The Influence of Climate Change Awareness on Energy-Saving Behaviors Among Urban Households

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ABSTRACT

Climate change awareness means knowing how the environment is changing and taking action to protect it. In the Philippines, many people are aware of environmental issues, but there is still a gap between what they know and what they actually do at home. This study examined how climate change awareness affects energy-saving behaviors among 100 college students at UM Panabo College. This study is anchored to SDGs 7, 11, 13, and 17 by integrating renewable energy and multi-stakeholder partnerships to reduce emissions in urban and rural communities. It utilized a descriptive - correlational design with a validated questionnaire. Students were chosen fairly from different departments. Results showed very high levels of climate change awareness with a mean of 4.45 and SD of 0.29, and energy-saving behaviors with a mean of 4.38 and SD of 0.36, both interpreted as Strongly Agree. Risk behaviors recorded the highest mean at 4.54 and SD of 0.43. A positive relationship exists between awareness and consumption where $r = 0.610$ and $R^2 = 0.3721$, showing that students with better environmental understanding are more likely to practice energy-saving behaviors. Urban residents should adhere to collective action, while policymakers, and institutions should provide more support, while schools should help students turn their knowledge into permanent habits. Future researchers can also look into other things that make people act for the environment.

Keywords: Climate change awareness, energy-saving behavior, urban households, environmental participation, sustainable communities, climate action

INTRODUCTION

Climate change, driven by energy consumption and production, requires collective action across all sectors, including individuals (Suntornsan et al., 2022). Adopting energy-saving behaviors such as using efficient technologies is crucial (Irmak et al., 2023). Yet, an "awareness-to-behavior gap" persists, where climate knowledge does not consistently translate into action due to cognitive, emotional, and social barriers (Venghaus et al., 2022; Pampanelli & Spagnolli, 2023). This study investigates how knowledge, attitudes, and social norms influence household energy-saving practices among urban residents.

Electricity is central to modern life (Parreño, 2022), and urban households responsible for over 30% of global energy use are key to climate solutions (Wang et al., 2023; Verma et al., 2024). Despite awareness, behavioral change remains limited (Mooney et al., 2022; UNDP, 2024). Cross-national studies show awareness correlates with curtailment behaviors like turning off appliances, though efficiency purchases are less consistent (Raimi et al., 2023). Nationally, personal experiences with extreme weather shape risk perception and energy-saving intentions (Bordallo, 2023). In the Philippines, science literacy enhances conservation behaviors among youth (Aruta, 2021), though barriers such as cost and administrative complexity hinder adoption (European Parliament, 2023).

Local studies reveal similar gaps. Northern Mindanao households showed knowledge but inconsistent practices (Manuel, 2020), while Batangas residents lacked renewable energy awareness (Gatmaitan et al., 2025). Chinese

youth demonstrated that climate beliefs and environmental concern predict conservation (Han et al., 2022). These findings highlight the need for global, national, and local interventions (Klein & Lee, 2021).

Urbanization intensifies energy demand, as seen in Vietnam's industrialization (Nguyen et al., 2024) and Japan's CO2 reduction goals (Xiao & Managi, 2023). In the Philippines, electricity use rose 6.3% nationally and 17% in Davao City (Parreño, 2022), underscoring the urgency of household energy-saving (Si et al., 2022). Energy efficiency also yields financial benefits (Stancu et al., 2025).

Awareness is shaped by socio-demographics such as age, education, gender, and income (Ishak et al., 2022; Khan et al., 2023; UNICEF & Gallup, 2023). Younger, educated cohorts show stronger engagement (Salguero et al., 2024; Pew Research Center, 2021). Philippine studies confirm environmental awareness correlates with responsibility (Natingga & Pelobello, 2024; Warguez et al., 2023). Yet barriers like habit, inconvenience, and perceived insignificance limit action (Han et al., 2022; IEA, 2021; Chopra, 2025). Social norms and shared responsibility strongly influence behavior (Sengupta et al., 2022; Zhang et al., 2023).

Theoretical frameworks guide this study. The Theory of Planned Behavior (Ajzen, 1991) emphasizes attitudes, norms, and perceived control (Kollmuss & Agyeman, 2002; Steg & Vlek, 2009; Abrahamse & Steg, 2011; Fishbein & Ajzen, 2010). The Values-Beliefs-Norms theory (Stern et al., 1999) highlights moral obligation rooted in values and beliefs (Schwartz, 1977; Hansla et al., 2008; Nordlund & Garvill, 2002; Ockwell et al., 2009; Gifford, 2020). Together, these explain how awareness translates—or fails to translate—into energy-saving behavior.

Despite rising awareness, the "knowledge-action gap" persists (Hochachka, 2024). Risk perception remains a strong motivator (Maartensson & Loi, 2022). This study hypothesizes that increased climate awareness among urban households leads to more energy-efficient behaviors, while recognizing the influence of psychological, social, and demographic factors. It supports SDG 7 (Clean Energy), SDG 11 (Sustainable Cities), SDG 13 (Climate Action), and SDG 17 (Partnerships), aiming to inform policies, strengthen environmental education, and empower households to reduce energy use.

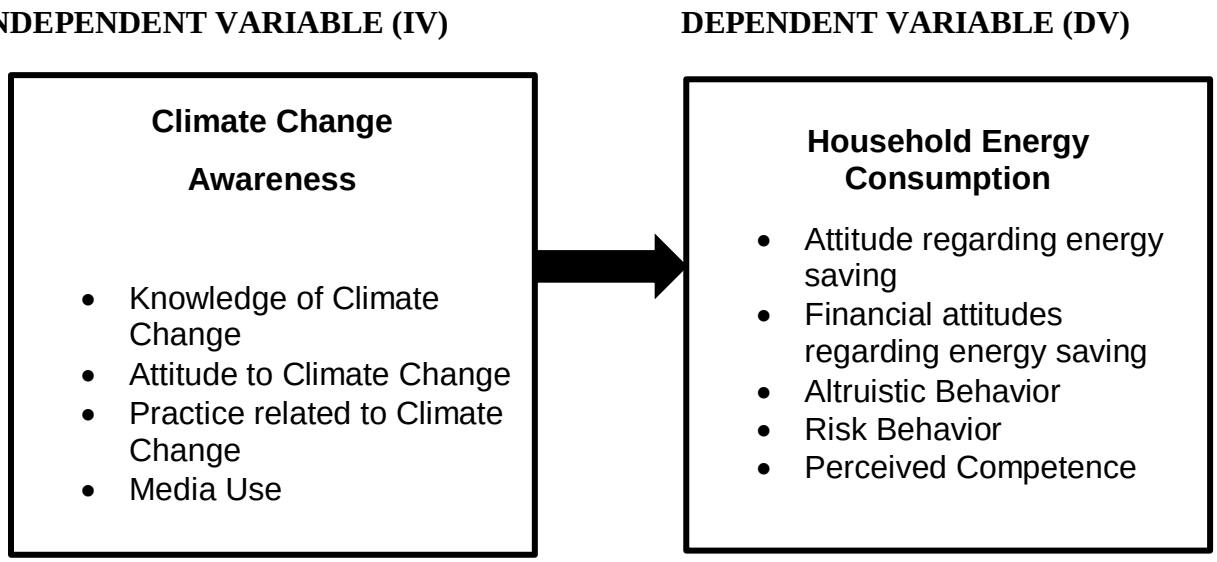

Figure 1. Relationship between climate change awareness and Household Energy use

The study examined the relationship between climate change awareness and household energy consumption behaviors in urban communities, with a focus on analyzing how awareness influences actual energy use, the specific behavioral changes adopted, and the perceived barriers and enablers that affect the adoption of energy saving practices. Specifically, it aimed to: (1) determine the impact of climate change awareness on actual household energy consumption patterns (2) identify the specific behavioral changes awareness; and (3) explore the perceived barriers and enablers that influences households' adoption of energy-saving behaviors despite climate change awareness.

The researchers developed a null hypothesis that there is no significant relationship between climate change awareness and household energy consumption behaviors of urban households at a 0.05 significance level.

METHOD

The study involved 100 fourth-year UM Panabo College students residing in urban areas and actively influencing household energy use. While larger samples increase statistical power, a sample of 100 is recognized as sufficient for student research given resource and time constraints (Lakens, 2022; Gopinath et al., 2023). College students are a critical demographic for climate action, as their residential energy behaviors will shape future consumption trends (Peng et al., 2024; Verma et al., 2024).

Participants were selected using purposive-quota sampling to ensure balanced representation across disciplines (Memon et al., 2025). Fifty students were drawn from Teacher Education and fifty from Accounting and Business Administration Education. This method ensured diversity in academic backgrounds, which may influence environmental awareness and behaviors.

Inclusion criteria required bona fide fourth-year enrollment, urban residence, and active involvement in household energy decisions. Exclusion criteria applied to non-urban residents, non-enrolled students, or those uninvolved in household energy use. This approach aligned with household energy behavior research emphasizing student roles in energy decisions (Ofototse et al., 2021).

Two validated questionnaires were used. The first, adapted from UNDP (2024), assessed climate change awareness across four indicators: knowledge, attitudes, practices, and media usage. The second, adapted from Niehoff (2021), measured household energy consumption through 51 items across six indicators: attitudes, financial attitudes, altruistic behaviors, empathic behaviors, risk behaviors, and perceived competence. Both instruments were adapted to the study context, with minor rewording for clarity.

Validity was ensured through pilot testing and expert review in environmental science, energy, and research methods (Wang et al., 2023). Data analysis employed the mean to determine average awareness and behavior levels (Ramdani et al., 2025), and Pearson's r to measure the strength and direction of relationships (Sarkar & Chakraborty, 2023).

A descriptive-correlational quantitative design was used to analyze climate change awareness and household energy-saving behavior (Miksza et al., 2023). This design described participant characteristics without manipulation (Shrestha et al., 2025) and explored natural relationships between variables (Bordallo, 2023). Structured survey questionnaires provided numerical data, following methods used in similar awareness studies (Rosales et al., 2024).

Data collection targeted urban households using purposive-quota sampling, consistent with UNDP (2024). Expert review established content validity, ensuring questionnaires measured awareness and energy behaviors accurately. Formal approval was obtained from UM Panabo College authorities, followed by cooperation from deans and program heads. Informed consent was secured, emphasizing voluntary participation and withdrawal rights.

Surveys were administered in controlled campus settings to minimize distractions. Responses were tallied, coded, and analyzed by a licensed statistician using descriptive statistics (frequency, percentage, mean, SD) and Pearson's correlation (Sabri et al., 2022; Shen et al., 2016). Ethical considerations included strict confidentiality, anonymity, and secure data handling.

RESULTS AND DISCUSSION

This chapter analyzes and interprets the gathered data to directly address the research problem presented in Chapter 1. The table arranged the information with the identified problem.

We then discussed the analysis and its significance for the study.

Level of Climate Change Awareness

This study evaluates the climate change awareness of 4th year DTE and DABAE students based on four indicators: knowledge of climate change, attitude to climate change, practice related to climate change, and media use. The results classify their awareness as strongly agreed with a mean 4.45 and SD of 0.29, which indicates an excellent level of awareness that significantly impacts them. According to Ahmad et al. (2021), individuals with a higher level of environmental awareness possess a better understanding of complex ecological problems. Because of this, they are more likely to support and follow public policies aimed at protecting the environment. Furthermore, Aruta (2021) notes that climate awareness builds personal confidence and empowerment. This allows individuals to better analyze environmental information and take an active role in community-led initiatives. These results show that the students have a strong understanding of climate change and a shared commitment to protecting the environment. This supports the idea that higher education is a key factor in building environmental literacy and encouraging students to take action. According to UNESCO (2021) and Marasigan (2022), universities play a vital role in turning classroom knowledge into a sense of social responsibility, helping students move from being informed observers to active participants in climate solutions.

Table 1. **Level of Climate Change Awareness**

Indicators	**Mean**	**SD**	**Descriptive Equivalent**
Knowledge of Climate Change	4.61	0.34	Strongly Agree
Attitudes to Climate Change	4.73	0.28	Strongly Agree
Practice Related to Climate Change	4.23	0.52	Strongly Agree
Media Use	4.24	0.51	Strongly Agree
Grand Mean	**4.45**	**0.29**	**Strongly Agree**

As shown in Table 1, the indicator attitude to climate change earned the highest overall high mean score of 4.73 and SD of 0.28, with a descriptive equivalent of strongly agree. This signifies that 4th-year DTE and DABAE students feel a strong personal duty to address climate change, which directly influences how they manage energy in their urban homes. Among the 12 items, item 8 obtained the highest mean of 4.88 with the statement "I believe it is important to increase public awareness". This result shows that students highly value advocacy and community action as tools to fight environmental decline. Moreover, the item with the lowest mean was item 11 with the statement "I believe businesses and industries are mainly responsible", with a score of 4.50. This suggests that while students still hold industries accountable, they place a greater emphasis on their own personal agency rather than shifting the entire burden of responsibility onto external corporations.

In the Philippine context, turning these positive attitudes into actual energy-saving habits is often difficult due to the high cost of efficient appliances and economic constraints. However, this mindset can be strengthened through community participation, showing that climate awareness is linked to civic duty. Although students are highly aware, research warns that awareness alone does not always lead to lower household energy use (Gifford & Chen, 2020). Additionally, a lack of deep climate literacy can make individuals vulnerable to misinformation, which weakens their ability to make sustainable choices (Aruta, 2021). Ultimately, the link between attitude and energy saving is maintained because individuals with high environmental concern are more willing to adopt pro-environmental habits in their daily lives (Oreg & Katz-Gerro, 2021).

In addition to positive attitudes the data also reveals that the indicator knowledge of climate change earned a high mean score of 4.61 and SD of 0.34, with a descriptive equivalent of strongly agree. This result indicates that 4th-year DTE and DABAE students are well-informed about environmental challenges and clearly grasp

the scientific importance of sustainability. Among the 10 items, item 2 obtained the highest mean of 4.75 with the statement "I believe that climate change is currently affecting my community". This shows that students possess a high level of situational awareness, recognizing that climate change is an immediate local reality rather than a distant global threat. Moreover, the item with the lowest mean was item 10 which obtained a mean of 4.20 with the statement "I have been affected by flooding over the past 10 years". While still within the range of agreement, this result implies that while students have a strong theoretical knowledge of climate change, their personal experience with its extreme physical disasters, such as flooding, varies depending on their specific urban location.

These high knowledge scores suggest that the energy-saving habits of students in their urban homes are intentional and driven by a factual understanding of environmental systems. Research confirms that environmental knowledge is a primary cognitive driver of environmental concern, meaning behavior is a structured response to understanding how systems work (Zeng et al., 2023). In the Philippines, local studies highlight that students who perceive climate change as a direct threat to their immediate community are more likely to support adaptation measures and conservation efforts (Vicente et al., 2023). Furthermore, when individuals understand the specific impact of their energy choices, they are significantly more likely to take practical, consistent steps to reduce their consumption (Arı & Yılmaz, 2022). However, for this knowledge to result in long-term behavior change, it must be accompanied by action knowledge knowing exactly how to save energy effectively within a household setting (Geiger et al., 2019).

Furthermore, data shows that the indicator media use reached a high overall mean of 4.24 and SD of 0.51 with a descriptive equivalent of strongly agree. This suggests that for most respondents, staying connected to digital and traditional news is a primary way they build their awareness of the climate crisis. Among the 11 items, the last item obtained the highest mean of 4.61 with the statement "I believe the most effective ways to get information to my community are from websites/ the internet." This indicates that students recognize the internet as the most powerful tool for community-wide information dissemination. In addition, the lowest mean was recorded in item 5 with the statement "I get my information on climate change from websites/the internet," with a score of 3.75. While still positive, the difference between these two items suggests that while students believe the internet is the most effective channel for the community, their own personal usage of websites specifically for climate data is more moderate.

Media platforms function as informal classrooms that translate complex environmental issues into digestible information for urban households. This reality aligns with the findings of Anderson and Howarth (2019), who emphasize that digital media is an indispensable tool in shaping how different cultures respond to climate change. Furthermore, the transition from passive media consumption to informed literacy allows respondents to build a solid factual foundation regarding the environment, a trend increasingly documented in recent Philippine and global literature (Ligsa et al., 2024; Hijazi et al., 2025). This engagement suggests that the internet acts as a bridge, connecting the students' academic knowledge with real-world climate advocacy.

Lastly, respondents strongly agree that their engagement in practices related to climate change reached a mean score of 4.23 and SD of 0.52 indicating that they consistently translate awareness into climate-friendly actions. Research shows that higher climate literacy strengthens pro-environmental intentions and facilitates the translation of those intentions into actual behaviors by enhancing individuals' capacity to perceive and act upon climate risks (Hu et al., 2025). Such findings are also consistent with Sapungan & Sapungan (2023), who noted that waste management is often the most visible and widely practiced pro-environmental behavior among Filipino students due to local community initiatives and school-based programs. This supports the idea that respondents' awareness is effectively translated into action.

Among the 12 items, item 3 obtained the highest mean with the statement "I practice proper waste disposal/composting" which has a mean of 4.48, demonstrating that simple and routine environmental behaviors are well integrated into daily life. In addition, the last item with the statement of "I believe it is not my responsibility to take action on climate change", had the lowest mean of 3.60, reflecting disagreement and a general recognition of personal responsibility. This aligns with evidence that greater climate change knowledge coupled with self-efficacy positively predicts pro-environmental behavior, suggesting that deeper understanding and personal empowerment drive consistent climate-positive practices (Akakpo, 2024).

Level of Household Energy Consumption

Table 2 outlines the levels of Household Energy Consumption by evaluating several key indicators, including attitude regarding energy saving, financial attitudes regarding energy saving, altruistic behavior, emphatic behavior, risk behavior and perceived competence. The findings reveal a high overall level of engagement across these areas, as shown by a grand mean of 4.38 and SD of 0.36. This high score means that the students in these urban households show a strong inclination toward energy-saving behaviors. It suggests that their daily actions are not accidental but are instead a result of being highly aware of how their personal consumption habits relate to the broader issue of climate change. In effect, this data implies that energy conservation in these homes is driven by a combination of practical and moral factors. Whether motivated by saving money or a desire to help others, the respondents feel capable and ready to manage their energy use.

This finding is supported by Steg (2023), who argues that while financial savings are a strong motivator, the moral belief that one should protect the environment is often more effective for long-term consistency in energy use. Additionally, in the Philippine context, Lores et al. (2022) found that the feeling of being capable is a major predictor of energy-saving habits among households, regardless of their income level.

This level of perceived competence is vital, as it shows they believe their individual actions at home actually make a difference. This finding aligns with research by Zhang et al (2024), who demonstrated that when individuals feel a strong personal obligation toward the environment often framed as personal norms or moral responsibility, they are significantly more likely to adopt energy-saving habits in both office and home environments. Additionally, Tian and Liu (2025) noted that a person's environmental self-identity, the extent to which they see themselves as someone who acts environmentally friendly, is a powerful driver of consistent energy conservation acting as a deep internalized guide for sustainable behavior

Risk Behaviors achieved the highest score among the six indicators evaluated, with a mean of 4.54 and SD of 0.43. This indicates that respondents strongly agree with their engagement, placing this category at the top of the household energy consumption assessment. These results suggest that the students are not merely observers of environmental issues; they are actively committed to energy-saving habits. Highlighting the individual indicators, the first item with the statement “I believe that saving energy in my household helps prevent climate change” attained the highest mean of 4.95, demonstrating that a strong belief in the efficacy of personal action is a primary driver of their commitment. Meanwhile, the sixth item with the statement “I am at risk because of climate change” recorded the lowest mean of 4.37, reflecting that while the sentiment remains very high, respondents feel slightly less personally threatened than they are empowered to take preventive action.

Table 2. Level of Household Energy Consumption

Indicators	**Mean**	**SD**	**Descriptive Equivalent**
Attitude regarding energy saving	4.51	0.40	Strongly Agree
Financial attitudes regarding energy saving	4.29	0.64	Strongly Agree
Altruistic Behavior	4.30	0.60	Strongly Agree
Emphatic Behavior	4.27	0.51	Strongly Agree
Risk Behavior	4.54	0.43	Strongly Agree
Perceived Competence	4.37	0.53	Strongly Agree
Grand Mean	**4.38**	**0.36**	**Strongly Agree**

Recent findings by Ballew et al. (2023) suggest that when individuals perceive high personal stakes, their internal locus of control strengthens, leading them to view daily consumer choices as essential components of a broader systemic solution. This aligns with the findings of Van der Linden (2015), who suggests that high risk perception can lead to positive behavioral changes if individuals believe their actions are effective. Furthermore, Ballew et al. (2024) emphasize that climate concern acts as a primary motivator for household energy efficiency, as it transforms abstract environmental anxiety into concrete, manageable household actions. This shift from general awareness to deliberate action demonstrates that they are taking ownership of their environmental impact. This finding aligns with the research of Piao and Managi (2023), who found that the perception of environmental risk is a key motivator of sustainable behavior, confirming that when individuals recognize potential consequences, they are more likely to adopt proactive habits.

In addition, the data also shows that the indicator attitudes regarding energy-saving indicators showed that respondents strongly agree with their engagement and reached the mean score of 4.51 and SD = 0.40, indicating a strong alignment between belief and behavior. Focusing on specific results, the eighth item with the statement "I believe everyone should do whatever they can to protect the environment" emerged as the most significant with a mean of 4.60, demonstrating that a deep conviction and sense of universal responsibility are well integrated into their mindset. In contrast, the third item with the statement "I believe that, overall, energy-saving appliances are environmentally friendly" recorded the lowest mean of 4.42, reflecting that while the sentiment remains very high, specific technical beliefs about appliance impact are slightly less pronounced than general environmental values. This data suggests a deep conviction among respondents, echoing Sarker et al. (2024), who noted that high environmental awareness translates directly into active resource management and energy saving. In the context of environmental psychology, internal disposition is a fundamental driver of action (Shaari et al., 2025), suggesting that the participants' high awareness scores directly translate into their energy-saving habits.

Much like how emotional states control consumer choices, a strong, positive attitude toward energy efficiency illuminates the practical benefits of sustainability, making individuals more likely to adopt green habits. For these urban households, such a high mean suggests that the respondents do not just acknowledge energy saving as a concept but view it as a personal priority. This finding aligns with research by Fang et al. (2022), whose research shows that modern students are moving toward a practice-based mindset, where they treat environmental goals as a daily, personal responsibility. Furthermore, for young adults living in urban areas, active sustainable behavior is no longer just a passive concern; it has become a defining part of their identity. Essentially, they aren't just saving energy; they see themselves as the type of people who prioritize the planet.

Perceived competence among the participants also showed that respondents strongly agree with their engagement and reached the mean score of 4.37 and SD of 0.53, indicating that they feel thoroughly equipped to manage their own energy consumption and implement sustainable habits at home. Highlighting the individual indicators, the third item with the statement "I can protect the environment by buying products that are environmentally friendly" attained the highest mean of 4.47, demonstrating that these students don't just feel informed they feel truly capable. Meanwhile, the fourth item with the statement "I feel capable of helping to solve environmental problems" recorded the lowest mean of 4.31, reflecting that while their confidence remains very high, their sense of impact on broad environmental issues is slightly less pronounced than their belief in specific consumer actions.

This sense of confidence is perhaps one of the most significant findings of the study. It suggests that their specific technical background serves as the practical foundation needed to turn general awareness into actual habit. For these students, energy saving isn't a complex or intimidating task; it is something they feel they have mastered. This implies that they are not just passive supporters of "green" initiatives, but are technically prepared to lead energy-saving efforts within their own households and communities. This is consistent with the work of He et al. (2023), who argue that environmental knowledge only bridges the gap to actual behavior when individuals have the self-efficacy, or the belief that they have the capacity to act. Similarly, Li and Zhang (2024) found that in urban household settings, perceived behavioral control—the internal belief in one's own ability is often the single strongest predictor of whether an individual will actually commit to long-term energy-saving measures.

The altruistic behavior related to household energy use was observed at a moderately high level mean score of 4.16 and SD of 0.59. This indicates that individuals who demonstrate greater concern for the well-being of others and the environment are more likely to engage in energy-saving practices at home. Among the 10 items, the seventh item obtained the highest mean of 4.44 and with the statement "I would describe myself as a person who helps carry a stranger's belongings (e.g., books, parcels)," showing that respondents strongly identify with everyday helpful behaviors. In addition, the sixth item which has the lowest mean of 4.01 with the statement "I am someone who donates blood," reflecting an agreement that suggests that not all altruistic actions are practiced equally. These results highlight that respondents' altruistic tendencies are reflected in both daily small acts and more formal forms of assistance.

These findings suggest that altruistic values serve as important motivators for reducing electricity consumption, even when such actions require personal effort or sacrifice. This aligns with research showing that individuals with stronger altruistic values are more likely to adopt behaviors that support both energy efficiency and broader environmental sustainability (Wan Hussain et al., 2021; Al Mamun et al., 2022). Furthermore, pro-environmental actions are fully internalized and individuals are more likely to maintain those behaviors across all areas of life, even when they involve a perceived loss of comfort or sacrifice (Molkenthin et al., 2024).

In addition, financial attitudes regarding energy-saving indicators showed that respondents strongly agree with their engagement and reached the mean score of 4.29 and SD of 0.64, indicating that they not only recognize the importance of saving energy to reduce costs but also consistently translate this financial motivation into intentional and sustained energy-saving practices. In terms of specific attitudes, this indicator has the highest mean in the sixteenth item with the statement "I believe purchasing energy-saving appliances is a pleasant experience" which has a mean of 4.40, demonstrating that positive emotional associations and perceived benefits are well integrated into financial decision-making. On the other hand, the thirteenth item with the statement "I am willing to purchase energy-saving appliances at a high price" had the lowest mean of 4.13, reflecting that while the sentiment remains positive, the direct financial burden is a relatively more challenging factor for some respondents.

This finding suggests that strong financial awareness can effectively encourage individuals to adopt regular energy-efficient behaviors, particularly when they perceive clear personal benefits and feel capable of maintaining such actions. According to Grilli and Curtis (2021), while people often have a moral desire to save energy, financial rewards or cost-savings serve as a powerful trigger that turns those good intentions into real-world action. Meta-analytic evidence highlights that positive attitudes toward energy conservation consistently predict energy-saving behavior across diverse contexts, reinforcing the psychological link between motivation, attitudes, and actions (Zawadzki et al., 2025). Moreover, structural equation modeling studies have shown that perceptions of personal benefit, including financial savings from reduced energy costs, significantly influence energy-saving intentions and behaviors (Busu et al., 2025).

These findings underscore that when motivational, cognitive, and financial factors align, individuals are more likely to adopt and sustain energy-efficient practices over time. Furthermore, the study revealed that empathic behavior regarding household energy consumption reached a high level, with an overall mean of 4.27 and SD of 0.51. This result suggests that individuals who possess a strong sense of concern for the well-being of others are significantly more likely to adopt energy-saving habits at home. Furthermore, research by Bolderdijk and Steg (2015) shows that the desire to do the right thing for society is often a more powerful and lasting motivator than simply trying to save money. This confirms that for these respondents, protecting the environment is a shared moral responsibility. For these students, saving energy appears to be an act of social care.

Empathic behavior related to household energy use showed that respondents strongly agree with their engagement and reached a mean score of 4.27 and SD of 0.51, which means that people who care about the well-being of others are more likely to save energy at home. Highlighting the individual indicators, the third item with the statement "It upsets me to see someone being treated disrespectfully" attained the highest mean of 4.50, showing that respondents strongly agree with emotional sensitivity and social fairness. Meanwhile, the second item with the statement "Other people's misfortunes do not disturb me a great deal" recorded the lowest mean of 4.02, which still shows agreement but indicates some variation in empathic behaviors.

These results suggest that empathic tendencies, both in caring actions and emotional sensitivity, help motivate energy-saving practices. When energy conservation is framed as benefiting others and the community, it becomes a strong reason for action. Overall, empathic values connect personal beliefs with actual energy-saving behavior, supporting social responsibility and environmental concern (Li, Zhao, & Sun, 2021). A significant study on electricity-saving behaviors, finding that "social accountability" is a primary driver. His work suggests that when individuals feel their actions are visible to their community, they prioritize the collective welfare of society over their own personal comfort (Vuong, 2024).

Significant relationship between the social media promotion and impulsive buying behavior

Table 3 illustrates a significant positive correlation between climate change awareness and the energy-saving behaviors of urban households. The independent variable, climate change awareness, yielded a high mean score of 4.45 and SD of 0.29, while the dependent variable, energy-saving behaviors, similarly reached a high level with a grand mean of 4.38 and SD of 0.36. These results indicate that participants possess a deep understanding of environmental risks, which directly translates into a strong commitment to practical conservation measures. The low standard deviations suggest a consistent consensus among urban residents, implying that energy-saving practices are no longer outlier behaviors but are becoming a standardized household norm.

This alignment suggests that as the perception of environmental risk grows, the psychological barrier of personal inconvenience diminishes. Household energy conservation is thus transformed from a mere cost-saving measure into an expression of broader social accountability. In this context, individuals appear to prioritize collective welfare and long-term ecological stability over personal indifference or the minor discomforts associated with reduced energy consumption. This transition from awareness to action is well-documented in recent literature. Recent studies back this up. Experts like Shaari et al. (2025) found that when people are personally committed to the planet, their green habits move from being something they do "once in a while" to something they do "all the time." Other researchers, such as Bergemann and Bertol (2025), point out that people are now more likely to save energy because they care about the welfare of their whole community, not just themselves. Finally, Akhter et al. (2025) explain that this happens because people have internalized responsibility meaning they do the right thing because it's part of who they are, even if it takes a bit more effort.

TABLE 3. Significant relationship between climate change awareness and household energy consumption

Variables	Mean	SD	Description	r-value	p-value	Decision
Climate change awareness	4.45	0.29	Strongly Agree			
Household Energy Consumption	4.38	0.36	Strongly Agree	0.610	0.3721	Ho is rejected

R= 0. 610; R^2=0.3721

The statistical relationship between climate change awareness and household energy consumption is detailed in Table 3. The data reveals that climate change awareness achieved a Strongly Agree mean of 4.45 and SD of 0.29 while energy-saving behaviors reached a similarly Strongly Agree with a grand mean of 4.38 and SD of 0.36, both corresponding to the descriptive equivalent of Strongly Agree. Statistical testing yielded an r-value of 0.610 and a p-value of .000 ($p < 0.05$), leading to the rejection of the null hypothesis.

Furthermore, the coefficient of determination indicates that climate change awareness accounts for 37.21% of the variance in energy consumption behavior, with other factors contributing the remaining 62.79%. These results indicate a strong and significant connection between environmental knowledge and actual household practice. The high mean scores suggest that urban residents do not merely possess a theoretical understanding of climate change; they have successfully translated that awareness into consistent, daily habits. The 37.21%

variance suggests that while awareness is a powerful catalyst, it serves as a foundational anchor that influences behavior even when other variables such as economic status or infrastructure are at play.

The data suggests that for these urban households, energy conservation is not merely a choice but a deeply held conviction. This alignment reinforces the idea that household energy conservation is often an expression of broader social accountability, where individuals prioritize collective welfare over personal convenience. However, while internal conviction is high, the 62.79% of variance attributed to other factors reminds us that environmentalism does not exist in a vacuum. It suggests that even the most committed "energy citizens" must still navigate external constraints, such as the efficiency of their dwellings or financial capacity, which can either facilitate or hinder their ability to act on their beliefs.

Current scholarship validates this transition from commitment to habit. As Shaari et al. (2025) recently observed, when individuals possess a high personal commitment toward the environment, their conservation efforts move from being occasional to habitual. This consistent behavior aligns with research by Wang et al. (2023), which identifies internalized moral norms as the primary bridge between simply knowing about climate change and actively reducing one's carbon footprint. Furthermore, the influence of external variables noted in this study is echoed by the OECD (2024) and the IEA (2024), both of which highlight how infrastructure and economic context moderate the impact of even the strongest environmental convictions.

CONCLUSIONS AND RECOMMENDATIONS

Based on the statistical analysis of the research findings it reveals the following conclusions were: (1) the level of climate change awareness among urban households has a grand mean of 4.45 (SD = 0.29), corresponding to the descriptive equivalent of strongly agree, indicating that the respondents consistently demonstrate a very high understanding of environmental issues; (2) the extent of household energy consumption behavior practiced by the respondents has a grand mean of 4.38 (SD = 0.36), which correlates to the descriptive equivalent of strongly agree, signifying that residents regularly exhibit responsible energy-saving habits and feel capable of managing their consumption at home; and (3) the r-value between climate change awareness and household energy consumption is 0.610 with a p-value of 0.000, which is lower than the 0.05 level of significance, indicating that a significant and strong relationship exists between climate change awareness and household energy consumption behavior. This result leads to the rejection of the null hypothesis, confirming that as the awareness of residents increases, their energy-saving practices and conservation efforts also improve significantly.

The researchers made the following recommendations based on the findings and conclusions of the study: (1) Policymakers and Institutions should work together to give practical help, like subsidies or low-interest "green" loans for solar power and energy-saving appliances. By making these programs last a long time, they can make sure that living sustainably stays affordable for all families. (2) Schools should include climate action in their lessons to help students learn how to solve environmental problems in real life. They can offer hands-on projects and support environmental clubs to keep students interested in protecting the planet. (3) Students should take the lead at home by using what they learn in school to help their families save energy.

Since students use social media and digital apps for information, they can act as "sustainability ambassadors" by sharing tips that help their households use electricity more wisely. (4) Urban Communities are encouraged to join local programs instead of just working alone. By sharing energy-saving ideas and starting neighborhood green projects, residents can work together to lower their community's carbon footprint. (5) Future Researchers are encouraged to study other factors like family income, the type of house people live in, and how local laws affect energy use. Doing this study in other cities or with more people will help create better ways to encourage long-term environmental change.

Ethical Considerations

Formal approval to conduct the study was obtained from the administration of UM Panabo College. All participants provided informed consent, and the study adhered to ethical principles of voluntary participation, anonymity, and confidentiality. No personal identifiers were collected, and data were securely stored for academic purposes only. The authors declare no conflict of interest in relation to this study.

Data Availability

The data supporting the findings of this study are available upon reasonable request from the corresponding author. Due to privacy and confidentiality agreements with participants, the raw survey responses are not publicly available. However, aggregated statistical results and analysis outputs can be shared for academic and research purposes.

Revisions

All reviewer comments were carefully addressed in the revised manuscript. A detailed response letter

accompanies the resubmission, outlining how each comment was considered and incorporated into the updated version of the paper.

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