# From Green Competence to Superior Performance: Bridging Pro-Environmental Behavior in the Hotel Ecosystem

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**Abstract:** This study aims to analyze the effect of competence on employee performance, the effect of pro-environmental behavior on employee performance, and the mediating role of pro-environmental behavior in the relationship between competence and employee performance at Oak Tree Hotel Semarang which has implemented the green hotel concept. The research used a quantitative approach with a survey method involving 109 employees selected using purposive sampling technique. Data were analyzed using Structural Equation Modeling (SEM) with AMOS software. The results showed that competence has a positive and significant effect on employee performance, pro-environmental behavior has a positive and significant effect on employee performance, and pro-environmental behavior partially mediates the relationship between competence and employee performance. These findings imply that to improve employee performance, hotel management needs to focus on developing employee competencies in environmental aspects and creating an organizational climate that supports pro-environmental behavior. This research contributes to the development of green hotel management literature by revealing the mechanism that connects competence, pro-environmental behavior, and employee performance..

**Keywords:** Competence; Pro-Environmental Behavior; Employee Performance; Green Hotel, Mediation.

## 1. Introduction

The issues of environmental degradation and global climate change have become critical concerns that demand serious responses across various economic sectors, including the hospitality industry, which has been recognized as a significant contributor to environmental problems [1]. The hotel sector extensively utilizes natural resources, generates substantial waste, and emits carbon through various operational activities [2]. Data from the Environmental Agency of Semarang City indicates that in 2020, daily waste production reached 1,270 tons, consisting of 61.95% organic waste, 15.34% plastic waste, and 10.19% paper waste. Meanwhile, the city's clean water consumption in the same year reached 57,741,304 m³.

Rising awareness of the environmental impact of hotel operations has led to the emergence of the green hotel movement—accommodations committed to sustainable practices such as water conservation, energy efficiency, and waste minimization [2]. Oak Tree Hotel Semarang has adopted the green hotel concept. However, a preliminary survey of 30 employees revealed that only 56.7% of respondents perceived the implementation of the concept to be optimal. Furthermore, 60% reported insufficient competence in applying pro-environmental behaviors, and 63.3% stated that their job performance had not significantly improved following the hotel's adoption of green practices.
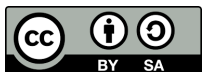
The success of environmentally friendly practices in the hospitality industry does not rely solely on managerial policies, but is also influenced by the competence and behavior of employees [3]. In the context of green hotels, employee competence encompasses knowledge, skills, awareness, attitudes, behaviors, and capabilities to perform environmentally sustainable practices [4]. Pro-environmental behavior is defined as voluntary initiatives that go beyond formal job requirements, aimed at demonstrating environmentally conscious behavior that exceeds standard job responsibilities [5]; [6].

Previous studies investigating the relationship between competence and employee performance have produced varied results. Some research identifies a positive and significant influence of competence on employee performance [7]; [8], while others suggest no significant effect [9]. Similarly, investigations into the link between pro-environmental behavior and performance yield inconsistent findings. Some studies have found that pro-environmental behavior positively affects organizational performance [10]; [11], whereas others argue that such behavior has no significant impact on employee performance in the hospitality sector [12]; [13].

These inconsistencies indicate a research gap that warrants further exploration. Although several studies have examined the independent relationships among competence, pro-environmental behavior, and performance, research specifically investigating the mediating role of pro-environmental behavior in the relationship between competence and employee performance in green hotels remains limited. Kim et al. (2019)[3] emphasized the urgency of identifying factors that mediate the competence-performance relationship in the green hotel context but did not explicitly examine the role of pro-environmental behavior as a mediating variable.

In light of the aforementioned background and identified research gap, this study aims to analyze the effect of competence on employee performance, evaluate the impact of pro-environmental behavior on employee performance, and explore the mediating role of pro-environmental behavior in the relationship between competence and performance at Oak Tree Hotel Semarang. The research questions addressed are: (1) How does competence influence employee performance? (2) How does pro-environmental behavior influence employee performance? and (3) How does pro-environmental behavior mediate the relationship between competence and employee performance?

Oak Tree Hotel Semarang was selected as the research site due to its implementation of the green hotel concept, providing a relevant context for investigating the roles of competence and pro-environmental behavior in influencing employee performance. This study employs a quantitative approach using a survey method, which facilitates data collection from a large sample and enables comprehensive statistical analysis [14]. The sample comprises 109 employees selected through purposive sampling, with the criterion of having worked at the hotel for at least one year.

Previous studies examining the relationships between competence, pro-environmental behavior, and performance have generally applied multiple regression analysis [10]; He et al., 2018), which is limited in its ability to test complex models involving mediating variables. To address this limitation, the present study utilizes Structural Equation Modeling (SEM), which enables simultaneous testing of both direct and indirect relationships and accounts for measurement error within the model [14]; [15]. SEM also allows for the testing of construct validity through Confirmatory Factor Analysis (CFA) prior to hypothesis testing, thereby enhancing the reliability of the findings.

This study proposes an integrated model that incorporates employee competence and pro-environmental behavior to explain employee performance in hotels implementing the green hotel concept. The model is grounded in the Competency Theory [16], Pro-environmental Behavior Theory [17], and Performance Theory [18]. The findings of this study are expected to contribute theoretically by enriching the literature on green hotel management and sustainable human resource management and to provide practical implications for hotel managers in enhancing employee performance through competence development and the promotion of pro-environmental behavior.

This research holds significance not only in the academic domain but also in terms of practical relevance for sustainable business practices. As stated by Pham et al. (2020)[19], hotels that implement environmentally friendly practices not only contribute to environmental conservation but also enhance financial performance, reputation, and customer loyalty. By uncovering the mechanisms linking employee competence, pro-environmental behavior, and performance, this study is projected to offer guidance for hotels in designing human resource development strategies that support environmental sustainability and competitive advantage.

## 2. Preliminaries or Related Work or Literature Review

### 2.1 Competence and Employee Performance in the Hospitality Context

Competence refers to the underlying characteristics of an individual that influence how one behaves or thinks, and which support effective performance across a range of situations [16]. In the hospitality industry, competence is a critical factor in determining service quality and employee performance. Nisar et al. (2019)[20] identified that employee competence, particularly in relation to technological knowledge and skills, significantly influences hotel performance. Similarly, Bani-Melhem et al. (2020)[21] found that employee innovation, supported by adequate competence, positively correlates with service performance.

In the context of green hotels, Yusoff et al. (2020)[22] emphasized the importance of green competence, which encompasses understanding environmental issues, the ability to apply eco-friendly practices, and awareness of the environmental impact of hotel operations. A study by Aboramadan et al. (2021)[23] demonstrated that employee competence in sustainable practices contributes to overall improvements in hotel environmental performance. However, Wu et al. (2020)[24] noted that the relationship between competence and employee performance is not always linear and can be influenced by various moderating and mediating factors.

### 2.2 Pro-Environmental Behavior in the Hospitality Industry

Pro-environmental behavior (PEB) is defined as deliberate actions taken to minimize the negative environmental impacts of one's activities [25]. Kim et al. (2019)[3] categorized PEB in the hospitality context into two main types: task-related PEB (directly associated with job responsibilities) and proactive PEB (initiatives beyond formal duties). Recent research by Han et al. (2020)[26] revealed that the implementation of PEB among hotel employees is influenced by both individual factors (such as environmental awareness and personal values) and organizational factors (including organizational culture and green leadership). Similar findings were reported by Islam et al. (2021)[27], who highlighted the crucial role of a green organizational culture in fostering employees' PEB. Although numerous studies have investigated the antecedents of PEB, Pham et al. (2020)[19] pointed out that research on the consequences of PEB—particularly in relation to employee performance—remains limited. This gap is crucial to explore, given the growing number of hotels incorporating sustainable practices as part of their business strategy [28].

### 2.3 The Mediating Role of Pro-Environmental Behavior

The concept of mediation in the relationship between competence and employee performance has received considerable attention in management literature. Malik et al. (2021)[29] identified organizational commitment as a key mediator in this relationship, Wu et al. (2020)[24] found that employee engagement mediates the link between green transformational leadership and employee green performance. In the green hotel context, Wang et al. (2022)[30] demonstrated that a green psychological climate mediates the relationship between green human resource management (HRM) practices and employees' green behaviors. Similarly, Yin et al. (2022)[31] showed that harmonious environmental passion mediates the relationship between environmental leadership and employee green creativity. However, Melnyk et al. (2022)[32] emphasized that the role of PEB as a mediator between competence and employee performance has not been thoroughly explored. Rezapouraghdam et al. (2021)[33] suggested that PEB may serve as a mechanism through which employee competence is transformed into enhanced performance, particularly within environmentally conscious hotel settings. Their study indicated that employees with high levels of green competence are more likely to exhibit stronger PEB, which in turn contributes to improved performance outcomes.

### 2.4 Green Hotel Management and Sustainable Performance

The green hotel concept has become a central topic in contemporary hospitality management. Yusof et al. (2023)[34] defined green hotels as accommodations that adopt environmentally friendly practices to reduce their ecological footprint. Moise et al. (2021)[35] identified five core dimensions of green hotel management: energy conservation, water conservation, waste management, eco-friendly procurement, and environmental education.

The Triple Bottom Line (TBL) perspective, which includes economic, social, and environmental dimensions, is increasingly used to assess green hotel performance [36]. In this regard, Chen et al. (2022)[37] showed that green hotel management practices not only enhance environmental performance but also improve economic outcomes through cost efficiency and increased reputation.

Research by Gürlek and Tuna (2019)[38] affirmed that the effective implementation of green hotel management requires the integration of management policies, employee competence, and pro-environmental behavior. However, Sulistiyani et al. (2023)[39] emphasized that the mechanisms linking these three factors in influencing hotel performance require further exploration, particularly in the context of developing countries.

This study seeks to address this gap by examining the mediating role of PEB in the relationship between competence and employee performance at Oak Tree Hotel Semarang. In contrast to previous studies that primarily focused on environmental performance [30]; [31], this research emphasizes employee performance as the primary dependent variable—encompassing dimensions such as work quality, timeliness, initiative, ability, and communication.

### 3. Proposed Method

This study adopts a quantitative approach using a survey method to examine the mediating role of pro-environmental behavior in the relationship between competence and employee performance at Oak Tree Hotel Semarang. The quantitative approach was chosen as it allows for hypothesis testing and objective, measurable analysis of variable relationships [14]. The survey method facilitates data collection from a relatively large sample at a lower cost and within a shorter timeframe [40].

This research employs an explanatory research design, aiming to explain the causal relationships among the study variables [41]. Data were collected cross-sectionally, meaning data were gathered at a single point in time [42]. This design enables the researcher to analyze both the direct and indirect effects of competence on employee performance, with pro-environmental behavior as a mediating variable. The conceptual model of this study is grounded in the integration of Competency Theory [16], Pro-Environmental Behavior Theory [17], and Performance Theory [18]. The model illustrates the relationship among competence (independent variable), pro-environmental behavior (mediating variable), and employee performance (dependent variable).

The population of this study comprises all 150 employees of Oak Tree Hotel Semarang. The sample was selected using purposive sampling, with the criterion that employees must have worked at the hotel for at least one year. This criterion ensures that the selected respondents are familiar with the green hotel concept and have sufficient experience in implementing eco-friendly practices [3]. The sample size was determined using Slovin's formula with a 5% margin of error [43] and the sample size was calculated to be 109 participants.

Data were collected through a structured questionnaire distributed online via Google Forms. The questionnaire consisted of statements measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The 5-point Likert scale was chosen as it provides a more nuanced expression of respondents' agreement levels compared to scales with fewer points [44].

Prior to distribution, the questionnaire was subjected to validity and reliability testing through a pilot test involving 30 respondents. Validity was assessed using Confirmatory Factor Analysis (CFA), and reliability was evaluated using Cronbach's Alpha [14].

Data were analyzed using Structural Equation Modeling (SEM) with the assistance of AMOS version 24. SEM was chosen as it enables simultaneous testing of both direct and indirect relationships and accounts for measurement error within the model [15].

### 3.1 Variable Operationalization
**a. Competence (X)**

Competence was measured using six dimensions based on Cabral and Dhar (2021): (1) Knowledge, (2) Skills, (3) Awareness, (4) Attitudes, (5) Behavior, and (6) Abilities. Each dimension was assessed with two indicators, resulting in a total of 12 indicators for the competence variable.

**b. Pro-Environmental Behavior (Z)**

Pro-environmental behavior was measured using three dimensions based on Saeed et al. (2019)[25]: (1) Relationship to nature factors, (2) Personality factors, and (3) Condition factors. Each dimension was measured with two indicators, totaling six indicators for this variable.

**c. Employee Performance (Y)**

Employee performance was measured using five dimensions based on Nikpour (2017)[18]: (1) Quality of work, (2) Promptness, (3) Initiative, (4) Capability, and (5) Communication. Each dimension included two indicators, resulting in 10 indicators for this variable.

As previously stated, questionnaires were distributed online using Google Forms and utilized a 5-point Likert scale. Before full distribution, a pilot test was conducted with 30 participants to assess the validity and reliability of the questionnaire using CFA and Cronbach's Alpha, respectively [14].

Data analysis followed the SEM procedure using AMOS version 24. SEM was chosen for its ability to simultaneously assess direct and indirect relationships and address measurement error [15]. The stages of SEM analysis are as follows:

### 3.2 SEM Analysis Stages
**a. Stage 1: Theory-Based Model Development**

At this stage, the hypothesized model was developed based on theoretical frameworks and prior empirical research [42].

**b. Stage 2: Path Diagram Construction**

Relationships among variables were depicted in a path diagram to visually represent the structural model [14].

**c. Stage 3: Conversion to Structural Equations**

The path diagram was translated into structural equations as follows:

Structural Equation 1: $Z = \alpha_1 X + e_1$

Structural Equation 2: $Y = \alpha_2 X + \alpha_3 Z + e_2$

Where:

$X$ = Competence

$Z$ = Pro-Environmental Behavior

$Y$ = Employee Performance

$\alpha_1, \alpha_2, \alpha_3$ = Path coefficients

$e_1, e_2$ = Error terms

**d. Stage 4: Model Goodness-of-Fit Evaluation**

The model was evaluated using various goodness-of-fit indices, including Chi-Square, CMIN/DF, GFI, AGFI, TLI, CFI, and RMSEA [15]

**e. Stage 5: Hypothesis Testing**

Hypotheses were tested by evaluating the Critical Ratio (C.R.) and P-value. A hypothesis is accepted if C.R. > 1.96 and P < 0.05 [45].

**f. Stage 6: Mediation Analysis**

The mediating effect was assessed using bootstrapping procedures to test the significance of the indirect effects [46]. This method is considered more robust compared to traditional approaches such as the causal steps approach or Sobel test [47].

Through this research method, the relationships among competence, pro-environmental behavior, and employee performance in a green hotel setting can be analyzed in a comprehensive and in-depth manner.

## 4. Results and Discussion

### 4.1 Research Findings

#### a. Respondent Characteristics

This study involved 109 employees of Oak Tree Hotel Semarang selected through purposive sampling. The characteristics of the respondents are presented in the table below:

**Table 1.** Respondent Characteristics by Gender, Age, Education, and Work Tenure

| Characteristic | Category | Frequency | Percentage (%) |
|---|---|---|---|
| **Gender** | Male | 63 | 57.8 |
| | Female | 46 | 42.2 |
| **Age (Years)** | < 25 | 28 | 25.7 |
| | 25–35 | 47 | 43.1 |
| | 36–45 | 25 | 22.9 |
| | > 45 | 9 | 8.3 |
| **Education Level** | High School/Vocational | 37 | 33.9 |
| | Diploma (D1/D2/D3) | 42 | 38.5 |
| | Bachelor's Degree (S1) | 28 | 25.7 |
| | Master's Degree (S2) | 2 | 1.8 |
| **Work Tenure (Years)** | 1–3 | 42 | 38.5 |
| | 4–6 | 38 | 34.9 |
| | 7–9 | 19 | 17.4 |
| | > 9 | 10 | 9.2 |

Based on Table 1, the majority of respondents were male (57.8%), aged between 25–35 years (43.1%), held a diploma-level education (38.5%), and had 1–3 years of work tenure (38.5%). This distribution provides a representative overview of the employee population at Oak Tree Hotel Semarang.

#### b. Descriptive Analysis of Research Variables

**Table 2**. Descriptive Statistics of Research Variables

| Variable | Dimension | Mean | Category |
|---|---|---|---|
| **Competence (X)** | Knowledge | 3.92 | High |
| | Skills | 3.85 | High |
| | Awareness | 3.97 | High |
| | Attitudes | 4.01 | High |
| | Behavior | 3.78 | High |
| | Abilities | 3.69 | High |
| | Average Competence | 3.87 | High |
| **Pro-Environmental Behavior (Z)** | Relationship to nature | 3.65 | High |
| | Personality factors | 3.82 | High |
| | Condition factors | 3.70 | High |
| | Average PEB | 3.72 | High |
| **Employee Performance (Y)** | Quality of work | 4.05 | High |
| | Promptness | 3.88 | High |
| | Initiative | 3.76 | High |

| Variable | Dimension | Mean | Category |
|---|---|---|---|
| | Capability | 4.02 | High |
| | Communication | 3.98 | High |
| | Average Performance | 3.94 | High |

Note: *1.00–1.80 = Very Low; 1.81–2.60 = Low; 2.61–3.40 = Moderate; 3.41–4.20 = High; 4.21–5.00 = Very High*

All variables were categorized as high. The competence variable had an average of 3.87, with the highest dimension being attitudes (4.01) and the lowest being abilities (3.69). The pro-environmental behavior variable averaged 3.72, with the highest dimension being personality factors (3.82) and the lowest being relationship to nature factors (3.65). Employee performance had the highest average score of 3.94, with quality of work scoring the highest (4.05) and initiative the lowest (3.76).

### c. Validity and Reliability Testing
**Table 3**. Validity and Reliability Test Results

| Variable | Indicators | Factor Loading | AVE | CR | Cronbach's Alpha |
|---|---|---|---|---|---|
| Competence (X) | X1–X12 | 0.725–0.832 | 0.629 | 0.927 | 0.893 |
| Pro-Environmental Behavior (Z) | Z1–Z6 | 0.759–0.831 | 0.652 | 0.918 | 0.875 |
| Employee Performance (Y) | Y1–Y10 | 0.735–0.823 | 0.614 | 0.940 | 0.887 |

*Note: AVE = Average Variance Extracted; CR = Composite Reliability*

As shown in Table 3, all factor loadings exceeded 0.70, AVE values were above 0.50, CR values were above 0.70, and Cronbach's Alpha values were greater than 0.70. These results indicate that all constructs meet the criteria for good validity and reliability [14].

### d. Model Fit Testing (Goodness of Fit)
**Table 4.** Goodness of Fit Index

| Index | Cut-off Value | Result | Model Evaluation |
|---|---|---|---|
| Chi-Square | Preferably small | 276.853 | Fit |
| Probability | $\geq 0.05$ | 0.082 | Fit |
| CMIN/DF | $\leq 2.00$ | 1.836 | Fit |
| GFI | $\geq 0.90$ | 0.921 | Fit |
| AGFI | $\geq 0.90$ | 0.903 | Fit |
| TLI | $\geq 0.90$ | 0.927 | Fit |
| CFI | $\geq 0.90$ | 0.935 | Fit |
| RMSEA | $\leq 0.08$ | 0.071 | Fit |

All goodness-of-fit indices indicate that the proposed model fits the data well, thus confirming that the structural model is acceptable for testing the relationships among variables [15].

### e. Hypothesis Testing
**Table 5**. Hypothesis Testing Results

| Hypothesis | Path | Estimate | S.E. | C.R. | P | Conclusion |
|---|---|---|---|---|---|---|
| H1 | Competence → Employee Performance | 0.385 | 0.098 | 3.928 | *** | Accepted |
| H2 | PEB → Employee Performance | 0.417 | 0.103 | 4.049 | *** | Accepted |
| H3 | Competence → PEB | 0.452 | 0.112 | 4.036 | *** | Accepted |

*Note: *** = p < 0.001*

**Table 6**. Mediation Effect Testing Results

| Path | Direct Effect | Indirect Effect | Total Effect | Sobel Test | P-value |
|------|---------------|-----------------|--------------|------------|---------|
| X → Y | 0.385*** | 0.188** | 0.573*** | 2.842 | 0.004 |
| X → Z | 0.452*** | – | 0.452*** | – | – |
| Z → Y | 0.417*** | – | 0.417*** | – | – |

Note*: ** = p < 0.01; *** = p < 0.001; X = Competence; Z = Pro-Environmental Behavior; Y = Employee Performance*

Based on Tables 5 and 6, all hypotheses were accepted. Competence significantly and positively affects employee performance (β = 0.385, p < 0.001), pro-environmental behavior significantly affects employee performance (β = 0.417, p < 0.001), and competence significantly influences pro-environmental behavior (β = 0.452, p < 0.001). Moreover, pro-environmental behavior partially mediates the relationship between competence and employee performance, with an indirect effect of 0.188 (p < 0.01) and a Sobel test value of 2.842 (p = 0.004).

### 4.2 Discussion
#### a. The Effect of Competence on Employee Performance

The findings reveal that competence has a positive and significant effect on the performance of employees at Oak Tree Hotel Semarang (β = 0.385, p < 0.001). This result supports the first hypothesis (H1), which posits that competence positively influences employee performance. This finding aligns with the study by Anwar et al. (2021)[7], which demonstrated that competence enhances employee performance by improving understanding and skills in task execution. Similarly, Suhardi (2019)[48] confirmed that employee competence significantly affects performance in a life insurance company in Batam.

These results are also consistent with the findings of Darban et al. (2022)[49], who found that job competence significantly impacts employee performance in hotels in Batam, and Widagdo et al. (2022)[50], who observed a positive relationship between competence and hotel employee performance. Bani-Melhem et al. (2020)[21] further emphasized the critical role of competence in fostering service innovation and performance in the hospitality industry.

In the context of green hotels, Kim et al. (2019)[3] highlighted the importance of employee competence in understanding and implementing environmentally friendly practices to improve overall hotel performance. According to Aboramadan et al. (2021)[23], employees with high competence in sustainable practices tend to demonstrate better performance, particularly in tasks related to green hotel implementation.

These findings suggest that Oak Tree Hotel Semarang should prioritize the development of employee competence in areas relevant to green hotel operations, particularly across dimensions such as knowledge, skills, awareness, attitudes, behavior, and abilities related to eco-friendly practices. Such development can be facilitated through training programs, educational initiatives, and hands-on experience in applying green practices.

#### b. The Effect of Pro-Environmental Behavior on Employee Performance

The study also finds that pro-environmental behavior (PEB) has a positive and significant effect on employee performance at Oak Tree Hotel Semarang (β = 0.417, p < 0.001). This supports the second hypothesis (H2), which proposes that PEB positively influences employee performance. This result is in line with previous studies by Montabon et al. (2007)[51] and Yu et al. (2017)[52], which found that pro-environmental behavior contributes to enhanced organizational performance.

The findings are further supported by Pham et al. (2020)[19], who showed that employees exhibiting pro-environmental behavior tend to perform better in their roles. Han et al. (2020)[26] asserted that employees who demonstrate strong PEB are more motivated and committed to achieving organizational goals, thereby improving their overall performance.

Wang et al. (2022)[30] identified that PEB among hotel employees can enhance operational efficiency and service quality—key components of employee performance. Islam et al. (2021)[27] also emphasized that employees who engage in pro-environmental behavior tend to be more innovative and proactive in fulfilling their duties.

This study offers new insights that contrast with the findings of Nurulfadhilah and Emilisa (2023)[53] and Zientara and Zamojska (2018)[54], who reported no significant relationship between PEB and employee performance in the hospitality sector. These differences may be attributed to the contextual setting, as Oak Tree Hotel Semarang has implemented the green hotel concept, which supports and rewards environmentally friendly behavior.

The results suggest that Oak Tree Hotel Semarang should encourage and strengthen employees' PEB, particularly across dimensions such as relationship to nature factors, personality factors, and condition factors. This can be achieved through creating a supportive organizational climate, providing green infrastructure, and rewarding employees who consistently engage in environmentally responsible behavior.

### c. The Effect of Competence on Pro-Environmental Behavior

The findings indicate that competence has a positive and significant effect on employees' pro-environmental behavior at Oak Tree Hotel Semarang ($\beta = 0.452$, $p < 0.001$). This supports the third hypothesis (H3), which suggests that competence positively influences PEB. This finding aligns with Cabral and Dhar (2021)[4], who identified that green competencies play a crucial role in shaping employees' pro-environmental behavior.

The results are also consistent with Yusoff et al. (2020)[22], who found that employees with high environmental competence tend to exhibit stronger pro-environmental behavior. Saeed et al. (2019)[25] also reported that environmental competence positively affects employees' PEB in the workplace.

Malik et al. (2021)[29] emphasized that developing employees' green competencies is essential for promoting PEB at work. Similarly, Wu et al. (2020)[24] demonstrated that employees' environmental competence significantly influences their PEB, particularly in organizations committed to environmental sustainability.

These findings suggest that Oak Tree Hotel Semarang should focus its efforts on enhancing employees' environmental competence to foster pro-environmental behavior. This can be accomplished through training, educational initiatives, and knowledge-sharing related to eco-friendly practices and environmental preservation.

### d. The Mediating Role of Pro-Environmental Behavior in the Relationship Between Competence and Employee Performance

The results demonstrate that pro-environmental behavior partially mediates the relationship between competence and employee performance at Oak Tree Hotel Semarang, with an indirect effect of 0.188 ($p < 0.01$) and a Sobel test value of 2.842 ($p = 0.004$). This finding supports the fourth hypothesis (H4), which posits that PEB mediates the competence-performance relationship.

The partial mediation indicates that competence exerts both a direct effect on employee performance ($\beta = 0.385$, $p < 0.001$) and an indirect effect through PEB (0.188, $p < 0.01$). Thus, the total effect of competence on employee performance amounts to 0.573 ($p < 0.001$), comprising both direct and indirect paths.

This finding contributes to a deeper understanding of the mechanisms linking competence and employee performance in the green hotel context. Prior research by Luu (2019) found that employee engagement mediates the relationship between green transformational leadership and green performance. Melnyk et al. (2022)[32] also highlighted the mediating role of environmental engagement in the relationship between sustainability practices and performance outcomes.

Rezapouraghdam et al. (2021)[33] noted that PEB can serve as a mechanism through which employee competence is transformed into improved performance,

particularly in environmentally oriented hotel settings. Nisar et al. (2019)[20] also found that PEB mediates the relationship between green human resource management practices and hotel environmental performance.

These findings imply that Oak Tree Hotel Semarang should adopt a comprehensive strategy that not only focuses on developing employee competence but also fosters an organizational climate that supports pro-environmental behavior. Such an approach would enable the hotel to optimize employee performance through both direct pathways (competence → performance) and indirect pathways (competence → PEB → performance).

## 5. Comparison

This study makes a significant contribution to the literature on green hotel management and sustainable human resource management by exploring the mediating role of pro-environmental behavior in the relationship between competence and employee performance. The following sections present a comparison of this study with the state-of-the-art in the relevant field:

### 5.1 Mediation Models in the Green Hotel Context

This research develops a mediation model that integrates competence, pro-environmental behavior, and employee performance into a comprehensive framework. Unlike the study by Kim et al. (2019)[3], which examined only the direct effect of green human resource management on employees' environmentally friendly behavior, this study reveals the mechanism by which competence is transformed into performance through pro-environmental behavior.

Gürlek and Tuna (2019)[38] identified organizational commitment as a mediator in the relationship between corporate social responsibility (CSR) and employee work engagement in hotels, yet did not specifically investigate pro-environmental behavior as a mediating variable. Wang et al. (2022)[30] analyzed the effects of green HRM on employee pro-environmental behavior with green values as a moderator, without exploring its impact on employee performance. This study fills that gap by highlighting the mediating role of pro-environmental behavior in the competence–performance relationship.

### 5.2 Comprehensive Measurement of Green Hotel Competence

This study adopts a six-dimensional framework for competence—knowledge, skills, awareness, attitudes, behavior, and abilities—based on Cabral and Dhar (2021)[4]. This approach is more comprehensive than previous research, such as that by Yusoff et al. (2020)[22], which used only three dimensions (green awareness, green knowledge, green skills). The broader measurement allows for a deeper understanding of the factors influencing employees' pro-environmental behavior.

### 5.3 Linkage with Employee Performance

This research focuses on employee performance as the main dependent variable, unlike studies by Aboramadan et al. (2021)[23] and Nisar et al. (2019)[20], which emphasized environmental performance. Pham et al. (2020)[19] examined the relationship between green HRM and organizational citizenship behavior for the environment but did not explicitly link it to employee performance. This study contributes to the literature by demonstrating how pro-environmental behavior enhances overall employee performance, not just environmental outcomes.

### 5.4 Research Context: Green Hotels in Indonesia

This research was conducted at Oak Tree Hotel Semarang, which has adopted the green hotel concept, thus providing important empirical insights in the Indonesian hospitality context. Most previous studies on green hotels have been conducted in developed countries or in different contexts [26]; [2]; [24]. While Sulistiyani et al. (2023)[39] explored green hotel knowledge management in Indonesia, their study did not focus on the mediating role of pro-environmental behavior. This research enriches the literature by providing empirical evidence on this mediating mechanism in an Indonesian green hotel context.

### 5.5 Methodological Approach

This study employs Structural Equation Modeling (SEM) to test the mediation model, enabling simultaneous analysis of direct and indirect relationships. This approach is more robust than those used in studies by Islam et al. (2021)[27] and Saeed et al. (2019)[25], which relied on stepwise regression analysis. The use of bootstrapping procedures for testing mediation effects also provides greater accuracy compared to traditional methods such as the causal steps approach or Sobel test [47].

In summary, this research offers a significant contribution by developing and validating an integrated model that explains the relationship among competence, pro-environmental behavior, and employee performance within the context of green hotels in Indonesia. The findings not only enrich theoretical understanding of the mechanisms linking competence and employee performance but also offer practical implications for hotel management in designing effective strategies to improve employee performance through competence development and the promotion of pro-environmental behavior.

## 6. Conclusions

This study aimed to analyze the influence of competence on employee performance, the influence of pro-environmental behavior on employee performance, and the mediating role of pro-environmental behavior in the relationship between competence and employee performance at Oak Tree Hotel Semarang. Based on the data analysis and discussion, the following conclusions can be drawn: First, competence has a positive and significant effect on employee performance at Oak Tree Hotel Semarang. Employees who possess adequate knowledge, skills, awareness, attitudes, behavior, and abilities in implementing environmentally friendly practices tend to perform better. This finding confirms the importance of developing employee competence to enhance performance in the hospitality sector. Second, pro-environmental behavior has a positive and significant effect on employee performance. Employees who demonstrate strong pro-environmental behavior tend to perform better in executing their tasks. This indicates that encouraging pro-environmental behavior not only benefits the environment but also contributes to higher employee performance. Third, pro-environmental behavior partially mediates the relationship between competence and employee performance. This demonstrates that competence influences performance both directly and indirectly through pro-environmental behavior. This finding enriches our understanding of the mechanisms that link competence to performance in the green hotel context.

The theoretical implication of this study lies in the contribution to the development of an integrated model explaining the relationship between competence, pro-environmental behavior, and employee performance in green hotels. Practically, this research provides recommendations for hotel management to focus on developing employees' environmental competence and fostering an organizational climate that supports pro-environmental behavior.

The main limitation of this study is its scope, which is restricted to a single hotel in Semarang. Therefore, caution is required in generalizing the findings. Future research should consider expanding the scope by involving multiple hotels in different regions, exploring moderating variables such as green organizational culture and green leadership, and adopting a longitudinal approach to observe changes in behavior and performance over time.
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