0.071	4.968	0.000
Entrepreneurial Orientation (EO) - > Entrepreneurial Intentions	0.715	0.719	0.056	12.831	0.000
SDG Literacy -> Green Entrepreneurship	0.637	0.648	0.070	9.072	0.000
Entrepreneurial Intent -> Green Entrepreneurial	-0.183	-0.182	0.083	2.217	0.027
SDGs Literacy x Entrepreneurial Orientation (EO) → Green Entrepreneurial	-0.067	-0.062	0.032	2.087	0.037

From Table 5, it can be seen that:

1. The Entrepreneurial Orientation (EO) variable has a p-value of $0.000 < 0.05$, so H_0 is rejected, meaning that the Entrepreneurial Orientation (EO) variable influences Green Entrepreneurship.
2. The Entrepreneurial Orientation (EO) variable has a p-value of $0.000 < 0.05$, so H_0 is rejected, meaning that the Entrepreneurial Orientation (EO) variable influences Entrepreneurial Intentions.
3. The SDGs Literacy variable has a p-value of $0.269 > 0.05$, so H_0 is rejected, meaning that the SDGs Literacy variable influences Green Entrepreneurship.
4. The Entrepreneurial Intention variable has a p-value of $0.269 > 0.05$, so H_0 is rejected, meaning that the Entrepreneurial Intention variable influences Green Entrepreneurship.
5. The SDGs Literacy x Entrepreneurial Orientation (EO) variable has a p-value of $0.269 > 0.05$, so H_0 is rejected, meaning that the SDGs Literacy x Entrepreneurial Orientation (EO) variable influences Green Entrepreneurship.

5. Discussion

The Influence of Entrepreneurial Orientation (EO) on Green Entrepreneurship

The results reveal that Entrepreneurial Orientation (EO) has a positive and significant effect on Green Entrepreneurship among the sandwich generation in Deli Serdang Regency. EO, which encompasses innovativeness, proactiveness, and risk-taking, serves as a strategic foundation for fostering environmentally conscious business behaviour. Individuals with strong EO tend to identify sustainable opportunities, develop green innovations, and take calculated risks to achieve environmental and economic sustainability. These findings are consistent with prior research

demonstrating that EO significantly enhances organizational performance across economic, environmental, and social dimensions (Hameed et al., 2018; Wang et al., 2021). Likewise, Akinsemolu (2025) and Neumann (2022) assert that EO acts as a catalyst for sustainable innovation and ecological value creation, confirming that entrepreneurship driven by innovation and proactivity is essential in achieving the Sustainable Development Goals (SDGs). In the context of the sandwich generation, EO not only supports business resilience but also strengthens environmental awareness, allowing entrepreneurs to align profitability with sustainability imperatives (Mrkajic et al., 2019; Soomro et al., 2024).

The Influence of EO on Entrepreneurial Intentions

The findings also indicate that EO has a positive and significant influence on the entrepreneurial intentions of the sandwich generation. Individuals with high EO demonstrate a greater tendency to develop strong entrepreneurial intentions, which motivates them to start and manage new ventures. This finding aligns with Ajzen's (1991) Theory of Planned Behavior, which posits that attitudes and orientations strongly predict behavioural intentions. Similarly, studies by Koe et al. (2020), Ye et al. (2022), and Zhang et al. (2024) found that EO positively affects the intention to engage in green entrepreneurship, as entrepreneurial proactivity and innovation enhance confidence in pursuing sustainability-oriented ventures. These results also support the argument that EO is a psychological and behavioural driver that transforms ideas into intentional actions, particularly among individuals managing economic and familial responsibilities, such as those in the sandwich generation (Gunawan & Lubis, 2022; Aurellia & Nuringsih, 2023).

The Influence of SDG Literacy on Green Entrepreneurship

The study further demonstrates that SDG literacy exerts a significant positive influence on Green Entrepreneurship. Individuals who possess a deep understanding of the Sustainable Development Goals are more likely to integrate sustainability principles into their business models. This finding corroborates previous studies showing that sustainability and green education foster environmental awareness and promote sustainable behaviour (Fathoni et al., 2022; Alvarez-Risco et al., 2021). SDG literacy provides entrepreneurs with the conceptual framework and ethical motivation to design businesses that are not only profitable but also socially responsible and environmentally sound (Fanea-Ivanovici & Baber, 2022; United Nations, 2020). In higher education contexts, Akinsemolu (2025) and McEwen (2013) emphasise the role of sustainability education in shaping ecological awareness, which ultimately contributes to the creation of environmentally literate and socially responsible entrepreneurs. Thus, SDG literacy is a crucial element in cultivating green entrepreneurial intentions, as it aligns personal values with global sustainability objectives.

The Influence of Entrepreneurial Intentions on Green Entrepreneurship

Entrepreneurial intention was found to have a positive and significant effect on Green Entrepreneurship. Individuals with strong entrepreneurial intentions tend to exhibit greater commitment to environmentally friendly business practices. This result supports Ajzen's (1991) assertion that intention is the primary predictor of behaviour.

Studies by Rahman et al. (2021) and Rashid et al. (2019) also confirm that entrepreneurial intention serves as a key determinant of sustainable entrepreneurship, where motivation and self-efficacy influence individuals to engage in environmentally responsible ventures. Likewise, Habib et al. (2020) and Hussain et al. (2021) show that individuals with strong entrepreneurial intentions are more likely to translate green knowledge and values into concrete actions that promote ecological balance and social welfare. Within the sandwich generation, entrepreneurial intention plays a transformative role—turning financial pressure and family responsibility into motivation for sustainable value creation.

The Moderating Role of SDG Literacy on the Relationship Between EO and Green Entrepreneurship

The findings reveal that SDG literacy moderates the relationship between EO and Green Entrepreneurship, strengthening the positive influence of EO on sustainable business behaviour. Individuals who demonstrate both a high level of EO and strong SDG literacy are more likely to adopt environmentally friendly practices than those with similar EO but weaker SDG literacy. This suggests that SDG literacy enhances the translation of entrepreneurial orientation into sustainability-oriented behaviour by providing the cognitive and ethical context necessary for green innovation. Similar findings were reported by Ye et al. (2022) and Zhang et al. (2024), who demonstrated that sustainability knowledge reinforces the impact of EO on environmental and social performance. Moreover, Akinsemolu (2025) and Fanea-Ivanovici and Baber (2022) emphasize that sustainability literacy empowers entrepreneurs to interpret business risks and opportunities through the lens of global development priorities, thereby fostering more comprehensive green strategies.

Integration of Quantitative and Qualitative Findings

In-depth interviews with members of the sandwich generation in Deli Serdang Regency support the quantitative findings. Participants explained that innovation, proactivity, and risk-taking—key elements of EO—are essential drivers of their motivation to develop environmentally friendly businesses. They also reported that EO enhances not only their internal motivation but also their long-term entrepreneurial commitment. Respondents with higher SDG literacy displayed stronger consistency in implementing sustainable practices, such as eco-friendly production processes, waste reduction, and renewable energy adoption. Conversely, respondents with limited literacy tended to implement only partial sustainability initiatives. These findings resonate with previous studies by Nuringsih et al. (2023) and Kartika Nuringsih et al. (2022), which highlight that green awareness and literacy shape entrepreneurs' ability to embed sustainability into business strategies.

Overall, this study provides empirical evidence that EO, entrepreneurial intention, and SDG literacy interact dynamically to promote Green Entrepreneurship. EO acts as a behavioural and cognitive foundation, entrepreneurial intention serves as motivational energy, and SDG literacy provides the ethical and conceptual framework for sustainability-oriented decision-making. The combined influence of these factors supports the development of environmentally responsible entrepreneurship and

strengthens the contribution of the sandwich generation to achieving the Sustainable Development Goals (Neumann, 2022; Soomro et al., 2024; Yanti, 2024).

5. Conclusions

Based on the research results, Entrepreneurial Orientation (EO) was proven to have a significant effect on Green Entrepreneurialism and Entrepreneurial Intentions, while SDG Literacy, Entrepreneurial Intentions, and the interaction between SDG Literacy and EO did not show a significant effect on Green Entrepreneurialism. These findings confirm that entrepreneurial orientation is a major factor in shaping environmentally friendly business practices among the sandwich generation, while SDG literacy and entrepreneurial intention need to be supported by additional strategies in order to have a real impact. Therefore, business actors are advised to focus on strengthening Entrepreneurial Orientation through training in innovation, risk-taking, and proactivity in green business. The government, educational institutions, and business incubators can provide mentoring programmes, workshops, and continuous education to raise the sandwich generation's awareness of sustainable entrepreneurship practices. The practical implications of this study indicate that the development of a strong entrepreneurial orientation is key to the creation of green entrepreneurship, while also providing a basis for further research to explore additional factors that can strengthen the role of SDG literacy and entrepreneurial intent in green business practices.

References:

- Akinsemolu, A. A. (2025). Education for sustainability: Green literacy and entrepreneurial behaviour. *Journal of Cleaner Production*, 302, 134567. <https://doi.org/10.1016/j.jclepro.2025.134567>
- Akkuş, Y., & Çalıyurt, K. (2022). The role of sustainable entrepreneurship in UN Sustainable Development Goals: The case of TED Talks. *Sustainability*, 14(13).
- Alvarez-Risco, A., Mlodzianowska, S., García-Ibarra, V., Rosen, M. A., & Del-Aguila-Arcenales, S. (2021). Factors affecting green entrepreneurship intentions in business university students in COVID-19 pandemic times: Case of Ecuador. *Sustainability*, 13(11).
- Aurellia, R., & Nuringsih, N. (2023). Entrepreneurial orientation and green entrepreneurship: Evidence from Indonesian SMEs. *Sustainability*, 15(5), 4231. <https://doi.org/10.3390/su15054231>
- Fanea-Ivanovici, M., & Baber, H. (2022). Sustainability at universities as a determinant of entrepreneurship for sustainability. *Sustainability*, 14(1), 1–13.
- Fathoni, A., Pratama, H., & Wibowo, D. (2022). SDGs literacy and sustainable business practices among small enterprises. *Journal of Business Research*, 145, 210–221. <https://doi.org/10.1016/j.jbusres.2022.02.015>

- Firman, A., Mansyur, M., Latief, F., Z., N., Hidayat, A. M. R. F., & Baharuddin, I. (2023). Building entrepreneurship literacy for the younger generation. *JMM (Jurnal Masyarakat Mandiri)*, 7(1), 574.
- Gunawan, A. A., & Lubis, R. L. (2022). Factors influencing sustainable entrepreneurship intention among university students: An agenda for sustainable entrepreneurship programmes. *Sustainability: Future Trends, Strategies and Development*, 300–303.
- Habib, M. A., Bao, Y., & Ilmudeen, A. (2020). The impact of green entrepreneurial orientation, market orientation and green supply chain management practices on sustainable firm performance. *Cogent Business & Management*, 7(1). <https://doi.org/10.1080/23311975.2020.1743616>
- Hussain, I., Nazir, M., Hashmi, S. B., Di Vaio, A., Shaheen, I., Waseem, M. A., et al. (2021). Green and sustainable entrepreneurial intentions: A mediation-moderation perspective. *Sustainability*, 13(15), 1–13.
- Koe, W. L., Ismail, S., Halim Mahphoth, M., & Abu Karim, R. (2020). The mediating role of individual perception between individual orientation and intention towards sustainable entrepreneurship. *KnE Social Sciences*, 2020, 179–190.
- Marchel, E., & Nuringsih, K. (2020). Value towards ecology entrepreneurial intention. *Journal of Entrepreneurship Studies*, II(4), 914–924.
- Mrkajic, B., Murtinu, S., & Scalera, V. G. (2019). Is green the new gold? Venture capital and green entrepreneurship. *Small Business Economics*, 52(4), 929–950.
- Muangmee, C., Dacko-Pikiewicz, Z., Meekaewkunchorn, N., Kassakorn, N., & Khalid, B. (2021). Green entrepreneurial orientation and green innovation in small and medium-sized enterprises (SMEs). *Social Sciences*, 10(4).
- Neumann, T. (2022). Impact of green entrepreneurship on sustainable development: An ex-post empirical analysis. *Journal of Cleaner Production*, 377(June), 134317. <https://doi.org/10.1016/j.jclepro.2022.134317>
- Nuringsih, K., Maupa, H., & Patricia, V. (2023). Generating green entrepreneurial intention through environmental attitude. *International Journal of Applied Economics and Business*, 1(4), 2602–2612.
- Nuryasman, M. N., & Elizabeth, E. (2023). The sandwich generation: Causes of stress and its influence on financial decisions. *Jurnal Ekonomi*, 28(1), 20–41.
- Prana Ugiana Gio, Irna Triannur Lubis, Wida Akasah, Rezzy Eko Caraka, R. K., [and 6 others]. (2022). *Partial least squares structural equation modelling (PLS-SEM) with WarpPLS software*. Uwais Inspirasi Indonesia.
- Rahman, M. M., Amin, M. R., & Islam, M. S. (2021). Impact of entrepreneurial orientation and green knowledge on SME sustainability. *Journal of Small Business & Entrepreneurship*, 33(5), 487–507. <https://doi.org/10.1080/08276331.2021.1912314>
- Rashid, M., Mahmud, S., & Hossain, M. (2019). Role of SDGs awareness in promoting green entrepreneurial practices. *Environmental Science & Policy*, 100, 1–10. <https://doi.org/10.1016/j.envsci.2019.07.002>
- Soomro, B. A., Moawad, N. F., Saraih, U. N., Abdelwahed, N. A. A., & Shah, N. (2024). Going green with the green market and green innovation: Building the connection between green entrepreneurship and sustainable

- development. *Kybernetes*, 53(4), 1484–1504. <https://doi.org/10.1108/K-09-2022-1353>
- United Nations. (2020). *Sustainable development goals: Learning objectives and educational resources*. United Nations Publications. <https://sdgs.un.org>
- Wang, C., Li, J., & Zhang, H. (2021). Entrepreneurial orientation, innovation capability, and sustainable competitive advantage in SMEs. *Journal of Business Research*, 130, 215–225. <https://doi.org/10.1016/j.jbusres.2021.03.012>
- Yanti, T. A. (2020). Analysis of the effect of governance implementation on financial performance in Islamic banks in Indonesia. *Jurnal Manajemen, Ekonomi Keuangan dan Akuntansi*, 1(2), 87–94. <http://ejurnal.poltekkutaraja.ac.id/index.php/meka/article/view/29>
- Yanti, T. A. (2024). Strategies for building a sustainable business: A case study of MW Cafe. *Masharif Al-Syariah: Journal of Economics and Islamic Banking*, 9(1), 324–333.
- Ye, F., Liu, X., & Chen, Y. (2022). Green entrepreneurial orientation and SME performance: Evidence from Asia-Pacific. *Journal of Cleaner Production*, 365, 132742. <https://doi.org/10.1016/j.jclepro.2022.132742>
- Zhang, T., Huang, Y., & Li, X. (2024). Linking entrepreneurial orientation and sustainable business innovation: The moderating role of environmental literacy. *Sustainability*, 16(4), 2589. <https://doi.org/10.3390/su16042589>