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Developing sustainable hospitality competencies for Gen Z hospitality management students: Matters of work-integrated learning and green mindset

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ABSTRACT

This study aims to examine the relationships among Work-Integrated Learning (WIL) in Hospitality, Green Mindset, and Sustainable Hospitality Competencies among Generation Z hospitality management students in Thailand. Drawing upon relevant theories and empirical literature, the conceptual framework was developed to investigate both direct and indirect effects of WIL in Hospitality towards students' Sustainable Hospitality Competencies, mediated by Green Mindset. Data were collected from 409 hospitality students through a structured questionnaire. They all had participated in WIL programs. Structural Equation Modeling (SEM) was employed to analyze the data. The findings revealed that WIL in Hospitality had significant positive effects on both Green Mindset and Sustainable Hospitality Competencies. Additionally, Green Mindset demonstrated a significant mediating role in the relationship between WIL Hospitality Internships and Sustainable Hospitality Competencies, indicating its critical function as a psychological pathway that enhances students' competency development toward sustainable hospitality practices. These findings extend the theoretical understanding of WIL and Green Mindset integration, and offer practical implications for educational institutes in hospitality and industry practitioners to design WIL programs and learning experiences for future hospitality professionals in enhancing their professional skills and sustainability-oriented mindsets.

1. Introduction

In the current era, the hospitality industry is expected to go beyond its traditional role of merely responding to the needs of tourists or service users. With the growing global emphasis on sustainability, hospitality businesses are increasingly held accountable for their

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practices across multiple dimensions—ranging from efficient resource utilization and environmental impact reduction to community well-being enhancement (Chong, 2023). As such, hospitality organizations are seeking strategies to cultivate sustainable hospitality competencies among the next generation of professionals, particularly students who are preparing to enter the service workforce directly (Silva et al., 2025). Generation Z hospitality students are regarded as a vital component of the future workforce and a critical segment of human capital. This generation has grown up in the context of rapid technological advancement and escalating environmental concerns, which has resulted in greater environmental awareness and stronger social responsibility compared to previous generations (Loverioa et al., 2022). However, in the context of Thailand, there remains a pressing concern regarding whether current hospitality education is adequately preparing students to meet sustainability expectations in real-world service environments. Many organizations continue to express concerns regarding the extent to which these students are adequately prepared to apply sustainability principles in real-world hospitality settings (Prasad & Vasugi, 2023). Despite their positive intentions, the lack of practical experience and structured support mechanisms may limit their ability to fully develop expertise in delivering sustainable services.

In response to this challenge, Work-Integrated Learning (WIL) has emerged as a key strategy for strengthening students' sustainable competencies. WIL enables students to bridge theoretical knowledge acquired in classrooms with practical experiences in actual work environments (Liu et al., 2024). It promotes experiential learning through problem-solving, skill development, and engagement with authentic workplace scenarios (Matsoso & Benedict, 2020). Previous studies (e.g., Jeske & Linehan, 2020) have identified that mentoring effectiveness, integration of classroom knowledge, and exposure to real-world operations are all critical factors contributing to the development of positive attitudes and professional competencies aligned with sustainability among students who participate in such learning models (Tran, 2024). However, gaining practical experience through WIL alone may not be sufficient to foster sustainable competencies, especially in the absence of a foundational green mindset (Pavlova & Singh, 2022, p. 286). Among hospitality students, developing a green mindset entails cultivating eco-centric attitudes, strengthening pro-environmental intentions, and encouraging resource conservation behaviors. When members of the new generation internalize sustainability values and are motivated to act accordingly, this intrinsic orientation can significantly influence their real-world practices in hospitality settings and eventually translate into long-term professional competencies (Mastria et al., 2023). Although several international studies have examined the influence of WIL and green mindset on sustainability development, little empirical evidence exists regarding their integrated impact on sustainable hospitality competencies—particularly among Generation Z hospitality students in Thailand. This gap underscores the need for localized research that reflects both the cultural and institutional context of Thai hospitality education.

This study, therefore, emphasizes two critical areas: (1) understanding the role of WIL in hospitality education as a mechanism for enhancing sustainable hospitality competencies—competencies that are increasingly vital for the service sector in the context of sustainable tourism; and (2) examining the extent to which green mindset functions as a contributing or mediating factor that strengthens students' development within WIL programs. By focusing on Thai hospitality students, the study directly addresses the need to contextualize sustainability education within the national labor market and educational landscape. Insights from this research can inform the design of experiential education models in higher education and provide practical direction for hospitality businesses seeking to refine their internship programs or workforce development strategies. A notable feature of this study lies in its integration of the concepts of work-integrated learning and green mindset, forming a cohesive framework to examine their combined influence on the development of sustainable competencies among Generation Z hospitality students. As members of a socially conscious and environmentally aware generation entering the hospitality workforce—a sector that contributes significantly to Thailand's economy and international image (Rungravee, 2022)—these students are key drivers of future sustainability efforts. This study further offers concrete recommendations on how higher education institutions can structure curricula and complementary activities to effectively instill green mindsets that are transferable to practical, work-based contexts.

Ultimately, this research responds to the pressing need to prepare new-generation professionals with both technical capabilities and sustainability-oriented perspectives. By systematically integrating WIL practices with green mindset development (Wegenberger & Ponocny, 2025), this study addresses the evolving demands of the modern labor market—particularly in a Thai context where environmental regulations and social expectations are becoming increasingly stringent. The findings offer meaningful implications for both higher education and the hospitality industry in building a future-ready workforce capable of advancing sustainable practices in the sector.

2. Literature review

2.1. Work-integrated learning in hospitality

Work-Integrated Learning (WIL) in the context of the hospitality industry refers to a pedagogical approach in which students are provided with opportunities to apply theoretical knowledge acquired in the classroom within real-world organizational settings. Grounded in Experiential Learning Theory (Kolb, 2014), this process is designed to enhance students' professional and sector-specific competencies through experiential learning (Matsoso & Benedict, 2020). During WIL placements, students assume roles that closely resemble those of actual employees, performing duties with accountability while receiving supervision, mentoring, and performance feedback from industry professionals. Given the service-oriented nature of hospitality work—which involves direct interaction with customers, rapid response to dynamic situations, and cross-functional collaboration—both technical and social competencies are crucial. As such, hospitality organizations place strong emphasis on developing graduates who are capable of meeting the multifaceted demands of the industry (Mwita et al., 2023).

The significance of WIL lies in its capacity to bridge theoretical learning with authentic professional experiences, thereby fostering deep learning, adaptability, and critical problem-solving abilities among students (Aprile & Knight, 2020). This aligns with Kolb's

(2014) four-stage learning cycle—concrete experience, reflective observation, abstract conceptualization, and active experimentation—which frames WIL as a structured process of transforming classroom knowledge into applied competencies. Immersion in real work environments allows students to confront complex service scenarios that are often absent in traditional classroom settings. For the host organizations, WIL serves as an opportunity to identify and cultivate future employees who possess a grounded understanding of workplace dynamics (Alfeld et al., 2013; Jackson, 2025). Meanwhile, higher education institutions benefit from feedback obtained through WIL partnerships, which can be used to revise curricula to better reflect the evolving needs of the hospitality labor market.

To systematically assess the effectiveness of WIL in hospitality education, several observable dimensions have been identified in the literature. The first is Internship Engagement, which refers to the level of enthusiasm and participation demonstrated by students during their placement, reflected through their commitment to assigned responsibilities and openness to learning (Imjai et al., 2024). The second is Authentic Industry Exposure, denoting the degree to which students are immersed in genuine workplace settings—such as direct interactions with customers, collaboration across departments, or the management of unforeseen operational challenges (Robinson et al., 2016). A third dimension is Mentoring Effectiveness, emphasizing the importance of structured guidance and constructive feedback in supporting students' skill development and professional motivation (Atalla et al., 2022). Lastly, Integration of Classroom Knowledge captures the extent to which students are able to connect academic theories with practical applications in their daily work (Boitel & Fromm, 2014).

Taken together, WIL in hospitality represents a transformative educational model that prepares graduates with both academic understanding and workplace readiness (Zopiatis & Theocharous, 2013). It plays a pivotal role in inspiring students, advancing professional skills, and nurturing creative thinking necessary for adaptive problem-solving. When WIL programs are strategically designed to foster student engagement, provide meaningful exposure to real industry operations, offer high-quality mentoring, and encourage the direct application of theoretical knowledge, they hold the potential to significantly elevate the quality of graduate outcomes. Thus, WIL serves not only as a pedagogical tool but also as a practical application of experiential learning theory in fostering industry-relevant and sustainability-oriented competencies. Moreover, they align students' competencies with the evolving demands of a hospitality sector increasingly oriented toward sustainable practices (Qubati & Tammim, 2021).

2.2. Green mindset

A green mindset refers to a psychological state and set of attitudes that prioritize environmental considerations in daily living and decision-making (Gazi et al., 2024). This concept has emerged in response to increasing awareness of natural resource degradation and the ecological consequences of human activity. A green mindset encourages individuals to recognize the value of environmental conservation and to make choices that are more ecologically responsible (Farrukh et al., 2023). It involves not only knowledge but also cognitive orientation and behavioral commitment to creating a balance between human well-being and the sustainable use of natural resources. This concept aligns with the Theory of Planned Behavior (Ajzen, 1991), which posits that behavior is shaped by an individual's attitudes, perceived social norms, and perceived behavioral control—factors that directly influence pro-environmental intentions and actions.

The importance of cultivating a green mindset has been increasingly recognized across sectors, including business and education. Establishing a strong foundation of environmental consciousness can lead individuals to use resources more judiciously, minimize waste, and reduce harmful emissions into the environment (Hariram et al., 2023). In the hospitality industry, employees with a green mindset are more likely to adopt environmentally friendly service practices and workplace behaviors, such as reducing single-use plastics, encouraging energy-saving behaviors among guests, and engaging with local communities to support sustainable tourism initiatives (Al-Romeedy & Alharethi, 2025). For Generation Z hospitality students, instilling a green mindset early in their education or during work-integrated learning experiences can foster creativity in developing green business models and promote their evolution into socially responsible entrepreneurs.

Researchers commonly assess green mindset using multiple observable variables that capture cognitive, affective, and behavioral dimensions. For instance, eco-centric attitude reflects an individual's appreciation of the ecological balance and a nature-centered worldview (Ngan et al., 2022). Pro-environmental intention denotes the willingness and determination to engage in behaviors that contribute to environmental preservation, as framed within the Theory of Planned Behavior (Ajzen, 1991) and operationalized in contemporary environmental research (Song et al., 2024). Resource conservation behavior evaluates concrete actions aimed at minimizing the use of electricity, water, and other materials, particularly in organizational or workplace settings (Syed et al., 2024). Another increasingly examined construct is green mindfulness, which highlights conscious awareness of the environmental implications of one's actions, including consumption patterns and resource use (Zhao et al., 2023). Together, these four dimensions offer a comprehensive framework for understanding and assessing the green mindset. When reinforced in a balanced manner, they enable individuals to develop a robust and proactive orientation toward sustainability.

2.3. Sustainable hospitality competencies

In an era where sustainability has become a central concern across the tourism and hospitality industry, the ability to balance high-quality service delivery with environmental conservation has emerged as a critical professional requirement (Baum et al., 2016). Sustainable competencies refer to the integrated knowledge, skills, and attitudes that enable professionals to operate in ways that simultaneously address environmental, social, and economic dimensions of sustainability (Alberton et al., 2020; Badruddin, 2024). This framework of competency development is consistent with Social Cognitive Theory (Bandura, 1986), which posits that individuals

acquire and refine professional capabilities through observational learning, experiential interaction, and self-efficacy. Individuals possessing these competencies not only adhere to standard service practices but also demonstrate a commitment to efficient resource use and meaningful engagement with stakeholders to promote sustainable outcomes.

The significance of sustainable hospitality competencies is evident across multiple levels. At the individual level, employees who understand and apply green practices—such as waste management, energy efficiency, and eco-friendly sourcing—can enhance operational efficiency and reduce environmental costs (Barakat et al., 2023). At the organizational level, embedding sustainability into service delivery and management systems contributes to a positive brand image and fosters customer trust (Ardiansyah & Alnoor, 2024). From a societal perspective, collective efforts by the hospitality sector to use clean energy, support local sourcing, and minimize waste generation can yield long-term benefits for both communities and ecosystems.

To assess sustainable hospitality competencies comprehensively, four key observed dimensions are commonly employed. The first is Knowledge of Sustainable Hospitality Practices, which refers to the level of understanding regarding environmentally friendly practices such as resource conservation, waste reduction, and the selection of sustainable suppliers (Raza & Khan, 2022). The second, Sustainable Service Delivery, reflects the ability to design and implement services that minimize social and environmental impacts—such as offering energy-efficient operations or sustainable menu planning (Mumssen & Saltiel, 2018). The third dimension, Ethical Behavior, concerns acting with integrity and responsibility toward all stakeholders, including customers, employees, local communities, and the natural environment (Pratiwi, 2021). Lastly, Stakeholder Collaboration for Sustainability captures the ability to engage collaboratively with relevant parties—such as local communities, governmental agencies, and NGOs—in co-developing sustainable initiatives within the hospitality sector (Koiwanit & Filimonau, 2023). These four indicators collectively offer a multidimensional and actionable framework for evaluating sustainability-oriented competencies in hospitality contexts.

Enhancing sustainable hospitality competencies not only equips individuals to perform effectively in dynamic social and environmental contexts but also strengthens an organization's market positioning in response to growing consumer demand for sustainable services (Hermundsdottir & Aspelund, 2021). In line with Social Cognitive Theory, this developmental process is strengthened through continuous feedback, goal-setting, and modeling of sustainable behaviors—especially when supported by structured learning environments like WIL and values such as green mindset. For next-generation hospitality students, developing a solid foundation in sustainability is increasingly seen as a competitive advantage—preparing them to contribute meaningfully as professionals and socially responsible citizens in the future workforce.

The literature reviewed above clearly supports the relationships among Work-Integrated Learning, Green Mindset, and Sustainable Hospitality Competencies. Beyond these direct connections, this study also aligns with broader educational frameworks, particularly sustainability education, which aims to cultivate knowledge, values, and practices supportive of sustainable development (Žalėnienė & Pereira, 2021). Additionally, the perspective transformation embedded in transformative learning theory provides a meaningful foundation for understanding how Gen Z students internalize sustainability values through real-world learning experiences (Leal Filho et al., 2018). These theoretical lenses further reinforce the study's relevance in advancing sustainability-focused competencies through hospitality education.

2.4. WIL in hospitality and green mindset

The concept of work-integrated learning (WIL) in the hospitality industry emphasizes the value of exposing students to real-world workplace environments where they are required to make decisions, address practical challenges, and apply problem-solving skills in authentic contexts (Xu et al., 2022). Concurrently, an increasing number of hospitality businesses have begun to incorporate sustainability principles into their operational processes—such as reducing waste, conserving energy, and promoting environmentally friendly practices within their organizational culture (Singh, 2024). As a result, when students are placed in such establishments for internships, they not only gain practical experience but are also immersed in sustainability-driven work environments that foster environmentally conscious perspectives (Mittal & Bansal, 2024).

In the context of developing a green mindset, numerous studies have shown that individuals' environmental awareness and attitudes can be significantly influenced by direct exposure to real-world sustainable practices and role models (Peng et al., 2021). For hospitality students participating in WIL programs where sustainability is embedded in the organizational culture, such experiences may promote the development of multiple dimensions of a green mindset, including enhanced environmental awareness, stronger eco-centric attitudes, and increased intention and confidence to engage in environmentally responsible behavior (e.g., pro-environmental intention and green self-efficacy). Therefore, experiential learning that integrates sustainability values into WIL settings is likely to support the internalization and advancement of green mindsets among students (García-Casarejos & Sáez-Pérez, 2020). Based on the above literature, this study proposes the following hypothesis (H):

H1. WIL in hospitality is positively associated with green mindset.

2.5. WIL in hospitality and sustainable hospitality competencies

Work-integrated learning (WIL) in the hospitality industry has been widely recognized as an effective mechanism for preparing students with the skills and competencies aligned with the evolving demands of the professional service sector (Xu et al., 2022). At the same time, sustainability has become a critical focus within the hospitality industry, with increasing emphasis placed on reducing resource consumption, implementing effective waste management systems, and promoting environmentally friendly products and services (Wang et al., 2021). When students are exposed to hospitality establishments that incorporate sustainability principles into

their operational frameworks, they are provided with opportunities to develop practical competencies related to sustainable service planning and to engage in stakeholder collaboration to support environmental preservation (Uzorka et al., 2024).

WIL programs that embed sustainability-focused activities or projects can enhance students' understanding of environmentally responsible practices—referred to as Knowledge of Sustainable Hospitality Practices—and equip them with the ability to deliver services that minimize social and environmental impact, known as Sustainable Service Delivery (Kapoor et al., 2023). Moreover, integrating ethical considerations and stakeholder responsibilities into internship experiences fosters the development of Ethical Behavior and encourages students to engage in Stakeholder Collaboration for Sustainability, such as joint initiatives with local communities or external organizations (Onyekwelu et al., 2024). Therefore, WIL in hospitality that is deliberately structured around sustainability values is likely to have a significant positive influence on the development of students' sustainable hospitality competencies. Based on the reviewed literature, the following hypothesis is proposed:

H2. WIL in hospitality is positively associated with sustainable hospitality competencies.

2.6. Green mindset and sustainable hospitality competencies

A green mindset refers to an individual's awareness of, and commitment to, environmental preservation, coupled with a proactive orientation toward nature-friendly practices (Ogiemwonyi et al., 2023). In the hospitality industry context, a strong green mindset among employees influences how services are designed and resources are managed with ecological sensitivity and efficiency (Tran, 2023). When sustainability is embraced as a core organizational value and shared responsibility, it leads to intentional planning and implementation of practices that address both environmental and social concerns in a tangible and impactful manner.

The concept of sustainable hospitality competencies encompasses a set of knowledge, skills, and behaviors necessary for promoting sustainable operations. These include Knowledge of Sustainable Hospitality Practices, Sustainable Service Delivery, Ethical Behavior, and Stakeholder Collaboration for Sustainability (Carlisle et al., 2022). Previous studies have shown that individuals with a strong green mindset are more likely to actively seek out and adopt eco-friendly practices. They tend to innovate service solutions that conserve energy and reduce waste (Faeni, 2024), and exhibit higher levels of ethical conduct and social responsibility—believing that actions disregarding environmental or community impact may lead to long-term harm (Jia et al., 2023).

Furthermore, a green mindset promotes stakeholder collaboration, as individuals are more inclined to initiate and participate in activities such as carbon reduction initiatives, energy-saving campaigns, and sustainable communication strategies that engage customers in environmentally responsible consumption (Stern & Valero, 2021). Integrating such values into the professional mindset helps reinforce and strengthen sustainable hospitality competencies at both the individual and organizational levels. Based on the aforementioned literature, this study proposes the following hypotheses:

H3. Green mindset is positively associated with sustainable hospitality competencies.

2.7. Mediating role of green mindset between WIL and sustainable hospitality competencies

Previous studies have highlighted that experiential learning opportunities, such as those found in work-integrated learning (WIL), can foster deeper environmental awareness and value internalization among students when sustainability is embedded in organizational practices (Karpudewan & Mohd Ali Khan, 2017; Rashed et al., 2025). A green mindset, in turn, promotes proactive, eco-conscious behaviors that align with the competencies required for sustainable hospitality operations (Sheikh et al., 2024). Drawing upon Social Cognitive Theory (Bandura, 1986), which emphasizes the role of environmental exposure and modeling in shaping behavior and capabilities, it is plausible that green mindset serves as a mediating mechanism through which WIL influences the development of sustainability-related competencies. Accordingly, this study proposes the following hypothesis:

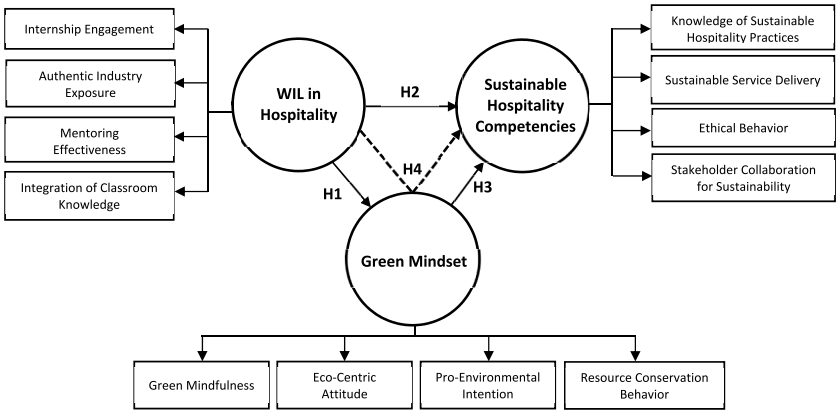

Fig. 1. Conceptual framework.

H4. Green mindset mediates the relationship between work-integrated learning in hospitality and sustainable hospitality competencies.

Based on the literature review related to Work-Integrated Learning (WIL) in Hospitality, Green Mindset, and Sustainable Hospitality Competencies, the conceptual framework of this study is illustrated in Fig. 1.

3. Research methodology

3.1. Research design

This study adopted a quantitative research approach using a cross-sectional survey method to examine the relationships among WIL in Hospitality, Green Mindset, and Sustainable Hospitality Competencies. The sample consisted of Generation Z hospitality management students who participated in work-integrated learning (WIL) programs conducted in real-world hospitality settings. This sample was chosen because hospitality students represent the primary group directly involved in structured WIL programs within the tourism and service sectors. Their educational context provides regular exposure to sustainability-oriented operations, making them highly suitable for examining how WIL and green mindset influence the development of sustainability-related competencies. The conceptual framework and measurement instruments were developed based on a systematic review of relevant literature, and observable variables were defined to align with each core construct. Data were collected using a structured questionnaire composed of close-ended items, enabling systematic analysis. Inferential statistics were applied, and data were analyzed using path analysis within the Structural Equation Modeling (SEM) framework. Prior to data analysis, the quality of the measurement instruments was assessed in terms of reliability and construct validity to ensure the robustness of the results. It is important to note that the use of a cross-sectional design presents a limitation in terms of causal inference. Since the data were collected at a single point in time, the study can only suggest statistical associations rather than definitive cause-and-effect relationships among the variables.

3.2. Data collection procedure

Data collection took place during the internship period of Gen Z students (the fourth-year of program) enrolled in WIL-based hospitality programs at actual hospitality establishments. The process began with coordination efforts involving academic internship coordinators and corporate internship or training managers, to explain the research objectives and request permission to distribute the survey. The sample size was determined using Cochran's formula (1977), which is appropriate when the total population is unknown. Based on a 95 % confidence level and a 5 % margin of error, the minimum required sample size was calculated to be 384 respondents. In the actual data collection phase, the structured questionnaire was distributed both online and offline to students who met the inclusion criteria and voluntarily agreed to participate. An initial screening section was used to confirm eligibility and willingness to participate. Of the 441 students reached, 409 provided informed consent and passed the screening, while the remaining 32 were either ineligible or declined to participate. Online responses were collected via Google Forms, which included a clear explanation of the study's objectives, a confidentiality statement, and informed consent disclosure. Data completeness and quality were monitored periodically. At the conclusion of the collection process, a total of 409 valid responses were obtained—sufficient for subsequent statistical analysis.

It should be acknowledged that, because participation was entirely voluntary, there may be a risk of self-selection bias. This implies that the respondents who chose to participate might systematically differ from those who declined, potentially affecting the generalizability of the findings. Efforts were made to minimize this bias by explaining the study's purpose clearly and encouraging participation through neutral and inclusive communication.

3.3. Measurement instruments

The primary instrument employed in this study was a structured questionnaire, which consisted of two main sections. The first section gathered demographic information from the respondents, including age, gender, field of study, internship experience, and cumulative grade point average (GPA). The second section measured the core constructs specified in the conceptual framework. The questionnaire items were developed by adapting validated instruments from prior research and were refined to suit the context of Gen Z hospitality students in Thailand.

The second section of the questionnaire employed a five-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). This section encompassed key observed variables under each of the study's main constructs: WIL in Hospitality, Green Mindset, and Sustainable Hospitality Competencies. During the instrument development process, the draft questionnaire was reviewed by three subject-matter experts to assess content validity. The Index of Item-Objective Congruence (IOC) was calculated, and revisions were made based on expert recommendations.

A pilot test was then conducted with a sample of 30 students. The reliability of the instrument was evaluated using Cronbach's alpha, and all constructs yielded alpha values exceeding 0.70, indicating satisfactory internal consistency. The validated instrument was subsequently used for the full-scale data collection phase. A summary of the main constructs, their respective component variables, observed indicators, and supporting references is presented in the Summary of Research Variables in Table 1.

3.4. Data analysis methods

After the completion of data collection, a thorough data cleaning process was conducted to ensure completeness and accuracy. Descriptive statistics were then employed to examine the characteristics of the sample and to summarize the distribution of the studied variables. Subsequently, the quality of the measurement instruments was assessed by evaluating reliability and construct validity through Confirmatory Factor Analysis (CFA).

Once the measurement model demonstrated an acceptable fit based on established statistical criteria, Path Analysis was conducted using Structural Equation Modeling (SEM) to examine the causal relationships among WIL in Hospitality, Green Mindset, and Sustainable Hospitality Competencies. The structural model was tested using SmartPLS version 3.0, which is a variance-based SEM technique (PLS-SEM). This approach was selected due to its suitability for complex models involving latent constructs and mediating variables, as well as its robustness in handling non-normal data distributions and moderate sample sizes. Compared to covariance-based SEM (CB-SEM) techniques such as AMOS, SmartPLS allows for more flexibility when data do not meet strict multivariate assumptions. Although background information such as GPA, type of institution (public or private), and internship setting (urban vs. rural) was collected for descriptive purposes, these variables were not included as control variables in the final SEM model. The primary focus of this study was to examine the core structural relationships among the key latent constructs. Nevertheless, the potential influence of these background variables is acknowledged and recommended as an avenue for further analysis in future research. The findings were interpreted and discussed in both theoretical and practical contexts relevant to the hospitality industry in the subsequent section.

Table 1
Summary of research variables.

Variables	Component variables	Indicators	References
WIL in Hospitality	Internship Engagement	• Felt fully engaged with assigned tasks during the internship (Q1) • Felt excited and enjoyed learning new skills during practical work (Q2)	Imjai et al. (2024)
	Authentic Industry Exposure	• Gained exposure to real working environments, such as customer service or coordination with different departments (Q3) • Faced real and challenging situations, such as problem-solving or handling customer complaints (Q4)	Robinson et al. (2016)
	Mentoring Effectiveness	• Received clear and helpful guidance from mentors or supervisors during the internship (Q5) • Received continuous feedback and evaluation, which helped improve work performance (Q6)	Atalla et al. (2022)
	Integration of Classroom Knowledge	• Was able to apply theoretical knowledge from the classroom to real-life work situations appropriately (Q7) • Recognized the connection between academic lessons and real-life problems encountered during the internship (Q8)	Boitel & Fromm, 2014
Green Mindset	Green Mindfulness	• Reflected on environmental impacts before making purchasing decisions (Q9) • Avoided behaviors that may cause environmental harm when possible (Q10)	Zhao et al. (2023)
	Eco-Centric Attitude	• Believed that “nature” is equally or more important than personal interests (Q11) • Considered unnecessary destruction of natural resources unacceptable (Q12)	Ngan et al. (2022)
	Pro-Environmental Intention	• Intentionally changed personal lifestyle to reduce daily waste generation (Q13) • Willingly chose environmentally friendly products/services even if they were more costly (Q14)	Song et al., 2024; .
	Resource Conservation Behavior	• Used resources such as water and electricity cautiously and only when necessary (Q15) • Often reused or repaired items before deciding to purchase new ones (Q16)	Syed et al. (2024)
Sustainable Hospitality Competencies	Knowledge of Sustainable Hospitality Practices	• Understood basic principles for minimizing environmental impacts in the hospitality business (e.g., waste management, energy efficiency) (Q17) • Clearly explained the benefits of using eco-friendly raw materials or sources (Q18)	Raza and Khan (2022)
	Sustainable Service Delivery	• Was able to design or improve service delivery processes to be energy-efficient and reduce waste (Q19) • Paid attention to providing services that considered consumer health and environmentally safe materials (Q20)	Mumssen and Saltiel (2018)
	Ethical Behavior	• Worked transparently and honestly, whether in providing information to customers or in internal operations (Q21) • Considered the impacts on stakeholders (customers, staff, community) before engaging in any activity (Q22)	Pratiwi (2021)
	Stakeholder Collaboration for Sustainability	• Collaborated with peers and other units to plan or implement environmentally-focused projects (Q23) • Supported and participated in activities that promote community well-being and social sustainability (Q24)	Koiwanit and Filimonau (2023)

4. Results

The data analysis process began with descriptive statistics to present the demographic characteristics of the respondents, followed by an assessment of the reliability and construct validity of the measurement instruments. Subsequently, the goodness-of-fit of both the measurement model and the structural model was tested. The final stage involved examining the causal relationships between the core constructs through hypothesis testing.

A total of 409 Gen Z hospitality students participated in this study. The demographic analysis revealed that the majority of the respondents were female (n = 315, 77.00 %), while male participants accounted for 94 individuals (23.00 %). Regarding the type of educational institution, 318 respondents (77.80 %) were enrolled in public universities, and 91 respondents (22.20 %) were from private institutions. In terms of field of study, Hotel Management had the largest number of respondents (n = 127, 31.10 %), followed by equal representation from Tourism Management and Restaurant Business Management (each n = 112, 27.40 %). Meanwhile, 51 respondents (12.50 %) majored in Airline Business Management, and 7 respondents (1.70 %) belonged to other fields.

With respect to internship duration, most participants reported an internship period of 3–5 months (n = 258, 63.10 %), followed by less than 3 months (n = 88, 21.50 %). Internships of 6–8 months and more than 12 months were reported by 41 (10.00 %) and 17 (4.20 %) participants, respectively, while only 5 respondents (1.20 %) completed internships of 9–12 months. Regarding cumulative GPA, the largest group fell within the range of 3.01–3.50 (n = 144, 35.20 %), followed by 3.51–4.00 (n = 127, 31.10 %) and 2.51–3.00 (n = 97, 23.70 %). Additionally, 40 participants (9.80 %) had a GPA between 2.01 and 2.50, while only one participant (0.20 %) had a GPA below 2.00. These details are summarized in Table 2.

Following the confirmatory factor analysis (CFA) to evaluate the quality of the measurement model, the results indicated an acceptable level of model fit. The goodness-of-fit indices considered included the Standardized Root Mean Square Residual (SRMR), Unweighted Least Squares Discrepancy (d_ULS), Geodesic Discrepancy (d_G), Chi-square statistic, and Normed Fit Index (NFI). The SRMR value was 0.062, which falls within the acceptable threshold of less than 0.08, indicating good model fit. Furthermore, the NFI value was 0.863, supporting the adequacy of the model. The d_ULS and d_G values were low, and the Chi-square statistic was 464.932, further affirming the overall fit of the measurement model. These results are presented in Table 3.

To assess the reliability and convergent validity of the measurement model, internal consistency and convergent validity of the latent variables were examined using Cronbach's Alpha (α), rho_A, Composite Reliability (CR), and Average Variance Extracted (AVE). The results showed that all latent constructs had Cronbach's Alpha and CR values exceeding the threshold of 0.70, and AVE values greater than 0.50, indicating a satisfactory level of internal consistency and convergent validity. In addition, all observable variables demonstrated acceptable factor loadings ranging from 0.797 to 0.875, and their Variance Inflation Factor (VIF) values ranged between 1.784 and 2.688, suggesting no issues with multicollinearity. To further ensure the robustness of the findings, common method bias (CMB) was assessed using the inter-construct correlation approach. Based on the correlation matrix among the observed variables, none of the correlations exceeded the conservative threshold of 0.90 (Podsakoff et al., 2003), indicating that CMB was not a significant concern in this study. Detailed results are presented in Table 4.

Discriminant validity of the three latent variables—WIL in Hospitality, Green Mindset, and Sustainable Hospitality Competencies—was assessed using the Heterotrait-Monotrait Ratio of Correlations (HTMT) and the Fornell-Larcker Criterion. The HTMT analysis showed that all inter-construct correlations were below the recommended threshold of 0.90. Specifically, the HTMT values between WIL in Hospitality and Green Mindset, and between WIL in Hospitality and Sustainable Hospitality Competencies, were 0.888 and 0.840 respectively. Although the HTMT value between Green Mindset and Sustainable Hospitality Competencies was relatively high at 0.973, it still remained within the acceptable margin (Henseler et al., 2015).

Table 2
Characteristics of the sample group.

Category	Subcategory	Frequency	Percent (%)
Gender	Male	94	23.00
	Female	315	77.00
Current Educational Institution (Public or Private)	Public Institution	318	77.80
	Private Institution	91	22.20
Field of Study in the Hospitality Industry	Tourism Management	112	27.40
	Hotel Management	127	31.10
	Airline Business Management	51	12.50
	Restaurant Business Management	112	27.40
	Others	7	1.70
Internship Duration	Less than 3 months	88	21.50
	3–5 months	258	63.10
	6–8 months	41	10.00
	9–12 months	5	1.20
	More than 12 months	17	4.20
Current Cumulative GPA	Below 2.00	1	0.20
	2.01–2.50	40	9.80
	2.51–3.00	97	23.70
	3.01–3.50	144	35.20
	3.51–4.00	127	31.10
Total	**Total**	409	100.00

Table 3
Goodness of model fit.

	Saturate Model	Estimate Model
SRMR	0.062	0.062
d_ULS	0.297	0.297
d_G	0.195	0.195
Chi-Square	464.932	464.932
NFI	0.863	0.863

Table 4
Reliability and validity test.

Latent variables	Observable variables	Loading	VIF	α	rho_A	CR	AVE
WIL in Hospitality	Internship Engagement	0.848	2.098	0.849	0.851	0.898	0.689
	Authentic Industry Exposure	0.797	1.805				
	Mentoring Effectiveness	0.863	2.179				
	Integration of Classroom Knowledge	0.809	1.784				
Green Mindset	Green Mindfulness	0.833	1.968	0.866	0.867	0.909	0.714
	Eco-Centric Attitude	0.835	2.030				
	Pro-Environmental Intention	0.868	2.327				
	Resource Conservation Behavior	0.842	2.082				
Sustainable Hospitality Competencies	Knowledge of Sustainable Hospitality Practices	0.862	2.658	0.878	0.879	0.916	0.733
	Sustainable Service Delivery	0.875	2.688				
	Ethical Behavior	0.817	2.104				
	Stakeholder Collaboration for Sustainability	0.869	2.522				

Additionally, the Fornell-Larcker Criterion confirmed that the square root of the AVE for each latent construct (as presented on the diagonal of the correlation matrix) exceeded the inter-construct correlations. The square roots of AVE were 0.830 for WIL in Hospitality, 0.845 for Green Mindset, and 0.856 for Sustainable Hospitality Competencies, indicating adequate discriminant validity and confirming that each construct is empirically distinct from the others. These results are summarized in Table 5.

The examination of causal relationships among variables based on the proposed hypotheses was conducted using path analysis within the framework of Structural Equation Modeling (SEM). The results demonstrated that Hypothesis 1 (H1), which tested the relationship between WIL in Hospitality and Green Mindset, was statistically significant at the 0.01 level, with a standardized path coefficient of 0.762 ($t = 28.701$, $p < 0.01$). Regarding Hypothesis 2 (H2), the results indicated that WIL in Hospitality had a positive effect on Sustainable Hospitality Competencies, with a path coefficient of 0.184 ($t = 3.260$, $p = 0.001$). In addition, Hypothesis 3 (H3) revealed that Green Mindset had a significant positive influence on Sustainable Hospitality Competencies, with a path coefficient of 0.710 ($t = 15.237$, $p < 0.01$). These findings highlight the critical role of Green Mindset in fostering sustainable service competencies among Gen Z hospitality students. Full details of the hypothesis testing are presented in Table 6.

To enhance the understanding of the structural relationships among the variables in this study, Fig. 1 illustrates the final SEM path model derived from the analysis. The model includes three latent constructs: WIL in Hospitality, Green Mindset, and Sustainable Hospitality Competencies, along with their corresponding observable indicators. The results clearly demonstrate the direct effects of WIL in Hospitality on both Green Mindset and Sustainable Hospitality Competencies, as well as the direct influence of Green Mindset on Sustainable Hospitality Competencies, all of which were statistically significant. Moreover, the model shows that the R^2 value for Green Mindset is 0.581, and for Sustainable Hospitality Competencies is 0.737, indicating a satisfactory level of explained variance for the dependent variables. These findings are summarized in Figs. 2 and 3, which presents a visual comparison of the standardized path coefficients among the latent constructs. This illustration helps emphasize the strength of each hypothesized relationship, particularly the strong indirect pathway from WIL in Hospitality to Sustainable Hospitality Competencies through Green Mindset.

Additionally, the study investigated the indirect effect of WIL in Hospitality on Sustainable Hospitality Competencies through

Table 5
Discriminant validity.

Heterotrait-Monotrait Ratio of Correlations (HTMT)			
Construct	(1)	(2)	(3)
WIL in Hospitality (1)			
Green Mindset (2)	0.888		
Sustainable Hospitality Competencies (3)	0.840	0.973	
Fornell-Larcker Criterion			
Construct	(1)	(2)	(3)
WIL in Hospitality (1)	0.830		
Green Mindset (2)	0.762	0.845	
Sustainable Hospitality Competencies (3)	0.725	0.850	0.856

Table 6
Summary results.

H	Effect	Original Sample (O)	Standard Deviation (STDEV)	t-Statistic	p-Value	Results
H1	WIL in Hospitality - > Green Mindset	0.762	0.027	28.701	0.000	Supported
H2	WIL in Hospitality - > Sustainable Hospitality Competencies	0.184	0.056	3.260	0.001	Supported
H3	Green Mindset - > Sustainable Hospitality Competencies	0.710	0.047	15.237	0.000	Supported

Note: **Significant at 0.01.

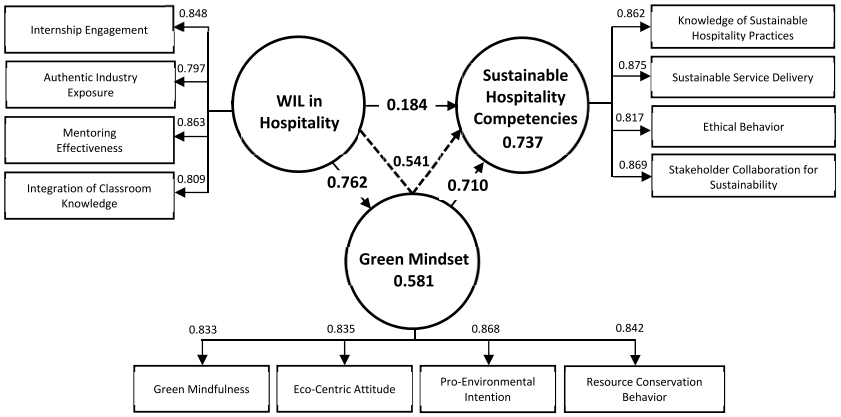

Fig. 2. Structural equation model.

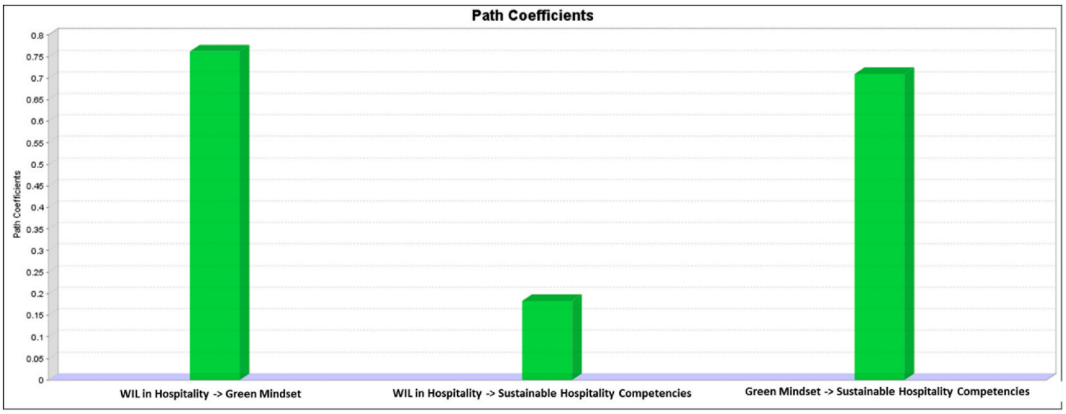

Fig. 3. Standardized path coefficients among latent constructs in the structural model.

Green Mindset. The results indicated that the indirect effect was statistically significant at the 0.01 level, with a path coefficient of 0.541 ($t = 14.223$, $p < 0.01$). This highlights the mediating role of Green Mindset in transmitting the influence of WIL in Hospitality to the development of Sustainable Hospitality Competencies among Gen Z hospitality students. Furthermore, the confidence interval (CI) method, as recommended by Preacher and Hayes, was used to assess the significance of the mediation effect. The 95 % CI for the indirect effect did not include zero ([0.470, 0.613]), confirming that the mediation is statistically significant. Details of the mediation

Table 7
Indirect relationship.

H	Indirect effect	Original Sample (O)	Standard Deviation (STDEV)	t-Statistic	Confidence Intervals	p-Value
H4	**WIL in Hospitality - > Green Mindset - > Sustainable Hospitality Competencies**	0.541	0.038	14.223	[0.470, 0.613]	0.000

Note: **Significant at 0.01.

analysis are provided in Table 7.

5. Discussion

The findings of this study provide statistically significant support for all three hypotheses, aligning with existing theoretical frameworks and empirical studies across multiple dimensions. Specifically, Hypothesis 1 (H1) revealed that Work-Integrated Learning (WIL) in the hospitality industry exerts a significant positive influence on the Green Mindset of Gen Z hospitality students. This outcome underscores the critical role of WIL in fostering environmentally conscious attitudes and behaviors through immersive work experiences in sustainability-oriented organizations. The findings are consistent with those of Mittal and Bansal (2024), who emphasized that participation in environmentally integrated internship programs can reshape individual attitudes and behaviors toward sustainability. Similarly, García-Casarejos and Sáez-Pérez (2020) found that experiential learning in real-world settings with a sustainability focus significantly promotes the development of a Green Mindset among youth and students.

In addition, Hypothesis 2 (H2) confirmed that WIL in hospitality positively influences Sustainable Hospitality Competencies. This finding supports prior assertions by Xu et al. (2022) and Kapoor et al. (2023), who argued that engaging students in industry-based internships that incorporate sustainability at all levels enhances their practical competencies. These include knowledge of sustainable hospitality practices, the ability to deliver environmentally friendly services, and ethical behavior, along with collaborative engagement with stakeholders to promote sustainability (Onyekwelu et al., 2024; Uzorka et al., 2024).

Furthermore, Hypothesis 3 (H3) demonstrated a strong and statistically significant influence of Green Mindset on Sustainable Hospitality Competencies. This result aligns with the studies of Carlisle et al. (2022) and Faeni (2024), which highlight that instilling an environmentally conscious mindset directly enhances sustainability-related behaviors and competencies in hospitality settings. Individuals with a high level of Green Mindset are more likely to incorporate eco-friendly thinking into service planning, product development, and resource management. They are also more inclined to engage stakeholders in driving sustainability-oriented initiatives. This is supported by Jia et al. (2023) and Stern and Valero (2021), who argue that Green Mindset serves as a foundational element in developing sustainable competencies at both individual and organizational levels. Taken together, these findings strongly reinforce the coherence and validity of the proposed conceptual framework, affirming that both WIL in hospitality and Green Mindset play essential roles in shaping sustainable service competencies among future professionals in the hospitality industry.

While previous international research has highlighted the influence of WIL in hospitality on the development of a Green Mindset (García-Casarejos & Sáez-Pérez, 2020; Mittal & Bansal, 2024), the present study contributes new contextual insights specific to Gen Z hospitality students in Thailand. The findings reveal that this group responded to their WIL experiences with a remarkably strong and tangible shift in their Green Mindset—more pronounced than anticipated. The path coefficient between WIL in Hospitality and Green Mindset was found to be as high as 0.762, a value notably higher than those reported in previous studies across other contexts. This result suggests that the presence of environmentally responsible practices in Thai hospitality enterprises serves as a significant catalyst for students' learning, awareness-building, and attitudinal transformation regarding environmental issues. This outcome reflects the distinct characteristics of Thai Gen Z students, who appear to be more environmentally conscious and receptive to ecological values than previous generations (Al-Romeedy & Alharethi, 2025). It also aligns with observations by Hariram et al. (2023), who noted that younger cohorts are more responsive to experiential learning when it is tied to social and environmental relevance. Particularly in the Thai context, where the hospitality industry has increasingly integrated green practices into its organizational culture, internship settings have emerged as vital platforms for accelerating environmental learning and cultivating a robust Green Mindset among students. This discovery represents a novel contextual contribution, extending the understanding of how Gen Z students in Thailand internalize sustainability values through applied learning. It reinforces the notion that WIL in Hospitality not only serves as a mechanism for professional skills development but also functions as a powerful pedagogical tool for embedding strong environmental attitudes and behaviors in the next generation of hospitality professionals.

Another notable finding is the significant mediating role of Green Mindset in transmitting the influence of WIL in Hospitality to the development of Sustainable Hospitality Competencies. The path analysis revealed a strong indirect effect, with a coefficient of 0.541 ($t = 14.223$, $p < 0.01$), and a confidence interval [0.470, 0.613], confirming the statistical robustness of the mediation effect. This result offers a novel conceptual contribution, as previous literature has not explicitly articulated this mechanism. While some studies have highlighted the direct role of WIL in Hospitality in enhancing service competencies (Kapoor et al., 2023; Xu et al., 2022), and others have demonstrated the influence of Green Mindset on sustainability-related competencies (Carlisle et al., 2022; Faeni, 2024), no prior research has clearly illustrated how the development of sustainable competencies among Gen Z hospitality students can be significantly strengthened when the experiential learning process from WIL is complemented by the cultivation of a Green Mindset. This finding extends existing theoretical frameworks, which have typically viewed WIL in Hospitality as a process that directly contributes to competency development (Uzorka et al., 2024), by proposing that such development may be insufficient without the parallel reinforcement of Green Mindset. Particularly in the context of contemporary sustainable hospitality, organizations demand professionals who not only possess technical skills and domain knowledge but also a strong green mindset as a foundational element guiding ethical decision-making and environmentally responsible behavior (Jia et al., 2023; Stern & Valero, 2021). Accordingly, this study proposes an integrated conceptual model that combines WIL in Hospitality with Green Mindset, emphasizing that effective development of Sustainable Hospitality Competencies should involve the intentional design of WIL programs that systematically foster environmental awareness. This could include the incorporation of sustainability-focused activities, the creation of organizational cultures that support ecological values, and mentorship by role models who exemplify resource conservation. Such an approach would ensure that the professional and sustainable service competencies developed among Gen Z hospitality students are both profound and enduring in the long term.

5.1. Theoretical implications

This study contributes to theoretical advancement by integrating Experiential Learning Theory and Social Cognitive Theory within the context of hospitality education. The findings affirm that Work-Integrated Learning (WIL) not only facilitates professional development but also serves as a cognitive mechanism that shapes sustainability-oriented mindsets. By confirming the mediating role of Green Mindset, the study extends the application of Social Cognitive Theory in explaining how attitudes and competencies interact in real-world experiential settings. Furthermore, this research enriches the literature by contextualizing these theories within the cultural and generational dynamics of Thai Gen Z students—a group underrepresented in current sustainability and hospitality education research. The validated conceptual model also offers a new theoretical lens through which the link between experiential learning and sustainable competencies can be viewed, especially in developing countries where such integration remains nascent.

5.2. Recommendations

Based on the findings that underscore the significant roles of Work-Integrated Learning (WIL) in Hospitality and Green Mindset in developing Sustainable Hospitality Competencies among Gen Z hospitality students in Thailand, this study presents several practical recommendations for higher education institutions and hospitality industry stakeholders. First, higher education institutions should redesign their WIL programs to systematically integrate sustainability principles and actively cultivate a Green Mindset among students. This integration should include clearly defined objectives, such as incorporating environmental conservation themes into course content, organizing related workshops or projects, and forming partnerships with eco-conscious enterprises. These efforts would ensure that students gain direct, meaningful experiences in real-world hospitality environments that support the development of a Green Mindset.

Simultaneously, hospitality businesses should recognize their role as influential learning environments capable of shaping both professional and sustainability-related competencies in students. Specifically, organizations should foster a green organizational culture, appoint mentors or internship supervisors who serve as role models for environmentally responsible behavior, and design internship activities that are linked to environmental or community-based projects. Such practices will allow students to concurrently enhance their technical capabilities and develop a deeper commitment to sustainability values.

Furthermore, this study recommends that relevant government agencies—such as the Ministry of Tourism and Sports or bodies responsible for hospitality workforce standards—incorporate Green Mindset and Sustainable Hospitality Competencies as core elements in future workforce development strategies. This could involve embedding these competencies into national guidelines for internship programs, integrating them into upskilling and reskilling curricula, and providing incentives for enterprises that actively promote sustainability-oriented learning environments at the national level.

6. Conclusion

This study highlights the pivotal role of Work-Integrated Learning (WIL) in Hospitality and Green Mindset in promoting the development of Sustainable Hospitality Competencies among Gen Z hospitality students in Thailand. The structural equation modeling analysis confirmed that real-world internship experiences—when conducted in organizations that integrate sustainability principles and offer quality mentorship—significantly enhance both students' Green Mindset and their sustainable service competencies. Furthermore, the findings underscore the mediating role of Green Mindset, which effectively transmits the influence of WIL experiences to the development of sustainable hospitality competencies. While these results reaffirm the value of designing workplace-integrated learning experiences that nurture environmentally conscious attitudes, it is important to acknowledge that the study employed a cross-sectional design, which limits the ability to draw causal inferences over time. Moreover, as participation was voluntary, potential self-selection bias cannot be entirely ruled out. Future studies may adopt longitudinal or cross-cultural approaches to further explore the developmental trajectories of sustainability competencies in diverse educational and industry settings. Such integration of WIL and sustainability education remains critical for preparing Gen Z students to enter the modern hospitality industry as ethically grounded professionals committed to advancing environmental and societal well-being. These competencies, in turn, contribute to elevating professional standards and ensuring long-term sustainability within the sector.

CRediT authorship contribution statement

Sunthorn Boonkaew: Writing – original draft, Visualization, Methodology, Formal analysis, Data curation, Conceptualization. **Narinthon Imjai:** Writing – original draft, Visualization, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Charoenchai Agmapisarn:** Writing – review & editing, Visualization, Validation, Investigation. **Theeraphan Sa-nguanwong:** Writing – review & editing, Validation, Resources, Investigation. **Shayesteh Moghadas:** Writing – review & editing, Visualization, Validation, Investigation. **Somnuk Aujirapongpan:** Writing – review & editing, Writing – original draft, Validation, Project administration, Methodology, Investigation, Formal analysis, Conceptualization.

Ethics declaration

Authors declared that the participants were assured that their participation is voluntary and that they can withdraw from the study at any time. The data collected from the participants was kept confidential and anonymous, and the data was only be used for research

purposes. Authors further declared that the study complied with ethical guidelines set forth by the Institutional Review Board of the human research ethics committee (NMCEC-0048/2567).

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT in order to assist with improving the readability and language of the manuscript. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

Data will be made available on request.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Al-Romeedy, B. S., & Alharethi, T. (2025). Leveraging green human resource management for sustainable tourism and hospitality: A mediation model for enhancing green reputation. *Discover Sustainability, 6*(1), 67. https://doi.org/10.1007/s43621-025-00829-2

Alberton, A., Kieling, A. P., Lyra, F. R., Hoffmann, E. M., Lopez, M. P. V., & Stefano, S. R. (2020). Competencies for sustainability in hotels: Insights from Brazil. *Employee Relations: The International Journal, 44*(3), 555–575. https://doi.org/10.1108/ER-01-2019-0093

Alfeld, C., Charner, I., Johnson, L., & Watts, E. (2013). *Work-based learning opportunities for high school students*. National Research Center for Career and Technical Education. https://doi.org/10.13140/RG.2.2.21917.33767

Aprile, K. T., & Knight, B. A. (2020). The WIL to learn: Students' perspectives on the impact of work-integrated learning placements on their professional readiness. *Higher Education Research and Development, 39*(5), 869–882. https://doi.org/10.1080/07294360.2019.1695754

Ardiansyah, M., & Alnoor, A. (2024). Integrating corporate social responsibility into business strategy: Creating sustainable value. *Involvement International Journal of Business, 1*(1), 29–42. https://doi.org/10.62569/iijb.v1i1.5

Atalla, A. D. G., Mostafa, W. H., & Ali, M. S. S. (2022). Assessing mentoring effectiveness in nursing education: Students' perspectives. *Tanta Scientific Nursing Journal, 26*(3), 33–49. https://doi.org/10.21608/tsnj.2022.255377

Badruddin, A. (2024). Impact of demographic profile on sustainability learning: A management education students' survey. *International Journal of Management in Education, 22*(2), Article 100984. https://doi.org/10.1016/j.ijme.2024.100984

Bandura, A. (1986). Social foundations of thought and action. *Englewood Cliffs, NJ, 1986*(23–28), 2.

Barakat, B., Milhem, M., Naji, G. M. A., Alzoraiki, M., Muda, H. B., Ateeq, A., & Abro, Z. (2023). Assessing the impact of green training on sustainable business advantage: Exploring the mediating role of green supply chain practices. *Sustainability, 15*(19), Article 14144. https://doi.org/10.3390/su151914144

Baum, T., Cheung, C., Kong, H., Kralj, A., Mooney, S., Nguyễn Thị Thanh, H., … Siow, M. L. (2016). Sustainability and the tourism and hospitality workforce: A thematic analysis. *Sustainability, 8*(8), 809. https://doi.org/10.3390/su8080809

Boitel, C. R., & Fromm, L. R. (2014). Defining signature pedagogy in social work education: Learning theory and the learning contract. *Journal of Social Work Education, 50*(4), 608–622. https://doi.org/10.1080/10437797.2014.947161

Carlisle, S., Ivanov, S., Dijkmans, C., & Marco-Lajara, B. M. L. (2022). Environmental skills gaps in tourism and hospitality organisations: Evidence from Europe. *Tourism: An International Interdisciplinary Journal, 70*(3), 411–431. https://doi.org/10.37741/t.70.3.6

Chong, K. M. M. Y. (2023). *Sustainability-oriented business model: An analysis of sustainable practices in the context of a luxury hotel.* urn:nbn:se:uu:diva-515189.

Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). John Wiley & Sons.

Faeni, D. (2024). Green practices and employees' performance: The mediating roles of green human resources management policies and knowledge development. *Journal of Infrastructure, Policy and Development, 8*(8), 4924. https://doi.org/10.24294/jipd.v8i8.4924

Farrukh, B., Younis, I., & Longsheng, C. (2023). The impact of natural resource management, innovation, and tourism development on environmental sustainability in low-income countries. *Resources Policy, 86*, Article 104088. https://doi.org/10.1016/j.resourpol.2023.104088

García-Casarejos, N., & Sáez-Pérez, L. A. (2020). Internships for higher education students to promote the local sustainability of rural places. *Sustainability, 12*(12), 4926. https://doi.org/10.3390/su12124926

Gazi, M. A. I., Al Masud, A., Yusof, M. F., Billah, M. A., Islam, M. A., & Hossain, M. A. (2024). The green mindset: How consumers' attitudes, intentions, and concerns shape their purchase decisions. *Environmental Research Communications, 6*(2), Article 025009. https://doi.org/10.1088/2515-7620/ad23f4

Hariram, N. P., Mekha, K. B., Suganthan, V., & Sudhakar, K. (2023). Sustainalism: An integrated socio-economic-environmental model to address sustainable development and sustainability. *Sustainability, 15*(13), Article 10682. https://doi.org/10.3390/su151310682

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A New Criterion for Assessing Discriminant Validity in Variance-Based Structural Equation Modeling. *Journal of the Academy of Marketing Science, 43*, 115–135. https://doi.org/10.1007/s11747-014-0403-8.

Hermundsdottir, F., & Aspelund, A. (2021). Sustainability innovations and firm competitiveness: A review. *Journal of Cleaner Production, 280*, Article 124715. https://doi.org/10.1016/j.jclepro.2020.124715

Imjai, N., Yordudom, T., Usman, B., Swatdikun, T., Meesook, K., & Aujirapongpan, S. (2024). Unlocking accounting student success: The interplay of student activity participation, social skills, and emotional maturity through internships in Thailand. *Social Sciences and Humanities Open, 10*, Article 100921. https://doi.org/10.1016/j.ssaho.2024.100921

Jackson, D. (2025). Work-integrated learning in business and management: Gauging impact and opportunities for growth. *International Journal of Management in Education, 23*(2), Article 101132. https://doi.org/10.1016/j.ijme.2025.101132

Jeske, D., & Linehan, C. (2020). Mentoring and skill development in e-internships. *Journal of Work-Applied Management, 12*(2), 245–258. https://doi.org/10.1108/JWAM-09-2019-0028

Jia, T., Iqbal, S., Ayub, A., Fatima, T., & Rasool, Z. (2023). Promoting responsible sustainable consumer behavior through sustainability marketing: The boundary effects of corporate social responsibility and brand image. *Sustainability, 15*(7), 6092. https://doi.org/10.3390/su15076092

Kapoor, R., Singh, A., & Manchanda, G. (2023). Hospitality internships and green leaders: Analysing the engagement of interns with hotel sustainable development practices. *Worldwide Hospitality and Tourism Themes, 15*(3), 295–307. https://doi.org/10.1108/WHATT-02-2023-0023

Karpudewan, M., & Mohd Ali Khan, N. S. (2017). Experiential-based climate change education: Fostering students' knowledge and motivation towards the environment. *International Research in Geographical and Environmental Education, 26*(3), 207–222. https://doi.org/10.1080/10382046.2017.1330037

Koiwanit, J., & Filimonau, V. (2023). Stakeholder collaboration for solid waste management in a small tourism island. *PLoS One, 18*(7), Article e0288839. https://doi.org/10.1371/journal.pone.0288839

Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development.* FT press.

Leal Filho, W., Raath, S., Lazzarini, B., Vargas, V. R., de Souza, L., Anholon, R., … Orlovic, V. L. (2018). The role of transformation in learning and education for sustainability. *Journal of Cleaner Production, 199*, 286–295. https://doi.org/10.1016/j.jclepro.2018.07.017

Liu, C., Zhuang, W., Wai Leong, A. M., Wu, S., & Huan, T. (2024). The impact of mentorship on internship satisfaction among hospitality interns: The moderating role of thriving at work. *International Journal of Management in Education, 22*(3), Article 101061. https://doi.org/10.1016/j.ijme.2024.101061

Loverioa, J. P., Shenb, C. C., & Chenc, L. H. (2022). Environmental awareness of tourism and hospitality (Generation Z) students. *Journal of Responsible Tourism Management, 2*, 11–30. https://doi.org/10.47263/JRTM.02-02-02

Mastria, S., Vezzil, A., & De Cesarei, A. (2023). Going green: A review on the role of motivation in sustainable behavior. *Sustainability, 15*(21), Article 15429. https://doi.org/10.3390/su152115429

Matsoso, M. L., & Benedict, O. H. (2020). Work-integrated learning: A powerful connecting tool between classroom and industry. *International Journal of Education Economics and Development, 11*(1), 94–112. https://doi.org/10.1504/IJEED.2020.104296

Mittal, P., & Bansal, R. (2024). *Community engagement for sustainable practices in higher education: From awareness to action*. Springer Nature. https://doi.org/10.1007/978-3-031-63981-4

Mumssen, Y., & Saltiel, G. (2018). Aligning institutions and incentives for sustainable water supply and sanitation services. https://doi.org/10.1596/29795.

Mwita, K. M., Kinunda, S., Obwolo, S., & Mwilongo, N. H. (2023). Soft skills development in higher education institutions: students' perceived role of universities and students' self-initiatives in bridging the soft skills gap. *International Journal of Research in Business & Social Science, 12*(3). https://doi.org/10.20525/ijrbs.v12i3.2435

Ngan, N. N. C., Omar, S. I., & Ngoc, H. N. (2022). Local perceptions towards the environmental impact of tourism on the Chàm islands, Vietnam. *Planning Malaysia, 20*. https://doi.org/10.21837/pm.v20i23.1174

Ogiemwonyi, O., Alam, M. N., Alshareef, R., Alsolamy, M., Azizan, N. A., & Mat, N. (2023). Environmental factors affecting green purchase behaviors of the consumers: Mediating role of environmental attitude. *Cleaner Environmental Systems, 10*, Article 100130. https://doi.org/10.1016/j.cesys.2023.100130

Onyekwelu, N. P., Ezeafulukwe, C., Owolabi, O. R., Asuzu, O. F., Bello, B. G., & Onyekwelu, S. C. (2024). Ethics and corporate social responsibility in HR: A comprehensive review of policies and practices. *International Journal of Science and Research Archive, 11*(1), 1294–1303. https://doi.org/10.30574/ijsra.2024.11.1.0216

Pavlova, M., & Singh, M. (2022). *Recognizing green skills through non-formal learning: A comparative study in Asia*. Springer Nature. https://doi.org/10.1007/978-981-19-2072-1

Peng, H., Li, B., Zhou, C., & Sadowski, B. M. (2021). How does the appeal of environmental values influence sustainable entrepreneurial intention? *International Journal of Environmental Research and Public Health, 18*(3), 1070. https://doi.org/10.3390/ijerph18031070

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Prasad, K. V., & Vasugi, V. (2023). Readiness factors for sustainable lean transformation of construction organizations. *Sustainability, 15*(8), 6433. https://doi.org/10.3390/su15086433

Pratiwi, D. C. (2021). The importance of ethics and social responsibility in international business. *Journal of management and business innovation, 3*(2). https://doi.org/10.30829/jombi.v3i02.10660

Qubati, T., & Tammim, K. (2021). The role of internship programs in enhancing graduates' employability. https://doi.org/10.13140/RG.2.2.27784.75529.

Rashed, R. Q. G., Abubakar, A. A., Madani, O., & Al-Mamary, Y. H. (2025). Enhancing student engagement and motivation for sustainable education: The role of internship and institutional support. *Sustainability, 17*(12), 5291. https://doi.org/10.3390/su17125291

Raza, S. A., & Khan, K. A. (2022). Impact of green human resource practices on hotel environmental performance: The moderating effect of environmental knowledge and individual green values. *International Journal of Contemporary Hospitality Management, 34*(6), 2154–2175. https://doi.org/10.1108/IJCHM-05-2021-0553

Robinson, R. N., Ruhanen, L., & Breakey, N. M. (2016). Tourism and hospitality internships: Influences on student career aspirations. *Current Issues in Tourism, 19*(6), 513–527. https://doi.org/10.1080/13683500.2015.1020772

Rungravee, S. (2022). HOW to retain generation Z in the it business in Thailand?. Doctoral dissertation, Mahidol University https://archive.cm.mahidol.ac.th/handle/123456789/4610.

Sheikh, A. A., Shan, A., Hassan, N. M., Khan, S. N., & AbdAlatti, A. (2024). Impact of green human resource management practices on hotels environmental performance: A mediation and moderation analysis. *Sustainable Futures, 8*, Article 100409. https://doi.org/10.1016/j.sftr.2024.100409

Silva, S., Silva, C., & Oliveira, M. (2025). The value of skills for a sustainable tourism and hospitality industry. *Tourism and Hospitality, 6*(1), 14. https://doi.org/10.3390/tourhosp6010014

Singh, A. (2024). Sustainability practices in business operations. *International Journal for Research Publication and Seminars, 15*(4), 18–34. https://doi.org/10.36676/jrps.v15.i3.1424

Song, E., Lee, M. S., Park, J., & Lee, H. (2024). Translating pro-environmental intention to behavior: The role of moral licensing effect. *Sustainable Production and Consumption, 52*, 527–540. https://doi.org/10.1016/j.spc.2024.11.018

Stern, N., & Valero, A. (2021). Innovation, growth and the transition to net-zero emissions. *Research Policy, 50*(9), Article 104293. https://doi.org/10.1016/j.respol.2021.104293

Syed, S., Acquaye, A., Khalfan, M. M., Obuobisa-Darko, T., & Yamoah, F. A. (2024). Decoding sustainable consumption behavior: A systematic review of theories and models and provision of a guidance framework. *Resources, Conservation and Recycling Advances*. , Article 200232. https://doi.org/10.1016/j.rcradv.2024.200232

Tran, N. K. H. (2023). An empirical investigation on the impact of green human resources management and green leadership on green work engagement. *Heliyon, 9*(11), Article e21018. https://doi.org/10.1016/j.heliyon.2023.e21018

Tran, M. T. (2024). Fostering sustainable mindsets: A critical exploration of educational psychology in business education. *The International Journal of Management Education, 22*(3), 101054. https://doi.org/10.1016/j.ijme.2024.101054.

Uzorka, A., Akiyode, O., & Isa, S. M. (2024). Strategies for engaging students in sustainability initiatives and fostering a sense of ownership and responsibility towards sustainable development. *Discover Sustainability, 5*(1), 320. https://doi.org/10.1007/s43621-024-00505-x

Wang, Y., Yuan, Z., & Tang, Y. (2021). Enhancing food security and environmental sustainability: A critical review of food loss and waste management. *Resources, Environment and Sustainability, 4*, Article 100023. https://doi.org/10.1016/j.resenv.2021.100023

Wegenberger, O., & Ponocny, I. (2025). Green skills are not enough: Three levels of competences from an applied perspective. *Sustainability, 17*(1), 327. https://doi.org/10.3390/su17010327

Xu, J. B., Tavitiyaman, P., Zhang, X., & Zhu, M. (2022). A study of work-integrated learning experience of hospitality and tourism management students in Guangdong under the COVID-19 pandemic. *Public Administration and Policy, 25*(3), 221–234. https://doi.org/10.1108/PAP-03-2022-0021

Žalėnienė, I., & Pereira, P. (2021). Higher education for sustainability: A global perspective. *Geography and Sustainability, 2*(2), 99–106. https://doi.org/10.1016/j.geosus.2021.05.001

Zhao, M., Yao, L., Ma, R., Sarmad, M., Orangzab, Ayub, A., & Jun, Z. (2023). How green mindfulness and green shared vision interact to influence green creative behavior. *Psychology Research and Behavior Management*, 1707–1723. https://doi.org/10.2147/PRBM.S405399

Zopiatis, A., & Theocharous, A. L. (2013). Revisiting hospitality internship practices: A holistic investigation. *Journal of Hospitality, Leisure, Sports and Tourism Education, 13*, 33–46. https://doi.org/10.1016/j.jhlste.2013.04.002