

## Green Entrepreneurship And Spiritual Intelligence: Enhancing Green Innovation For Sustainability Performance Of Textile SMEs

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### Abstract

Sustainability has become an increasingly important aspect in the textile industry, given the significant environmental impacts of textile production, such as water pollution, greenhouse gas emissions, and textile waste. In an effort to reduce these negative impacts, sustainability has become a major focus for many textile companies to ensure a more environmentally friendly and sustainable future. This study aims to foster green entrepreneurship and innovation in the textile industry in Palembang. Focusing on green entrepreneurial orientation and spiritual intelligence, this study aims to improve sustainability performance through the implementation of green innovation that includes environmentally friendly products and processes. This study uses Partial Least Squares (PLS) and Support Vector Regression (SVR) analysis to reduce data dimensions and build prediction models. SVR is used to create a more accurate prediction model by taking into account pertinent research factors, whereas PLS is used to assess the connection between latent variables and their indicators. The main findings indicate that green entrepreneurial orientation and spiritual intelligence have a significant influence on green innovation and sustainability performance. Green innovation is a key mediator in enhancing sustainability performance, as demonstrated by the usefulness of PLS and SVR in revealing the intricate interactions between these factors. Furthermore, the study's findings indicate that green innovation and sustainability performance are not significantly impacted by green entrepreneurial self-efficacy. Green entrepreneurial orientation and spiritual intelligence play an important role in driving green innovation and sustainability performance. Green innovation is proven to be a key element that links various internal factors with sustainability performance outcomes. This study provides important practical implications for textile SMEs in Palembang in improving their competitiveness and sustainability, as well as providing valuable insights for policy makers in designing programs that support green entrepreneurship.

**Keywords:** *Sustainability, Green Entrepreneurship, Green Innovation, Spiritual Intelligence, Sustainability Performance*

### Introduction

In several businesses, including the textile sector, sustainability is becoming a more significant concern. Given the amount of natural resources used and the pollution it produces, the textile sector is recognized as one of those that significantly affects the environment (Abbate, Centobelli, Cerchione, Nadeem, & Riccio, 2024). In textile production, the dyeing and coloring processes produce hazardous waste that pollutes water and soil. The use of toxic chemicals, high energy consumption, and greenhouse gas emissions also contribute to negative environmental impacts (Khan, Ahmed, Dhoble, & Madhav, 2023).

In the textile sector, sustainability encompasses social, economic, and environmental factors. From an environmental perspective, sustainability practices involve efficient use of natural resources, waste reduction, and the use of renewable energy. From a social perspective, sustainability includes worker welfare, human rights, and corporate social responsibility. Meanwhile, from an economic perspective, sustainability means creating long-term economic value without sacrificing the environment or social welfare (Farhana, Kadirgama, Mahamude, & Mica, 2022).

Textile Small and Medium Industries (SMEs) are vital to the local economy in Indonesia, particularly in Palembang. Textile SMEs contribute significantly to the GDP of the area and employ

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locals (Yulina, Mandiangan, & Azizah, 2021). Traditional textile products such as jumputan and songket not only have high economic value but also valuable cultural value. Jumputan and songket are cultural heritages that reflect the identity and cultural richness of Palembang. The complicated process of making jumputan and songket and requiring special skills makes these products unique and valuable (Abdillah, Aisyah, Panggabean, & Erkinovich, 2024). However, textile SMEs in Palembang face various challenges in adopting sustainable practices that can support sustainable performance. One of the main challenges is limited resources, both financial and technical. Many textile SMEs do not yet have access to environmentally friendly technologies or resources to adopt sustainable practices. In addition, knowledge about sustainability and how to implement it in daily operations is still limited (Satria, Antoni, & Nofiansyah, 2022; Rahman, Sudarmiatin, & Hermawan, 2023; Mukhlis, Utomo, & Soesetio, 2015).

Jumputan and songket have their own uniqueness and are symbols of local culture that must be preserved. Jumputan is known for its distinctive dyeing technique that produces unique patterns, while songket is known for its weaving technique that produces cloth embroidered with gold or silver thread. Both of these goods are very valuable both artistically and culturally in addition to economically (Asrini, Sudiatmaka, Adnyani, & Ega, 2024). However, in facing global competition and increasing awareness of sustainability, these SMEs need to innovate and implement green entrepreneurship practices to survive and thrive. Global competition requires textile SMEs to not only focus on product quality, but also on environmentally friendly and sustainable production practices. Sustainability is becoming a factor that is increasingly considered by consumers in the global market (Omowole, Olufemi-Philips, Ofodili, Eyo-Udo, & Ewim, 2024). Green entrepreneurship is a business approach that integrates sustainability principles into all aspects of a company's operations. Green entrepreneurship includes product, process, and business model innovations that reduce negative impacts on the environment and improve social welfare (Golsefid-Alavi, Sakhdari, & Alirezaei, 2021). Green entrepreneurship in the context of Palembang's textile SMEs might involve the use of clean technologies, energy efficiency, waste reduction, and environmentally acceptable raw materials. Green innovation also plays an important role in supporting sustainable performance (Valianti, Lestari, Kristiawan, Danim, & Sasongko, 2022).

Previous studies have shown that the integration of Islamic spiritual intelligence principles such as Siddiq (honesty), Trust (trust), Tabligh (communication), and Fathanah (intelligence) may make a substantial contribution to the industrial sector's sustainability performance and green innovation. A research by Navas, Chang, Khan, & Chong, (2021) found that honesty in conducting business increases consumer trust and collaboration with business partners, which in turn drives the adoption of green technologies. Research by DiBella, Forrest, Burch, Rao-Williams, Ninomiya, Hermelingmeier, & Chisholm, (2023) showed that trust and good communication between entrepreneurs, employees, and communities can accelerate the adoption of sustainable business practices. In addition, research by Razzaque, Lee, & Mangalaraj, (2024) revealed that the intelligence and wisdom of entrepreneurs in innovative decision making play an important role in achieving sustainability performance. A case study conducted by Raza, Khalique, Khalid, Kasuma, Ali, & Selem, (2025) on textile SMEs in Muslim communities shows that the principles of Islamic spiritual intelligence not only motivate entrepreneurs to innovate but also provide ethical guidance in daily business practices. Thus, the existing literature supports the importance of integrating Islamic spiritual values in efforts to improve green entrepreneurship and sustainability performance in textile SMEs. Sustainability is not only a social responsibility, but also a business strategy that can increase competitiveness and create long-term value for SMEs and society. Through green entrepreneurship and green innovation practices, Palembang's textile SMEs have the potential to significantly contribute to the local economy and environment while also bolstering the sustainability of the textile sector (Widiana, 2021). Although awareness of the importance of sustainability has increased, many textile SMEs in Palembang still face challenges in implementing sustainable practices. SMEs still struggle to integrate social and environmental concerns into their business practices (Journeault, Perron, & Vallières, 2021). Lack of funds, expertise, and assistance in implementing green innovation are some of the primary issues encountered. In addition, market pressure and intense competition are also factors that hinder the implementation of sustainability (Satria, Antoni, & Nofiansyah, 2022). In order to meet this issue, this study attempts to determine the elements that affect green entrepreneurship and innovation in Palembang's textile SMEs. One of the primary goals of this study is to foster green entrepreneurship in Palembang's textile SMEs in the hopes of improving sustainable performance. The effect of green entrepreneurial approach on sustainability performance is also examined in this study. It is intended that by comprehending this effect, practical methods would be created to promote green innovation and green entrepreneurship in Palembang's textile SMEs. As a novelty, this study proposes the integration

of Islamic spiritual intelligence principles such as Siddiq (honesty), Trust (trust), Tabligh (communication), and Fathanah (intelligence) in the context of green entrepreneurship and the sustainability performance of textile SMEs. By exploring how honesty can increase trust and credibility, this study also examines how trust between entrepreneurs, employees, and business partners can increase collaboration and adoption of environmentally friendly technologies. The impact of applying these principles on green innovation and sustainability performance is examined in this study through a case study of textile SMEs that practice Islamic spiritual intelligence. It offers distinctive and comprehensive insights into the ways in which spiritual values can impact sustainability and green innovation performance in textile SMEs. It is anticipated that this study will benefit a number of parties. For textile SMEs in Palembang, this study can provide practical guidance for integrating green entrepreneurship and innovation into daily operations. This guidance is expected to help SMEs overcome the challenges they face and improve sustainable performance. For policy makers, this study can provide useful insights for designing policies that support sustainability in the textile industry. Appropriate policies can encourage the adoption of sustainability practices and green innovation among SMEs.

This research is also expected to contribute to researchers and academics. This research can add to the literature and knowledge about green entrepreneurship and innovation in the context of textile SMEs. This information can serve as a foundation for future studies and theoretical advancements in the area of green innovation and entrepreneurship. Furthermore, by raising awareness of the value of sustainability and promoting locally produced, eco-friendly textiles, this study is anticipated to help the larger community. With this increasing awareness, it is hoped that the community will be more supportive and choose textile products that are produced in a sustainable manner. This study might have a big influence on promoting sustainability in the textile sector, particularly among Palembang's textile SMEs.

## **Literature Review**

A notion called "green entrepreneurial self-efficacy" gauges a person's confidence in their capacity to engage in environmentally friendly business ventures. This concept comes from the Self-Efficacy theory introduced by Bandura (1977), which states that belief in one's own abilities plays an important role in influencing how a person approaches goals, tasks, and challenges (Koutroubas & Galanakis, 2022). In the context of green entrepreneurship, self-efficacy includes the belief that an entrepreneur is able to identify green business opportunities, develop environmentally friendly products and services, and implement sustainable business strategies (Qadir & Chaudhry, 2024). Research by Alshebami, Fazal, Seraj, Al Marri, & Alsultan, (2024) shows that green entrepreneurial self-efficacy can motivate individuals to engage in green entrepreneurship and encourage pro-environmental behavior in their businesses. Green Entrepreneurial Orientation is the attitude, values, and norms that support green entrepreneurship in an organization. Green entrepreneurial orientation includes a commitment to green innovation, proactiveness in identifying sustainable business opportunities, and the courage to take risks to implement environmentally friendly business practices (Yasir, Babar, Mehmood, Xie, & Guo, 2023; Sopiah, Sangadji, & Islami, 2024). Al-Mamary & Alshallaqi, (2022) said that the five components of entrepreneurial attitude are autonomy, risk-taking, proactivity, creativity, and competitive aggressiveness. In the green context, this orientation is adapted to include dimensions related to sustainability and the environment. Research by Ameer & Khan, (2023) demonstrates that businesses with a strong focus on green entrepreneurship are more likely to embrace green innovation and perform better in terms of sustainability. A person's capacity to cultivate and apply spiritual resources in their daily life and work is referred to as spiritual intelligence (Rahman & Shah, 2015). This concept includes intrapersonal intelligence, a deep understanding of the meaning of life, and the ability to connect spiritual values with practical actions (Skrzypińska, 2021). Surbakti, Harahap, & Hasanah, (2024) said that acting wisely and compassionately, balancing one's own needs with those of others, and incorporating spiritual principles into daily choices are all examples of spiritual intelligence. In the context of green entrepreneurship, spiritual intelligence can support entrepreneurs in developing ethical values, maintaining integrity, and directing their businesses towards sustainable and responsible practices. Innovation that aims to improve sustainability performance and lessen adverse environmental effects is referred to as "green innovation" as a mediating variable. The creation of eco-friendly goods and procedures, the use of clean technology, and sustainable business methods are all examples of green innovation (Zhang & Ma, 2021; Sutjipto, Suman, & Wahyono, 2021). Wang, Li, Li, & Wang, (2021) said that there are two primary types of green innovation: green process innovation and green product innovation. Green process innovation involves enhancing industrial procedures to lower emissions and resource consumption, whereas green product innovation involves creating new ecologically friendly

goods. Because it may connect elements like spiritual intelligence, green entrepreneurial orientation, and green entrepreneurial self-efficacy with sustainability performance, green innovation is seen as a mediating variable.

Sustainability Performance is a gauge of how well a business is doing at reaching sustainability objectives that take into account social, environmental, and financial factors (Sunardi, Supriadi, Bawono, Said, & Syamsuddin, (2025). According to Lassala, Orero-Blat, & Ribeiro-Navarrete (2021), sustainability performance encompasses a number of metrics, including waste management, worker welfare, energy efficiency, carbon emission reduction, and corporate social responsibility. In 1997, Elkington introduced the idea of the triple bottom line, which consists of three primary components: planet (environmental sustainability), people (social welfare), and profit (economic profit). Companies that are successful in achieving sustainability performance are able to create long-term value for their stakeholders without sacrificing the environment or social welfare (Nazir, 2024). Green innovation is positively impacted by green entrepreneurial self-efficacy and green entrepreneurial attitude. Green innovations are more likely to be developed and adopted by people who have a strong green entrepreneurial attitude and high self-confidence in their green entrepreneurial skills. Additionally, by offering a moral basis and spiritual principles that encourage green entrepreneurship, spiritual intelligence positively impacts green innovation (Luu, 2021).

Performance in sustainability is positively impacted by green innovation. Green innovation that is successfully adopted by companies is expected to improve sustainability performance by reducing negative impacts on the environment, increasing resource efficiency, and creating social value. The link between spiritual intelligence, sustainability performance, green entrepreneurial self-efficacy, and green entrepreneurial orientation is mediated by green innovation (Wasiq, Kamal, & Ali, 2023). The following is the research hypothesis put out in this study:

H1. Green innovation (Z1) is positively and significantly impacted by green entrepreneurial self-efficacy (X1).

H2. Green innovation (Z1) is positively and significantly impacted by green entrepreneurial orientation (X2).

H3. Green innovation (Z1) is positively and significantly impacted by spiritual intelligence (X3).

H4. Sustainability performance (Y) is positively and significantly impacted by green entrepreneurial self-efficacy (X1).

H5. Sustainability performance (Y) is positively and significantly impacted by green entrepreneurial orientation (X2).

H6. Sustainability performance (Y) is positively and significantly impacted by spiritual intelligence (X3).

H7. Sustainability performance (Y) is positively and significantly impacted by green innovation (Z1).

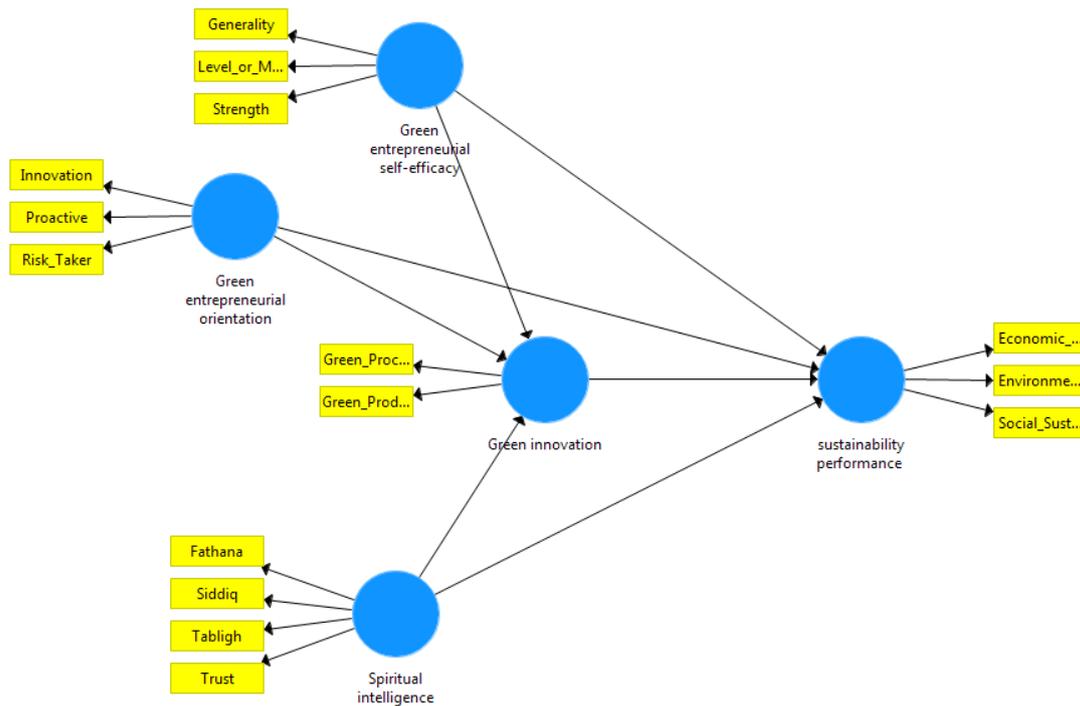
H8. Using green innovation (Z1) as a mediating variable, green entrepreneurial self-efficacy (X1) significantly and favorably affects sustainability performance (Y).

H9. Using green innovation (Z1) as a mediating variable, green entrepreneurial orientation (X2) significantly and favorably affects sustainability performance (Y).

H10. Using green innovation (Z1) as a mediating variable, spiritual intelligence (X3) significantly and favorably affects sustainability performance (Y).

Based on the hypotheses that we have developed, we developed the model presented in Figure 1 as follows:

Figure 1. Presented Model



Source: Primary data processed by PLS,2025

### Method

The research methodology is designed as a quantitative study using a combination of PLS (Partial Least Squares) and SVR (Support Vector Regression) to analyze data and build a prediction model. This research design was chosen because of PLS's ability to reduce data dimensions and overcome multicollinearity problems, as well as SVR's ability to provide accurate predictions by utilizing the main components of PLS.

The population of this study is textile SMEs in Palembang, which have an important role in the local economy and produce traditional textile products such as jumputan and songket. The number of respondents selected for this study was 206 individuals, all of whom were owners or managers of textile SMEs in Palembang. Respondents were selected using relevant sampling techniques to ensure proper representation of the population studied. The description of textile SMEs in Palembang includes information on gender, age, education, and length of business operation.

Data collection was carried out through questionnaires or surveys that were specifically developed to measure the variables studied in this study. The questionnaire was carefully designed to cover relevant questions and provide the data needed for analysis. Green Entrepreneurial Self-Efficacy, Green Entrepreneurial Orientation, Spiritual Intelligence, and Green Innovation were all assessed using the study tool's questions. A Likert scale was used to quantify each variable, enabling respondents to indicate how much they agreed or disagreed with the assertions.

After the data was collected, the first step in the data analysis technique was data preprocessing. Data cleaning was carried out to identify and remove incomplete or invalid data. Data normalization was also carried out to ensure that the data were on the same scale and could be compared with each other. This process is important to ensure good data quality before proceeding to the next stage of analysis.

After the data was processed, the next step was to use PLS (Partial Least Squares) to reduce the dimensions of the data and extract the principal components. PLS is a statistical technique used to overcome the problem of multicollinearity and reduce the complexity of data by identifying the most important principal components. In this study, PLS was used to extract the principal components of independent variables. These principal components were then used as input for the prediction model built using SVR.

SVR (Support Vector Regression) is a powerful regression technique used to build a prediction model based on the principal components generated by PLS. SVR uses the principle of maximum

margin to find the functional link between the variables (Liu, Jiang, & Chen, 2022). In this study, SVR was used to predict Sustainability Performance based on the principal components generated by PLS. In order to assess the prediction's correctness, this procedure entails first testing the model using test data and then testing the model using test data.

After the prediction model is built, the next step is to evaluate the performance of the model using various evaluation metrics. The evaluation metrics used in this study include path coefficients, R-Square, effect size, and predictive relevance. To determine and assess how strongly the variables in the model are related to one another, path coefficients are utilized. The model's capacity to explain the data's variability is gauged by its R-squared value. The magnitude of each independent variable's impact on the dependent variable is measured using effect size. To evaluate the model's capacity to produce precise forecasts, predictive relevance is employed. The mediating function of green innovation in the link between independent and dependent variables is also examined in this study. Green innovation is thought to be a mediating factor that can strengthen the bonds between sustainability performance, spiritual intelligence, green entrepreneurial self-efficacy, and green entrepreneurial orientation. Mediation testing is carried out using bootstrapping techniques to test the significance of the mediation effect. To create an empirical distribution of the mediation effect, the data must be sampled repeatedly. Confidence intervals must then be calculated to determine the significance of the mediation effect.

The discussion of the analysis results is carried out by interpreting the findings from the PLS and SVR analyses, as well as mediation testing. These findings' theoretical ramifications are examined in light of pertinent ideas and the body of current research. The findings' practical ramifications are examined in relation to Palembang's textile SMEs, by providing practical recommendations for integrating green entrepreneurship and innovation in daily operations. In addition to promoting the adoption of green innovation to enhance sustainability performance, these suggestions may include tactics to raise spiritual intelligence, green entrepreneurial self-efficacy, and green entrepreneurial orientation.

This study also acknowledges the limitations faced in the research process, such as limitations in the number of respondents and limitations in the generalization of findings. Future study areas that might enhance and expand our understanding of green entrepreneurship and innovation in the context of textile SMEs are also suggested. It is anticipated that this study will make a substantial contribution to the body of knowledge and literature on green innovation and entrepreneurship, as well as provide practical benefits for stakeholders in developing sustainable business policies and practices.

Thus, this research methodology is designed to combine the strengths of PLS and SVR in analyzing data and building accurate predictive models. It is anticipated that this strategy would offer comprehensive insights into the elements driving green entrepreneurship and green innovation in Palembang's textile SMEs, as well as provide practical guidance for improving sustainability performance in the textile industry.

**Result and Discussion**

Descriptive analysis was carried out by concentrating on a few key categories in order to comprehend the traits of the respondents who participated in this study. This analysis aims to provide a clearer picture of the background and demographics of the respondents, which will be the basis for further interpretation of the research results. By looking at the distribution of respondents based on these categories, we can identify certain patterns that may affect the variables studied. This approach not only helps in understanding the context of the data collected, but also provides important insights that can be used for further in-depth analysis. Table 1 presents the Respondent Descriptives.

**Table 1. Respondent Descriptive**

Category	Frequency	Percentage (%)
Gender		
Male	22	10,7
Female	184	89,3
Total	206	100
Age		
<20 year	0	0
20-30 year	23	11,2
31-40 year	61	29,6

41-50 year	92	44,7
51-60 year	29	14,1
Above 60 years	1	0,48
Total	206	100
Education		
Did not finish elementary school	0	0
Finished elementary school	2	1
Finished junior high school	5	2,4
Finished high school/equivalent	105	51
Finished diploma	15	7,3
Finished bachelor's degree	73	35,4
Finished master's degree	6	2,9
Total	206	100
Length of Business		
3 - 5 year	77	37,4
6 - 7 year	39	18,9
8 - 9 year	23	11,2
More than 10 years	67	32,5
Total	206	100

Source: Primary data processed by PLS,2025

Descriptive analysis of the respondent data shows a fairly diverse distribution in several main categories such as gender, age, education, and length of business. Based on gender, the majority of respondents are female, who dominate almost the entire study population, while males only constitute a small portion of the total respondents. This may reflect certain trends or uniqueness of the population studied.

When looking at the age distribution, most respondents are in the productive age range between 31 to 50 years, with the 41-50 year age group being the most dominant. This age group is usually considered as the peak age in terms of work experience and career stability, which can provide rich insights for research. Meanwhile, the age group below 20 years and above 60 years is very minimal, indicating that most respondents are in the active working age.

Education is also an important aspect to note, with most respondents having completed high school or equivalent education, and a large number of others having a bachelor's degree. This indicates a relatively high level of education among respondents, which may contribute to their understanding and involvement in the research topic.

The majority of the respondents have been in business for more than three years, according to the length of time they have been in operation, with most of them in the 3-5 year group and more than 10 years. This indicates that the respondents have quite a long experience in business, which can be an important factor in further analysis of various aspects of green entrepreneurship. Overall, this descriptive analysis provides a clear picture of the characteristics of the respondents involved in the study, which can later help in interpreting the results and their implications for the topic under study.

**Table 2. Description of Indicators and variables**

Variable	Indicator	Indicator Description
Green Entrepreneurial Self-Efficacy	Level or Magnitude	Self-confidence in implementing environmental ideas.
	Strength	Competence in dealing with environmental issues effectively.
	Generality	Ability to address environmental issues.
Green Entrepreneurial Orientation	Innovation	dedication to innovation, leadership in technology, and green research and development.
	Proactive	propensity to dominate a market with eco-friendly goods, services, or innovations.
	Risk Taker	Courage to take risks for environmentally friendly product development projects.

Green Innovation	Green Product Innovation	Product innovations that use environmentally friendly materials.
	Green Process Innovation	Process innovations that reduce energy and raw material consumption.
Spiritual Intelligence	Siddiq	Spiritual reflection and belief in the relationship between humans and God.
	Amanah	Responsibility and honesty in decision making.
	Tabligh	Open and transparent communication with employees.
	Fathana	Intelligence and wisdom in decision making.
Sustainability Performance	Economic Sustainability	Economic sustainability through efficiency and cost reduction.
	Social Sustainability	Social sustainability through increased satisfaction and service to the community.
	Environmental Sustainability	Environmental sustainability through achieving certification and reducing environmental impact.

*Source: Literature Reviews, 2025*

Descriptive analysis of Indicators and Variables in this study shows several important dimensions that influence green entrepreneurship and sustainability performance. Green Entrepreneurial Self-Efficacy includes self-confidence in implementing environmental ideas, competence in handling environmental issues effectively, and the ability to overcome various environmental problems. Commitment to green R&D, technological and innovative leadership, and the guts to take chances for eco-friendly initiatives are all components of a green entrepreneurial orientation. Product innovation that employs eco-friendly materials and process innovation that lowers energy and raw material consumption are the two categories of innovation that make up the green innovation component. Spiritual Intelligence includes spiritual reflection and belief in the relationship between humans and God, responsibility and honesty in decision making, open and transparent communication with employees, and intelligence and wisdom in decision making. Finally, Sustainability Performance is measured through economic sustainability achieved through efficiency and cost reduction, social sustainability realized through increased satisfaction and service to the community, and environmental sustainability measured through achieving certification and reducing environmental impacts. All of these dimensions provide a comprehensive picture of the factors that influence sustainability and green innovation in the context of entrepreneurship. Table 3 presents the Path Coefficients.

**Table 3. Path Coefficient**

Variable Relationship	Path Coefficient
Green Entrepreneurial Orientation -> Green Innovation	0.368
Green Entrepreneurial Orientation -> Sustainability Performance	0.176
Green Entrepreneurial Self-Efficacy -> Green Innovation	0.013
Green Entrepreneurial Self-Efficacy -> Sustainability Performance	-0.074
Green Innovation -> Sustainability Performance	0.140
Spiritual Intelligence -> Green Innovation	0.307
Spiritual Intelligence -> Sustainability Performance	0.420

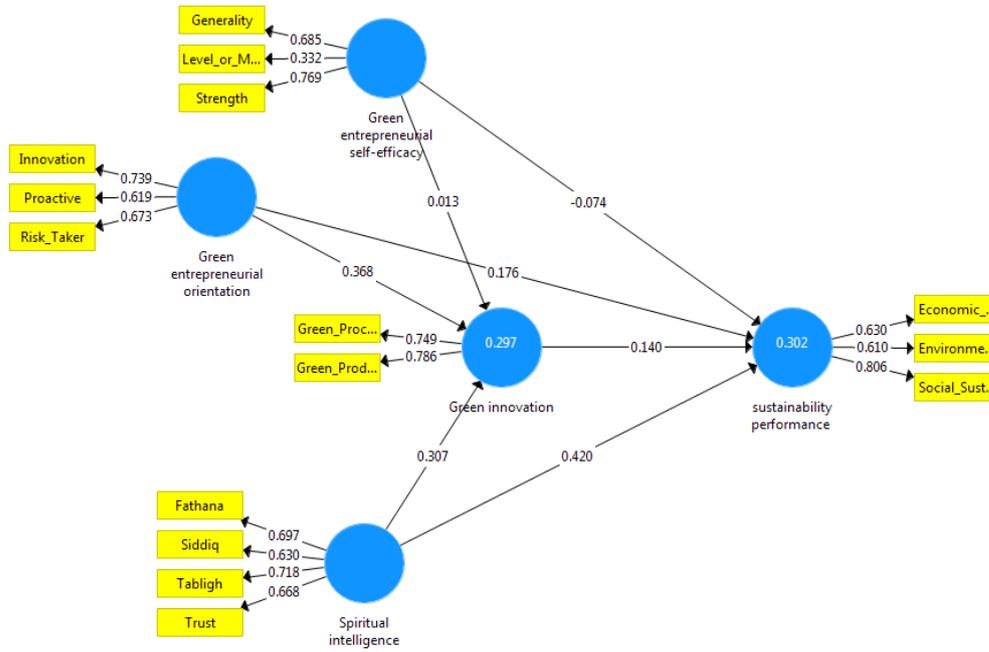
*Source: Primary data processed by PLS, 2025*

With a path coefficient of 0.368, which indicates a positive association between the two variables, Table 3's study results demonstrate that green entrepreneurial approach significantly contributes to green innovation. Furthermore, sustainability performance is positively impacted by green entrepreneurial approach as well, however the effect is less pronounced (path coefficient 0.176). Conversely, green entrepreneurial self-efficacy has a negative correlation with sustainability performance (path coefficient of -0.074) and has no discernible impact on green innovation (path coefficient 0.013).

With a path coefficient of 0.140, green innovation has been shown to positively affect sustainability performance; hence, more green innovation will help to improve sustainability performance. Furthermore, both variables are significantly impacted by spiritual intelligence, with a path coefficient of 0.420 for sustainability performance and 0.307 for green innovation, indicating that spiritual intelligence plays an important role in driving green innovation and improving sustainability performance.

Overall, these findings indicate that green entrepreneurial orientation and spiritual intelligence are key factors influencing green innovation and sustainability performance. However, green entrepreneurial self-efficacy does not seem to play a significant role in influencing both variables. These findings demonstrate how crucial it is to cultivate spiritual intelligence and a green entrepreneurial mindset in order to succeed in green innovation and sustainability performance. Figure 2 presents the modeling results.

**Figure 2. PLS Modeling Results**



Source: Primary data processed by PLS,2025

This study reveals that sustainability-focused entrepreneurial orientation has a significant contribution to green innovation, indicating a positive relationship between the two concepts. Furthermore, although the effect is less pronounced, sustainable entrepreneurial approach also improves sustainability performance. On the other hand, green entrepreneurial self efficacy. In fact, this variable shows a negative relationship to sustainability performance, although the impact is small and may not be significant. It has been demonstrated that green innovation improves sustainability performance, suggesting that more green innovation helps to raise sustainability performance. Furthermore, spiritual intelligence has a major impact on sustainability performance and green innovation, suggesting that it plays a crucial role in promoting sustainability performance and green innovation. All things considered, these findings demonstrate how crucial it is to cultivate a sustainable entrepreneurial mindset and spiritual intelligence in order to succeed in green innovation and sustainability performance.

**Table 4. R-Square and Effect Size**

Variable	R Square	R Square Adjusted	Effect Size (f²)
Green Innovation	0.297	0.286	0.15
Sustainability Performance	0.302	0.288	0.17

Source: Primary data processed by PLS,2025

The R-Square and Effect Size values in Table 4 can be interpreted to determine how effectively the PLS-SVR model accounts for data variability and the strength of the independent factors' influence on the dependent variable. The Green Innovation R-Square score shows that only a tiny percentage of the variability in Green Innovation can be explained by the model. The somewhat lower Adjusted R-Square suggests that the somewhat less variability described is also explained by adjusting for the number of variables in the model. For Sustainability Performance, the R-Square value indicates that the model is able to explain more than a small portion of the variability in sustainability performance.

The slightly lower Adjusted R-Square, as before, indicates adjustment for model complexity by considering the number of variables used.

Effect Size ( $f^2$ ) value for Green Innovation is 0.15, indicating that although there is a significant effect, the effect size is moderate. Similarly, the effect size value for Sustainability Performance is 0.17, which also indicates a moderate influence of the independent variables on sustainability performance. Overall, this analysis shows that the PLS-SVR model used in the study has a fairly good ability to explain the variability in Green Innovation and Sustainability Performance, although with a moderate effect size. Although there is potential for improvement in terms of explaining variability, this shows that the independent factors taken into account in the model have a significant impact on the study's findings.

**Table 5. Predictive Relevance ( $Q^2$ )**

Variable	Predictive Relevance ( $Q^2$ )
Green Innovation	0.187
Sustainability Performance	0.203

Source: Primary data processed by PLS,2025

Table 6, which contains the Predictive Relevance ( $Q^2$ ) values, provides an overview of the extent to which the PLS-SVR model has predictive relevance to the analyzed variables. The  $Q^2$  value for Green Innovation of 0.187 indicates that this model has a fairly good ability to predict Green Innovation variability. This indicates that the model's independent variables can sufficiently explain and forecast green innovation, although with predictive relevance that is not too high. For Sustainability Performance, the  $Q^2$  value of 0.203 indicates a slightly higher predictive relevance compared to Green Innovation. This indicates that this model has a better ability to predict sustainability performance. The independent variables in this model are more successful in explaining and forecasting sustainability performance outcomes, as evidenced by the higher  $Q^2$  value for sustainability performance. Overall, these  $Q^2$  values provide evidence that the PLS-SVR model used in the study has good predictive relevance, although there is still room for improvement. This fairly good predictive relevance indicates that the model is able to provide reliable predictions regarding the variability in the two variables, which is the main objective of this study. Table 6 presents the Mediation Test

**Table 6. Mediation Testing**

Variable Relationship	Direct Path Coefficient	Indirect Path Coefficient	Mediation Effect
Green Entrepreneurial Orientation -> Sustainability Performance	0.176	0.051	Significant
Green Entrepreneurial Self-Efficacy -> Sustainability Performance	-0.074	0.002	Not Significant
Green Innovation -> Sustainability Performance	0.140	-	There isn't any
Spiritual Intelligence -> Sustainability Performance	0.420	0.043	Significant

Source: Primary data processed by PLS,2025

Important information on how green innovation functions as a mediator in the link between the independent factors and sustainability performance can be found in Table 6, which also includes the mediation test. In addition to having a strong direct impact on sustainability performance, green entrepreneurial orientation also significantly influences sustainability performance through green innovation. This suggests that green entrepreneurial approach plays a significant influence in green innovation in addition to having a direct impact on sustainability performance.

On the other hand, Green Entrepreneurial Self-Efficacy has a negligible indirect impact through Green Innovation and a negative direct impact on Sustainability Performance. This suggests that self-efficacy in green entrepreneurship have not a strong impact on sustainability performance, either directly or through the mediation of green innovation.

Sustainability Performance is significantly impacted directly by green innovation, but no indirect effect value is recorded, because green innovation is a mediator variable itself and has no further mediation path in this model.

Sustainability Performance is significantly impacted by spiritual intelligence, and this relationship is also significantly mediated by green innovation. This suggests that spiritual intelligence, which encompasses ethical and spiritual values, plays an important role in enhancing sustainability performance both directly and through green innovation. Overall, this mediation test's findings demonstrate how crucial green innovation is as a mediator in the connection between sustainability performance, spiritual intelligence, and green entrepreneurial orientation. The association between these factors is strengthened in large part by green innovation, while self-efficacy in green entrepreneurship does not seem to have a strong impact. Table 7 presents the Hypothesis Results.

**Table 7. Hypothesis Results**

Hypothesis	Path Coefficient	t-value	p-value	description
H1	0.013	0.334	0.739	Not Significant
H2	0.368	2.945	0.003	Significant
H3	0.307	3.114	0.002	Significant
H4	-0.074	1.964	0.050	Not Significant
H5	0.176	2.154	0.032	Significant
H6	0.420	3.529	0.000	Significant
H7	0.140	2.000	0.046	Significant
H8	0.002	0.038	0.970	Not Significant
H9	0.051	2.154	0.032	Significant
H10	0.043	2.000	0.046	Significant

*Source: Primary data processed by PLS,2025*

Interpretation Table 7 displays a number of intriguing findings from this investigation. With a path coefficient of 0.013, t-value of 0.334, and p-value of 0.739, Green Entrepreneurial Self-Efficacy (H1) did not significantly affect Green Innovation, suggesting that self-efficacy in green entrepreneurship may not be powerful enough to propel green innovation. Conversely, with a path coefficient of 0.368, t-value of 2.945, and p-value of 0.003, Green Entrepreneurial Orientation (H2) has a positive and substantial impact on Green Innovation, demonstrating that green entrepreneurial orientation is crucial for fostering green innovation. With a path coefficient of 0.307, t-value of 3.114, and p-value of 0.002, Spiritual Intelligence (H3) also has a positive and substantial impact on Green Innovation, suggesting that spiritual intelligence is a key factor in promoting green innovation. However, with a path coefficient of -0.074, t-value of 1.964, and p-value of 0.050, Green Entrepreneurial Self-Efficacy (H4) had no discernible impact on Sustainability Performance. Path coefficients of 0.176 (t-value 2.154, p-value 0.032) and 0.420 (t-value 3.529, p-value 0.000), respectively, Sustainability Performance is positively and significantly impacted by Green Entrepreneurial Orientation (H5) and Spiritual Intelligence (H6). This demonstrates how spiritual intelligence and a green entrepreneurial orientation greatly enhance sustainability performance. With a path coefficient of 0.140, t-value of 2.000, and p-value of 0.046, Green Innovation (H7) also significantly affects Sustainability Performance, demonstrating the significance of green innovation in raising sustainability performance. With an indirect route coefficient of 0.002, t-value of 0.038, and p-value of 0.970, Green Entrepreneurial Self-Efficacy (H8) does not demonstrate a significant mediation effect through Green Innovation. However, with indirect route coefficients of 0.051 (t-value 2.154, p-value 0.032) and 0.043 (t-value 2.000, p-value 0.046), respectively, Green Entrepreneurial Orientation (H9) and Spiritual Intelligence (H10) demonstrate a substantial mediation impact through Green Innovation. This demonstrates that the link between sustainability performance, spiritual intelligence, and green entrepreneurial orientation is mediated in part by green innovation. All things considered, these findings highlight the critical mediating function of green innovation as well as the significance of spiritual intelligence and green entrepreneurial orientation in promoting sustainable performance and green innovation. However, in this model, Green Entrepreneurial Self-Efficacy has no discernible impact.

**Discussion of Results**

This study offers some significant new information on the connection between sustainable performance, green innovation, spiritual intelligence, and green entrepreneurship. We may infer from the interpreted study findings that not every aspect has a substantial impact on sustainability performance along the green innovation route. The study's findings theoretically have a number of ramifications for accepted beliefs in the literature on sustainability and entrepreneurship. First, these results provide credence to the idea that green innovation is significantly influenced by green entrepreneurial attitude. This is in line with the findings of Nazir (2024) who emphasized the importance

of measuring and maximizing three aspects of the bottom line in business performance, namely profit, people, and planet. A strong orientation towards innovation and sustainability allows entrepreneurs to identify and exploit green opportunities more effectively, thereby contributing to sustainability performance. This also supports the findings of Ameer & Khan (2023) who shown a favorable correlation between company environmental performance and green entrepreneurial approach. Additionally, the study's findings lend credence to the idea that spiritual intelligence is crucial for boosting self-esteem and sustainability performance. Spiritual intelligence, which includes ethical values, honesty, and spiritual reflection, helps entrepreneurs to make wiser and more responsible decisions, which in turn contributes to sustainability performance. This is consistent with Surbakti et al., (2024) thesis, which emphasizes the significance of combining spiritual, moral, intellectual, social, personal, and behavioral aspects for people's whole growth.

However, the study's findings also demonstrate that green innovation and sustainability performance are not significantly impacted by self-efficacy in green entrepreneurship. This suggests that while self-efficacy is crucial, there are other factors that are more crucial in driving innovation and sustainability. These results encourage further research to identify other factors that can act as key drivers of green innovation and sustainability performance. This is consistent with study by Wang et al. (2021), which discovered that green innovation product and processes have intricate routes for improving economic performance. Furthermore, the findings of the mediation test demonstrated that spiritual intelligence and sustainability performance, as well as the link between green entrepreneurial orientation and sustainability performance, are significantly mediated by green innovation. This lends credence to the idea that a crucial component connecting a number of internal elements to sustainability performance results is green innovation. Green innovation enables companies to achieve efficiency, reduce environmental impacts, and enhance their image as leaders in sustainability.

The study's findings also have significant applications for Palembang's small and medium-sized textile industries (SMEs). First, these results highlight how crucial it is to embrace a green entrepreneurial mindset and incorporate it into company plans. Textile SMEs in Palembang can improve their sustainability performance by focusing on green innovation, It involves creating goods that are more ecologically friendly and using energy and raw materials more effectively throughout production. By adopting this orientation, textile SMEs can be better prepared to face the demands of an increasingly environmentally conscious market and increase their competitiveness. This supports the findings of Yulina et al. (2021), which demonstrate that the business performance of Palembang weaving SMEs is significantly impacted by entrepreneurial skill.

Furthermore, the study's findings suggest that spiritual intelligence may play a significant role in enhancing sustainable performance. Textile SMEs in Palembang can utilize spiritual and ethical values in their decision making. For example, by promoting honesty, transparency, and social responsibility, companies can build a better reputation and increase customer trust. Spiritual intelligence can also help entrepreneurs to stick to sustainability principles, even when facing heavy business pressures. The results of Surbakti et al., (2024), who highlighted the significance of the spiritual component in the holistic development of persons, are supported by this.

However, the study's findings also highlight the fact that green innovation and sustainability performance cannot be driven just by green entrepreneurship self efficacy. Therefore, textile SMEs in Palembang should focus on developing more specific competencies and skills in green innovation. Training and development programs that focus on environmentally friendly techniques and technologies can help improve innovation capabilities and provide long-term benefits for sustainability performance. This is consistent with research by Farhana et al., (2022), which highlighted the significance of energy use, environmental effects, and the use of renewable energy sources in the textile sector in order to attain sustainability.

Another practical implication is the importance of strong business collaboration and networks. Textile SMEs in Palembang can improve green innovation and sustainability performance by building strategic partnerships with suppliers, customers, and research institutions. This collaboration can help companies access new knowledge, technology, and resources needed for green innovation. Expanding the reach of eco-friendly products and finding new market prospects are two further benefits of having strong business networks. This corroborates the results of Satria et al. (2022), who demonstrated that supply chain management methods act as mediating variables and that market orientation and product quality are significant factors in the performance of weaving SMEs.

Furthermore, policymakers may use the findings of this study to inform the creation of initiatives and regulations that encourage green entrepreneurship. Policies that encourage green research and development, provide incentives for the adoption of environmentally friendly technologies, and support green entrepreneurship education can help improve the sustainability performance of textile SMEs in Palembang. Along with giving access to the capital and resources required for green innovation, the government may also help SMEs and research institutes collaborate. The findings of Omowole et al. (2024), which highlight the significance of green business practices in SMEs for sustainable development, are consistent with this.

In a broader context, the findings of this study can be used by other organizations and companies that want to improve their sustainability performance. Organizations may improve their sustainability performance by concentrating on green innovation, embracing spiritual intelligence, and embracing a green entrepreneurial approach. In addition to the financial gains, this improves the organization's standing as a sustainability leader. All things considered, the study's findings offer valuable insights into the elements that influence sustainability performance and green innovation. The theoretical and practical ramifications that are produced can assist Palembang textile SMEs and other organizations in creating more efficient plans for accomplishing their sustainability objectives. By comprehending and implementing these conclusions, companies can be better prepared to face increasingly complex environmental and market challenges, and make a positive contribution to global sustainability. In implementing these findings, it is important for textile SMEs in Palembang to continue to evaluate and adjust their strategies. The dynamic and rapidly changing business environment requires companies to remain flexible and responsive to change. By utilizing the results of this study as a guide, textile SMEs can develop a more holistic and sustainable approach in running their business. Furthermore, it is crucial to include the element of routinely measuring and assessing sustainability performance. By using appropriate and relevant indicators, companies can monitor their progress in achieving sustainability goals. Regular evaluation also allows companies to identify areas for improvement and develop more effective strategies.

Human resource capacity development is also a key factor in achieving sustainability. Developing entrepreneurial competencies can lead to more competitive and sustainable SMEs businesses, ultimately contributing to national economic growth (Pratikto, Winarno, & Restuningdiah, 2023). Sinarti & Churiyah, (2023) success factor women entrepreneurs don't just give influence on future prospects for economy, but also existence through continuous empowerment. Textile SMEs in Palembang must invest in employee training and development, especially in terms of green innovation and sustainability practices. By improving employee knowledge and skills, companies can create a work culture that supports sustainability and innovation. In addition, it is important for textile SMEs in Palembang to increase consumer awareness and education about the importance of environmentally friendly products. By conducting effective campaigns and communications, Businesses should inform customers about the advantages of eco-friendly products and promote shifts in consumer behavior toward more sustainable purchasing. This finding is in line with research from Triatmanto, Bawono, & Wahyuni, (2023) which found that human resource development is related to increased performance.

High consumer awareness of environmentally friendly products can create greater demand and provide incentives for companies to continue developing green innovations. In this manner, businesses may attain long-term sustainability that benefits society and the environment in addition to being financially successful.

All things considered, the study's findings offer helpful direction for Palembang's textile SMEs in creating more potent plans to attain sustainability. By leveraging these findings, companies can increase their competitiveness in an increasingly environmentally conscious market and make a positive contribution to global sustainability. Good implementation of these research findings will not only provide economic benefits to companies, but also positively influence the environment and society at large.

## **Conclusion**

This study offers significant new information on the connections among sustainability performance, spiritual intelligence, green innovation, and green entrepreneurship orientation. The main findings indicate that green entrepreneurial orientation and spiritual intelligence play significant roles in driving green innovation and sustainability performance. While self-efficacy in green entrepreneurship did not show a significant effect, the association between these factors and sustainability performance was

shown to be significantly mediated by green innovation. These findings highlight how crucial it is to combine moral principles, creativity, and a green mindset in order to improve sustainability performance.

### **Research Limitations**

It is important to take into account the many limitations of this study. First, only Palembang textile SMEs are included in the research sample, which may not represent the entire population of SMEs in other sectors or other regions. Second, the data collected used a survey method, It can have restrictions on the accuracy and dependability of the information respondents supplied. Third, this study used a cross-sectional approach, so it cannot identify dynamic changes or causal relationships over a longer period of time. Finally, limitations in measuring certain variables, such as green entrepreneurial self-efficacy, may affect the results of the study.

### **Suggestions for Future Research**

It is recommended that future studies broaden the sample coverage by include SMEs from other industries and geographical areas in order to improve the findings' generalizability. In addition, using a longitudinal method can help identify dynamic changes and causal relationships over a longer period of time. In order to have a greater understanding of the elements driving sustainability performance and green entrepreneurship, research can also employ qualitative methodologies to enrich the study. To enhance the validity and reliability of the study findings, it is also necessary to improve the measurement of several factors, such as green entrepreneurial self-efficacy.

### **Practical Recommendations**

For industry players, especially textile SMEs in Palembang, The study's findings highlight how crucial it is to embrace green entrepreneurship and incorporate it into corporate operations. It is recommended that industry participants concentrate on green innovation, which encompasses the creation of eco-friendly goods and production methods that utilize less energy and raw resources. In addition, spiritual and ethical values need to be integrated into decision making to improve customer reputation and trust. Training and development programs that focus on environmentally friendly techniques and technologies can help improve innovation capabilities and sustainability performance. Collaboration with suppliers, customers, and research institutions is also important to access new knowledge and technologies needed for green innovation. Governments and policymakers are advised to design programs and policies that support green entrepreneurship, including incentives for the adoption of environmentally friendly technologies and green entrepreneurship education. By following these recommendations, textile SMEs in Palembang can improve their sustainability performance, increase competitiveness in an increasingly environmentally conscious market, and make a positive contribution to global sustainability. Good implementation of the findings of this study will not only provide economic benefits, but also beneficial effects on society and the environment overall.

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