

Green Entrepreneurship, Organizational Commitment, and AI Adoption in Inclusive School Sustainability

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ABSTRACT:

This study explores how factors such as green entrepreneurship, green human capital, innovation, school inclusivity, and stakeholder support affect the sustainability of businesses in inclusive and special schools. Using frameworks such as stakeholder theory, the resource-based view, human capital theory, and technology acceptance, it develops an integrated model in which green organizational commitment and artificial intelligence adoption serve as mediators. Digital literacy, organizational culture, and government policy are analyzed as contextual moderators. Data from teachers, principals, and education staff across Indonesia were analyzed through partial least squares structural equation modeling. Results highlight that green and inclusive resources significantly enhance sustainability outcomes. Green organizational commitment demonstrates how internal environmental values translate green resources into sustainable practices, while AI adoption provides a technological pathway that links all factors to sustainability. Government policy serves as a boundary condition that supports green entrepreneurship, although digital literacy and organizational culture do not moderate this relationship. This research advances green entrepreneurship in inclusive education by illustrating how commitment, AI, and policy support translate green and inclusive capabilities into sustainable school outcomes.

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Keywords: Green Entrepreneurship, Artificial Intelligence Adoption, Inclusive School, Organizational Commitment, Business Sustainability.

1. Introduction

In the current climate of growing environmental degradation, resource shortages, and social inequality, educational institutions must take sustainability very seriously. This issue requires coordinated, sector-wide responses. Green entrepreneurship provides a strategic approach to transforming environmental issues into innovation, value creation, and sustainability-focused practices (AlQershi et al., 2023; Demirel et al., 2019; Rahmawati et al., 2023; Soenarto et al., 2022). In addition, it fosters sustainable development by promoting economic, social, and environmental well-being (Galindo-Martín et al., 2021; Neumann, 2021). In this context, schools are more than mere educational facilities; they serve as catalysts for ecological awareness and sustainable actions. Given the correlation between environmental decline and long-term social and institutional instability, educational institutions are required to incorporate green initiatives that integrate environmental responsibility, innovation, and inclusive participation (Sarkodie et al., 2020; Yu et al., 2025).

The sustainability challenge in inclusive and special schools increases because environmental initiatives must be accessible to all students, including those with disabilities. Inclusive education focuses on equity, participation, and removing barriers to access to learning and activities (Ainscow, 2020; Slee, 2018; UNESCO, 2020), suggesting viewing special and inclusive education as complementary systems serving diverse learners, while Sharma et al. (2012) emphasize teacher efficacy as vital for successful inclusive practices. Universal Design for Learning offers a framework for creating flexible learning environments that accommodate various needs, preferences, and accessibility standards (CAST, 2024; Kelly et al., 2022). Thus, sustainability in inclusive schools should encompass not only environmental impact but also the capacity to promote equitable participation.

In Indonesia, inclusive and special schools operate within a policy framework that increasingly emphasizes accessibility, learner-

centered education, and environmental sustainability (Rahmawati et al., 2024). Permendikbudristek No. 48/2023 requires educational institutions to offer reasonable accommodations for students with disabilities. Furthermore, Permen LHK No. 52/2019 introduces the Gerakan Peduli dan Berbudaya Lingkungan Hidup di Sekolah as a policy base for environmentally conscious schooling. The Merdeka Belajar initiative also advocates for adaptive, student-centered, and context-aware teaching methods (Hidayat et al., 2021; Sholeh et al., 2023). Together, these policies imply that Indonesian schools are expected to adopt inclusive education, promote eco-friendly school practices, and employ innovative management approaches, especially in provinces with diverse levels of resources, infrastructure, and capacity.

Although green entrepreneurship and sustainability are extensively studied, most empirical models focus primarily on corporate, manufacturing, and business sectors (AlQershi et al., 2023; Mulyani et al., 2024; Yong et al., 2020). Green Human Capital has been associated with intellectual capital, Green HRM, and sustainability-oriented capabilities, yet its application within inclusive school settings remains limited (Becker, 1964; Nejati et al., 2017; Sharabati et al., 2010). Similarly, Green Organizational Commitment has been linked to Green HRM, ethical leadership, organizational commitment, and green culture. However, its mediating role in deploying green initiatives to foster inclusive school sustainability is still underexplored (Islam et al., 2021; Li et al., 2025; Roscoe et al., 2019; Shoaib et al., 2021). Another research gap involves the adoption of Artificial Intelligence. While AI has been examined for learning analytics, personalization, assessment, adaptive systems, and decision-making, its integration into inclusive environmental education remains limited (Al-Takhayneh et al., 2022; Chen et al., 2020; Hwang et al., 2020; Murtono & Prayitno, 2025; Ouyang & Jiao, 2021; Wang et al., 2024; Yuan et al., 2022; Zawacki-Richter et al., 2019). Moreover, adhering to ethical AI principles is crucial to ensure fairness, transparency, privacy, accountability, and

accessibility for students with disabilities (Adams et al., 2023; Rina et al., 2024).

A new analysis and theory have been developed to link green entrepreneurship, green human capital, innovation, school inclusivity, and stakeholder support to business sustainability. Green organizational commitment and the adoption of artificial intelligence act as mediators, while digital literacy, organizational culture, and government policy act as moderators, potentially strengthening the link between green entrepreneurship and business sustainability. Within this framework, stakeholder theory centers on stakeholder support for school sustainability (Freeman, 1984), resource-based view emphasizes green capabilities, organizational commitment, culture, and AI as resources (Barney, 1991), the theory of planned behavior defines green commitment in terms of attitudes, norms, and perceived control over behavior (Ajzen, 1991), and innovation diffusion theory explores how green and technical innovations spread (Rogers, 2003). Additionally, the Technology Acceptance Model (TAM) – UTAUT considers factors related to technology adoption, such as ease of use, performance, social influence, and facilitating conditions (Davis, 1989; Venkatesh et al., 2003). Organizational culture theory examines how shared values and leadership continue to influence and support change (Denison et al., 2003; Fondas & Denison, 1991; Schein, 2010).

This study examines how Green Entrepreneurship, Green Human Capital, Innovation Activities, School Inclusivity, and Stakeholder Support directly influence Business Sustainability. It also assesses the mediating roles of Green Organizational Commitment and AI Adoption, as well as the moderating effects of Digital Literacy, Organizational Culture, and Government Policy. Using a quantitative, cross-sectional survey, data were gathered from teachers, principals, and education staff in inclusive and special schools across 34 Indonesian provinces. The analysis employed SEM-PLS with SmartPLS, chosen for its effectiveness in handling complex models with multiple latent variables, direct effects, mediation, and moderation, making it ideal for prediction (Hair & Alamer, 2022; Latifah et al., 2021). Innovation Activity is included because it

promotes the development of adaptive, sustainability-focused practices in schools (Najib et al., 2020).

This study expands the scope of green entrepreneurship and Green HRM literature by applying these concepts to inclusive and special education contexts, extending prior Indonesian research on green entrepreneurship, sustainability-oriented local practices, and digital entrepreneurship among disabled people (Rahmawati et al., 2024, 2023). It provides practical guidance for principals, teachers, and school administrators aiming to implement green initiatives while maintaining accessibility for students with disabilities. On a policy level, the findings may support the adoption of reasonable accommodations, Adiwiyata practices, “Merdeka Belajar”, and AI-based school management. However, the research is limited to Indonesia and relies on self-reported survey data and a cross-sectional design, which limits causal inference. Despite these limitations, it establishes a foundation for understanding how green entrepreneurship, organizational commitment, and AI integration promote inclusive and sustainable educational environments.

2. Literature Review and Hypotheses Development

The research draws on several theories, including stakeholder theory, human capital theory, the resource-based view, the theory of planned behavior, innovation diffusion theory, the technology acceptance model, and UTAUT. Schools are considered sustainable when they maintain positive relationships with various stakeholders, including educators, principals, students with disabilities, parents, communities, and the government (Ainscow, 2020; Freeman, 1984; Shamil et al., 2014; Slee, 2018; UNESCO, 2020). Human capital theory holds that the knowledge, skills, and competencies of teachers and other educational staff constitute a form of human capital that can be invested in (Becker, 1964; Yong et al., 2020). The resource-based view maintains that schools are sustainable when they effectively organize resources such as green competency, inclusiveness, organizational commitment, innovation routines, and AI-

enabled learning (AlQershshi et al., 2023; Barney, 1991).

TPB, Innovation Diffusion Theory, TAM, and UTAUT explain the behavioral and technological mechanisms in the model. TPB describes attitudes, subjective norms, and perceived control regarding participation in green programs and green organizational commitment (Ajzen, 1991; Shoaib et al., 2021). The second, Innovation Diffusion Theory, explains how innovation and AI adoption spread through knowledge, persuasion, implementation, and confirmation (AL-Takhayneh et al., 2022; Najib et al., 2020; Rogers, 2003; Yuan et al., 2022). The third and fourth theories, TAM and UTAUT, respectively, explain AI adoption and digital literacy in terms of perceived usefulness, ease of use, expected effort, social influence, and supportive conditions (Davis, 1989; Dwianto et al., 2024; Kannan et al., 2024; Ly et al., 2025). Organizational culture also explains how shared values, norms, and leadership support green and inclusive behaviors (Denison et al., 2003; Schein, 2010). Together, these theories support the direct, mediating, and moderating relationships in the model.

Green entrepreneurship refers to a school's focus on environmentally responsible initiatives, such as recycling, energy efficiency, a green curriculum, and partnerships with environmental organizations. Inclusive and special schools are expected to support business sustainability through green entrepreneurship by enabling them to create environmental, educational, and social value simultaneously (AlQershshi et al., 2023; Demirel et al., 2019). Green human capital also supports sustainability. It does this by equipping teachers and educators with environmental knowledge. It also provides them with an inclusive pedagogy. And it provides them with the adaptive skills needed to implement green programs effectively. This is according to (Becker, 1964). It is also according to (Sharabati et al., 2010; Yong et al., 2020). The sustainability of schools depends not only on green initiatives, but also on the human capacity to implement them.

Innovation, school inclusivity, and stakeholder support can all help to enhance business sustainability at inclusive and special schools. Innovation provides schools with new

approaches to learning and inclusive learning tools, while inclusivity ensures that students with disabilities can participate in inclusive green programs (Ainscow, 2020; Florian, 2019; Najib et al., 2020; Slee, 2018; UNESCO, 2020). Stakeholder support is also vital, as parents, communities, government agencies, donors, and school partners can provide legitimacy, resources, and continuity to inclusive green programs (Freeman, 1984). Together, these five aspects of business sustainability can enhance sustainability in inclusive and special schools.

Green organizational commitment refers to a school's collective institutional dedication to embedding environmental values in its vision, resource allocation, decision-making, culture, and daily practices. According to organizational commitment theory, commitment involves psychological attachment, value alignment, a willingness to contribute, and a perceived obligation towards organizational goals (Meyer & Allen, 1991; Mowday et al., 1979). In green management contexts, such commitment is strengthened through green ethical leadership, a green organizational culture, and environmental discretionary behavior (Hidayat et al., 2021; Li et al., 2025; Roscoe et al., 2019; Shoaib et al., 2021; Vázquez-Brust et al., 2023). Inclusive schools demonstrate a different type of green organizational commitment to green human capital, as the former reflects collective institutional dedication, whereas the latter concerns teachers' and staff members' environmental knowledge and skills. According to the Theory of Planned Behavior (TPB) and innovation diffusion theories, schools with a stronger green orientation, competent human resources, and innovative routines are more likely to institutionalize environmental commitment (Ajzen, 1991; Rogers, 2003). Green entrepreneurship, green human capital, and innovation activity reinforce this commitment by encouraging green value creation, environmental capability, and routine innovation (AlQershshi et al., 2023; Demirel et al., 2019; Najib et al., 2020; Sharabati et al., 2010; Yong et al., 2020). Likewise, inclusivity and stakeholder support reinforce commitment through equity, participation, legitimacy, and external resources (Ainscow, 2020; Florian, 2019; Freeman, 1984; Slee, 2018; UNESCO, 2020).

Adoption of artificial intelligence refers to integrating AI-based tools into school activities to enhance adaptive learning, personalized teaching, environmental program monitoring, sustainability analytics, and inclusive decision-making (Iqbal Baihaqi et al., 2024). In education, AI is applied through intelligent tutoring systems, learning analytics, assessment, prediction, personalization, and data-driven decisions. 'AI-directed' describes learning guided by AI; 'AI-supported' indicates AI-assisted learning; and 'AI-empowered' signifies learning enabled by AI. This illustrates that AI implementation ranges from system-led instruction to learner-centered empowerment. However, in inclusive education, AI adoption must address fairness, transparency, privacy, accountability, and accessibility for students with disabilities (Adams et al., 2023). According to 'TAM and UTAUT' frameworks, schools are more likely to adopt AI if teachers and staff find it useful, easy to use, socially supported, and institutionally encouraged (Davis, 1989; Venkatesh et al., 2003). Green entrepreneurship can facilitate AI adoption, as environmentally focused schools tend to implement tech solutions for sustainable learning and environmental monitoring (AlQershi et al., 2023; Demirel et al., 2019). The shift toward AI is further driven by green human capital, innovation activities, inclusive school practices, and stakeholder backing through competence, innovation routines, adaptive learning needs, universal design, legitimacy, resources, and infrastructure support (Ainscow, 2020; CAST, 2024; Freeman, 1984; Najib et al., 2020; Nejati et al., 2017; Rogers, 2003; Sharabati et al., 2010; Slee, 2018; UNESCO, 2020; Yong et al., 2020).

Green Organizational Commitment and Artificial Intelligence Adoption serve as key mechanisms by which green initiatives translate into tangible Business Sustainability outcomes in inclusive and special schools. Schools with strong Green Organizational Commitment are more likely to allocate resources consistently, actively involve school members, continuously evaluate environmental programs, and institutionalize sustainability beyond individual initiatives. Prior studies on Green HRM, organizational commitment, green organizational culture, and environmental behavior show that commitment strengthens the translation of environmental

values into sustainable organizational practices (Hidayat et al., 2021; Li et al., 2025; Roscoe et al., 2019; Shoaib et al., 2021; Vázquez-Brust et al., 2023). From the Resource-Based View, such commitment represents a valuable organizational resource that supports continuity, adaptability, and long-term performance (Barney, 1991), while studies on green entrepreneurship and Green HRM further indicate that environmental capabilities and commitment contribute to sustainability outcomes (AlQershi et al., 2023; Yong et al., 2020). Similarly, Artificial Intelligence Adoption can improve Business Sustainability by enabling adaptive teaching materials, personalized learning for students with disabilities, environmental program monitoring, sustainability analytics, and more efficient resource use. AI in education supports learning analytics, adaptive systems, intelligent tutoring, assessment, prediction, and decision-making, but its effective use requires ethical safeguards, perceived usefulness, ease of use, social influence, and facilitating conditions (Chen et al., 2020; Davis, 1989; Hwang et al., 2020; Ouyang & Jiao, 2021; Venkatesh et al., 2003; Wang et al., 2024; Zawacki-Richter et al., 2019). In line with Stakeholder Theory, AI-enabled sustainability practices may also improve transparency, responsiveness, and stakeholder engagement in school governance (Freeman, 1984).

Green Organizational Commitment serves as a psychological, behavioral, and institutional mechanism through which organizational resources and green-oriented initiatives translate into Business Sustainability. Although Green Entrepreneurship, Green Human Capital, Innovation Activity, Inclusivity of School, and Stakeholder Support provide strategic direction, capability, innovation readiness, equity values, and external legitimacy, these inputs may not produce sustainable outcomes unless they are internalized into collective commitment, resource allocation, participation, monitoring, and continuous improvement. Prior studies on Green HRM, green organizational culture, organizational commitment, and environmental behavior indicate that environmentally oriented practices can strengthen institutional commitment and convert greening pressures into sustained environmental protection and performance outcomes (Hidayat et al., 2021; Li et

al., 2025; Roscoe et al., 2019; Shoaib et al., 2021; Vázquez-Brust et al., 2023). From the Resource-Based View, such commitment represents an organizational resource that enables schools to mobilize green capabilities for long-term sustainability (Barney, 1991).

Specifically, Green Entrepreneurship may enhance Business Sustainability through Green Organizational Commitment, as strategic green initiatives foster institutional commitment to environmental programs (AlQershi et al., 2023). Green Human Capital may also influence Business Sustainability through Green Organizational Commitment because teachers' and staff members' environmental knowledge, skills, and competencies help build shared green values and collective responsibility (Nejati et al., 2017; Sharabati et al., 2010; Yong et al., 2020). Similarly, Innovation Activity can improve sustainability through commitment because innovative schools are more likely to institutionalize continuous improvement and adaptive green practices (Najib et al., 2020). Inclusivity in schools may affect sustainability through commitment, as inclusive values strengthen participation, equity, and collective responsibility for all students, including those with disabilities (Ainscow, 2020). Stakeholder Support may also promote sustainability through commitment because parents, communities, government agencies, and partners provide legitimacy and resources that reinforce internal school dedication to green programs (Freeman, 1984). Before testing these mediation paths, construct validity and reliability must be established, and mediation effects should be evaluated using bootstrapped indirect effects within PLS-SEM (Fornell & Larcker, 1981; Hair & Alamer, 2022).

The adoption of artificial intelligence (AI) is a technological mechanism that translates environmentally friendly resources into business sustainability in inclusive and special schools. In educational settings, AI facilitates learning analytics, adaptive instruction, assessment, personalization, and data-driven decision-making. This extends sustainability practices beyond administrative monitoring to the improvement of inclusive learning (Chen et al., 2020; Hwang et al., 2020; Ouyang & Jiao, 2021). Adoption of this technology is particularly relevant to inclusive schools, as AI can support adaptive learning requirements, environmental program monitoring, and accessibility-oriented decision-making, provided that fairness, transparency, privacy, and accountability are maintained (Adams et al., 2023). According to the Theory of Acceptance and Use of Technology (TAM) and the Technology Acceptance and Use Theory (UTAUT), AI adoption is more likely when teachers and school staff perceive AI as useful, easy to use, and supported by the wider community and the institution itself (Davis, 1989; Rogers, 2003; Venkatesh et al., 2003). Schools may be encouraged by green entrepreneurship to use AI-enabled tools for green learning and sustainability monitoring, while AI-mediated sustainability is strengthened through competence, experimentation, accessibility, legitimacy, and resource support by green human capital, innovation activity, school inclusivity, and stakeholder support (Ainscow, 2020; AlQershi et al., 2023; Freeman, 1984; Yong et al., 2020). Therefore, the adoption of artificial intelligence is expected to mediate the relationship between green and inclusive organizational resources and business sustainability.

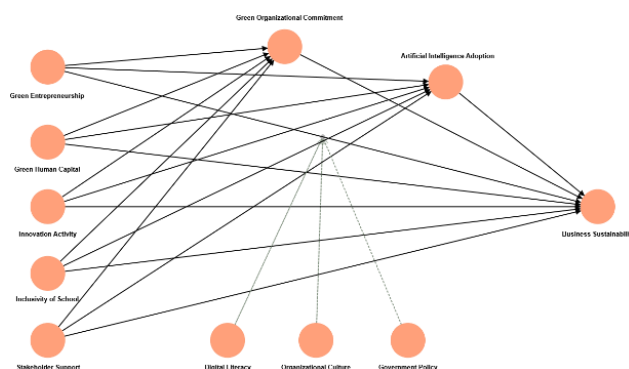


Figure 1. The conceptual framework

Figure 1 illustrates a conceptual framework that connects Green Entrepreneurship, Green Human Capital, Innovation Activity, School Inclusivity, and Stakeholder Support to Business Sustainability through Green Organizational Commitment and AI Adoption. It emphasizes Digital Literacy, Organizational Culture, and Government Policy as moderators that influence the relationship between Green Entrepreneurship and Business Sustainability. This framework is suitable for SEM-PLS analysis because it includes multiple latent variables, direct effects, mediation pathways, and moderation effects.

The success of green entrepreneurship in promoting sustainable business practices varies among schools, depending on contextual factors that either facilitate or hinder its adoption (Hibban Al Asyim Kusuma & Qurrota A'yun, 2025). According to the Resource-Based View, green initiatives become sustainable when supported by complementary capabilities, institutional readiness, and long-term resource commitment (AlQershi et al., 2023; Barney, 1991).

It is anticipated that digital literacy will strengthen the GE–BS relationship, as platforms, AI tools, and data-driven systems can be utilized by digitally proficient teachers and staff for environmental education, monitoring, communication, and decision-making, aligning with the Technology Acceptance Model (TAM) and User-Technology Acceptance Theory (UTAUT) (Davis, 1989; Dwianto et al., 2025; Venkatesh et al., 2003).

Organizational culture can further support this link, with shared values, leadership norms, collaboration, and routines focused on sustainability, helping integrate green initiatives into daily practices (Davis, 1989; Denison et al., 2003; Fondas & Denison, 1991; Li et al., 2025; Roscoe et al., 2019). Additionally, government policies bolster the GE–BS connection by legitimizing green efforts and providing training, incentives, accountability, and institutional backing for inclusive and environmental programs, including Adiwiyata and other supportive regulations (Ainscow, 2020; Slee, 2018; UNESCO, 2020; Yong et al., 2020).

3. Methodology

3.1 Research Design

This study employs a quantitative explanatory research design with a cross-sectional survey to investigate causal relationships among factors such as Green Entrepreneurship, Green Human Capital, Innovation Activities, School Inclusivity, Stakeholder Support, Green Organizational Commitment, Artificial Intelligence Adoption, Digital Literacy, Organizational Culture, Government Policy, and Business Sustainability in inclusive and special schools across Indonesia. Data were collected through structured questionnaires distributed to teachers, principals, and education staff. The hypothesized links were analyzed using SEM-PLS with SmartPLS 4, adhering to the guidelines (Hair & Alamer, 2022).

3.2 Population and Sample

This study's participants include teachers, principals, and education staff from inclusive and special schools across 34 provinces in Indonesia, covering both public and private institutions. A stratified purposive sampling method was used to ensure proportional representation based on school status (60% public, 40% private), geographic area (Java 50%, Sumatra 20%, Kalimantan 10%, Sulawesi 10%, others 10%), school type (50% special schools, 50% inclusive schools), and respondent role (70% teachers, 15% principals, 15% education staff). The minimum sample size was 300, with a target of 400 respondents, aligned with SEM-PLS analysis recommendations (Hair & Alamer, 2022). Participants needed at least 3 years of work experience and active involvement in school environmental programs; those with less experience, working outside inclusive settings, or submitting incomplete responses were excluded. The unit of analysis is individual school stakeholders, and data were gathered using a five-point Likert scale (Salim & Rajabiyah, 2025).

3.3 Research Instrument

The research instrument consists of 11 constructs. These are measured by 55 indicators. These are measured using a five-point Likert scale. This scale ranges from 1 (strongly disagree) to 5 (strongly agree). These are presented in Appendix A1. The model incorporates five exogenous variables: green entrepreneurship,

green human capital, innovation activity, school inclusivity, and stakeholder support; two mediators: green organizational commitment and artificial intelligence adoption; three moderators: digital literacy, organizational culture, and government policy; and one endogenous variable: business sustainability. Each construct is represented by five indicators, which were adapted from validated scales and adjusted to the context of Indonesian inclusive and special schools. The items for green entrepreneurship were adapted from (AlQershi et al., 2023), and the items for green human capital and innovation activity were developed based on the work (Najib et al., 2020; Nejati et al., 2017; Sharabati et al., 2010; Yong et al., 2020). Items for green organizational commitment were adapted from (Hidayat et al., 2021; Li et al., 2025; Roscoe et al., 2019; Shoaib et al., 2021). Items on artificial intelligence adoption were developed based on the Technology Acceptance Model (TAM), the Unified Theory of Acceptance and Use of Technology (UTAUT), and the literature on AI in education (Davis, 1989; Hwang et al., 2020; Venkatesh et al., 2003). We adapted the moderator indicators from (Denison et al., 2003; Fondas & Denison, 1991; Schein, 2010), while we based the Government Policy and School Inclusivity items on Indonesian policy frameworks on reasonable accommodation and the Adiwiyata program. The instrument supports SEM-PLS analysis of reliability and validity, as well as the proposed direct, mediating, and moderating relationships (Hair & Alamer, 2022).

3.4 Data Collection Procedure

Data collection involved structured questionnaires distributed to teachers, principals, and education staff within inclusive and special schools across 34 Indonesian provinces. These questionnaires were available both online via Google Forms and offline as printed copies, with the format chosen based on respondents' accessibility needs and regional preferences. Prior to distribution, the instrument was translated into Bahasa Indonesia using a back-translation method to ensure semantic accuracy and clarity for all participants (Brislin, 1970). A pilot test with 30 respondents was conducted to evaluate the questionnaire's clarity, readability, and face validity, resulting in minor revisions based on

their feedback. The survey remained open for three months, during which follow-up reminders were sent to non-respondents to improve response rates.

3.5 Data Analysis Technique

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4, following the two-step approach outlined by Hair et al. (2022). Initially, the measurement model was evaluated by checking indicator reliability through outer loadings (≥ 0.708), internal consistency with Cronbach's alpha and composite reliability (≥ 0.70), convergent validity via Average Variance Extracted (AVE ≥ 0.50), and discriminant validity using the Heterotrait-Monotrait (HTMT) ratio (< 0.85). Subsequently, the structural model was examined for collinearity (VIF < 5), and path coefficients and their significance were tested via bootstrapping with 5,000 resamples (Hair et al., 2022). The model's explanatory power was assessed with R^2 , effect size (f^2), and predictive relevance measures such as Q^2 and PLSpredict. Mediation effects were evaluated via bootstrapped indirect effects within 95% confidence intervals, and moderation effects were analyzed using the two-stage approach focusing on interactions among Green Entrepreneurship, Digital Literacy, Organizational Culture, and Government Policy.

4. Results

4.1 Respondent Profile

Table 1 outlines the demographic characteristics of the 400 respondents. The sample consisted mainly of female public school teachers who held a Bachelor's degree. Most participants were aged 26–45 and had diverse levels of professional experience. The data reflect an even distribution between inclusive and special schools. Geographically, respondents came from major regions across Indonesia, with Java providing the largest share. All participants were engaged in school environmental initiatives, making the sample well-suited to exploring topics such as green entrepreneurship, organizational commitment, AI adoption, and business sustainability in inclusive and special school environments.

Table 1. Respondent Demographic Profile

Characteristic	Category	Frequency	Percentage (%)
Gender	Male	170	42.5
	Female	230	57.5
Age	<25 years	40	10
	26–35 years	140	35
	36–45 years	130	32.5
	>45 years	90	22.5
Education	Diploma/Certificate	50	12.5
	Bachelor's Degree	210	52.5
	Master's Degree	120	30
	Doctoral Degree/Other	20	5
Work Experience	3–<5 years	80	20
	5–10 years	120	30
	11–20 years	130	32.5
	>20 years	70	17.5
School Status	Public	240	60
	Private	160	40
School Type	Special School	200	50
	Inclusive School	200	50
Position	Teacher	280	70
	Principal	60	15
	Education Staff	60	15
Geographical Area	Java	200	50
	Sumatra	80	20
	Kalimantan	40	10
	Sulawesi	40	10
	Others	40	10
Environmental Program Involvement	Yes	400	100
School Green Program Orientation	Adiwiyata/Go Green Program	240	60
	Non-Adiwiyata but Green-Oriented Program	160	40

4.2 Descriptive Statistics

Table 2 presents the descriptive statistics for all constructs used in this study. The data indicate that all variables span the full Likert scale, with the lowest and highest scores being 1.000 and 5.000. Mean scores ranged from 2.985 for business sustainability to 3.072 for green entrepreneurship, implying respondents generally

held moderate views on these constructs. Standard deviations varied from 1.000 to 1.055, reflecting acceptable response variability. Skewness values were near zero, ranging from -0.118 to 0.081, and kurtosis ranged from -1.065 to -0.594. These findings suggest the data were approximately normally distributed, with no

significant deviations from symmetry at the descriptive level.

Table 2. Descriptive Statistics of Variables

Construct	N	Minimum	Maximum	Mean	SD	Skewness	Kurtosis
GE	400	1.000	5.000	3.072	1.012	-0.026	-0.754
GHC	400	1.000	5.000	3.033	1.004	-0.118	-0.725
INA	400	1.000	5.000	3.016	1.000	0.081	-0.808
IS	400	1.000	5.000	3.010	1.055	0.066	-1.065
SS	400	1.000	5.000	2.990	1.004	0.073	-0.594
GOC	400	1.000	5.000	3.027	1.040	0.004	-0.948
AIA	400	1.000	5.000	2.997	1.009	0.044	-0.792
DL	400	1.000	5.000	3.018	1.008	0.071	-0.790
OC	400	1.000	5.000	2.993	1.017	0.076	-0.727
GP	400	1.000	5.000	3.025	1.034	-0.034	-0.681
BS	400	1.000	5.000	2.985	1.001	0.019	-0.688

Source: Author 2026

4.3 Measurement Model Evaluation

Table 3 shows that the measurement model achieved strong indicator reliability, internal consistency, and convergent validity. All outer loadings exceeded the recommended 0.70 threshold, ranging from 0.784 to 0.880, indicating that each indicator adequately represented its latent construct. The lowest loading was observed in DL5, while the highest was observed in DL3. Importantly, DL1 reached 0.818, and all Government Policy indicators ranged from 0.819 to 0.870, confirming that the previously problematic indicators met the required standard. Cronbach's alpha values ranged from 0.880 to 0.905, rho_A ranged from 0.881 to 0.967, composite reliability ranged from 0.912 to 0.929, and AVE ranged from 0.675 to 0.724. These results confirm that all constructs demonstrated satisfactory reliability and convergent validity without requiring indicator deletion.

Table 4 presents the Fornell–Larcker criterion for assessing discriminant validity. The diagonal values, representing the square root of AVE, ranged from 0.821 to 0.851 and were consistently higher than the correlations among constructs. The strongest inter-construct correlation was between GOC and BS at 0.565, followed by AIA and BS at 0.527; both remained below their respective diagonal values. This indicates that each construct shared more variance with its own

indicators than with other constructs in the model. Therefore, Green Entrepreneurship, Green Human Capital, Innovation Activity, Inclusivity of School, Stakeholder Support, Green Organizational Commitment, Artificial Intelligence Adoption, Digital Literacy, Organizational Culture, Government Policy, and Business Sustainability were empirically distinct. These findings support the adequacy of discriminant validity as assessed by the Fornell–Larcker criterion.

Table 5 reports the HTMT ratio as a stricter assessment of discriminant validity. All HTMT values were below the conservative threshold of 0.85, confirming that no construct pair suffered from serious conceptual or empirical overlap. The highest HTMT value was 0.634 between GOC and BS, followed by 0.593 between AIA and BS, and 0.492 between GE and GOC. These relatively higher values are theoretically reasonable because organizational commitment, AI adoption, green entrepreneurship, and business sustainability are conceptually related within the proposed model. However, none of these values approached the critical threshold, indicating that the constructs remained sufficiently distinct. Thus, the HTMT results provide additional evidence that the measurement model achieved satisfactory discriminant validity and is suitable for proceeding to structural model evaluation.

Table 3. Factor Loadings, Reliability, and Convergent Validity

Construct	Indicator	Outer Loading	Cronbach's Alpha	rho_A	(rho_c)	AVE
GE	GE1	0.841	0.892	0.896	0.92	0.697
	GE2	0.843				
	GE3	0.827				
	GE4	0.856				
	GE5	0.807				
GHC	GHC1	0.838	0.89	0.891	0.919	0.694
	GHC2	0.836				
	GHC3	0.824				
	GHC4	0.849				
	GHC5	0.817				
INA	INA1	0.84	0.88	0.881	0.912	0.675
	INA2	0.815				
	INA3	0.822				
	INA4	0.829				
	INA5	0.801				
IS	IS1	0.838	0.903	0.904	0.928	0.721
	IS2	0.838				
	IS3	0.851				
	IS4	0.875				
	IS5	0.842				
SS	SS1	0.828	0.887	0.889	0.917	0.688
	SS2	0.833				
	SS3	0.827				
	SS4	0.845				
	SS5	0.813				
GOC	GOC1	0.865	0.896	0.897	0.923	0.706
	GOC2	0.843				
	GOC3	0.836				
	GOC4	0.849				
	GOC5	0.807				
AIA	AIA1	0.849	0.886	0.889	0.917	0.688
	AIA2	0.831				
	AIA3	0.828				
	AIA4	0.845				
	AIA5	0.793				
DL	DL1	0.818	0.893	0.967	0.918	0.69
	DL2	0.853				

Construct	Indicator	Outer Loading	Cronbach's Alpha	rho_A	(rho_c)	AVE
	DL3	0.88				
	DL4	0.816				
	DL5	0.784				
OC	OC1	0.832	0.883	0.896	0.914	0.679
	OC2	0.85				
	OC3	0.797				
	OC4	0.81				
	OC5	0.832				
GP	GP1	0.844	0.905	0.92	0.929	0.724
	GP2	0.867				
	GP3	0.819				
	GP4	0.87				
	GP5	0.852				
BS	BS1	0.846	0.885	0.887	0.916	0.686
	BS2	0.796				
	BS3	0.804				
	BS4	0.853				
	BS5	0.842				

Note. Interaction terms $GP \times GE$, $DL \times GE$, and $OC \times GE$ were excluded from this table because they are single-item interaction constructs with loadings of 1.000 by construction.

Table 4. Fornell–Larcker Criterion

Construct	GE	GHC	INA	IS	SS	GOC	AIA	DL	OC	GP	BS
GE	0.835										
GHC	0.204	0.833									
INA	0.179	0.133	0.821								
IS	0.083	0.078	0.022	0.849							
SS	0.171	0.241	0.141	0.043	0.829						
GOC	0.442	0.378	0.256	0.228	0.212	0.840					
AIA	0.336	0.396	0.298	0.184	0.234	0.321	0.829				
DL	0.148	0.126	0.019	0.034	0.015	0.086	0.109	0.831			
OC	0.270	0.202	0.214	0.254	0.189	0.353	0.280	0.110	0.824		
GP	0.210	0.229	0.218	0.161	0.153	0.301	0.211	0.051	0.293	0.851	
BS	0.415	0.434	0.313	0.233	0.343	0.565	0.527	0.132	0.283	0.232	0.828

Note. Diagonal values represent the square root of AVE.

Table 5. HTMT

Construct	GE	GHC	INA	IS	SS	GOC	AIA	DL	OC	GP	BS
GE	—										
GHC	0.228	—									

INA	0.200	0.149	—									
IS	0.092	0.087	0.037	—								
SS	0.193	0.271	0.158	0.056	—							
GOC	0.492	0.423	0.287	0.252	0.239	—						
AIA	0.373	0.444	0.334	0.203	0.263	0.358	—					
DL	0.159	0.143	0.060	0.070	0.053	0.091	0.112	—				
OC	0.306	0.223	0.240	0.280	0.215	0.401	0.311	0.133	—			
GP	0.232	0.253	0.238	0.180	0.169	0.328	0.233	0.059	0.329	—		
BS	0.462	0.488	0.353	0.259	0.386	0.634	0.593	0.129	0.312	0.253	—	

Note: All HTMT values are below the 0.85 threshold, confirming discriminant validity.

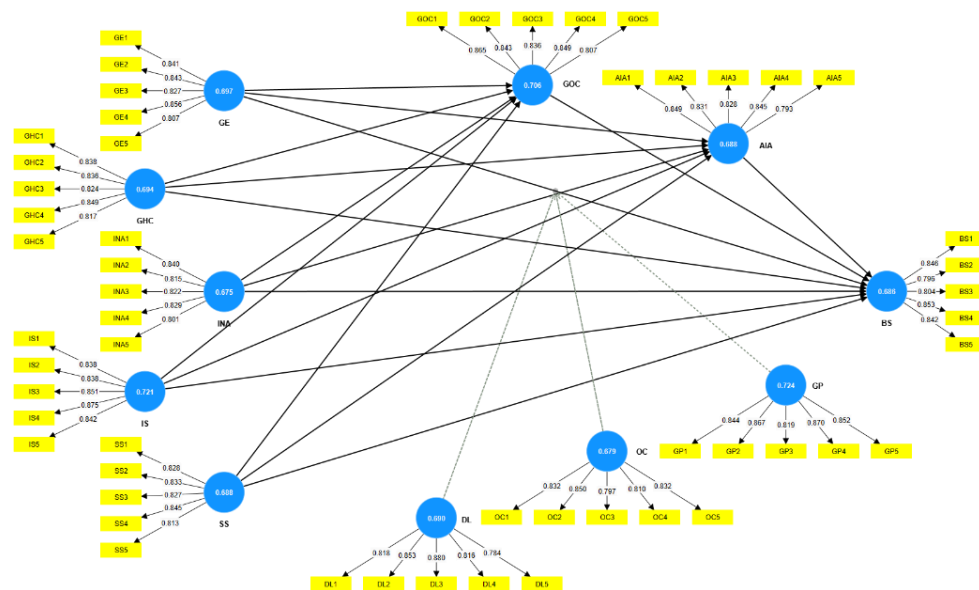


Figure 2. Outer Model

Figure 2 presents the measurement model comprising 11 reflective constructs and 55 indicators. All outer loadings ranged from 0.784 to 0.880, exceeding the recommended threshold of 0.708, indicating adequate indicator reliability (Hair et al., 2022). AVE values ranged from 0.675 to 0.724, confirming convergent validity, while composite reliability values above 0.90 indicated strong internal consistency. Overall, the measurement model demonstrates acceptable psychometric quality for subsequent assessment of the structural model.

4.4 Structural Model Evaluation

Table 6 presents the collinearity assessment of the structural model. The inner VIF values ranged from 1.011 to 1.597, indicating that all predictors were free of multicollinearity, as they were below the recommended threshold of 5.00. This confirms that the structural paths could be

interpreted reliably. Table 7 reports the path coefficients and hypothesis testing results. The findings show that Green Entrepreneurship, Green Human Capital, Innovation Activity, Inclusivity of School, and Stakeholder Support had significant positive effects on Business Sustainability. Green Entrepreneurship, Green Human Capital, Innovation Activity, and Inclusivity of School significantly influenced Green Organizational Commitment, whereas Stakeholder Support did not. All five exogenous variables significantly influenced Artificial Intelligence Adoption. In addition, Green Organizational Commitment and Artificial Intelligence Adoption significantly improved Business Sustainability. For moderation, only Government Policy significantly strengthened the Green Entrepreneurship–Business Sustainability relationship, while Digital Literacy and Organizational Culture were not significant.

Figure 3 illustrates the estimated inner model and confirms the central role of Green Organizational Commitment and Artificial Intelligence Adoption as mechanisms linking green and inclusive school resources to Business Sustainability. Table 8 shows that the model explained 29.5% of Artificial Intelligence Adoption, 33.8% of Green Organizational Commitment, and 53.4% of Business Sustainability, indicating moderate explanatory

power. Table 9 reports that most effect sizes were small, with the strongest effect found for Green Entrepreneurship on Green Organizational Commitment. Table 10 shows that all Q^2 values were above zero, confirming predictive relevance for all endogenous constructs. Finally, Table 11 indicates acceptable model fit, with an estimated SRMR of 0.041 and an NFI of 0.857, supporting the adequacy of the PLS-SEM model for hypothesis testing.

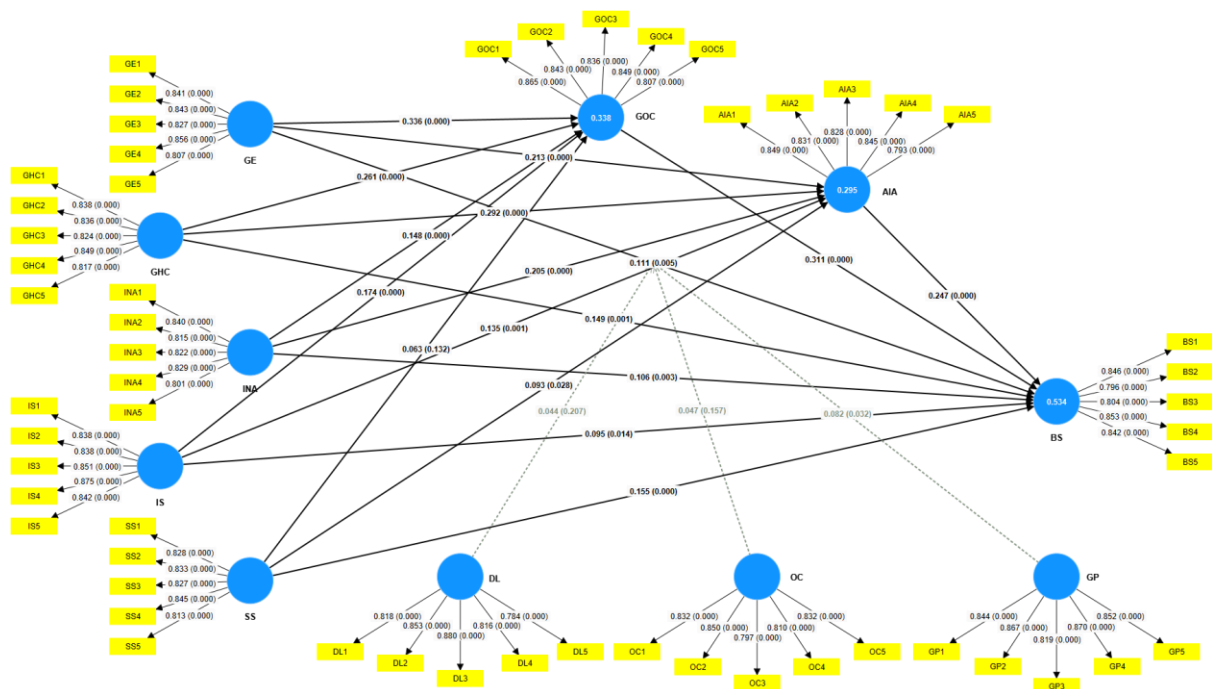


Figure 3. Inner Model

Table 6. Inner Variance Inflation Factor (VIF)

Structural Path	VIF
GE > AIA	1.088
GHC > AIA	1.104
INA > AIA	1.053
IS > AIA	1.011
SS > AIA	1.089
GE > GOC	1.088
GHC > GOC	1.104
INA > GOC	1.053
IS > GOC	1.011
SS > GOC	1.089
GE > BS	1.378

Structural Path	VIF
GHC > BS	1.364
INA > BS	1.177
IS > BS	1.138
SS > BS	1.122
GOC > BS	1.597
AIA > BS	1.441
DL > BS	1.053
OC > BS	1.309
GP > BS	1.224
DL × GE > BS	1.130
OC × GE > BS	1.203
GP × GE > BS	1.156

Table 7. Path Coefficients and Hypothesis Testing

Hypothesis	Path	β	STDEV	t-value	p-value
H1a	GE > BS	0.111	0.040	2.784	0.005
H1b	GHC > BS	0.149	0.044	3.430	0.001
H1c	INA > BS	0.106	0.036	2.948	0.003
H1d	IS > BS	0.095	0.038	2.456	0.014
H1e	SS > BS	0.155	0.037	4.220	0.000
H2a	GE > GOC	0.336	0.040	8.430	0.000
H2b	GHC > GOC	0.261	0.041	6.372	0.000
H2c	INA > GOC	0.148	0.039	3.830	0.000
H2d	IS > GOC	0.174	0.041	4.292	0.000
H2e	SS > GOC	0.063	0.042	1.508	0.132
H3a	GE > AIA	0.213	0.042	5.114	0.000
H3b	GHC > AIA	0.292	0.045	6.548	0.000
H3c	INA > AIA	0.205	0.044	4.662	0.000
H3d	IS > AIA	0.135	0.041	3.269	0.001
H3e	SS > AIA	0.093	0.042	2.201	0.028
H4a	GOC > BS	0.311	0.041	7.540	0.000
H4b	AIA > BS	0.247	0.042	5.913	0.000
H7a	DL × GE > BS	0.044	0.035	1.261	0.207
H7b	OC × GE > BS	0.047	0.033	1.414	0.157
H7c	GP × GE > BS	0.082	0.038	2.148	0.032
—	DL > BS	0.029	0.037	0.778	0.437
—	OC > BS	-0.025	0.038	0.667	0.505

—	GP > BS	-0.036	0.039	0.920	0.358
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Note. β = standardized path coefficient; STDEV = standard deviation. Hypotheses were supported when $p < 0.05$.

Table 8. Coefficient of Determination (R^2)

Endogenous Construct	R^2	Adjusted R^2	Interpretation
AIA	0.295	0.286	Moderate
GOC	0.338	0.330	Moderate
BS	0.534	0.519	Moderate

Table 9. Effect Size (f^2)

Path	f^2	Effect Size
GE > AIA	0.059	Small
GHC > AIA	0.110	Small
INA > AIA	0.057	Small
IS > AIA	0.025	Small
SS > AIA	0.011	Very small
GE > GOC	0.157	Medium
GHC > GOC	0.093	Small
INA > GOC	0.032	Small
IS > GOC	0.045	Small
SS > GOC	0.006	Very small
GE > BS	0.019	Very small
GHC > BS	0.035	Small
INA > BS	0.020	Small
IS > BS	0.017	Very small
SS > BS	0.046	Small
GOC > BS	0.130	Small to medium
AIA > BS	0.091	Small
DL > BS	0.002	Very small
OC > BS	0.001	Very small
GP > BS	0.002	Very small
DL $\times$ GE > BS	0.004	Very small
OC $\times$ GE > BS	0.004	Very small
GP $\times$ GE > BS	0.012	Very small

Table 10. Predictive Relevance (Q^2)

Construct	(SSO)	SSE	$Q^2 (= 1 - SSE/SSO)$	Interpretation
AIA	2000.000	1607.978	0.196	Predictive relevance
GOC	2000.000	1535.005	0.232	Predictive relevance
BS	2000.000	1287.510	0.356	Predictive relevance

Note. Q^2 values greater than zero indicate predictive relevance for endogenous constructs.

Table 11. Model Fit Summary

Fit Index	Saturated Model	Estimated Model	Interpretation
SRMR	0.038	0.041	Acceptable
d_ULS	2.212	2.614	Reported
d_G	0.852	0.86	Reported
Chi-square	1978.283	1992.446	Reported
NFI	0.858	0.857	Adequate

Note. SRMR = Standardized Root Mean Square Residual; NFI = Normed Fit Index.

4.5 Mediation and Moderation

The mediation analysis examined whether Green Organizational Commitment and Artificial Intelligence Adoption mediate the influence of factors such as Green Entrepreneurship, Green Human Capital, Innovation Activity, Inclusivity of School, and Stakeholder Support on Business Sustainability. Table 12 presents the specific indirect effects. Results indicate that Green Organizational Commitment significantly mediated the impacts of Green Entrepreneurship, Green Human Capital, Innovation Activity, and Inclusivity of School on Business Sustainability. However, the indirect effect from Stakeholder Support to Business Sustainability via Green Organizational Commitment was not significant. In contrast, Artificial Intelligence Adoption significantly mediated all five relationships with sustainability, making it a more consistent mediator. Table 13 shows that all antecedents had significant positive total indirect effects on Business Sustainability, with Green Entrepreneurship and Green Human Capital contributing the most. Table 14 confirms that Green Organizational Commitment, Green Human Capital, Green Entrepreneurship, Artificial Intelligence Adoption, Innovation Activity, Stakeholder Support, and Inclusivity of

School are key factors for Business Sustainability. The notable $GP \times GE$ interaction suggests that Government Policy enhances the Green Entrepreneurship–Business Sustainability link, whereas the $DL \times GE$ and $OC \times GE$ interactions were not significant.

The moderation analysis examined whether Digital Literacy, Organizational Culture, and Government Policy strengthen the relationship between Green Entrepreneurship and Business Sustainability. As shown in Table 15, only the interaction between Government Policy and Green Entrepreneurship had a positive and significant effect on Business Sustainability ($\beta = 0.082$, $t = 2.148$, $p = 0.032$), with a confidence interval that did not include zero. Thus, H7c was supported, indicating that Government Policy strengthens the effect of Green Entrepreneurship on Business Sustainability. In contrast, the interaction effects of Digital Literacy and Green Entrepreneurship ($\beta = 0.044$, $p = 0.207$) and Organizational Culture and Green Entrepreneurship ($\beta = 0.047$, $p = 0.157$) were not significant; therefore, H7a and H7b were not supported. Overall, Table 15 shows that policy support is the only significant boundary condition, although all moderation effect sizes were small.

Table 12. Mediation Analysis Results

Hypothesis	Path	β	STDEV	t-value	p-value	95% CI
H5a	GE > GOC > BS	0.105	0.020	5.339	0.000	0.069, 0.146
H5b	GHC > GOC > BS	0.081	0.016	4.969	0.000	0.051, 0.115
H5c	INA > GOC > BS	0.046	0.014	3.332	0.001	0.021, 0.076
H5d	IS > GOC > BS	0.054	0.014	3.789	0.000	0.029, 0.085
H5e	SS > GOC > BS	0.020	0.014	1.451	0.147	-0.005, 0.048
H6a	GE > AIA > BS	0.052	0.014	3.748	0.000	0.027, 0.083
H6b	GHC > AIA > BS	0.072	0.016	4.431	0.000	0.042, 0.106
H6c	INA > AIA > BS	0.051	0.014	3.549	0.000	0.026, 0.081
H6d	IS > AIA > BS	0.033	0.012	2.710	0.007	0.011, 0.060
H6e	SS > AIA > BS	0.023	0.011	2.063	0.039	0.003, 0.047

Note. β = standardized indirect effect; STDEV = standard deviation; CI = confidence interval. Mediation is significant when $p < 0.05$ and the confidence interval does not include zero.

Table 13. Total Indirect Effects

Relationship	β	STDEV	t-value	p-value	95% CI
GE $\rightarrow$ BS	0.157	0.024	6.629	0.000	0.113, 0.207
GHC $\rightarrow$ BS	0.153	0.024	6.369	0.000	0.108, 0.203
INA $\rightarrow$ BS	0.097	0.020	4.870	0.000	0.061, 0.139
IS $\rightarrow$ BS	0.087	0.019	4.722	0.000	0.055, 0.126
SS $\rightarrow$ BS	0.043	0.018	2.324	0.020	0.008, 0.080

Table 14. Total Effects

Relationship	β	STDEV	t-value	p-value	95% CI
GOC $\rightarrow$ BS	0.311	0.041	7.540	0.000	0.232, 0.394
GHC $\rightarrow$ BS	0.303	0.041	7.316	0.000	0.218, 0.383
GE $\rightarrow$ BS	0.268	0.039	6.879	0.000	0.189, 0.344
AIA $\rightarrow$ BS	0.247	0.042	5.913	0.000	0.163, 0.325
INA $\rightarrow$ BS	0.202	0.039	5.160	0.000	0.125, 0.280
SS $\rightarrow$ BS	0.198	0.040	4.893	0.000	0.118, 0.276
IS $\rightarrow$ BS	0.182	0.040	4.569	0.000	0.106, 0.263
GP $\times$ GE $\rightarrow$ BS	0.082	0.038	2.148	0.032	0.006, 0.155
DL $\times$ GE $\rightarrow$ BS	0.044	0.035	1.261	0.207	-0.029, 0.111
OC $\times$ GE $\rightarrow$ BS	0.047	0.033	1.414	0.157	-0.021, 0.110
DL $\rightarrow$ BS	0.029	0.037	0.778	0.437	-0.036, 0.104
OC $\rightarrow$ BS	-0.025	0.038	0.667	0.505	-0.098, 0.051
GP $\rightarrow$ BS	-0.036	0.039	0.920	0.358	-0.110, 0.042

Note. Total effects include direct and indirect effects. For moderation terms, total effects are equivalent to the interaction effect on Business Sustainability.

Table 15. Moderation Analysis Results

Hypothesis	Relationship	(O)	t-value	p-value	2.5% CI	97.5% CI	f ²
H7a	DL x GE > BS	0.044	1.261	0.207	-0.029	0.111	0.004
H7b	OC x GE > BS	0.047	1.414	0.157	-0.021	0.110	0.004
H7c	GP x GE > BS	0.082	2.148	0.032	0.006	0.155	0.012

Note. DL = Digital Literacy; OC = Organizational Culture; GP = Government Policy; GE = Green Entrepreneurship; BS = Business Sustainability. Moderation is supported when the interaction term is statistically significant at $p < 0.05$, and the confidence interval does not include zero. The f^2 values indicate that the moderation effects were small.

5 Discussion

The findings demonstrate that Green Entrepreneurship contributes significantly to Business Sustainability in inclusive and special schools. This result suggests that schools capable of initiating recycling programs, energy efficiency practices, green curriculum integration, and environmental partnerships are more likely to sustain their educational, environmental, and institutional functions. This finding extends prior green entrepreneurship research, which has largely focused on firms and manufacturing organizations, into inclusive school settings (AlQershi et al., 2023; Demirel et al., 2019). From the Resource-Based View, green entrepreneurial orientation can be interpreted as a strategic capability that enables schools to transform environmental initiatives into long-term institutional value (Barney, 1991).

Green Human Capital also has a significant positive effect on Business Sustainability. This confirms that teachers' and education staff members' environmental knowledge, inclusive pedagogical skills, and green competencies are essential resources for sustaining inclusive school programs. Human capital does not merely support operational activities; it enables schools to translate environmental values into teachable content, adaptive learning practices, and sustainable routines (Becker, 1964; Sharabati et al., 2010; Yong et al., 2020). Although Green Human Capital was not positioned as a mediator in the final model, its significant direct and indirect effects indicate that competent human resources remain a foundational driver of sustainability.

Innovation Activity significantly improves Business Sustainability, indicating that schools adopting innovative learning methods, green

learning aids, and environmentally oriented management practices are better equipped to adapt to sustainability challenges. This supports Innovation Diffusion Theory, which explains that new ideas become effective when they are adopted, implemented, and routinized within organizations (Rogers, 2003). In inclusive schools, innovation is particularly important because environmental programs must be adapted to diverse student needs rather than implemented uniformly (Najib et al., 2020).

The school's inclusivity also significantly enhances Business Sustainability. This finding implies that sustainability in inclusive and special schools cannot be separated from accessibility, equity, participation, and reasonable accommodation. When students with disabilities are meaningfully included in green programs, sustainability becomes both an environmental and a social agenda. This supports inclusive education scholarship, which emphasizes that schools must remove barriers and create learning environments that enable all students to participate (Ainscow, 2020; Florian, 2019; UNESCO, 2020). The result also underscores the relevance of Universal Design for Learning in environmental education, as inclusive sustainability requires flexible pathways for participation (CAST, 2018).

Stakeholder Support has a significant direct effect on Business Sustainability and also shows a significant indirect effect through Artificial Intelligence Adoption, although its indirect path through Green Organizational Commitment was not significant. This suggests that parents, communities, government agencies, donors, alumni, and partners may contribute more through practical support, legitimacy, infrastructure, and resources than through

internal school commitment. This is consistent with Stakeholder Theory, which argues that organizational sustainability depends on managing relationships with actors who provide resources, legitimacy, and social expectations (Freeman, 1984).

Green Organizational Commitment significantly influences Business Sustainability and mediates the effects of Green Entrepreneurship, Green Human Capital, Innovation Activity, and Inclusivity of School. This confirms that sustainability-oriented resources become more effective when internalized into collective commitment, shared values, resource allocation, participation, and continuous improvement. The result aligns with Green HRM and green organizational culture literature, which argues that environmental practices are more likely to influence sustainability outcomes when they shape organizational commitment and employee environmental behavior (Islam et al., 2021; Li et al., 2025; Roscoe et al., 2019; Shoaib et al., 2021; Vázquez-Brust et al., 2023). However, the unsupported $SS \rightarrow GOC \rightarrow BS$ path indicates that external support alone is insufficient to build internal commitment unless it is absorbed into school culture and leadership routines.

Artificial Intelligence Adoption plays a strong mediating role across all five antecedent–sustainability relationships. This finding highlights AI as a technological mechanism that helps schools convert green initiatives, human competence, innovation, inclusivity, and stakeholder support into sustainable outcomes. AI can support adaptive learning, environmental monitoring, personalized instruction, learning analytics, and data-driven decision-making, which are especially valuable in inclusive schools serving diverse learners (Chen et al., 2020; Hwang et al., 2020; Ouyang & Jiao, 2021; Wang et al., 2024; Zawacki-Richter et al., 2019). Nevertheless, AI adoption must be governed ethically to ensure fairness, transparency, privacy, accountability, and accessibility for students with disabilities (Nguyen et al., 2023).

The moderation results show that only Government Policy significantly strengthens the relationship between Green Entrepreneurship and Business Sustainability. This means that green entrepreneurial initiatives are more

effective when schools perceive stronger policy support, regulatory legitimacy, training, incentives, and institutional direction. In the Indonesian context, this finding is highly relevant because inclusive and green school programs depend on policy frameworks such as reasonable accommodation and Adiwiyata-related environmental programs. In contrast, Digital Literacy and Organizational Culture did not significantly moderate the GE–BS relationship. This does not mean that they are unimportant; rather, their influence may operate indirectly through AI adoption, organizational commitment, or school-level implementation routines. Overall, the study confirms that inclusive school sustainability is shaped by strategic green initiatives, human capability, innovation, inclusion, stakeholder support, organizational commitment, AI adoption, and enabling policy conditions.

6 Conclusion

This study examined how Green Entrepreneurship, Green Human Capital, Innovation Activity, School Inclusivity, and Stakeholder Support influence Business Sustainability in inclusive and special schools, with Green Organizational Commitment and Artificial Intelligence Adoption serving as mediators. Results indicate that all five factors positively affect sustainability, underscoring the importance of strategic green efforts, skilled personnel, innovation, inclusive practices, and stakeholder backing. Green Organizational Commitment significantly mediates the effects of Green Entrepreneurship, Green Human Capital, Innovation Activity, and School Inclusivity on sustainability, but it does not mediate the effects of Stakeholder Support. Additionally, Artificial Intelligence Adoption mediates all five relationships, highlighting its role as a vital technological facilitator for sustainable, inclusive schools. Moderation analysis shows that only Government Policy significantly strengthens the link between Green Entrepreneurship and Business Sustainability, whereas Digital Literacy and Organizational Culture do not have significant moderating effects.

Appendix Table

Appendix A1. Measurement Items and Construct Sources

Construct	Code	Measurement Item	Source
Green Entrepreneurship	GE1	The school implements recycling and waste management programs.	AlQershi et al. (2023)
	GE2	The school promotes energy efficiency and environmentally friendly resources.	
	GE3	The school integrates environmental education into the inclusive curriculum.	
	GE4	The school has environmentally friendly policies involving students with disabilities.	
	GE5	The school develops green partnerships with parents, communities, and local institutions.	
Green Human Capital	GHC1	Teachers have good knowledge of environmentally friendly practices.	Sharabati et al. (2010); Nejati et al. (2017); Roscoe et al. (2019); Yong et al. (2020); Ainscow (2020); Sharma et al. (2012)
	GHC2	Teachers are skilled at integrating environmental education into inclusive learning.	
	GHC3	Education staff have the competence to support school environmental programs.	
	GHC4	Teachers can adapt environmental materials for students with disabilities.	
	GHC5	The school routinely enhances green capacity through training.	
Innovation Activity	INA1	The school develops innovative and environmentally friendly learning methods.	Najib et al. (2020); Florian (2019); Rogers (2003)
	INA2	The school uses environmentally friendly technology in learning.	
	INA3	The school creates environmentally friendly learning aids for students with disabilities.	
	INA4	The school innovates in involving parents and communities in environmental programs.	
	INA5	The school adopts best practices in environmental management.	
Inclusivity of School	IS1	Students with disabilities are actively involved in environmental programs.	Ainscow (2020); UNESCO (2020); CAST (2018); Florian (2019); Permendikbudristek No. 48/2023
	IS2	The school provides accessibility for all students to participate in green activities.	
	IS3	Environmental programs are designed based on Universal Design principles.	
	IS4	The school accommodates special needs in environmental activities.	
Stakeholder Support	IS5	The school promotes equal access to environmental education.	Freeman (1984); UNESCO (2020); KLHK Regulation No. 52/2019
	SS1	Parents support the school's environmental programs.	
	SS2	The local community participates in green programs.	

Construct	Code	Measurement Item	Source
	SS3	The local government provides support for environmental programs.	
	SS4	Private institutions or donors support environmental activities.	
	SS5	Alumni and school partners are involved in sustainability programs.	
Green Organizational Commitment	GOC1	The school has a strong commitment to environmental programs.	Roscoe et al. (2019); Shoaib et al. (2021); Islam et al. (2021); Li et al. (2025); Vázquez-Brust et al. (2023)
	GOC2	All school members participate in green programs.	
	GOC3	The school allocates resources for environmental programs.	
	GOC4	The school integrates environmental values into its vision and mission.	
	GOC5	The school consistently evaluates and improves green programs.	
Artificial Intelligence Adoption	AIA1	The school uses AI to develop adaptive environmental teaching materials.	Davis (1989); Venkatesh et al. (2003); Hwang et al. (2020); Zawacki-Richter et al. (2019); Chen et al. (2020); Ouyang and Jiao (2021); Nguyen et al. (2023); Wang et al. (2024)
	AIA2	The school uses AI to monitor and analyze environmental programs.	
	AIA3	Teachers use AI to personalize environmental learning for students with disabilities.	
	AIA4	The school uses AI to monitor the sustainability of inclusive programs.	
	AIA5	The school adopts AI to optimize environmental resources and learning.	
Digital Literacy	DL1	Teachers can use digital devices for learning.	Davis (1989); Venkatesh et al. (2003)
	DL2	Teachers can use digital platforms for environmental programs.	
	DL3	The school provides adequate digital infrastructure.	
	DL4	Teachers and staff routinely participate in digital literacy training.	
	DL5	The school uses digital technology to monitor green programs.	
Organizational Culture	OC1	The school has a culture that supports innovation and change.	Schein (2010); Denison (1990)
	OC2	The school encourages collaboration among teachers in environmental programs.	
	OC3	The principal supports green and inclusive initiatives.	
	OC4	The school has values that support sustainability.	
	OC5	The school culture supports the active participation of all members.	
Government Policy	GP1	Government policy supports inclusive education.	Permendikbudristek No. 48/2023; KLHK

Construct	Code	Measurement Item	Source
	GP2	Government policy supports environmentally friendly programs in schools.	Regulation No. 52/2019
	GP3	The government provides training for teachers on inclusive education and environmental programs.	
	GP4	The government provides incentives for schools implementing green programs.	
	GP5	Government policy promotes accessibility and equality in education.	
Business Sustainability	BS1	The school has financial stability to maintain inclusive education programs.	Yong et al. (2020); UNESCO (2020); Freeman (1984); Barney (1991)
	BS2	The school is able to maintain the quality of inclusive education services.	
	BS3	The school has good student and teacher retention.	
	BS4	The school receives support from stakeholders for inclusive and environmental programs.	
	BS5	The school is able to adapt to changes in policy, technology, and student needs.	

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Author Contributions

Rahmawati led conceptualization, design, methodology, supervision, and project administration. Junaid M. Shaikh refined the theory, validated the methods, and enhanced the international relevance. Agus Dwianto handled data processing, PLS-SEM analysis, and technical validation. Mi'raj Akbar Pradianto collected data, conducted the investigation, organized the literature, and drafted the manuscript. Siti Nurlaela developed instruments, validated the context, reviewed the literature, and refined the text. All authors edited, reviewed, and approved the final manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data are available from the corresponding author upon reasonable request.

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AI Usage Statement

The authors confirm that artificial intelligence tools were not used to generate research data, conduct statistical analysis, or produce research findings. AI-based tools were used only for minor language editing, grammar checking, and readability improvement. All intellectual content, interpretation, analysis, and conclusions remain the responsibility of the authors.