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Exploring the Mediating Role of Students' Big-5 Personality and PsyCap between Ecological Leadership and Students' Pro-eco Behavior

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Abstract

Environmental problems have not yet been solved, as evidenced by the increasing temperature of the earth. It is not only needed through conferences but there must be a change in human lifestyle in the form of behavior. One of the behaviors is Pro-ecological Behavior (PEB) which can be formed with a relevant leadership style, namely Ecological Leadership Styles (ELS). Whether environmental big-5 personality and PsyCap can be good mediators between ELS and PEB is important to immediately research.

For this reason, a causal survey was used involving around 626 students in Jakarta, as a randomly selected sample. There are 4 instruments developed to measure PEB (reliability coefficient of 0.658), ELS (0.865), big-5 personality (0.833), and PsyCap (0.860). Data was analyzed using path analysis. The research results show that the two factors, namely big-5 personality and PsyCap, have a direct and very significant effect on students' PEB, but they are not proven to be good mediators between ELS and students' PEB. This is because ELS has a direct but negative effect on both Big 5 personalities and PsyCap, even though the effect is very significant. However, ELS itself has a direct and only significant effect on PEB students. Based on these findings, the path indirect effect and total effect coefficients cannot be calculated. Therefore, based on these findings, it can be concluded that ecological leadership plays a very important role in the formation of pro-ecological behavior, especially meaningful for policy implications as a form of campus concern in its participation in saving the planet Earth from destruction.

Keywords: Ecological Leadership Styles. Pro-ecological Behavior.

Introduction

Studying the mediating role of students' environmental Big Five personality traits and PsyCap (Psychological Capital) between ecological leadership styles and students' pro-eco behavior (PEB) holds several significant implications. Investigating the interplay between ecological leadership styles, individual personality traits, PsyCap, and pro-eco behavior allows for a nuanced understanding of the factors influencing environmentally responsible actions.^{25,39,41,55.} This holistic approach acknowledges the multifaceted nature of human behavior and environmental decision-making (Chiiras, 1991).⁹ By identifying how different leadership styles impact students' attitudes and behaviors towards environmental issues, findings can inform educational institutions and leaders about effective strategies for fostering pro-environmental behavior among students. This can lead to the development of tailored leadership training programs and interventions aimed at promoting sustainable practices.^{5,7,10.}

Exploring the role of personality traits and PsyCap in mediating the relationship between leadership styles and pro-eco behavior can contribute to the development of more effective environmental education programs. Understanding how individual characteristics interact with leadership influences can help educators design curricula and activities that resonate with students and motivate them to adopt sustainable lifestyles.¹⁹ Research in this area can provide valuable insights for policymakers, businesses, and organizations seeking to promote sustainability initiatives. By uncovering the psychological mechanisms underlying pro-environmental behavior, stakeholders can develop targeted interventions and campaigns aimed at fostering a culture of sustainability within communities and institutions (Hollweg, 2011).¹⁸

Researching the mediating role of personality traits and PsyCap in the context of ecological leadership styles expands our understanding of both psychological processes and environmental behavior. This interdisciplinary approach can contribute to theoretical advancements in psychology, leadership studies, and environmental science, bridging gaps between disciplines and fostering collaboration in addressing pressing environmental challenges. Therefore, studying the mediating role of students' environmental Big Five personality traits and PsyCap between ecological leadership styles and pro-eco behavior is important for informing leadership practices, enhancing environmental education, promoting sustainability initiatives, and advancing both psychological and environmental science.^{17,23,24,31,61.}

Nevertheless, it is still required a rational think rationally about whether this research would have a kind of state of the art in relating ecological leadership styles and pro-ecological behavior (PEB) which involves several key considerations and methodologies.⁴⁰ Researchers often use established frameworks, such as transformational leadership, servant leadership, or eco-leadership, to conceptualize ecological leadership styles. These styles emphasize values, behaviors, and practices that prioritize environmental sustainability and stewardship. Studies may employ validated scales to assess leadership styles, such as the Multifactor Leadership Questionnaire (MLQ) or the Eco-Leadership Scale.^{2,5,61} PEB encompasses a range of actions individuals take to protect, preserve, or enhance the natural environment. This can include recycling, reducing energy consumption, participating in environmental advocacy, and supporting sustainable practices. Researchers typically measure PEB using self-report surveys, observational methods, or behavioral assessments.⁷

Many studies utilize quantitative research methods to examine the relationship between ecological leadership styles and PEB. This often involves surveying individuals within

organizations or communities to assess their perceptions of leadership behavior and their engagement in pro-environmental actions. Statistical analyses, such as regression analysis or structural equation modeling, are employed to explore the associations between variables. Qualitative approaches, such as interviews or focus groups, may be used to gain in-depth insights into the mechanisms underlying the relationship between ecological leadership and PEB. Qualitative methods allow researchers to explore individuals' experiences, motivations, and perceptions regarding environmentally responsible behavior in the context of leadership influence.^{16,19.}

Cross-cultural studies examine how ecological leadership styles and PEB vary across different cultural contexts. By comparing leadership practices and environmental attitudes across cultures, researchers can identify universal principles as well as cultural-specific factors that influence the relationship between leadership and PEB. In short, the state of the art in relating ecological leadership styles and PEB involves a multidisciplinary approach that integrates theories from leadership studies, environmental psychology, and organizational behavior. By employing diverse methodologies and considering individual, organizational, and contextual factors, researchers can advance our understanding of how leadership influences environmentally responsible behavior.^{10,11,12.}

Moreover, studying students' pro-ecological behavior (PEB) in the context of ecological leadership styles, mediated by Big Five personality traits and PsyCap, is crucial for several reasons. Ecological leadership styles play a pivotal role in shaping organizational culture and influencing individuals' attitudes and behaviors toward sustainability.^{23,24, 32,33,34.} Investigating how these leadership styles affect students' PEB provides insights into the mechanisms through which leadership can foster environmental responsibility among future leaders and citizens. The Big Five personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism) have been linked to various aspects of behavior, including environmental attitudes and actions. Understanding how these traits mediate the relationship between ecological leadership and PEB can elucidate the role of individual differences in shaping environmentally responsible behavior.^{6,16,20,21.}

PsyCap, comprised of components such as self-efficacy, optimism, hope, and resilience, reflects individuals' psychological resources for coping with challenges and achieving goals. Investigating the mediating role of PsyCap provides insights into how students' psychological strengths and resources influence their responsiveness to ecological leadership and their engagement in pro-ecological behaviors.^{3,4,6,57,58,59,60.} By identifying the pathways through which ecological leadership influences students' PEB, educational institutions, and leaders can develop strategies to cultivate sustainable leadership qualities and behaviors among students. This can contribute to the development of future leaders who prioritize environmental stewardship and sustainability in their decision-making and actions.^{5,13,14,15,22,25,36,37.}

Understanding the interplay between ecological leadership, personality traits, PsyCap, and PEB can inform the design and implementation of environmental education programs. Tailoring educational initiatives to leverage students' personality strengths and psychological resources in conjunction with effective leadership practices can enhance the effectiveness of environmental education efforts and promote lasting behavior change.^{23,24,54.} In logical thought, the relationship between these variables can be conceptualized as follows: Ecological leadership styles within educational settings influence students' perceptions of environmental issues and their attitudes toward sustainability. These attitudes, in turn, interact with students' Big Five personality traits,

shaping their predisposition towards pro-ecological behaviors. Additionally, students' PsyCap serves as a psychological resource that mediates the translation of leadership influence and personality traits into actual behavioral outcomes, such as engaging in environmentally responsible actions.^{1,2,4,5,27,28.}

By examining these interrelated factors, researchers can uncover the underlying mechanisms driving students' PEB and identify opportunities for intervention and education to promote sustainable behavior among future generations.^{26,26,29,37,42,43} Therefore, some research problems could be formulated as follows; (1) does ecological leadership styles affect directly students' pro-eco behavior (PEB)?; (2) does environmental big-5 personality directly affect students' PEB?; (3) does students' PsyCap directly affect students' PEB?; (4) does ecological leadership styles affect directly on students' big-5 personality?; (5) does ecological leadership styles directly affect students' PsyCap?; (6) does ecological leadership styles indirectly affect students' PEB through students' big-5 personality?; (7) does ecological leadership style indirectly affect students' PEB through students' PsyCap?

Research Methodology

This type of research is quantitative and exploratory because this research aims to obtain information on whether students' environmental personality and PsyCap can act as mediating factors between ecological leadership styles and students' pro-environmental behavior (PEB). Therefore, in this research, a hypothesis was not formulated at the beginning because a theoretical model had not been found. So, to achieve the research objectives, only a kind of hypothetical structural path model is proposed. The model that we want to improve is the student PEB model based on empirical findings later as a result of research.

Therefore, a causal survey method was applied to determine its population. The population is all University students in Jakarta, then selected by multistage random sampling which has begun by using purposive sampling to determine the sampling area is east Jakarta. Several Universities or all at the tertiary level of education would be selected by applying cluster random sampling until several students from some of the study programs from some Faculties. Then, selected students would be sent a Google form link to be filled and expected, it would be found around 650 students as respondents. Based on those respondents, were then selected by using simple random sampling around 626 students as sample of this research.

There were 4 instruments developed to measure students' PEB (25 items, with a reliability, was 0.658, and items valid was 23), ecological leadership (18 items, with a reliability was 0.865, and 17 items were found valid), environmental big-5 personality (19 items, its reliability was 0.833, and all items was valid), and PsyCap (33 items, its reliability was 0.860, only 1 item was not valid). All instruments are validated before being used for data collection during research. The data was then analyzed using path analysis.

Results

Testing of structural model 1 involves the big-5 personality (X2) and PsyCap (X3) variables on students' PEB (X4). From the results of calculations using SPSS ver.24 software, a path coefficient of 0.325 (based on a regression model of $X4=49.75+ 0.312 X2$, was also highly significant with the form of the relationship assumed to be linear. Based on the results of other calculations, the regression model $X4= 49.75 + 0.133 X3$, was also obtained that was highly significant with the form of the relationship assumed to be linear. Based on this model, the path coefficient that determines the direct effect of X3 on X4 was found 0.178 which was also only significant.

Based on these findings, it can be interpreted that the students' PEB variance is separately influenced by environmental big-5 personality and PsyCap directly and significantly. This big-5 personality effect is similar and relevant to several previous research results (Putrawan, 2027;2019;2020;2021), different from the PsyCap effect which is currently being studied for the first time.

Verifying structural model 2 is related to the direct effect of the ecological leadership styles variable (X1) on students' PEB (X4). The regression model $X4 = 83.70 + 0.105 X1$ obtained turns out to be significant with the form of the relationship assumed to be linear. The path coefficient obtained regarding the direct effect of X1 on X4 was 0.129 which is also significant. Because the magnitude of this coefficient is still relatively small, the students' PEB variance which cannot be explained by the leadership variance is quite large (see the empirical model image below).

Testing of structural model 3 is related to the direct effect of the ecological leadership styles variable (X1) on students' environmental big-5 personality (X2). The regression model $X2= 82.87 - 0.242 X1$ obtained turns out to be highly significant with the form of the relationship assumed to be linear. The path coefficient obtained regarding the direct effect of X1 on X2 was -0.284 which was also highly significant, but the direct effect was found negative.

Finally, testing of structural model 4 is related to the direct effect of the ecological leadership styles variable (X1) on students' PsyCap (X3). The regression model $X3= 150.20 - 0.350 X1$ obtained turns out to be very significant with the form of the relationship assumed to be linear. The path coefficient obtained regarding the direct effect of X1 on X3 was -0.319 which was also highly significant, but the direct effect was negative (see figure below in detail).

Related to coefficient path error which occurred between ecological leadership (X1) on big-5 personality (X2), PsyCap (X3), and students' PEB (X4) found respectively was 0.99, 0.95, and 0.94, which meant that it was only less than 1% of all those three variable variances could be explained by ecological leadership styles perceived by students during its teaching and learning process, the rest could be explained by others. It was a small variance contribution, therefore, this research will not be the final research conducted scientifically, however, it still needs further repeated research in the coming future.

Discussion

Here are some potential reasons why ecological leadership styles perceived by students might harm their Big Five personality traits. Ecological leadership styles that are perceived as overly controlling or intrusive may threaten students' sense of autonomy. This can lead to feelings of resentment or rebellion, which could manifest as changes in their personality traits, such as

decreased agreeableness or conscientiousness.²⁶ If students perceive ecological leadership styles as conflicting with their values or beliefs, it could create cognitive dissonance. This internal conflict might prompt them to change their personality traits to align with their perceived sense of self or their environmental values.^{38,44, 45.}

Ecological leadership styles that are perceived as ineffective or incompetent may undermine students' self-efficacy beliefs. If students do not have confidence in their leaders' abilities to enact positive change, they may become disillusioned, and experience decreases in traits like extraversion or openness to experience.⁴ If students experience negative emotions in response to ecological leadership styles, such as frustration or anger, it could lead to changes in their personality traits.³⁸For example, prolonged exposure to stress or negative affect might contribute to decreases in emotional stability (neuroticism) over time.⁴⁸

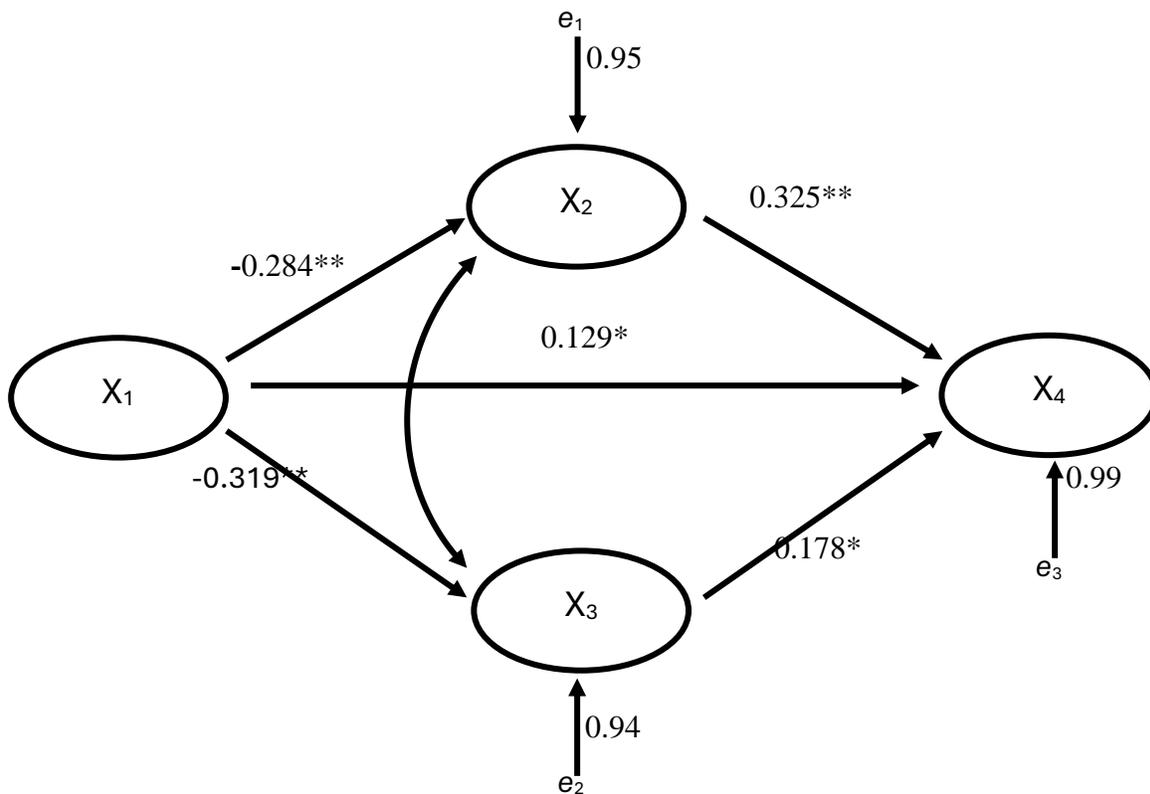


Figure: Empirical Structural Path Model

** p < 0.01; *p < 0.05

If students perceive ecological leadership styles as ineffective communicators or poor role models, it could influence their communication styles and behaviors. This could result in changes to their personality traits, particularly in the domains of openness to experience or agreeableness. These are just a few potential reasons why ecological leadership styles perceived by students might harm their Big Five personality traits.⁵⁴ It's important to analyze your research findings in greater detail and consider additional factors that may be influencing this relationship.^{2,17, 25,49.}

The negative effect of perceived ecological leadership styles (ELS) on students' PsyCap (Psychological Capital) could be attributed to several factors. If students perceive ecological leadership as ineffective or lacking in competence, it could undermine their confidence in the

leadership's ability to address environmental issues. This erosion of confidence can diminish students' PsyCap, particularly in terms of self-efficacy, as they may doubt their abilities to make a positive impact.⁴⁶ Ecological leadership styles that are perceived as ineffective or indifferent may diminish students' sense of hope for creating meaningful change. Without a belief in the possibility of positive outcomes, students' PsyCap, specifically in terms of optimism, can be negatively affected.⁶¹

Students may interpret ineffective ecological leadership as a sign of organizational or societal inertia in addressing environmental challenges. This perception can reduce their resilience in the face of setbacks or obstacles, leading to a decline in PsyCap components such as resilience and optimism. If students perceive ecological leadership as disengaged or uninterested in environmental issues, it can reduce their engagement and commitment to pro-eco behaviors. This lack of alignment between leadership values and student priorities can weaken PsyCap, particularly in terms of engagement. Effective leadership is often associated with providing support and resources to facilitate goal attainment. If students perceive ecological leadership as failing to provide adequate support or resources for addressing environmental concerns, it can diminish their PsyCap, particularly in terms of perceived organizational support and resilience.^{34,35,36.}

Finally, in short, it could be interpreted that the negative impact of perceived ecological leadership styles on students' PsyCap may stem from a lack of confidence in leadership's ability to address environmental challenges effectively, which in turn undermines students' belief in their capacity to make a difference and cope with adversity.^{32,33.}

On the other hand, another result found that ecological leadership styles (ELS) perceived by students affected directly and significantly on students' pro-ecological behavior could be explained as follows. The positive impact of perceived ecological leadership styles (ELS) on students' pro-ecological behavior can be attributed to several logical reasons. Ecological leadership styles that prioritize and actively demonstrate pro-eco behaviors serve as role models for students. When students observe their leaders engaging in environmentally friendly practices, they are more likely to emulate those behaviors themselves, leading to an increase in pro-ecological behavior. Perceived ecological leadership styles can shape the perceived social norms within a group or organization. When students perceive their leaders as endorsing and valuing pro-eco behaviors, it establishes a normative influence that encourages conformity to those behaviors among students, thereby increasing their pro-ecological behavior.^{5,29,52.}

Effective ecological leadership can inspire and motivate students to engage in pro-ecological behavior. When students perceive their leaders as passionate, knowledgeable, and committed to environmental stewardship, it can ignite their sense of purpose and motivation to contribute positively to environmental conservation efforts. Ecological leadership styles that actively support and provide resources for pro-eco initiatives create an enabling environment for students to engage in such behaviors. When students perceive that their leaders are facilitating and endorsing pro-eco activities, it increases their confidence and capability to engage in pro-ecological behavior.^{2, 53,61.}

Ecological leadership styles that prioritize environmental sustainability and awareness-raising efforts can increase students' knowledge and awareness of environmental issues. This heightened awareness can lead to a greater sense of personal responsibility and commitment to pro-ecological behavior among students.⁴² Therefore, the positive impact of perceived ecological leadership styles on students' pro-ecological behavior is grounded in the principles of social influence, role modeling, motivation, and resource provision, all of which contribute to creating an environment conducive to the adoption of pro-environmental behaviors.^{23,24.}

Another finding was found also that students' big-5 personalities affected directly and highly significantly students' pro-ecological behavior can be explained by several logical reasons. Individuals high in conscientiousness tend to be organized, responsible, and goal oriented. They are more likely to engage in pro-ecological behaviors because they feel a sense of duty and responsibility towards the environment. Their conscientious nature drives them to take proactive steps to conserve resources, reduce waste, and adopt sustainable practices. People high in openness to experience are curious, creative, and open-minded. They are more receptive to new ideas and alternative ways of thinking, including environmental issues and sustainability initiatives. Their openness encourages them to explore and adopt pro-ecological behaviors as a way to support innovation and positive change.^{26,49,50,51.}

Individuals high in agreeableness are compassionate, empathetic, and cooperative. They are more inclined to consider the well-being of others, including future generations and non-human species affected by environmental degradation. Their concern for others motivates them to engage in pro-ecological behaviors as a means of promoting harmony and social responsibility. Extraverted individuals are sociable, outgoing, and energetic. They may engage in pro-ecological behaviors as a way to connect with others and contribute to collective efforts for environmental conservation. Their sociability and enthusiasm can inspire others to join in pro-ecological initiatives, amplifying the impact of their behaviors.^{26,38,46,54.}

People high in emotional stability are resilient, calm, and emotionally secure. They are better equipped to cope with environmental challenges and setbacks without becoming overwhelmed or disheartened. Their emotional stability enables them to maintain a positive outlook and continue engaging in pro-ecological behaviors even in the face of adversity. It could be concluded that the effect of students' Big Five personality traits on their pro-ecological behavior is rooted in their dispositions, motivations, and attitudes towards environmental stewardship. Each personality trait contributes uniquely to shaping their beliefs, values, and behaviors related to environmental conservation.^{17,23,24,27.}

It was found that the effect of students' PsyCap (Psychological Capital) on their pro-ecological behavior as well can be clearly described as follows. PsyCap encompasses self-efficacy, which refers to individuals' beliefs in their ability to successfully perform specific tasks or behaviors. Students with higher levels of PsyCap are more likely to believe in their capacity to engage in pro-ecological behaviors, such as recycling, reducing energy consumption, or participating in environmental initiatives.^{8,28} This confidence in their abilities motivates them to take action to contribute positively to the environment. Optimism, another component of PsyCap, involves maintaining a positive outlook and belief in the possibility of favorable outcomes. Students with higher levels of optimism are more likely to view their pro-ecological efforts as meaningful and impactful, even in the face of challenges or setbacks. This optimism fuels their persistence and resilience in adopting and maintaining pro-ecological behaviors over time.⁵⁷

PsyCap also includes resilience, which refers to individuals' ability to bounce back from adversity and setbacks. Students with greater resilience are better equipped to overcome barriers or obstacles to pro-ecological behavior, such as social pressures, convenience factors, or lack of resources. Their resilience enables them to persevere in their efforts to enact positive environmental changes despite challenges they may encounter.³¹

Hope, as part of PsyCap, involves maintaining a sense of agency and belief in the possibility of achieving desired goals. Students with higher levels of hope are more likely to be motivated to engage in pro-ecological behaviors as they believe in the potential for creating a more sustainable future. Their sense of hope inspires them to take action and make a meaningful difference in

environmental conservation efforts. PsyCap includes self-regulation, which involves the ability to manage one's thoughts, emotions, and behaviors in pursuit of goals. Students with stronger self-regulation skills are better able to control impulses, prioritize environmental values, and maintain consistency in their pro-ecological behaviors. Their capacity for self-regulation enables them to overcome temptations or distractions that may hinder their commitment to environmental stewardship.^{46,53,57.}

Therefore, it could be stated that the effect of students' PsyCap on their pro-ecological behavior is grounded in their psychological resources, including self-efficacy, optimism, resilience, hope, and self-regulation. These positive psychological attributes empower students to believe in their ability to make a difference and to take proactive steps toward environmental conservation.

Conclusion

Based on the discussion above, the research findings indicate several key conclusions:

- (1) Ecological Leadership Styles and Pro-Ecological Behavior: Perceived ecological leadership styles have a significant and direct impact on students' pro-ecological behavior. Effective ecological leadership, characterized by authenticity, support, and role modeling of pro-eco behaviors, can positively influence students' attitudes and actions toward environmental conservation.
- (2) Big Five Personality Traits and Pro-Ecological Behavior: Students' Big Five personality traits, including conscientiousness, openness to experience, agreeableness, extraversion, and emotional stability, significantly affect their pro-ecological behavior. Each personality trait contributes uniquely to shaping students' beliefs, motivations, and behaviors related to environmental stewardship.
- (3) Psychological Capital (PsyCap) and Pro-Ecological Behavior: Students' PsyCap, encompassing components such as self-efficacy, optimism, resilience, hope, and self-regulation, also has a direct and highly significant impact on their pro-ecological behavior. Higher levels of PsyCap empower students with the psychological resources needed to believe in their ability to make a difference and to take proactive steps toward environmental conservation.
- (4) Impact of Ecological Leadership Styles (ELS): Students' perception of ecological leadership styles significantly influences their pro-eco behavior (PEB). This suggests that how leadership is exercised within ecological contexts has a direct and positive effect on students' environmental behaviors.
- (5) Effect on Big-5 Personality (PER): ELS has a negative and direct impact on students' big-five personality traits. This implies that certain ecological leadership styles may clash with or hinder the development of certain personality traits among students.
- (6) Effect on Psychological Capital (PsyCap): ELS also negatively and directly affects students' psychological capital (PsyCap). This indicates that certain ecological leadership styles may not foster the psychological resources necessary for students to thrive and excel in environmental initiatives.
- (7) Role of Personality in Pro-Eco Behavior: The big five personality traits have a direct and significant influence on students' pro-eco behavior. This suggests that individual

personality differences play a crucial role in shaping environmental attitudes and actions among students.

- (8) Role of Psychological Capital in Pro-Eco Behavior: Psychological capital (PsyCap) directly and significantly affects students' pro-eco behavior. This highlights the importance of psychological resources, such as optimism, resilience, self-efficacy, and hope, in motivating and sustaining environmentally friendly behaviors among students.

Finally, the findings underscore the complex interplay between ecological leadership styles, personality traits, psychological capital, and pro-environmental behavior among students. Understanding these dynamics is essential for developing effective strategies to promote environmental sustainability within educational contexts. Therefore, those findings could be implied especially for campus policy development regarding building a green campus as one of the campus activities would regulate its green programs, the most important thing to be taken into account is how to literate campus people with the new concepts of ecological leadership to promote all campus components would behave pro-ecologically.

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