QATAR UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

HIGHER EDUCATION STUDENT'S INTENTION AND PRO-ENVIRONMENTAL

BEHAVIOR GAP, THE ROLE OF UNIVERSITY PRACTICES, SOCIOCULTURAL

FACTORS, AND INDIVIDUAL NORMS

BY

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ABSTRACT

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Title: Higher Education Students' Intention and Pro-environmental Behavior Gap, the Role of University Practices, Sociocultural Factors, and Individual Norms

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The significance of research on students' environmental behavior has grown in response to serious environmental concerns. Nevertheless, there is still a gap in comprehension because sustainable environmental intentions frequently do not manifest as factual behavior.

This research aims to explore how sociocultural factors and personal norms affect students' pro-environmental behavior. Additionally, we seek to assess the role of university practices in bridging the gap between intention and actual green behavior. Our primary emphasis is to elucidate how these elements interact to predict pro-environmental behavior across university students, offering insight into effective strategies to prompt environmentally friendly actions and to contribute to cultivating environmentally conscious future generations.

We deployed a hypothesis-driven, deductive confirmatory approach, using a quantitative cross-sectional data-gathering technique, based on a random selection of a large sample. 641 responses were collected through an online questionnaire and its hard copy version and validated for analysis.

The analysis highlights the significant influence of behavioral intention on pro-environmental behavior. Although the moderation impact of ability, motivation, and opportunity differs, motivation and opportunity are distinguished as key variables that determine the translation of intention into positive and actual environmental conduct.

The substantially significant conceptual model's explanatory and predictive power provide useful practical insights for researchers and professionals in anticipating and stimulating pro-environmental behavior.

By challenging established assumptions and emphasizing the significance of motivation and personal agency, the current research advances our understanding of university students' pro-environmental behavior. Optimum results could be achieved by integrating personal norms into learning activities, awareness campaigns, and the development of supportive policies.

Prospective research might emphasize various demographic categories for a more thorough understanding of the sociocultural effects on pro-environmental behavior. Employing objective measurements may further enhance the accuracy of findings, and longitudinal research has great potential in tracking the evolving dynamics between behavioral intention and pro-environmental behavior, enabling the implementation of highly effective interventions.

Keywords: Environmental sustainability; Pro-environmental behavior; University practices; Perceived behavioral control; Personal norms; Subjective norms; Environmental attitude interchangeably used with Attitude toward pro-environmental behavior; Future leaders; Business opportunities.

DEDICATION

I dedicate this research to my parents, my wife, and my Childrens, for the continuous

support they have been providing .

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CHAPTER 1: INTRODUCTION

Preserving our planet's resources to protect the future of coming generations is an urgent need, sustainability is an increasingly important concept associated with the fulfillment of this need. Environmental sustainability is a crucial component of sustainability, concerned with preserving the natural system to sustain life on earth. It has far-reaching repercussions on the social and economic aspects of our life. Environmental degradation would result in financial setbacks, while environmentally friendly practices are promising economic prosperity and new business opportunities. Moreover, an ecologically healthy sound environment is vital for humanity's well-being and social sustainability. This research study examines the essence of individual pro-environmental behavior, and its significance among students in higher education, with the aim to promote environmentally as well as economically and socially sustainable future.

Studying students' environmental behavior requires a more comprehensive approach considering the sociocultural characteristics, altruistic and normative attributes, and university practices effect on the behavior. Lack of such all-encompassing approach within the academic writings led to an underestimation and overlooked assessment of the intention-behavior gap in higher education students' pro-environmental behavior. It draws the attention to explore the role of university practices in enhancing students' capabilities and motivation in conjunction with providing the opportunities to engage them in pro-environmental practices (Swaim et al., 2014).

Since macro-social behavior and common social practices frequently stems from micro-behavior and smaller scale individual actions, the study will investigate the interplay between sociocultural factors, altruistic factors, and university practices to guide and improve student environmental conduct.

The study introduction will address in depth the background and concepts, research problems, research purpose, research objectives, research questions, motivation behind the study, and significance of the study.

1.1 Background information

Higher education students' pro-environmental behavior as a topic alludes to the study of college and university students' beliefs, attitudes, and engagements with regards to the environment. It is a flourishing field of research, expanding swiftly consequently to the adverse effects of our environmental choices and actions on the environment, and the pressing need for international collaboration to overcome the real ecological challenges.

The exploration of pro-environmental behavior especially among university students has relatively recent history, with the initial studies conducted in this field in 1990s. However, as concerns about climate change and other serious environmental threats are becoming increasingly critical, researchers' interest in this area of study is noticeably growing.

Variables such as attitudes toward environmental behavior, knowledge about environmental concerns, social norms, and personal values pertaining to environmental conduct of university students have been thoroughly tested. Certain studies have additionally delved into the effectiveness and influence of various pro-environmental behavior, as an instance environmental education program and campus environmental sustainability projects, in empowering students' pro-environmental behavior (Hansmann et al., 2020).

Theory of Planned Behavior (TPB) and Norm Activation Model (NAM) have been heavily employed to properly understand and clarify the pro-environmental behavior. The Ability, Motivation, and opportunity (AMO) theory was humbly activated in the context of educational environment especially university campuses to

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improve the organizational citizenship and mainly the environmental performance. The TPB claims that behaviors are affected by subjective norms, attitudes, and perceived control through behavioral intention (de Leeuw et al., 2015). Based on NAM, personal beliefs and norms have an enormous impact on environmental behavior given that high level of awareness of environmental implications advocates the sense of personal responsibility (Schwartz, 1977). The AOM theory argues the significance of human motivation, enhancing ability, and providing opportunities for regulating behaviors as well as achieving the targeted outcome (Anwar et al., 2020a; Appelbaum et al., 2000).

The current environmental setting is marked by complex problems including climate change, biodiversity loss, and resources depletion. Thus, advancing pro-environmental behavior among future leaders and decision makers is more imperative than ever.

1.2 Research problem

Environmental learning has been proved to have substantial positive outcomes on students' environmental attitudes, used interchangeably with attitude toward pro environmental behavior in the literature, and behavior. Additionally, the dominant personal beliefs, peers' effect, and socioeconomic factors such as income and social network, are essential factors in the development of pupils' pro-environmental behavior. Furthermore, the obstacles to behavioral change should be acknowledged, as it requires sustaining efforts and supportive practices targeting education, societal norms, and a rewarding system. However, the scope of research focusing on environmental behavior has been criticized for not being sufficiently thorough and comprehensive to adequately consider every influential factor.

The growing interest in the topic of environmental sustainability and pro-environmental conduct within university is inadequate in terms of exploring the intention-behavior gap within the environmental context. Which implies the necessity

for further study on how to make university role more efficient in bridging the intention – behavior gap and move students to the positive environmental actions phase.

Assessing the general facet of environmental behavior as a phenomenon was granted less attention compared to some specific behavior such as recycling. Though, a holistic approach in exploring environmental conduct is fundamental to shed light on various convictions, attitudes, and driving forces that are major determinants of distinguished behaviors related to the current environmental challenges.

A more comprehensive approach enables researchers to further comprehend factors supporting durable positive behavioral changes. Consequently, provide decision makers with an insight into successful alternatives and interventions to align policies with significant sociocultural variables, students' individual altruistic aspect, and university practices.

1.3 Purpose of the research

The study is grounded on the assumption that individual practices and micro behaviors often give rise to popular macro behaviors in societies. Hence, individuals through their daily actions, interactions, and conducts contribute to the development of collective norms and cultural values.

Given the scarcity of research related to general environmental behavior of higher education students, the focus of this study is to examine the connection between students' environmental behavior and the interplay of sociocultural factors, normative altruistic variables, and university practices. Clarifying this connection enable the development of appropriate techniques and strategies to enhance students' pro-environmental behavior.

The followings are the research study objectives:

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1-Investigate the relationship between sociocultural factors and students' pro-environmental behavior and determine their predictive and positive impact on students' adoption of such conduct.

2-Explore the role of personal norms in predicting students' pro-environmental behavior and identify to what extent can influence the adoption of such behavior.

3-Examine how university practices can promote pro-environmental behavior among students and identify the practices that might bridge the intention-behavior gap.

4-Analyse the interaction between sociocultural factors, personal norms, and university practices, to successfully guide students' environmental behavior.

The study will address the following research questions revolving around environmental behavior:

1-How sociocultural factors influence students' pro-environmental behavior?

2-What is the impact of personal norms on students' pro-environmental behavior?

3-To what extent do university measures stimulate the pro-environmental conduct within learners through addressing the intention-behavior gap?

4-How do personal norms, sociocultural factors, and university practices interact to predict and shape the pro-environmental behavior with regards to university students?

1.4 Scope of the study

The scope of the study is to determine the predictive power and influence of the socio-cultural dimension along with the altruistic aspect of the environmental behavior and campus practices as well as procedures.

The sample population consists of diversified range of higher education students, representing the whole population involved in the research study. It includes students with different socioeconomic and demographic backgrounds, academic disciplines, and levels of environmental awareness.

1.5 The motivation behind the study

The study motivation is to get an in-depth understanding of how today's students' pro-environmental behavior could have a positive durable impact on the environment. It also aims to assist in elaborating policies able to lessen the consequences of imminent ecological threats and successfully overcome major environmental challenges, starting by developing environmentally responsible behavior amid campus students.

The research study is driven by the need to comprehend the young adults' perceptions of the environmental issues and their possible response to it, taking into consideration the potential discrepancies across social groups in terms of environmental awareness and actions. Therefore, inform the efforts invested to strengthen environmentally oriented thinking amid future policies and decision makers.

UNESCO's efforts in promoting environmental education and sustainability, is a compelling incentive behind studying students' eco-friendly conduct. UNESCO established programs such as the university Network for Climate Action and Sustainability (UNCAS) to emphasize the universities' participation significance in the environmental sustainability global endeavor. Examining students' green behavior is worthwhile to measure the effectiveness of the current environmental education programs, assess their effects on students' attitudes and behaviors, then pinpoint the areas of improvements within the programs and university practices in general.

1.6 Significance of the study

The research study is an addition to the scarce body of research on pro-environmental behavior among college students, it is a contribution to advance our understanding of the topic.

Firstly, it facilitates the recognition of factors that drive environmentally responsible behavior, to design the relevant interventions able to successfully promote ecologically responsible behavior. Additionally, it recommends to higher education

institutions leaders the importance of implementing programs and initiatives that stimulate and strength students' pro-environmental conduct. Consequently, this will result in a more environmentally conscious campuses and students with high sense of ecological responsibility that carry over into their post-graduate journey and professional careers, as future leaders and policies makers well equipped to address complex environmental challenges toward healthier and sustainable planet.

1.7 Structure of the study

In light of extensive explanations and well-informed assumptions, the study presents a comprehensive research model comprising eight hypotheses.

The research's practical implications and findings are discussed in the following chapters, organized as follows: The literature review in Chapter 2 explores and analyzes the key elements of the conceptual model and hypotheses. Subsequently, the research methodology adopted to conduct the study in Chapter 3. Data analysis and outcomes are covered in Chapter 4. Discussion of the study's results in Chapter 5. Chapter 6 addresses the limitations, and future research recommendations. Chapter 7 covers theoretical and practical implications . Finally, Chapter 8 is the conclusion.

CHAPTER 2 : LITERATURE REVIEW

2.1 Sustainable development and environmental issues

The twenty-first century has been marked by global sustainability challenges. Sustainable development is defined by the Word Commission on Environment and Development (WCED) as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Rayner & Morgan, 2017).

Sustainability as a goal is challenging and inspiring since it pertains directly to the quality of life for both present and future generations. Therefore, sustainability nowadays is a pivotal concept in a variety of disciplines. It is widely discussed in various political, social, academic, economic, and environmental debates, with special focus on the economic, social, and environmental dimensions, as the three pillars of sustainable development (Shittu, 2020).

Researchers and decision makers argue that having deep insight into the contextual factors accompanying the emergence of sustainable development concept and its evolution is necessary to better understand the root needs for sustainability and measure global community commitment to sustainability plans. Consequently, elaborate futuristic strategic vision that aligns needs fulfillment with the required capabilities to achieve the sustainable development objectives (Dyllick & Hockerts, 2002).

Long term, durable, sound, or systematic are traditional synonyms of the word "sustainability", a nearly restricted expression to the environmental setting, that emerged in the 1970s by ecologists within the framework of forest development efforts facing the disastrous consequences of the forest industry. The concept evolved into consensus under the umbrella of the United Nations. Sustainability definition by the WCED in the report published in 1987 Titled "Our Common Future" included the social

(equity, social justice with respect to morals and values), environmental (natural resources), and economic aspects of sustainability, with an emphasis on the environmental as being equally important as economic and social sustainability. Therefore, growth and development must not occur at the expense of natural resources (Filho, 2000).

Attaining sustainability long-run objectives and strategic goals is achievable through an overarching approach that respects the independence between the three pillars of sustainable development. Environmental sustainability is fundamental as it promotes a healthy environment for economic growth and prosperity. Economic sustainability generates the necessary economic opportunities to facilitate the social involvement of disadvantaged groups and leverage their capabilities to achieve social sustainability.

Environmental sustainability is a critical equilibrium between the individual and collective interests. Thus, high standards of ethics and social justice are required in situations of conflict, so self-interest can be ignored for the advantage of the collective interest.

The overlapping relationship between the three sustainability pillars imposes a specific approach that center attention on each component aside without omitting the connection between them. The focus strategy on every element will assist in identifying the necessary action that must be implemented within the policies and respected during the decision-making process, to bring sustainability requirement to the factual status as common practices (Goodland, 1995).

2.1.1 Social sustainability

The principal objective of social sustainability is improving communities' life conditions. Integrity, equity, and solidarity are essential attributes a community must process for its well-being.

Equity within societies can be measured through both the qualitative and quantitative aspects of each member access to housing, adequate healthcare, effective educational system, transportation, and recreational activities as basic rights. The value of equity as a concept and practice should be mirrored into the next generations' culture and choices. Therefore, equity principles must be implemented within the framework of futuristic vision, so our current behavior never has adverse effects on our descendants.

Respect of diversity in all its manifestations promotes tolerance, acceptance, and integration values. Additionally, it creates a solid consensus on social norms that ensure long-term harmonious interaction and community consolidation. (McKenzie, 2004).

Active participation in national choices and decision-making processes, associated with the development of extensive social networks fuels the feeling of citizenship and belongingness, then the awareness of the social responsibilities. Both formal and informal framework must embrace to build up the preferable life standards. Communities that prioritize social sustainability are more likely to sustain its well-being, as they are equipped with good understanding of how collective decisions might have an optimum impact on natural resources, they are able also to effectively adapt to economic disruptive (Diamond, 2005, pp. 439-440).

2.1.2 Economic sustainability

Economic development and concerns over the environment are profoundly interrelated. Economic growth frequently results in greater exploitation of energy,

materials, and natural resources, which has serious adverse environmental consequences involving pollution, deforestation, and climate change.

Conversely, environmental challenges such as air and water pollution along with the depletion of natural assets, may all result in detrimental effects on the world's economy. These concerns may induce a surge in healthcare spending, negatively impact productivity, and limit the accessibility of necessary resources for the economy to flourish.

Establishing an optimum balance between economic progress and ecological well-being is a complex goal to achieve. This tradeoff gave rise to the concept of "smart growth", which argues that economic growth is crucial aspect of the economic development, stressing the significance of maintaining an equilibrium between financial success and quality of life, aligned with the social and environmental sustainability considerations (Portney, 2013).

Realizing long term economic growth and adapting the productivity level to rising needs and consumption require wise allocation of natural resources through an active search for substitutes as the current resource approaches irreversibility. The emergence of green technology measures, the shift to renewable energy, the advancement of sustainable agriculture, and the rigorous execution of sustainable development policies, are indicators of a satisfactory level of environmental awareness, promising more efficient and effective utilization of natural resources. Helps to balance and further the co-evolutionary relationship between the economy and the environment, in order to sustain the desired economic prosperity despite resources scarcity and the alarming levels of pollution. Therefore, there is an urgent need for coexistence and fruitful interaction among political commitment, legal framework, cultural progress, and technological innovation (Klaassen & Opschoor, 1991).

The stimulation of green economy concept and its implementation as real practices to ensure environmental sustainability rely heavily on green technology advancement, that is essential to reduce the environmental footprint of industrial activities by minimizing waste generation, diminishing greenhouse gas emission, and preserving scarce resources. In consequence, a substantial evolvement in new green industries and fields of investment, such as green construction, sustainable agriculture, electric cars, recycling, and energy efficient appliances emerged to create green jobs opportunities then advance sustainable consumption behavior.

Overall, green innovative technology helps to create a more sustainable and equitable economy that meets the needs of the present without compromising the ability of future generations to meet their own needs (Bina, 2013; Xuan et al., 2023).

2.1.3 Environmental sustainability concept, importance, and measures

Environmental sustainability and social welfare are strongly connected since ecological sustainability aims to align the enhancement of human well-being with the protection of the natural environment. People dependent on earth's resources, and environmental degradation has negative impacts on people's well-being and life's quality. Therefore, promoting ecological protection and pro-environmental behavior warrants social welfare and a better common future.

Balancing the velocity of regeneration to the intensity of harvest is of paramount importance to ensure long lasting natural reservoir. It is achievable through vigilant management practices such as continuous monitoring of natural assets, determining sustainable harvesting limits, and mandate regulations to make certain that harvesting rate is beneath the regeneration rate. Large scale environmentally friendly endeavors in agriculture, forestry, fisheries, energy generation, and transportation, are worthwhile to induce a significant decrease in waste, pollution, and protect biodiversity. Individuals'

contribution through green daily practices and environmental stewardship, encouraging the use of public transportation and supporting sustainable products for example are vital as well to maintain healthy ecosystem (Goodland, 1995).

Following its emergence, sustainability concept was perceived as abstract to the point of being considered not quantifiable and difficult to assess. However, facing the pressing need to elaborate practical solutions due to the increased environmental threats, sustainability began to be more accurately defined. Hence, the development of quantitative analysis tools, assessment procedures, and performance indicators must be carried out to deliver useful data in monitoring the evolvement and inform the decision-making process with regards to sustainability plans and strategies (Moldan et al., 2012).

The quantitative assessment of environmental sustainability utilizes statistical methods to examine the economic, social, and ecological repercussions of people's behavior on the environment. It comprises the development of accurate indicators enabling the collection of necessary data, to capture and deduce important information about related fields such as greenhouse gas emissions, the species concerned with extinction, biodiversity, CO2 emission, the share of land area covered by forest, and water quality. The use of indicators is also fundamental to contrast the current performance measures against the targeted level of achievements pertaining to pro-environmental behavior and environmental sustainability.

The compelling demand for practical and easily quantifiable solutions, facing the growing complexity of environmental threats, requires the implementation of statistical methods and environmental indicators to appraise the effectiveness of existing policies, pinpoint the area of defectiveness, and optimize toward more

successful environmental management strategies (Moldan et al., 2012; Spangenberg, 2002).

2.2 Environmental sustainability and social dilemmas

Phenomena caused by human behaviors are resistant to changes since they must be resolved through human behavior. A thorough understanding of the social psychology related to specific conducts is essential to conceptualize key solutions enabling successful behavioral change. Environmental issues are basically induced by either individual or collective human behaviors resulting in real threats to natural resources. Therefore, the shift from harmful environmental behavior to pro-environmental behavior is one of the highest priorities in nowadays national and international agendas (Onwezen et al., 2013).

Since environmental challenges derive from population behavior, it is necessary to address them from the sociocultural and moral-altruistic aspects. Utilizing such technique psychologists were able to pinpoint core reasons for environmental issues, commonly referred to as "The Social Dilemma" and formerly renowned as "The Tragedy of The Commons Theory" by Hardin (1968) . The theory argues that when a resource is held in common, individuals have an incentive to exploit it for their benefit, because they often face a conflict between their individual interest and the collective interest, which can lead to its depletion and suboptimal outcomes for everyone involved. The concept was designed to find solutions to societal or population problems, through an extensive investigation of moralities, where technical solutions are either useless or lead to poor outcomes (Hardin, 1968; Staats, 2004).

2.3 Sociocultural factors, individual-level factors, and personal values to shape the pro-environmental behavior

The Tragedy of The Commons is based on the ability of individuals within a community to access shared or public resources known as "Common". Thus,

individuals driven by individual interest and ignoring community benefits will adversely impact society. The conflict cannot be resolved through appealing to morality but require an understanding of how individual conduct could impact collective outcomes in circumstances where people share common resources or participate in a collective decision-making process. A holistic approach integrating socio-cultural factors, values and normative concerns, besides education is of choice to solve the social dilemma with regards to environmental behavior, along with the required forms of regulations and control (Gärling et al., 2003).

Use of public transport, recycling, and energy conservation are instances of pro-environmental behavior, to be successfully promoted through the enhancement of social norms that prioritize environmental responsibility and cooperation. Establishing educational programs dedicated to foster students' environmental behavior is fundamental, as it provide them with the necessary skills and knowledges to successfully address and overcome environmental challenges, then identify themselves beyond the boundary of self-interest through the responsible use of commons (Hardin, 1968; Steg et al., 2005).

2.3.1 Sociocultural and individual-level factors

Sociocultural factors direct to greater cultural, social, and environmental setting in which people live. Values, social relationships, cultural norms, portrayals in the media, access to resources, economic or political systems, and geographical or historical context are examples of elements that have profound effect on human behavior and attitudes. Understanding these factors is fundamental for the development of successful strategies driving positive behavior changes.

Individual-levels variables are the traits and past experiences of an individual that determine and shape their behavior. Motivation, abilities, personal norms,

experience, knowledge, cognitive processes, and environmental awareness are variables with great potential to influence a person's behavior. However, individual-level factors vary significantly among individuals and might influence their behavior in atypical manners.

Sociocultural and individual-level factors can influence the pro-environmental behavior in a variety of ways comprising knowledge enhancing, values, social norms, modeling personal attitudes, and improving self-efficacy.

An in-depth understanding of the interaction between these elements might require employing a distinct theoretical approach, such as the theory of planned behavior (TPB), which posits that behavior is influenced by three major variables: attitudes toward the behavior, perceived behavioral control, and subjective norms.

Both societal and individual-level effects are pivotal in shaping the constructs of the TPB and ultimately influence the pro-environmental behavior. Researchers, decision makers, and practitioners need to comprehend the interplay between these components to design and execute the appropriate interventions in order to foster constructive green behavior (Ajzen, 1991).

2.3.1.1 Perceived behavioral control

Ajzen defined perceived behavioral control (PBC) as "the perceived ease or difficulty of performing the behavior, which is assumed to reflect past experience as well as anticipated impediments and obstacles".

PBC represents an essential element of the TPB, it is a psychological concept relevant to an individual's perception of their ability to perform an activity. It encompasses a person's beliefs concerning the resources, opportunities, and skills they possess to undertake a behavior, in addition to the perceived ease and difficulty of performing the behavior. PBC reflects essentially an individual's perception of the

degree of control they have on certain conducts, consequently this perception could impact their decision whether they engage in those conducts (Ajzen, 1985).

PBC has been empirically verified to influence pro-environmental behavior within the framework of environmental sustainability, referring to measures people actions to minimize their ecological footprint, such as recycling, cutting energy consumption, and use of public transport. Several research confirmed that individuals who believe they are equipped with significant level of control over their capacity to accomplish pro-environmental actions are more likely to engage in those behaviors. People who consider recycling inconvenient or challenging are less motivated to recycle than those who thought it easy and convenient. Similarly, people are more likely to take steps to reduce energy consumption, if they believe they possess sufficient knowledge and skills to do so (Tonglet et al., 2004).

Since PBC might be influenced by numerous factors, including social norms, availability of resources, and individual attitudes, interventions aiming to promote PBC, for instance improving access to resources (e.g., recycling bins) and providing education on ecologically conscious conduct, are significant in encouraging pro-environmental behavior. Emphasizing the critical importance of environmental education, PBC is considered a major predictor of both intention and behavior of environmentally sustainable behavior among students. Specifically, students who sensed a greater degree of control over their ability to execute environmentally friendly behavior were inclined to engage in pro-environmental behavior without mediators.

The higher the perceived behavioral control, the more likely an individual is to take direct action toward a behavior. Overall, PBC is an important factor to consider when designing interventions aimed at fostering environmentally responsible behaviors (Swaim et al., 2014).

2.3.1.2 Attitude Toward Pro-Environmental Behavior

Ajzen (1985) stated that an environmental attitude is " an individual's positive or negative feelings, beliefs, and evaluations toward the environment, which influence their intentions and behavior towards environmental issues".

Within the context of environmental sustainability, an individual's overall belief, opinion, or feelings concerning the environment and natural resources are covered by the environmental attitude. This attitude can be favorable or unfavorable. A positive environmental attitude is concerned with the well-being of the natural realm and marked by the willingness to take actions to safeguard it, whereas a negative attitude is characterized by apathy and carelessness about the environment (Ajzen, 1985).

Researchers emphasized that individuals with favorable environmental attitudes are more prone to engage in behaviors like lowering energy consumption and recycling. Additionally, they are more inclined to support policies and legislation targeting environmental protection. Favorable environmental attitudes lead to greater ties to nature, higher esteem for the natural world, and internal encouragement to behave pro-environmentally. A favorable environmental attitude does not merely inspire pro-ecological activities, but they can also develop a more profound connection to nature and greater respect for the environment. This consequently improves one's personal well-being by strengthening mental wellness and lessening stress levels.

Given that environmental attitude is a substantial driver of change toward positive environmental behavior, there is a pressing need for additional research and investigations into the components that influence its development and evolution.

A complex interplay of personal experiences, cultural norms, and environmental education determines environmental attitudes. Several research demonstrated the role of environmental education in empowering individuals,

especially students, to make a constructive impact on the environment. Environmental education role in stimulating awareness and concerns for environmental issues is vital, it also increase the willingness to engage in pro-environmental behavior involving conserving resources and

reducing waste. Consequently, much more study concerning the integration of environmental education into various contexts, mainly educational institutions, must be conducted (Olsson et al., 2016; Stern et al., 2008).

2.3.1.3 Subjective norms

Ajzen (1985) defines subjective norms as " a person's perception of social pressure to perform or not perform a certain behavior".

According to Ajzen's TPB, subjective norms are one of the three key factors that influence an individual's intention to engage in a particular behavior, and it consists essentially of two components:

normative beliefs, refers to a person's perception of whether significant others such as family, friends, or colleagues, believe they should or should not perform the behavior in question, and the motivation to comply with those significant others' expectations in order to maintain an optimistic relationship with them. This perception can influence an individual's intention to perform a given behavior, even if they believe they are competent to perform the behavior or they have a positive attitude toward it (Ajzen, 1985; Park & Ha, 2014).

While promoting environmental sustainability, it is important to examine the social context in which individuals are positioned, not only individual attitudes and opinions. Stimulating constructive subjective norms by highlighting others' pro-environmental behavior is an effective behavior transformation strategy that aid in developing sustainable society.

Subjective norms are particularly important in the context of ecological behavior such as recycling, energy saving, and waste control as they often require a high level of social responsibility and environmental consciousness. As such , an individual's perception of social norms regarding recycling for instance, can strongly influence their recycling intention and conduct. Thus, subjective norms can help to activate these personal norms and increase an individual's motivation particularly for people with limited comprehension or personal motivation to engage in ecologically responsible activities.

Given the social pressure that individuals perceive in relation to behaving pro-environmentally, interventions and campaigns to promote environmental activism must address not only attitude and beliefs but also the social context and social influences that positively shape people's intentions and behaviors. As a result, policy makers and practitioners can develop more effective regulations and strategies aimed at promoting environmental sustainability principles (Fielding et al., 2008).

2.3.2 Personal values and altruistic aspects

2.3.2.1 Personal norms

The Norm Activation Model, first proposed by Schwartz in 1977, is an ideal theoretical framework for explaining altruistic behavior. According to the hypothesis, personal norms perform a pivotal role in prediction and motivating pro-environmental behavior. Through understanding how personal norms are stimulated and developed, interventions may be designed perfectly to enhance individuals to act in

environmentally responsible way, aligned with their values and beliefs to promote for higher sense of environmental responsibility.

Schwartz defines personal norms as "internalized standards that guide an individual's behavior, based on their values and beliefs about what is right and wrong.

"Personal norms reflect a person's sense of moral obligation to act in particular way, even when it may not be in their immediate self-interest" (Schwartz, 1977, pp. 222-224).

Personal norms have a significant impact on an individual's opinions and actions. When people perceive that their behavior is inconsistent with their personal norms, they will experience a sense of moral obligation to act in a way aligned with their values rather than the external pressures or rewards. Therefore, people with highly internalized environmental values are more prone to exhibit pro-ecological behaviors.

Prioritizing social responsibility and welfare of others rather than personal convenience and individualistic values, is a vital incentive to behave pro-environmentally. Thus, personal norms and altruistic values are significant predictors of pro-environmental behavior.

Anticipated pride and guilt serve as potent motivators for environmental conscious conduct. If individuals expect to feel good about themselves acting environmentally friendly, they will be more inclined to take part in pro-environmental behavior. Similarly, the anticipation of guilt helps deter individuals from engaging in behaviors that are harmful to the environment. Education and awareness raising campaigns, addressing the significance of personal values and the favorable repercussions of behaving pro-environmentally on the social and environmental surrounding, are highly effective instruments in promoting personal norms and

inspiring people to develop emotions of pride and guilt with regards to their environmental conducts (Onwezen et al., 2013).

Addressing the egoistic and altruistic motivational aspects of the social dilemma, along with the emphasis on the vital role of education, is of paramount importance to achieve the desired positive shift in individual's environmental behavior.

While perceived green behavioral control, subjective norms, and environmental attitudes provide insight to understand the egoistic aspect that impact the green behavior, these concepts could not sufficiently capture the significance of social and moral norms in furthering environmental sustainability. Better understanding of environmentally sustainable behavior requires a more comprehensive approach considering the valuable role of personal norms based on moral commitments and a feeling of social responsibility.

An all-inclusive research framework integrating these elements will be highly informative and supportive to policymakers' efforts in addressing social dilemmas, developing multiple sustainable choices and productive measures.

2.4 Environmental sustainability in higher education, importance, and challenges

Environmental sustainability and sustainable development are ultimately related to human well-being. Promoting sustainable growth ensures social equity and economic progress, so everyone has access to basics like food, water, energy. Environmentally sustainable practices on the other hand are imperative to safeguard the natural resources we rely on for our livelihood and the ongoing existence of our planet.

Natural resources and ecosystems upon which humans rely face real threats from climate change, pollution, biodiversity degradation, and other numerous environmental challenges. These issues can result in social discontent and economic

instability. The United Nations (UN) stresses that environmental sustainability and sustainable development are important foundations to achieve purposes such as promoting peace, human rights, and societal development. To that end, the UN developed various initiatives and programs. For example, the International Environmental Program, followed by Agenda 21, also the period from 2005 to 2014 was tagged as the Decade of Education for Sustainable Development (Leicht, 2018).

In 1992 during the UN Conference on Environment and Development held in Rio de Janeiro, Brazil, Agenda 21 was adopted as an extensive strategic plan and roadmap for sustainable development with regards to the environmental, social, and economic, pillars of sustainability. Agenda 21, places a strong emphasis on the significance of protecting Earth's natural resources, minimizing waste, and supporting environmentally friendly patterns of production and consumption. Furthermore, it acknowledges how important it is to integrate environmental concerns into all aspects of social as well as economic growth, thereby creating a harmonious and sustainable future for all.

One of Agenda 21's core themes are the importance of higher education in achieving sustainable development. Higher education's role is vital in providing the required knowledge and skills promoting sustainable practices and technologies, also preparing the next generations of environmentally responsible leaders. In order to accomplish these goals higher education institutions are expected to adopt the concepts and incorporate the principles of environmental sustainability into their policies, regulations, campus operations, research, and teaching processes.

The UN announced in 2005 the Decade of Education for Sustainable Development (DESD) as a global initiative aligned with the efforts to advocate education as critical tool for developing ecologically sustainable future and achieving

the goals of sustainable development. The DESD was launched to empower individuals through an academic process, enabling them to make well informed decisions and take responsible actions towards environmental integrity, social equity, and economic viability. Throughout the DESD governments were encouraged to implement environmental sustainability into all levels of education, from basic to higher education. Additionally improve the general public's awareness of sustainable development significance.

The DESD ended in 2014, but its legacy is ongoing. The UN continues its efforts to promote education for sustainable development through the global Action Program on Education for Sustainable Development, which was launched in 2015 to build on the achievement of the DESD and promote education as key driver of sustainable development.

The incorporation of environmental sustainability into higher education programs and principles will equip students with the appropriate skills and understanding to recognize the complexity of sustainability concerns and elaborate innovative solutions. Moreover, higher education institutions can serve as an inspiring model for sustainability leaders, among other institutions or corporations on national level as well as globally (Swaim et al., 2014; UNESCO, 2002) .

2.4.1 Importance

2.4.1.1 Promote students' knowledge and skills.

Education for sustainable development has a paramount contribution in achieving sustainability goals. Higher education has a great potential to promote environmental sustainability through offering courses and degree programs pertinent to sustainability, environmental science, and renewable energy technologies.

These programs educate students about the latest research and technologies in the field and qualify them to pursue careers in sustainability. The implementation of

environmental science programs including courses founded on the most recent research in addition to various important resources such as research databases, industry reports, and professional organizations, keep students actively updated about new technologies and theories in the field of sustainability.

Sustainability and environmental science programs provide students with the opportunity to learn from experts through collaborative projects, field trips, and guest lecturers. These interactions allow access to cutting-edge knowledge and insights from professionals working in the field. Furthermore, hands-on experience with renewable energy technologies and sustainable practices involving lab work, internship, and fieldwork leverage students' essential practical skills and prepare them to collaborate with industry partners to conduct research on the environmental impact of different industries and develop strategies to control it.

Because of its official and moral authority, and the possible integration of various environmentally sustainable practices, higher education institutions offer a suitable environment to establish and foster a culture of sustainability among students, faculties, and staff both on and off campus. Hence, empower students to become leaders in sustainability, capable of driving positive changes in their communities and beyond (Dijkstra & Goedhart, 2012; Hansmann et al., 2020).

2.4.1.2 Environmental sustainability awareness among new generations

Preparing students to make informed decisions and take responsible actions to protect the environment requires an active engagement in various learning activities to acquire the necessary information, skills, and attitudes. However, the process of making responsible and ethical judgement relies on specific areas of knowledge and practice that must be prioritized to adequately train future leaders, decision makers, and policymakers. One of these critical areas is the project-based learning system

demonstrated as an effective method to engage students in sustainability issues. Working on projects having applications in the real world enhances students' understanding of the potential challenges and the consequences of their actions. Additionally, the collaborative learning process based on teamwork and interactive environment enables students to exchange thoughts, develop critical thinking skills, and take advantages from the experiences of others (Erskine & Johnson, 2012).

Students involved in service learning about sustainable development and community service projects related to environmental sustainability develop a higher sense of responsibility and ownership for the environment. Learning by doing allows students to apply their knowledge and skills to the real word environmental problems and challenges. Consequently, it promotes their overall civic engagement and personal growth. Students who can interact with experts in sustainability related fields will enrich their learning experiences and gain insights into real-word challenges and solutions. Thus, they are theoretically and practically empowered to successfully achieve the academic targets as well as the societal needs of the service-learning experience, since they will develop a worthwhile background of various valuable solutions and innovative potential.

Knowledge of environmental systems, ecological principles, and approaches for mitigating repercussion of climate change are worth considering variables while cultivating generations of eco-leaders and climate action pioneers, able to tackle complex environmental challenges. Collaboration skills, problem solving capabilities, and critical thinking are equally important qualities students must develop during their academic journey and professional carriers. In addition to the analytical and predictive thinking necessary to evaluate possible impacts of the established policies and long-

term strategies, to ensure that our planet is protected and sustainable for later generations.

Learning programs promoting respect for the natural environment and guided by the principles of environmental justice and intergenerational equity are important for fostering the sense of stewardship even in business schools. As the modern measures of organizational performance are not limited to shareholders satisfaction and profit maximization, it also encompasses the environmental responsibility and compliance to the policies and regulations with regards to the overall sustainable development (Dyllick & Hockerts, 2002; Erskine & Johnson, 2012).

2.4.1.3 Inspiring other sectors and strengthening public awareness

Educating students on environmental sustainability in higher education may result in ripple effects on society. It not only equips students with necessary knowledge and skills to become environmentally responsible professionals and citizens, but it also prompts graduates to become leaders in promoting sustainable practice and technologies. Their success will extend beyond their respective fields to inspire other businesses and the overall community.

Serving as platform for research and innovation is highly important for the development of new green procedures and practices such as sustainable supply and sustainable urban planning in collaboration with various industries, businesses, and government to ease its implementation (Lozano et al., 2013).

Campuses and higher learning institutions must set a precedent for leading by example, through the adoption of environmentally friendly operations such as energy efficient technology, investment in renewable energy, activation of recycling programs, and incorporation of sustainable design practices into new construction or renovation projects. In order to communicate those eco-friendly efforts to the wider community

then enlarge the boundary of its possible favorable impact to involve the society, higher education institutions are required to actively collaborate with community organizations, hosting large scale events, and serve as positive model of change toward reducing the environmental impact (Findler et al., 2019).

2.4.2 Challenges

Environmental sustainability is a multidimensional topic that is mutually affected by the economic and social aspects of sustainable development. The topic involves social, cultural, moral, and ethical dimensions that need to be considered. Therefore, the implementation of environmental sustainability in curricula requires in-depth research on the impact of the prevailing socio-cultural surroundings on students' environmental beliefs and attitudes. Such research must include the formulation of valid and reliable scales to accurately measure students' interest in environmental sustainability. Consequently, identify the most successful teaching strategies and pedagogies, to convey the core essence of environmental stewardship academic materials to students, taking into consideration the disparities in mindset and topic valuation between societies as well as within the same community, which might impede the development of universally standardized green sustainability programs (Erskine & Johnson, 2012).

Despite the high level of environmental awareness expected among faculties and their tireless efforts to invest in research, lectures, and other academic pursuits to spread pro-environmental behavior beyond academic-level partners toward regional and global stakeholders, they are still under pressure from external socio-cultural malpractices and forces that exacerbate the environmental problems. These environmental violations and the overall unfavorable environmental condition are very

likely to have detrimental effects on students' attitudes and environmental culture; it also hinders the potential outcomes of faculties endeavor (Dyer & Dyer, 2017).

Highly specialized faculties in certain academic fields may encounter hindrances pertinent to the interdisciplinary nature of sustainability topics, which span multiple areas. They often view environmental sustainability as a soft skill and a diversion from the core content of their discipline. Moreover, they may lack knowledge or skills to teach and conduct research on sustainability related subjects, which might make it challenging for them to implement sustainability concepts into the existing research plans and programs.

The concept of sustainability is relatively new to some fields in higher education, particularly in business schools, where the emphasis has long been on maximizing shareholders' satisfaction, increasing the return on equity, and wealth growth. Given the newness and significance of sustainability, it is necessary to revise the current programs then update it and provide adequate training to educators in order to establish a balanced approach that supports both business financial interest and environmental sustainability within the framework of ethical and legal considerations. This is fundamental to develop future generations knowledgeable and well skilled to make socially responsible sound decision based on moral judgement and reduce businesses adverse footprint on the environment as well as the natural resources (Swaim et al., 2014).

While universities have a significant role to play in advancing sustainability, they are still falling behind companies in helping societies become more environmentally friendly. This is because universities have been slow to adopt sustainable practices and integrate sustainability into their curricula. One of the main reasons for this lag is that universities frequently prioritize research and academic

pursuit rather than focusing on the practical real-world implementations of green sustainable practices. Companies on the other hand are driven by profit and have more direct incentives to adopt sustainable practices that result in long-term cost savings.

Typically working in silos inside universities, lead various departments to pursue their own learning research objectives without necessarily considering the broader impacts of their efforts on sustainability. The insufficient collaboration between different departments can result in deficient approach to tackle the sustainability topic.

Developing innovative and effective strategies for the successful integration of sustainable procedures on campuses, through an active collaboration and engagement with the local community in addition to the international endeavors to promote sustainability initiatives, is a significant leap to advocate policies changes and broaden the boundaries of eco-friendly practices (Lozano et al., 2013).

2.5 University practices to vitalize pro-environmental behavior

Higher education institutions have a major role in cultivating influential academics, planners, executives, and leaders capable of successfully creating the desired positive shift in behavior a performance aligned with long-term environmental sustainability strategies. These institutions also provide communities with the necessary core capabilities to tackle future challenges like global warming. However, the prioritization of disciplines that promote hyperspecialized technological programs without taking the effects of technological advancements on the environment into account is criticized for their inefficient ecological consequences. This in turn could explain the modest engagement of the campus community in the environmental sustainability efforts. Institutional leaders need to take more proactive measures with

regards to promoting pro-environmental behavior by setting goals, providing resources, and opportunities to support sustainability initiatives (Dyer & Dyer, 2017).

To recognize how university operations affect sustainability, researchers have analyzed campuses as organizations, they have seen an alarming rise in the use of material consumption and infrastructure development. This has resulted in a corresponding rise in energy consumption due to the growing use of information technology systems and the demand for more specialized equipment.

According to experts, the operations of universities have a substantial influence on sustainability, appealing for greater engagement in the practical implementation of environmental sustainability principles among internal stakeholders particularly students. Green human resources management such as green training, employee's involvement, and green incentives are effective techniques to establish supportive green organizational culture and leverage the environmental stewardship (Anwar et al., 2020a).

The integration of advanced technological disciplines and the evolution of higher education institutions are expected and needed. Although, it is imperative to mitigate their environmental adverse effects. Campus environmental responsibility should be reflected in regulations, policies, and academic practices to unify the effort about achieving green operations. Since students are the university's greatest human capital, they should be well trained and equipped with the knowledge to facilitate their role as agents of change within the community (Dagiliūtė et al., 2018).

2.5.1 Strengthen students' pro-environmental Abilities

A review of literature on performance and behavior suggests the interplay of ability, motivation, and opportunity work together to influence behavior, ultimately

improving performance and output (Appelbaum et al., 2000; Blumberg & Pringle, 1982a; Tuuli & Van Rhee, 2021).

Developing several key abilities and capabilities is important for students who aim to change their environmental behaviors. These abilities include self-awareness, goal setting, planning, self-efficacy, feedback, and monitoring.

Students need to be aware of their environmental behavior and how it impacts the environment. By understanding their behavior, they can identify areas for improvement, set specific goals, and develop plans of actions to achieve the objectives. Goal setting is essential for tracking progress and making the necessary adjustments. Similarly, self-efficacy is equally important for students to believe in their abilities to make positive changes. Motivation as well is crucial for sustaining favorable behaviors. Therefore, they should identify their personal reasons and internal motivations for wanting to change their environmental behaviors, then sustain the changes despite the challenges and setbacks.

It is important to use behavioral science principles while developing interventions for changing environmental behavior. These interventions must consider the physical abilities involving the identification of possible barriers for instance the lack of access to recycling facilities or physical limitations that could prevent individuals from participating in recycling initiatives. Strategies to improve physical capabilities might include education about recycling, aiding with recycling tasks, and modifying recycling programs to be more accessible to people with physical limitations. Considering physical abilities, ensure that individuals have the physical

resources and capacities to engage in constructive environmental behavior and the potential success of the designed interventions (Gainforth et al., 2016).

Several qualitative and quantitative studies have been conducted in response to claims that an individual's environmental behavior is a natural reaction to personal experiences within their natural and social environment. This research has been conducted to address various environmental issues, among groups of students with different educational levels and social backgrounds as part of science courses. The comparison of students' ecological attitudes and behaviors in both pre-course and post-course phases reveals a significant improvement in environmental knowledge, abilities, and environmental awareness of participants. Therefore, societal, cultural, and individual variables do play a role in shaping favorable environmental behavior, but they are insufficient in their own to raise subsequent generations' levels of environmental responsibility (Bradley et al., 1999).

Putting an end to environmental threats and mitigating the effects of environmental malpractices is a lengthy process that involves multiple local and international stakeholders. Being an active participant in this global challenge and accomplishing objectives aligned with the international agendas calls for resources and resilience to swiftly adopt new educational methodologies.

Innovation and flexibility are vital qualities to possess for academic leaders, educators, planners, and students. These traits serve the transition to a cohesive and interdisciplinary educational system. Hence, students from various fields will gain relevant knowledge about environmental sustainability and sustainable development principles. Moreover, they will enhance their abilities and skills to make informed decisions regarding critical environmental concerns beyond their fields (Lozano, 2006).

2.5.2 Motivating students to behave pro-environmentally

Motivation as defined by Michie et al. (2011) is " all those processes that energize and direct behavior, not just goals and conscious decision making. It includes habitual processes, emotional responding, as well as analytical decision-making".

Motivating students to participate in pro-environmental behavior, for instance recycling, is essential for the prosperity of sustainability concept. Multiple extrinsic incentives and motivational strategies may be employed to achieve this goal. One effective approach is to make performing pro-environmental behaviors convenient; it can be accomplished for instance by supplying reusable cups and water bottles in schools, offering rewards for using them and designating areas for refilling them. Ensuring that recycling bins are easily accessible, visible, and clearly labeled may significantly increase recycling rates. Students are more inclined to recycle if it is simple to do so. Another strategy is to stress the networking effect and the role models of behaving pro-environmentally. This includes demonstrating how these practices are common in certain societies and identifying role models who exhibit these characteristics. Students are more likely to adopt these behaviors if they witness them being recognized, and widely admired.

Providing incentives and rewards to students who participate in pro-environmental initiatives is a further effective approach, it might entail additional credit, prizes, or acknowledgement because students are more willing to contribute whenever they realize a benefit from doing so.

Extrinsic motivation is important in facilitating rapid behavioral changes. However, these changes need to be sustained. Advocating intrinsic motivation is an effective technique to ensure long-term eco-friendly conduct and turn it into habit.

Regular positive feedback and constructive commentaries on progress toward determined environmental goals in addition to how beneficial and fruitful students'

environmental practices are, is vital intrinsic motivator, that ca inspire them to sustain their pro-environmental behaviors.

Encouraging students to work collaboratively in order to reduce their environmental impact is a positive environmental culture, to nurture through prompts and reminders such as posters or announcements. When students are frequently reminded of the desired behavior, they are more likely to participate in it. A balanced strategy that encompasses both extrinsic and intrinsic motivating techniques is necessary to ensure students' long-term engagement in green habits (Gainforth et al., 2016).

The university policies, strategic planning, mission, vision, and objectives mirror its values and culture. It is essential to formally commit to sustainable development practices through principles and internal rules as it helps to actively engage internal partners in the effort toward creating eco-friendly community that extend beyond the campus to societal level (Lee et al., 2013).

Starting at university, students' motivation for positive ecological behavior stems from their interest in the environment and awareness of their essential role. The incorporation of environmental sustainability values into educational institution policies is a significant starting point. However, it is not always sufficient to achieve the desired outcome due to the conservative nature of universities and their resistance to change. Therefore, a comprehensive review of university policies, structures, and strategies is necessary for the transition from environmental sustainability plans to actual sustainable practices (Velazquez et al., 2005).

Formally recognizing higher education institutions as green institutions and implementing an environmentally sustainable strategy will strengthen existing partnership while building new ones with local as well as international environmental

activists, community groups, and public or private organizations. Additionally, it grows university resources to support various practices and activities and motivate students to actively contribute to the establishment of favorable environmental culture (Dagiliūtė & Liobikienė, 2015).

2.5.3 Provide opportunity

Opportunity is defined as " all factors that lie outside the individual that make the behaviors possible or prompt it" (Michie et al., 2011).

Students are more likely to develop healthy environmental habits when given the opportunity to practice pro-environmental behaviors. Regularly participation in ecological sound actions lead to these behaviors becoming habitual and increase the likelihood of continued engagement in the future.

Promoting a sustainable campus environment is beneficial in assisting students incorporating sustainable practices into their daily lives. Additionally inspiring students to participate in community based environmental projects can foster a deeper sense of responsibility and care for the natural world. When students participate in decisions and choices that impact the environment, they feel a sense of ownership and accountability for their actions. This sense of involvement can be achieved through student-led environmental projects or by engaging students in university or community environmental committees (Bertossi & Marangon, 2022).

Higher education institutions provide an ideal learning environment for students interested in environmental issues to acquire research skills, such as conducting surveys, interviews, and exploring how behavioral science can help address environmental challenges then promote pro-environmental behaviors. Universities offer valuable opportunities for interdisciplinary collaboration between fields like psychology and environmental sciences, which is crucial for tackling complex

environmental problems. Multidisciplinary cooperation with people from diverse backgrounds can be incredibly beneficial for students, particularly when it comes to promoting green behavior and designing practical solutions such as developing recycling programs, creating educational materials, and devising sustainable transportation solutions. The interdisciplinary teamwork allows students to Gain skills and experience That can be applied in a range of settings, from academic industry, private, and non-profitable organizations making them valuable for a variety of career paths (Gainforth et al., 2016).

One efficient method to encourage green habits is to hold energy-saving competitions among students from different residences over a specific period, with the winning residence receiving a prize. Moreover, universities can organize recycling campaigns to educate students on the importance of recycling and provide them with the appropriate resources, such as strategically placed recycling bins throughout campus to encourage proper waste management. Additionally, awareness campaigns can be organized to educate students on various environmental threats such as climate. This can be done through talks, workshops, and seminars (Mtutu & Thondhlana, 2016).

Campuses can deploy green campus programs such as solar panels and energy sufficient lighting systems, to encourage students in taking part in such projects and gather feedback, universities can engage with the local community by organizing outreach programs. establishing sustainability-focused student groups, for instance green clubs and environmental societies, provide students with opportunities to collaborate on ecological projects and engage in sustainability activities both on campus and in the wider community. Activities such as tree planting recycling drives, and community clean-up can be organized to involve students in sustainable practices. Campuses may further stimulate scholars to use environmentally friendly modes of

transportation such as cycling, or public transit, as well as by installing bike racks and supporting carpooling programs.

Creating green areas on campuses promotes biodiversity and offers opportunity to interact with nature. This can be achieved by tree planting or creating gardens, which provide habitats for wildlife and beautify the campus. Universities can also encourage energy conservation by promoting behaviors such as turning off lights and gadgets when not in use, using energy efficient appliances, and reducing water usage. These actions not only reduce energy consumption and lower costs but also contribute to a healthier and more eco-friendly campus environment (Mtutu & Thondhlana, 2016; Vicente-Molina et al., 2013).

2.6 University practices to bridge students' intention-behavior gap

A multitude of factors influence student behaviors, including sociocultural and individual factors, as well as personal values that encompass both egoistic and altruistic aspects of environmentally friendly behavior. Even if these elements are present, they may only result in positive intentions toward pro-environmental behavior, rather than real behavior changes. Gollwitzer (1993) defines the gap between an individual's intention and actual action as "the phenomenon, where individuals form intentions to perform a behavior but fail to carry it out".

The intention-behavior gap is a common issue in accomplishing objectives and changes in behaviors, it is mostly attributed to the lack of desire, insufficient resources, opportunities, and abilities, or unexpected hurdles. Understanding the intention-behavior gap is essential to successfully make the desired changes, because it

emphasizes the importance of not only setting intentions but taking specific practical actions to actualize those intentions (Gollwitzer, 1993).

Both individuals and groups should prioritize abilities, motivation, and opportunities as three key factors for narrowing the gap between good intentions and sustainable actions.

The Ability, Motivation, and Opportunity theory (AMO) also the Capability, Opportunity, Motivation, Behavior model (COM-B) are the major frameworks for understanding behavior change and performance in the literature. In the COM-B model capacity is analogous to ability in the AMO theory in that it refers to an individual physical and psychological abilities, skills, knowledge, and cognitive capabilities to execute one's behavior (Gainforth et al., 2016; Kollmuss & Agyeman, 2002; Sheeran & Webb, 2016) .

2.7 Theoretical background

The research study aims to evaluate the key factors that impact the environmental behavior and performance of university students. The study is conducted in two phases in order to accomplish this goal. The first step involves undertaking a thorough literature review to identify the current theoretical frameworks that explain pro-environmental behavior among university students. In the second phase, an online as well as hard version survey is used to gather data from participants. This section's primary objective is to provide a detailed analysis of the elements affecting university

students' environmental conduct by exploring further the theoretical frameworks that are linked to green behavior among students.

This study adopted five variables from the TPB, one variable from NAM theory, and three variables from AMO theory.

The five factors adopted from the TPB as shown in Figure 1, are attitude toward the behavior, subjective norm, perceived behavioral control, intention , and behavior.

The TPB is being deployed in this study to better understand and accurately forecast the pro-environmental behavior. The cognitive self-regulation-based theory seeks to enhance and clarify our awareness of human behavior in particular settings, with particular focus on environmental sustainability.

According to Swaim et al. (2014) intention "reflects the motivation to engage in environmentally sustainable actions in everyday lives and is influenced by attitude, subjective norm, and perceived behavioral control". Intention is not only the most

reliable predictor of behavior, but also serves as a mediating variable explaining how other factors affect action.

The general rule is " the more favorable the attitude and subjective norm with respect to a behavior, and the greater the perceived control, the stronger should be an individual intention to perform the behavior under consideration" (Ajzen, 1991).

According to Ajzen (2002) " all else equal, a high level of perceived control should strengthen a person's intention to perform the behavior and increase effort and perseverance".

"Logically, perceived behavioral control, rather than having a direct effect, is expected to interact with attitudes and with subjective norms in determining intentions, and with intentions in its effects on behavior" (Ajzen, 2002).
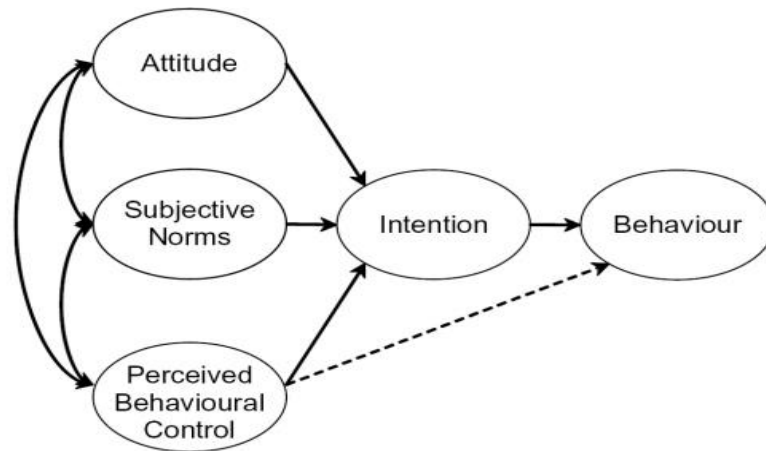
Figure 1. The theory of planned Behavior (Ajzen, 1991).

The NAM theory's varied personal standards were also incorporated, through personal norms variable which play a significant role within altruistic contexts. The activation of personal norms is preceded by an awareness of the implications of

engaging or refraining from engaging in a certain behavior regarding the wellbeing of others as illustrated in Figure 2 (Schwartz, 1977).

Empirical research strongly supports the major role of personal norms in promoting pro-environmental behavior. Multiple studies have consistently identified personal norms as the most robust predictor of behaviors such as energy adaptation which can help us better comprehend our practices towards the environment. Particular emphasis is placed on the moral and social value components of personal norms, since these highly interact with pro-environmental actions (Black et al., 1985).

Figure 2. Norm Activation model of prosocial behavior as mediator (De Groot & Steg, 2009).

The AOM theory framework was established employing three essential psychological principles as presented in Figure 3 and 4. Motivation, to stimulate behavior; Opportunity, encompassing situational conditions and contextual circumstances; and Ability, which comprises capacities and skills essential to perform an activity. It serves as the cornerstone that provides key variables pertaining to university practices for describing and developing behavioral change interventions toward responsible environmental performance. The theory highlights the vital function of Ability, Motivation, and Opportunity as critical behavioral outcome determinants. Because intention alone may not be sufficient for behavioral change, all three

components of the AOM theory must be considered for the desired changes and outputs to occur (Appelbaum et al., 2000; Blumberg & Pringle, 1982b) .
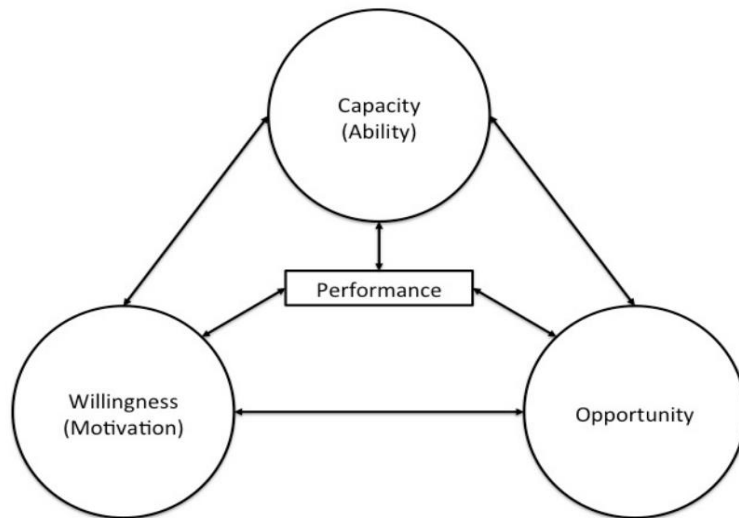
Figure 3. Early Interactive OCW Model (Blumberg & Pringle, 1982b).
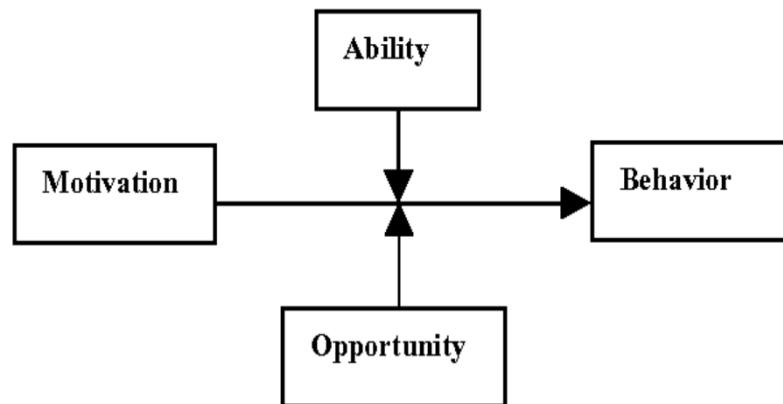
Figure 4. The Ability, Motivation, Opportunity Framework for Behavior Research (Hughes, 2007)

The concept of intention-behavior gap has been recognized because sole reliance on intention is insufficient for changing one's behavior. This refers to the misalignment of people's and their actual behavior, even when they have strong intentions to act (Gollwitzer, 1993). Even in the eco-friendly context Individuals may

not always follow through on their objectives, though they have great intention. Therefore, understanding the role of Ability, Motivation, and Opportunity as moderators in the intention-behavior relations is crucial for this study as it enable the development of techniques and methods that promote the alignment of intentions and actions (Sheeran, 2002).

2.8 Research model and hypotheses development

Human behavior is complicated and cannot be entirely understood within a single theoretical framework. Combining the TPB and NAM on the other hand can provide researchers with useful insights into how social-altruistic values influence pro-environmental behavior. This combined approach is adopted to improve prediction accuracy and offers a more comprehensive analysis by integrating the normative aspects of personal norm with the three components of TPB. Previous criticism of TPB for omitting the normative aspect can therefore be addressed through this integrated framework (Zhang et al., 2020).

Previous study findings back up the combination of the TPB and NAM, highlighting the significance of behavioral intention as mediator in the relation between personal norms and pro-environmental behavior (Onwezen et al., 2013).

Multiple theories are required to comprehensively investigate behaviors related to global challenges such as environmental sustainability. To understand and potentially influence pro-environmental behavior among higher education students, this research study adopts a theoretical framework that incorporates three theories. It focuses on the role of university practices in bridging the gap between intention and behavior, aiming to gain insights into how universities can effectively promote pro-environmental behavior among their students.

2.8.1 Hypotheses development

Based on the findings from existing research in the environmental sustainability field, the comprehensive literature review conducted, and the analysis of relevant studies, this research study puts forth the following hypotheses for investigation:

H.1 Behavioral Intention mediates the positive relationship between perceived behavioral control and pro-environmental behavior.

H.2 Behavioral Intention mediates the positive relationship between environmental attitude and pro-environmental behavior.

H.3 Behavioral Intention mediates the positive relationship between subjective norms and pro-environmental behavior.

H.4 Behavioral Intention mediates the positive relationship between personal norms and pro-environmental behavior.

H.5 Behavioral intention is positively related to pro-environmental behavior.

H.6 Students' higher ability will positively moderate the relationship between behavioral intention and pro-environmental behavior.

H.7 students' higher level of motivation will positively moderate the relationship between behavioral intention and pro-environmental behavior.

H.8 Greater opportunities available to students will positively moderate the relationship between behavioral intention and pro-environmental behavior.

H.9 University practices moderated the positive relationship between behavioral intention and pro-environmental behavior.

2.8.2 Research model

The primary objective of this research is to deliver a meaningful contribution to continuing efforts to further demonstrate the growing value of environmental sustainability and cultivate environmentally responsible behavior. To achieve this, the study proposes, to the best of my knowledge, a novel research model that integrates

relevant theories, in order to thoroughly define the variables that influence the pro-environmental behavior among university students.
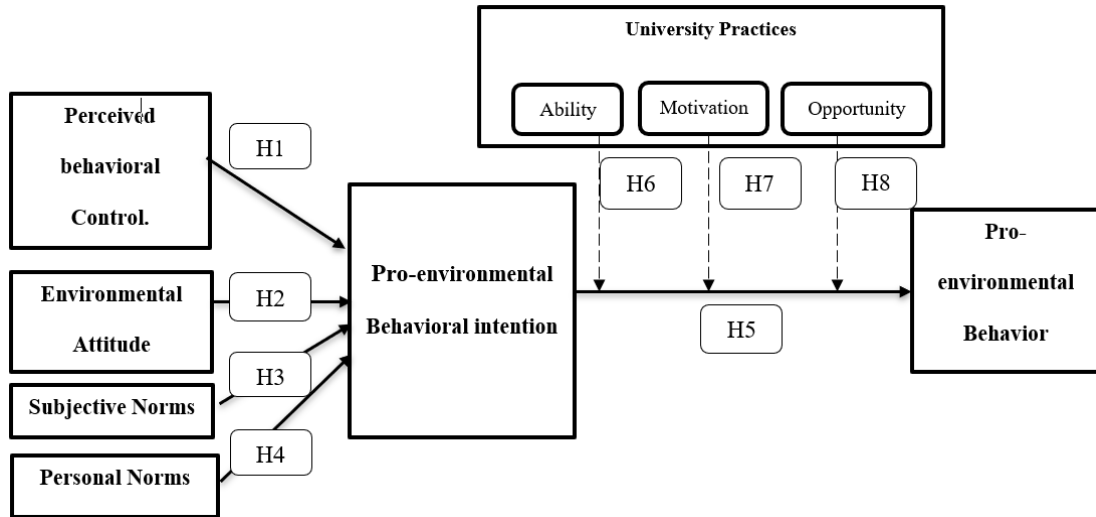
Figure 5. Research Model

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Research approach and design

The study is designed to determine the factors that shape and influence university students' pro-environmental behavior, then progress toward broad implementation of environmentally friendly practices. A hypothesis-driven approach associated with the deductive confirmatory aspect of the research is utilized to serve accomplishing the research aim.

A sample size of 400 participants was targeted for the optimal representation of the study population. To get a snapshot of the current higher education students' pro-environmental behavior, then contrast it with the existent and desired environmental sustainability objectives, the quantitative cross-sectional data method was adopted to collect data at a single point in time.

A positivism philosophy guided the quantitative aspect of the research study, through objectives and measurable methods to investigate students' pro-environmental behavior objective reality within the broad context of human behavior. An online questionnaire and its hard copy version are employed to collect data about variables that are supposed to have either a direct or indirect impact on students' pro-environmental conduct. Therefore, measure or quantify these variables, and recognize patterns using statistical analysis to come up with results and explanations that can be tested and validated through further research.

3.2 Sampling and data collection method

Random sampling strategy utilized to have participant at random from the entire population of university students, so each student has an equal chance of being selected. Random sampling ensure that our sample is diverse and representative, it will reduce the bias in the sample and allow the generalization of the findings to the larger population of higher education students, which improve the external validity of the

study and make significant contribution to the global effort toward environmental sustainability.

Using random sampling, allows for a larger number of participants in the current research, which enable the detection of possible significant discrepancies in pro-environmental behavior among university students' groups as well as enhance the statistical power of the analysis. The more the analysis is refined the more the results are accurate and useful to develop practical measures in terms of policies and regulations with regards to environmental sustainability.

The quantitative data collection methods using both online survey and its hard copy counterpart were applied to gather data quickly and efficiently from the desired large sample size, the survey used is attached to Appendix A (Arabic) and Appendix B (English). Access to broad population offers greater opportunity for trends identification especially for investigating the environmental behavior which is argued in the literature as influenced by various factors.

The survey is designed to include standardized questions and response options, allow, and guide the respondents to interpret the questions in a way that minimizes measurement error. In addition, the survey is the tool of choice for structured approach in collecting data, such approach will enhance in turn the validity and reliability of data.

3.3 Research instrument

The study employed a self-administered online survey using Google forms, and its hard copy variant distributed personally to students to collect data from higher education institutions. The questions were elaborated to retrieve information about participants' demographic characteristics and opinions towards pro-environmental behavior along with the factors assumed to have potential effect on that behavior. All

the measures utilized in the questionnaire had been previously validated and proven reliable within the context of human behavior related to environmental sustainability.

The questionnaire was designed in two languages, English an Arabic. In the first section of the survey participants were requested to provide demographic information, including their age, gender, marital status, nationality, educational level, program area, and employment.

The second section included a total of forty-nine items designed to quantify nine variables.

Perceived behavioral control: to measure perceived behavioral control five items Likert scale was used, adopted from Swaim et al. (2014). Each item on the scale was rated on a seven-point scale, ranging from "Strongly Disagree" to " Strongly Agree".

Attitude toward pro-environmental behavior: It was assessed using five items Likert scale sourced from Blok et al. (2015). Participants were requested to rate each item using a five-point scale ranging from "Strongly Disagree" to "Strongly Agree".

Subjective norms: three items Likert scale were sourced from Park and Ha (2014) to measure subjective norms on seven-point scale ranging from "Strongly Disagree" to "Strongly Agree".

Personal norms: Four items were employed for the measurement of personal norms on a seven-point scale with labeled endpoints of "1=Strongly Disagree" to " 7=

Strongly Agree", These items were adopted from the following literature (Onwezen et al., 2013).

Behavioral intention: It was measured utilizing two items Likert scale adopted from de Leeuw et al. (2015). Each item was rated on a six-point scale ranging from "1= Definitely Not" to " 6= Yes Definitely".

Pro-environmental behavior: Thirteen items Likert scale sourced from de Leeuw et al. (2015) to measure the pro-environmental behavior variable, participants were asked to rate each item using a six-point scale ranging from "0= Never" to "5= Always".

The variables' ability, motivation, and opportunity were measured using respectively six items Likert scale for ability, six items Likert scale for motivation, and five items Likert scale for opportunity. Students were asked to rate items following a five-points scale ranging from "1= Not at all" to "5= To a very great extent". The seventeen items were adopted from the following literature (Anwar et al., 2020b).

The overall items adopted from the literature were used within the context of environmental behavior. Some wording from the original items sourced to measure environmental attitude subjective norms, and behavioral intention variables was slightly amended to better suit higher education students as the targeted participants.

Responses collected from participants are kept confidential and anonymous. The questionnaire underwent ethical review and received approval from QU-IRB, the QU-IRB REFERENCE is QU-IRB 1847-E/23 (Appendix C).

3.4 Analysis tool and Data preparation

3.4.1 Analysis tool

The instrument of choice deployed for data analysis was Smart PLS 4, which is widely reputed in both academia and industry. It redirects attention to research queries thanks to its user-friendly layout rather than technicalities. Smart PLS 4 excels in

complicated models and was designed for Partial Least Squares Structural Equation Modeling (PLS-SEM), which can handle both confirmatory and exploratory research. For data from the actual world such as the case in the current research, PLS-SEM's reduced sensitivity to multivariate normality breaches is crucial. The emphasis on predictive capabilities in Smart PLS 4 increases its utility for theoretical and practical applications, assisting data-driven decisions.

3.4.2 Data preparation and cleaning

3.4.2.1 Data validation

Responses were represented using the following numerical scales: "0 to 5", "1 to5", and "1 to 7".

Data collected from respondents to measure their attitudes, opinions, and perceptions through the survey, adhered to the characteristics and rules specific to Likert-type items. The following validation criteria for Likert-scale survey responses were adopted, verified, and respected:

Response range verification: The minimum and maximum values of responses are within the predefined Likert-scale ranges.

Valid response options: respondents have chosen only the available response options.

Respondent misconduct consistency check: response patterns do not show or indicate inattentive responding, lack of thoughtfulness in answering, or response bias. Assessment of the standard deviation of answers for each specific respondent revealed only one response with standard deviation of $0.1979 < 0.25$, most of the questions were

marked by the same answer (47 items over a total of 49 were marked by 2). Thus, the response was excluded from the analysis (Shi et al., 2023).

Neutral response handling: no excessive use of neutral responses was detected for Likert-scales with neutral midpoint "neither agree nor disagree".

3.4.2.2 Data diagnosing

3.4.2.2.1 De-duplication

Respondents are allowed to submit only one response to the online survey to avoid duplication issues. The hard copy of the survey was distributed to students during the classes and collected immediately after completion; various classes and different students were involved.

3.4.2.2.2 Missing data

Responses completeness: ten items are left unanswered, two on the same questionnaire and the remaining eight on different surveys. The mean imputation method was used to replace missing values with the mean of the observed values for the corresponding variable.

3.4.2.2.3 Outliers

The Likert-scale responses collected data are ordinal. Thus, the interquartile range as a non-parametric statistic that does not require interval-level assumption is adopted to identify possible outliers (Mircioiu & Atkinson, 2017).

PEB: due to the nature of the variable measures referring to the frequency of compliance to behavior rather than opinion, it is important to search for outliers within the items.

As presented in Figure 6, the boxplot does not show outliers. Contrasting the data to the upper and lower limits computed using excel spreadsheet software to identify the first quartile, third quartile, and interquartile range, no outliers were identified.
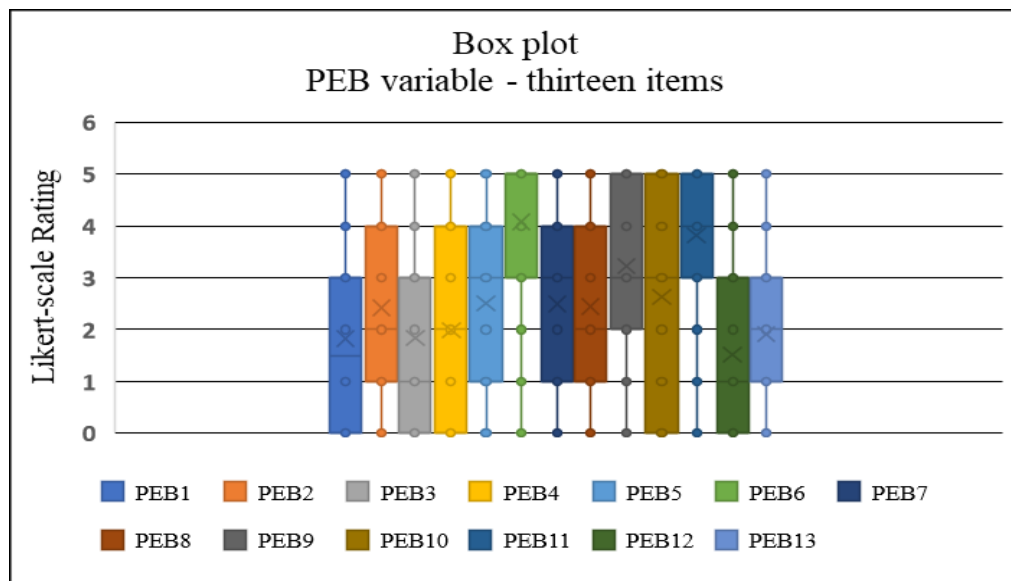
Figure 6. Box plot for outliers' detection

BI: the variable was captured through two items only; they provide a straightforward measure of the respondent's intention. To avoid results distortion, outliers were verified. Figure 7 box plot illustrates that no outliers were detected.
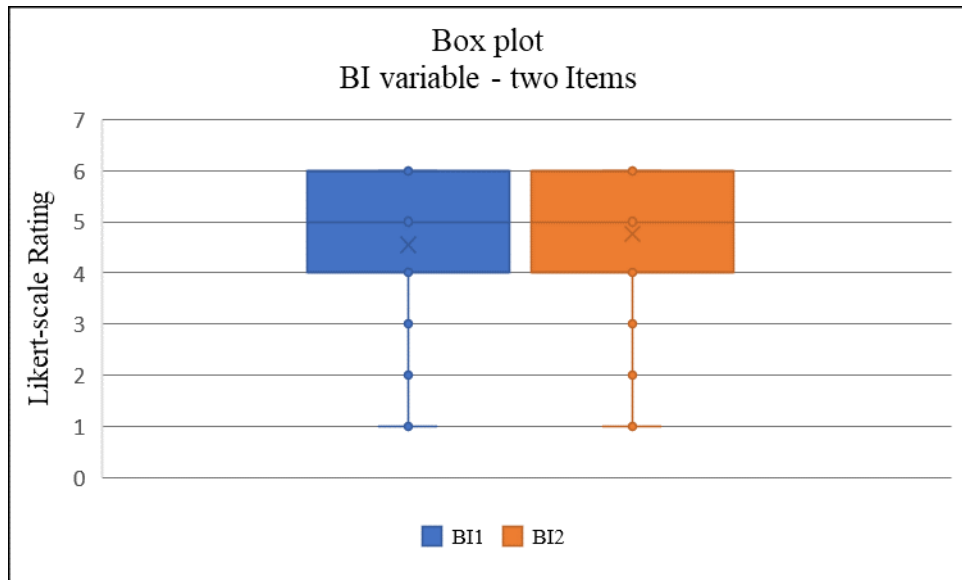
Figure 7. Box plot for outliers' detection

APB, A, M, O, PN, PBC, and SN: measure the subjective responses that can vary widely due to the diverse perspectives and experiences of respondents. Subjective responses do not have a clear definition of what constitutes an outlier, as they represent individual opinions and perceptions. Therefore, the concept of outliers might not be applicable in the traditional statistical sense.

CHAPTER 4: DATA ANALYSIS AND RESULTS

A total of 641 validated responses will be analyzed using Smart PLS 4, as it represents an ideal choice for Structural Equation Modeling (SEM), especially for complex models. The software can manage reflective as well as formative constructs within SEM, it performs exceptionally at predictive modeling and complex connections. Smart PLS 4 provides thorough and comprehensive analysis, including the path coefficients significance assessment, examining model fit, determining the model predictive relevance, and measuring its explanatory power.

4.1 Measurement model assessment

The quality of the construct in the study is assessed based on the evaluation of the measurement model. The assessment of the quality criteria starts with the evaluation of the factor loadings which is followed by establishing reliability and constructs validity.

4.1.1 Factor loadings

Factor loadings refer to the extent to which each item in the correlation matrix correlates with the given principal component. Factor loadings can range from -1.0 to +1.0, with higher absolute values indicating a higher correlation of the item with the underlying factor (Pett, 2003). Table 1 (Find the full results in Appendix D) illustrates very low loading, below 0.4, for the items PEB1, PEB2, PEB3, PEB7, and PEB9, items were excluded. Furthermore, items listed as PEB12, PEB4, PEB10, PEB8, and PEB13 loaded with values between 0.4 and 0.5 have also been dropped to attain overall highest possible reliability and validity results (Hair et al., 2021, p. 77).

Table 1. Factor Loadings

	09. PEB
PEB1	-0.020
PEB2	0.046
PEB3	0.060
PEB4	0.416
PEB5	**0.499**
PEB6	**0.734**
PEB7	0.126
PEB8	0.461
PEB9	0.347
PEB10	0.457
PEB11	**0.608**
PEB12	0.403
PEB13	0.469

4.1.2 Inner and outer model multicollinearity analysis

Variance Inflation Factor (VIF) statistics was utilized to assess both the inner model and outer model multicollinearity (Fornell & Bookstein, 1982).

The outer model collinearity shows above threshold level for PN2 (VIF=5.948 > 5) which was expected due to the reflective nature of the lower order constructs in the model (Appendix E).

Since the current study model comprises purely reflective lower order constructs, the attention will be focused on the inner model multicollinearity. According to Kock (2015) and Hair et al. (2021), multicollinearity is not a serious issue if the VIF value is less than 3.3. Table 2 lists the inner model VIF's, (all VIF's < 3.3). Hence, no issue of multicollinearity, and the model is considered free from common method bias.

Table 2. Inner model Multicollinearity.

	VIF
01. PBC -> 05. BI	**3.219**
02. APB -> 05. BI	**2.013**
03. SN -> 05. BI	**1.832**
04. PN -> 05. BI	**3.063**
05. BI -> 09. PEB	**1.207**
06. A -> 09. PEB	**2.444**
07. M -> 09. PEB	**2.311**
08. O -> 09. PEB	**2.533**

Note: VIF: Variance Inflation Factor.

4.1.3 Reliability analysis

Mark (1996, p. 60) defines reliability as "the degree to which the same instrument provides a similar score when used repeatedly". Thus, the essence of reliability is repeatability that refers to which extent a given measurement instrument is stable and consistent. One of the primary measures used to examine internal consistency reliability in PLS-SEM is Joreskog (1971) composite reliability (rho-c). higher rho-c values indicate higher level of reliability.

Cronbach's alpha is another measure of internal consistency reliability, which assumes the same threshold as the composite reliability (rho-c > 0.70). However, a major limitation of Cronbach's alpha is that it assumes all indicator loadings are the same in the population referred to as tau-equivalence. The violation of this assumption manifests itself in lower reliability values than those produced by (rho-c) (Dijkstra & Henseler, 2015).

Table 3 (Appendix F) lists Composite reliability and Cronbach's alpha results. The Cronbach's alpha for all variables ranged (from 0.857 to 0.949), except PEB (0.539). whereas the composite reliability statistics for all variables ranged (from 0.757 to 0.963). Both indicators show reliability statistics over the required threshold of (0.70) (Hair et al., 2011). Except Cronbach's alpha indicator for PEB. However, while

Cronbach's alpha is relatively conservative, the Composite reliability may be too liberal, and the construct's true reliability is typically viewed as within these two extreme values. Subsequent research has proposed the exact or consistent reliability coefficient (rho-a) (Dijkstra & Henseler, 2015; Dijkstra, 2014).

The reliability coefficient rho-a usually lies between the conservative Cronbach's alpha and the liberal composite reliability coefficient. Therefore, considered as an acceptable compromise between these two measures. Table 4 results illustrates that construct reliability is established for all constructs including PEB (Appendix G).

Table 3. Construct Reliability Analysis

	Cronbach's alpha	Composite reliability (rho-c)
09. PEB	0.539	**0.757**

Table 4. Construct Reliability Analysis

	Cronbach's alpha	Composite reliability (rho-a)	Composite reliability (rho-c)
09 PEB	0.539	**0.617**	0.757

4.1.4 Validity analysis

4.1.4.1 Convergent validity analysis

"Convergent validity is the degree to which multiple attempts to measure the same concept are in agreement. The idea is that is that two or more measures of the same thing should covary highly if they are valid measure of the concept" (Bagozzi et al., 1991, p. 425).

Items converge to measure the underlying construct if (AVE>=0.50) (Hair et al., 2021). Results in Table 5 demonstrates (AVE > 0.50) for each construct. Convergent validity is established.

Table 5. Construct Convergent Validity (AVE)

Constructs	The average variance extracted (AVE)
01. PBC	**0.750**
02. APB	**0.638**
03. SN	**0.838**
04. PN	**0.868**
05. BI	**0.876**
06. A	**0.608**
07. M	0.571
08. O	**0.697**
09. PEB	0.517

4.1.4.2 Discriminant validity

"Discriminant validity is the degree to which measures of different concepts are distinct. The notion is that if two or more concepts are unique, then valid measures of each should not correlate too high" (Bagozzi et al., 1991, p. 425). Three key techniques, "Fornell and Larcker", "Cross-Loading", and Heterotrait-Monotrait Ratio" are employed for results robustness.

4.1.4.2.1 Fornell and Larcker criterion

According to Fornell and Larcker (1981), discriminant validity is established when the square root of AVE for a construct is greater than its correlation with all other constructs. Table 6 provide strong support for discriminant validity among the nine constructs.

Table 6. Discriminant Validity Fornell and Larcker Criterion

	01. PBC	02. APB	03. SN	04. PN	05. BI	06. A	07. M	08. O	09. PEB
01. PBC	**0.866**								
02. APB	0.627	**0.799**							
03. SN	0.662	0.512	**0.915**						
04. PN	0.781	0.687	0.556	**0.931**					
05. BI	0.506	0.549	0.372	0.549	**0.936**				
06. A	0.396	0.454	0.421	0.396	0.392	**0.780**			
07. M	0.261	0.272	0.353	0.179	0.165	0.658	**0.756**		
08. O	0.356	0.319	0.424	0.292	0.265	0.701	0.714	**0.835**	
09. PEB	0.349	0.392	0.231	0.401	0.449	0.278	0.095	0.131	**0.719**

Note: Bold and Italics represent the square root of AVE.

4.1.4.2.2 Cross loadings

Table 7 full results attached in Appendix H, illustrates that items are well loaded only on their parent constructs (>0.7), and discriminant validity is established (Chin, 2010, p. 685).

Except for items (APB4=0.685, APB5=0.662 and PEB5=0.544). However, the difference between their parents loading and their second highest loading are respectively (0.23, 0.206, 0.319>0.2) much higher than the threshold of 0.20 (Knekta

et al., 2019). Additionally, dropping itemAPB4, APB5, and PEB5 will not enhance the reliability and validity statistically proved and established. Thus, the items are kept (Chin, 2010; Maskey et al., 2018).

Table 7. Cross Loading for Discriminant Validity

Items	01. PBC	02. APB	03. SN	04. PN	05. BI	06. A	07. M	08. O	09. PEB
APB4	0.408	0.685	0.406	0.373	0.316	0.455	0.360	0.334	0.218
APB5	0.422	0.662	0.456	0.345	0.304	0.381	0.343	0.348	0.197
PEB5	0.162	0.207	0.099	0.225	0.206	0.128	0.047	0.076	0.544

4.1.4.2.3 Heterotrait-Monotrait Ratio

All values in Table 8 are less than 0.9, so no issue of discriminant validity (Hair et al., 2021, p. 79).

Table 8. HTMT for discriminant validity

	01. PBC	02. APB	03. SN	04. PN	05. BI	06. A	07. M	08. O	09. PEB
01. PBC									
02. APB	0.697								
03. SN	0.725	0.596							
04. PN	0.833	0.733	0.599						
05. BI	0.566	0.621	0.422	0.608					
06. A	0.411	0.517	0.467	0.397	0.415				
07. M	0.289	0.347	0.409	0.189	0.189	0.782			
08. O	0.384	0.380	0.472	0.295	0.288	0.815	0.859		
09. PEB	0.473	0.537	0.306	0.549	0.629	0.347	0.106	0.158	

4.1.5 Higher order construct validation

In the current study, the disjoint two-stage approach proposed as an alternative to the repeated indicators approach is adopted for the validation of the reflective formative higher-order construct (HOC), University Practices (UP), based on three lower-order constructs Ability (A), Motivation (M), and Opportunity (O). The approach adopted offers an easier interpretation of the relationship between constructs and their

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indicators as well as a clear hypothesis testing (Crocetta et al., 2021; Wetzels et al., 2009). Two steps are taken to validate the higher order formative construct:

4.1.5.1 Multicollinearity Assessment

The higher order construct measurement model should not be affected by collinearity. Table 9 shows that the VIF's for A, M, O are less than 5 (VIF < 5.0). Consequently, the higher-order construct measurement model is confirmed not to be affected by multicollinearity (Hair et al., 2021).

Table 9. VIF Values for LOCs for HOCs

Constructs	VIF
06. A	**2.181**
07. M	**2.264**
08. O	**2.525**

4.1.5.2 Assessment of outer loadings outer weights, and significance

Table 10 delineates the level of significance of (A), (M), and (O) as formative indicator for UP. Only (O) as formative indicator was found insignificant (p = 0.154 > 0.05). Table 11 shows that (O) outer loading is less than 0.50 but significant (p = 0.001). Hence, (O) was kept in the model (Sarstedt et al., 2019).

Since all criteria are met, we conclude the HOC validity is established.

Table 10. Outer Weights

	Original sample (O)	T statistics (|O/STDEV|)	P values
06. A -> UP	1.332	14.348	**0.000**
07. M -> UP	-0.418	2.432	**0.008**
08. O -> UP	-0.203	1.019	0.154

Table 11. Outer Loadings

	Original sample (O)	T statistics (|O/STDEV|)	P values
06. A -> UP	**0.915**	16.876	**0.000**
07. M -> UP	**0.312**	2.592	**0.005**
08. O -> UP	**0.432**	3.409	**0.000**

The measurement model assessment demonstrated the model predictors independence, and the absence of multicollinearity between them at the LOC as well as HOC.

4.2 Structural model assessment

4.2.1 Lower-order constructs model

4.2.1.1 Mediation effect analysis

Mediation analysis was performed to assess the mediating role of BI in the relationship between the independent variables PBC, EA, SN, and PN, and PEB the dependent variable. The results revealed the following (Tables 12 and 13):

H1: BI mediates the positive relationship between PBC and PEB.

The direct effect of PBC on PEB with the inclusion of the mediator was insignificant ($ß = 0.034$, $t = 0.594$, $p = 0.276 > 0.05$).

The indirect effect of PBC on PEB through BI was significant (H1: $ß = 0.034$, $t = 1.909$, $p = 0.028 < 0.05$).

The total effect of PBC on PEB was insignificant ($ß = 0.068$, $t = 1.127$, $p = 0.130 > 0.05$).

The results indicates a full mediating role of BI in the relationship PBC and PEB. Hence, H1 is supported.

H2: BI mediates the positive relationship between EA and PEB.

The direct effect of EA on PEB considering the inclusion of the mediator was significant ($ß = 0.117$, $t = 2.065$, $p = 0.019$).

The indirect effect of EA on PEB through BI was significant (H2: $ß = 0.081$, $t = 3.698$, $p < 0.001$).

The total effect of EA on PEB was also significant ($ß = 0.197$, $t = 3.299$, $p < 0.001$). This illustrates a complementary partial mediating role of BI in the relationship EA and PEB. Consequently, H2 is supported.

H3: BI mediates the positive relationship between SN and PEB.

The direct effect of SN on PEB taking into account the mediator effect, was insignificant ($ß = -0.043$, $t = 0.908$, $p = 0.182$).

The indirect impact of SN on PEB when BI mediates the relationship is not significant (H3: ß = -0.001, t = 0.032, p = 0.487).

The total effect of SN on PEB was not significant (ß = -0.043, t = 0.865, p = 0.194). Therfore, H3 is rejected.

H4: BI mediates the posititve relationship between PN and PEB.

The direct impact of PN on PEB, considering the the mediator, displayed statistical significance (ß = 0.141, t = 2.135, p = 0.016).

The indirect influence of PN on PEB is significant when BI mediates the interaction (H4: ß = 0.064, t = 3.083, p = 0.001).

the total effect of PN on PEB is significant (ß = 0.205, t = 3.102, p = 0.001).

The findings validate the complementary partial mediating role of BI in the relation between PN and PEB. Hence, H4 is supported.

Table 12. Mediation Analysis Results

	Total effects			Direct effect		
	Coefficients	|T values|	P-values	Coefficients	|T values|	P-values
01. PBC -> 09. PEB	0.068	1.127	0.130	0.034	0.594	0.276
02. APB -> 09. PEB	0.197	3.299	**0.000**	0.117	2.065	**0.019**
03. SN -> 09. PEB	-0.043	0.865	0.194	-0.043	0.908	0.182
04. PN -> 09. PEB	0.205	3.102	**0.001**	0.141	2.135	**0.016**

Table 13. Mediation Analysis Results

					Percentile bootstrap 95% confidence intervals	
					Indirect Effects	
Hypotheses	Coefficients	SE	|T values|	P-values	Lower	Upper
H1: PBC -> 05. BI -> 09. PEB	0.034	0.018	1.909	**0.028**	0.007	0.065
H2: APB -> 05. BI -> 09. PEB	0.081	0.022	3.698	**0.000**	0.049	0.119
H3: SN -> 05. BI -> 09. PEB	-0.001	0.012	0.032	0.487	-0.021	0.020
H4: PN -> 05. BI -> 09. PEB	0.064	0.021	3.083	**0.001**	0.034	0.101

4.2.1.2 Direct effect analysis

H5: BI is positively related to PEB.

H5 evaluates whether BI significantly and positively affects PEB, and results revealed that BI has a significant and positive impact on PEB ($\beta = 0.265$, $t = 5.290$, $p < 0.001$). Consequently, H5 is supported (Table 14).

Table 14. Direct Effect Analysis

Hypothesis	Coefficient	SE	|T values|	P-values	Percentile bootstrap 95% confidence intervals	
					Lower	Upper
H5. BI -> 09. PEB	0.269	0.050	5.290	**0.000**	0.187	0.350

4.2.1.3 Moderation effect analysis

The current study assessed the moderating role of (A), (M), and (O) on the positive relationship between BI and PEB. The following hypotheses were developed.

H6: (A) positively moderates the positive relationship between (BI) and (PEB). Such, an increase in students' (A) strengthens the relationship between (BI) and (PEB).

H7: (M) positively moderates the relationship between (BI) and (PEB). Such, increased students' (M) strengthens the relationship between (BI) and (PEB).

H8: (O) positively moderates the positive relationship between (BI) and (PEB). Such, offering appropriate (O) strengthens the relationship between (BI) and (PEB).

Statistical analysis shows the following empirical evidence (Table 15):

(A) Has insignificant moderating effect on the association BI and PEB ($ß = 0.020$, $t = 0.287$, $p = 0.387$). Therefore, H6 is rejected.

(M) Has a positive significant moderating effect on the association BI and PEB ($ß = 0.114$, $t = 1.784$, $p = 0.037$). H7 is supported.

(O) Has a negative significant moderating role on the relationship BI and PEB ($ß = -0.141$, $t = 1.943$, $p = 0.026$). H8 is supported.

Table 15. Moderating Role Analysis Results

	Beta Coefficients	SE	|T values|	P values
A x 05. BI -> 09. PEB	0.020	0.068	0.287	0.387
M x 05. BI -> 09. PEB	0.114	0.064	1.784	**0.037**
O x 05. BI -> 09. PEB	-0.141	0.073	1.943	**0.026**

Considering only the significant moderating effects (M*BI) and (O*BI), the R-Sq value for PEB was 0.252, which demonstrate that 25.2% change in PEB is accounted for by (BI) in addition (M) and (O).

The inclusion of the interaction term (A*BI) in the analysis, result in R-Sq of 26.2%, showing an increase of 1% despite the insignificant moderating role of (A).

Running the model without moderators, the PEB variable R-Sq plummet to 0.201. Consequently, we conclude that an increase of 5.1% of variance explained in the dependent variable PEB was attribute to the moderating impact of (M) and (O).
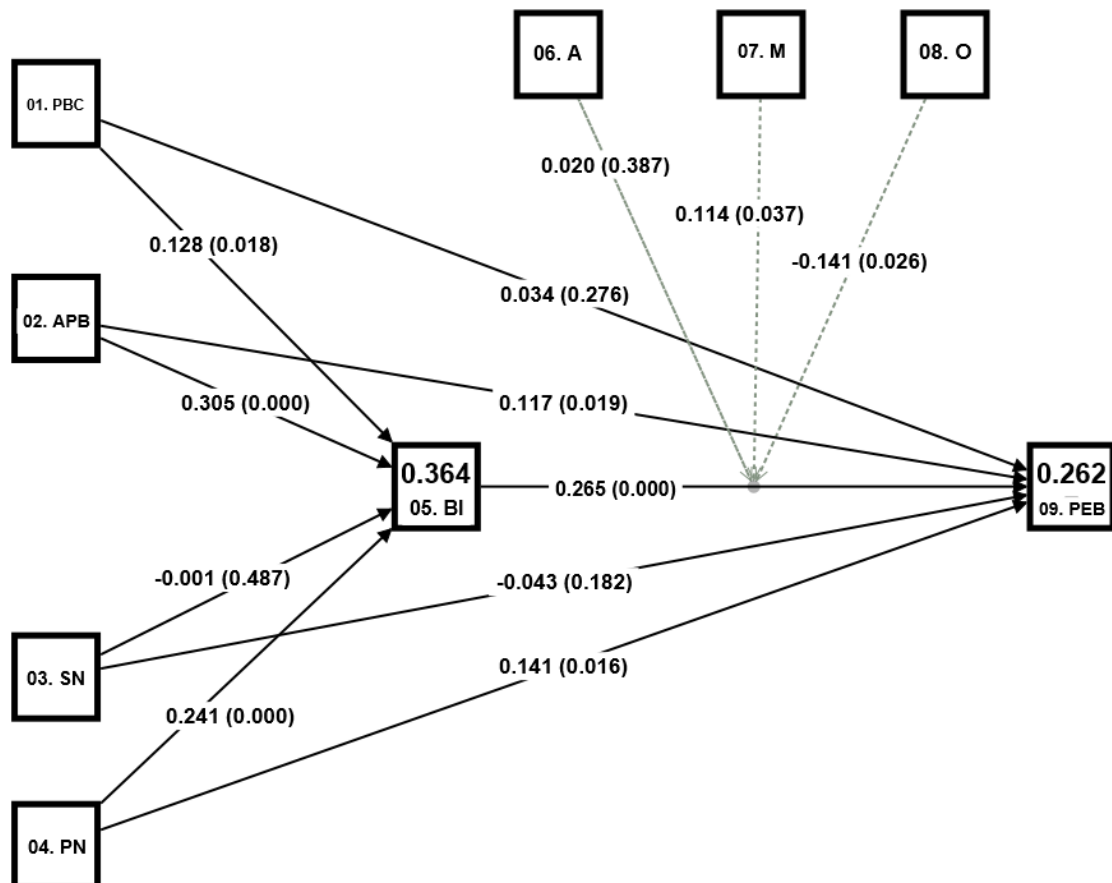
Figure 8. Structural model path coefficients

4.2.1.3.1 F-square analysis

According to Kenny's, 0.005, 0.01, and 0.025 constitute respectively small, medium, and large effect sizes of moderation (Hair et al., 2021, p. 162). Results presented in Table 16 show:

F-Square effect size of 0.001 for the moderating term (A*BI), indicating that the moderating effect does not contribute to explaining the endogenous construct PEB.

F-Square effect size of 0.007 for the moderating term (M*BI), indicating a medium moderating effect size contribution in explaining the endogenous construct PEB.

F-Square effect size of 0.010 for the moderating term (O*BI) indicating a medium moderating effect size contribution in explaining the endogenous construct PEB.

Table 16. F-square Results

	f-square
06. A x 05. BI -> 09. PEB	0.000
07. M x 05. BI -> 09. PEB	**0.007**
08. O x 05. BI -> 09. PEB	**0.010**

4.2.2 Higher-order construct model

4.2.2.1 Moderating effect analysis

The assessment of the moderating role of (UP) on the relationship between (BI) and (PEB) reveals an insignificant moderating impact of (UP) on the association (BI) and (PEB) ($\beta = -0.040$, t = 0.868, p = 0.193). H9 is rejected (Table 17).

Table 17. HOC Moderating Effect Analysis

	Coefficient	SE	|T value|	P value
UP x 05. BI -> 09. PEB	-0.040	0.046	0.868	0.193

Further, running the model without the moderating term (UP*BI) yields an R-Square value of 0.201 for (PEB), illustrating that 20.1% change in (PEB) is accounted for by (BI).

With the inclusion of the moderator effect (UP*BI), the R-Square increased to 22.2% , showing a raise of 2.1% in variance explained in the dependent variable PEB.

The assessment of F-Square revealed an effect size of 0.002. Therefore, the moderating effect is considered negligible and insignificant, so not contributing to the explanation of the endogenous construct PEB.
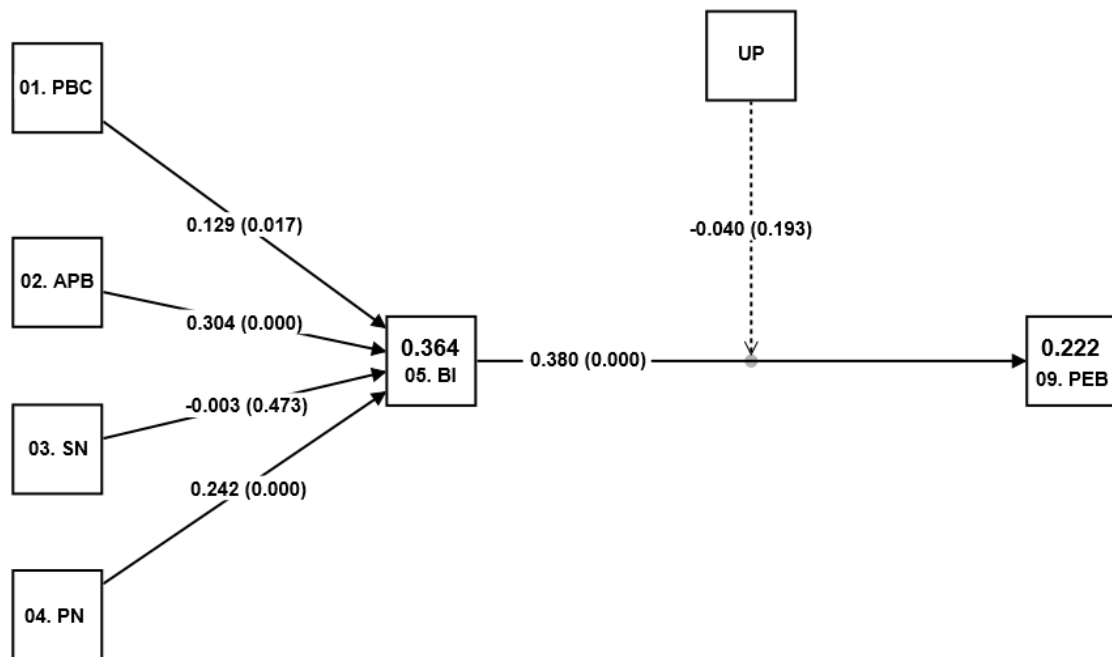
Figure 9. Higher order construct structural model path coefficients

Table 18: Results of Hypothesis

Hypothesis	Hypothesis Result
H.1 Behavioral Intention mediates the positive relationship between perceived behavioral control and pro-environmental behavior.	Supported (significant), full mediation.
H.2 Behavioral Intention mediates the positive relationship between environmental attitude and pro-environmental behavior.	Supported (significant), complementary partial mediation.
H.3 Behavioral Intention mediates the positive relationship between subjective norms and pro-environmental behavior.	Rejected (Not significant)
H.4 Behavioral Intention mediates the positive relationship between personal norms and pro-environmental behavior.	Supported (significant), complementary partial mediation.
H.5 Behavioral intention is positively related to pro-environmental behavior.	Supported (significant)
H.6 Students' higher ability will positively moderate the relationship between behavioral intention and pro-environmental behavior.	Rejected (Not significant)
H.7 students' higher level of motivation will positively moderate the relationship between behavioral intention and pro-environmental behavior.	Supported (significant)
H.8 Greater opportunities available to students will positively moderate the relationship between behavioral intention and pro-environmental behavior.	Supported (significant)
H.9 University practices moderated the positive relationship between behavioral intention and pro-environmental behavior.	Rejected (Not significant)

4.3 Model explanatory and predictive power

The R-Square statistic elucidates the level of variability in the endogenous construct that one or more independent variables may explain. It gauges the degree to which changes in the dependent construct can be ascribed to one or multiple independent constructs. Since it represents the variance explained in each of the endogenous constructs and measures the model explanatory power, it is also referred to as in-sample predictive power (Hair et al., 2021, p. 118; Rigdon, 2012).

The R-Square ranges from (0 to 1), higher values indicating greater explanatory power. As general guidelines by Cohen et al. (2003, p. 212) suggested R-Square values for endogenous latent variables are assessed as following:

Substantial = 0.26, Moderate = 0.13, and Weak = 0.02.

Table 18 elucidates that R-Square for both endogenous constructs (BI = 0.364) and (PEB = 0.262) is over 0.26, illustrating the substantial explanatory power of the model. To improve estimation of the explanatory significance of every exogenous construct in the model, the change in R-Square is estimated if a given exogenous construct is excluded from the model, this measure is recognized as F-Square. In PLS path model context, excluding an independent variable from the model implies measuring the variation in squared correlation values and ascertains whether the excluded independent variable has a strong influence on the value of independent variable. The impact of the

predictor variable is considered high at the structural level if the F-Squared = 0.35, medium if F-Squared = 0.15, and small if F-Squared = 0.02 (Cohen et al., 2003).

Results revealed that the F-Square effect size for the impact of (APB) on (BI) is 0.072 and the F-Square effect size for the impact of (PN) on (BI) is 0.030, so both considered as small effect sizes Table 18.

The F-Square effect size for (PBC) on (BI) is 0.008, and the F-Square effect size for (SN) on (BI) is 0.001, so both considered negligible effect sizes.

The effect size for (BI) on (PEB) is 0.057, which is a small effect size.

Finally, the assessment of Q-Square values for the endogenous constructs exhibits, (BI) Q-Square = 0.353, and (PEB) Q-Square = 0.181. results are greater than (0), so the predictive relevance of the model was established, and ranges from moderate to strong degree of predictive relevance (Hair et al., 2013).

Table 19. Explanatory and Predictive Power Results

Predictor(s)	Outcome(s)	R-Square	f-Square	Q-square
PBC			0.008	
APB	BI	0.364	0.072	0.353
SN			0.000	
PN			0.030	
BI			0.057	
O x BI			0.010	
A x BI			0.000	
M x BI	PEB	0.262	0.007	0.181
PBC			0.000	
APB			0.008	
SN			0.001	
PN			0.008	

CHAPTER 5: FIDINGS AND DISCUSSION

The research study intends to comprehensively explore environmental behavior in higher education institutions, with a particular focus on bridging the pro-environmental, intention-behavior gap. A comprehensive strategy was adopted, to take into account personal convictions, peer influence, socioeconomic factors, and university practices. The overarching objective is to provide valuable insights that inform interventions and policymaking. Thereby, improving university efficacy in bridging the gap between students ' intentions and desired behaviors.

5.1 Sociocultural factors and personal norms to predict students 'PEB?

In our analysis, we developed four hypotheses exploring (BI) as the mediator in distinct relationships.

The first hypothesis investigates whether (BI) mediates the positive association between (PBC) and (FEB) and provides support for full mediation. The second hypothesis examined whether (BI) mediates the positive relationship between (APB) and (PEB), and findings demonstrated partial mediation. As for the third hypothesis concerned with (BI) mediating the favorable relation between (SN) and (PEB), the obtained findings revealed no significant mediation or direct effect. Finally, assessing

the positive association between (PN) and (PEB), the statistical analysis supported partial mediation.

In conclusion, the analysis findings support full mediation for H1, partial mediation for H2 and H4, and no mediation for H3 in the association between the independent variable and (PEB).

The fifth hypothesis examined the relationship between (BI) and (PEB). Findings validated H5 demonstrating the significant and positive impact of (BI) on (PEB).

It is important to draw attention to the fact that the TPB in the current research varies from Ajzen's original 1991 model as it lacks a distinct direct path from PBC to PEB. Additionally, it implies that to further enhance PEB we should influence first all the antecedents of BI, since simplifying the behavior without considering attitude and SN may have a limited impact (Kaiser & Gutscher, 2003).

5.1.1 Interpretation

The first hypothesis outcomes significantly validate the concept of full mediation, illustrating that BI is crucial in translating PBC into actual pro-environmental actions. Which emphasizes the relevance of understanding the psychological processes driving university students' environmental choices. In essence, it demonstrates that perceived ability alone is insufficient to encourage environmentally conscious actions, their intention to do so is an essential component. This insight reflects how complex it is to motivate university students to green behavior and stresses the importance of stimulating their behavior intentions for long-lasting change. This reasoning has been established in previous research (Kaiser, 2006).

Results obtained from the second hypothesis indicate partial mediation, implying that although BI contributes significantly to the transition from a positive

environmental attitude to pro-environmental conduct, further factors could influence these behaviors. This finding extends the results of earlier studies (Chan & Lau, 2001; Chen, 2013; Swaim et al., 2013).

It implies that students with greater levels of optimism about the environment and more favorable attitudes toward environmental behavior are more prone to acquire intentions to engage in pro-environmental behaviors. However, further variables related to contextual effects such as the lack of sustainability programs or recycling facilities within the university, might retain an effect as to how intentions evolve into factual actions.

The analysis enrolled to explore whether BI mediates the presumed positive relation between SN and PEB yielded unexpected results, as an obvious correlation was anticipated, but the results do not show any significant evidence of the mediation effect or direct impact. This outcome makes us reconsider the relevance and importance of SN, which includes societal and cultural pressure on students to engage in or abstain from eco-friendly conduct. No obvious connection was detected between SN and students' intentions as well as subsequent pro-environmental behavior in our research population. It demonstrates that the social and cultural pressures supposed to shape university students' (SN) might not have the anticipated substantial impact.

In essence, our research results raise doubts and challenge the conventional belief about how SN affects PEB notably among university students. Thus, it is important to consider various influential factors and drivers of students' environmental choices particularly around SN.

University pupils are from a wide array of backgrounds and are likely to have differing levels of knowledge and exposure to environmentally conscious values,

norms, and cultures. The heterogeneity in opinions, perspectives, and mindsets may potentially weaken the influence of SN on behavioral intentions.

Additionally, students usually face competing objectives and priorities, including personal life, work, and academic commitments. These conflicting demands erode the effect of SN on their intention and behavior.

Furthermore, the current study intended to explore the generalized aspect of pro-environmental behavior. The survey reflected this intention by including questions either revolving around the concept of green behavior or involving various examples of environmentally friendly behavior. Thus, it is likely that the student's SN was highly specific or particularly relates to environmental contexts that cannot be generalized to comply with the broader pro-environmental behavior.

Moreover, SN could possess an ongoing or delayed effect on BI and the resulting behavior change. The survey may have captured a snapshot in time that could not accurately reflect the dynamic nature of such interactions.

Equally important, the economic factors, cultural changes, and political events are instances of external forces that strongly impact people's and definitely higher education students' pro-environmental behavior, masking either the direct or indirect impact of SN.

In summary, the absence of significant mediation between SN and FEB within the subject of the study may be attributed to a variety of factors. Nevertheless, it is conceivable that other variables, for instance, PN or the perceived benefits of engaging in PEB, will create a substantially greater impact in this specific context.

PN, which reflects the moral responsibility to behave in a particular manner, emerged in our study as a significant factor. The statistical findings show that BI partially mediates the association of PN and PEB. Furthermore, the positive

relationship between PN and PEB was statistically confirmed, referring to PN pertinent to environmentally friendly conduct, highlighting previous discoveries suggesting that PN may effectively motivate PEB (Bamberg et al., 2007; Bamberg & Möser, 2007; Onwezen et al., 2013).

The partially mediated relation between PN and PEB by BI is a key finding in our research. Implying that PN has a further impact on PEB through BI to promote and steer behaviors, through incorporating the moral factors into the TPB (Manstead, 2000).

Overall, the results emphasize the ethical and altruistic facets of environmentally conscious behavior, stressing the need to nurture moral responsibility along with the sociocultural factors, to enhance the pro-environmental behavior and raise ecologically responsible generations.

5.2 To what extent do university practices address the intention-behavior gap?

In addition to the previously well-established role of BI, except for the relation between SN and PEB, H5 testing results reveal a substantial correlation between BI and PEB among university students. The association is significant in statistical terms and strongly supported by evidence. A moderate positive effect size confirms that greater intention results in superior PEB. In addition to the high significance of the positive relation, statistics suggest that it is highly unlikely to occur by chance or randomly. In accordance with well-established theories, intention explains a large amount of the variance in people's behavior (Ajzen, 1991; Kaiser & Scheuthle, 2003).

The current research results strengthen the correlation between students' BI and PEB. However, the intention-behavior gap poses a struggle for university students who intend to engage in pro-environmental action. This highlights the vital role of A, M, and O in facilitating the transition.

The main objective of this research was to determine the moderator effect of A, M, and O. To attain this goal three hypotheses were formulated. Based on the research

outcomes, (A) had no significant moderating impact, while (M) had a positive significant moderating influence on the interaction between (BI) and (FEB). On the other hand (O) had a negative significant moderating effect on the same relationship between (BI) and (PEB). Findings provided support for H7 and H8, but not H6.

Discussing the moderating role of (A). H6 findings unexpectedly indicate that within the study population consisting of university students, the ability level did not significantly influence the transition from BI to PEB. This result was supported by a negligible effect size for the moderating term (A*BI), indicating that it does not contribute to explaining the endogenous construct PEB.

One potential reason is that the levels of environmental skills and knowledge among university students are sufficiently high to weaken the variation of ability in our sample. Consequently, the identification of significant moderating roles becomes challenging and problematic.

Moreover, a complex interplay and interaction are possible between A, M, and O. As (A) impact on PEB is not constant since it varies depending on the presence and importance of M and O, the interaction might influence the PEB differently than (A) independently.

Other extrinsic factors unaccounted for in our research, could act as barriers and restraints that overshadow the moderating role of (A). Economic constraints for instance are one of the influential external factors. Engaging in environmentally conscious practices pertinent to purchasing an eco-friendly product such as energy-saving high-efficiency home appliances or hybrid vehicles, could be either costly or not aligned with the average purchasing power of the community. Thus, the cost of green conduct could outweigh the financial capabilities, then limit the (A). Media and news outlets can weaken the ability to behave pro-environmentally. As an example,

inaccurate or conflicting information about climate change or the benefits or renewable energy could create a feeling of helplessness despite possessing the ability to take green actions.

Furthermore, the lack of a moderating effect may highlight the diverse and evolving nature of environmental behavior, ranging from basic to complex actions. Our results illustrated that the moderator role of (A) and its impact may be minor on broad and general environmental behavior. Conversely, it might be strong enough to influence specific PEB requiring particular expertise.

Testing for H7, we uncover the essential moderator role of (M) in determining the association between BI and PEB across university students as our sample population. Statistical findings demonstrated a positively significant moderator effect. Stressing the substantial role of (M) in turning intentions into choices and actions. The medium moderating effect size (F-square = 0.007), pronounced (M) as a crucial influencer, suggesting that greater student motivation results in a higher level of engagement in PEB. This conclusion is consistent with the concept that (M) is a pivotal factor in driving PEB (Ajzen, 1991).

Examining H8, the analysis showed a significant negative moderating impact of (O) on the relation between BI and PEB. It also implies that the accessibility to opportunities and their availability affects the strength of BI's impact on PEB. It is remarkable that the effect is greater for students who have scarce opportunities, conveying that opportunity limitations lead to higher reliance on personal intention toward ecologically friendly actions.

The medium effect size (F-square = 0.010) indicates a moderate contribution of the moderating term (O*BI) in explaining PEB. However, it is meaningful and

significant and affirms that a powerful BI is fundamental in the context of a lack of opportunity and when resources are scarce, triggering a notable impact on PEB.

The significant, yet unexpectedly negative moderating effect of (O) on (PEB) can be attributed to circumstances variability, discrepancies in individual experiences, and campus context. Such factors affect students' perception of available opportunities and their influence on the PEB. Scarce opportunities to engage in PEB serve as catalysts that strengthen students' feelings of accountability toward the environment, leading to psychological reactance, and empowering the significance of their contribution.

Furthermore, limited resources prompt students to create close-knit communities and strong networks to share eco-friendly values, goals, and the possible consequences of passiveness regarding green conduct. Hence, promotes the commitment to PEB.

Lastly, the cross-sectional nature of the research study does not account for potential temporal dynamics in the relationship between BI and PEB. The impact of limited opportunity on this relationship may differ over time.

In summary, BI is a key predictor of PEB. Nevertheless, the moderating effects of A, M, and O are distinct. (A) has negligible impact, (M) has a significant and positive influence, and the effect of (O) is dependent on its availability.

5.2.1 University practices

The research study examined the moderator effect of (UP) in the relationship between BI and PEB. The conceptual framework proposed suggests that (UP) incorporating (A), (M), and (O) will improve the influence of students' BI on their PEB. However, results did not provide support for this hypothesis, and (UP) has a statistically

insignificant moderating effect. Thus, UP does not contribute significantly to the explanation of PEB further than students' individual intentions.

These unanticipated findings could be due to the intricated relationship between BI and PEB, so it cannot completely rely on UP. Several social and cultural factors as well as external forces can heavily affect PEB. However, it is highly possible that the impacts of A, M, and O are more unique and specific to BI and PEB, compared to the supplementary, indirect, and minor impact of UP.

In the scope of the current research A, M, and O refer to UP aimed to enhance students' individual factors, then leveraging their PEB. However, the influence of UP might change in scope and duration depending on the national or international agendas, leading to a lager impact not directly affecting the association BI and PEB.

Universities have widely distinct approaches in promoting students A, M, and O. The disparities and diversity in UP across universities can result in insignificant moderating effects of the higher order construct on the association BI and PEB. Suggesting the vital role of particular policies, regulations, and practices in comparison to the overarching concept of UP.

Additionally, a longitudinal study could support the influence of UP on the relation BI and PEB. Focusing on the cumulative experiences and knowledge students acquire over time, would reveal a cumulative influence of UP.

Despite the insignificant moderating role and negligible effect of UP, these results may demonstrate A, M, and O as key constructs influencing PEB.

5.3 Explanatory and Predictive Power :

A noteworthy finding pertaining to the research model explanatory power addresses using R-square values for BI and PEB as the endogenous constructs revealed the following significant insights:

R-square values for BI and PEB were greater than 0.26. it implies that the chosen independent variables explain more than 26% of the endogenous variables, illustrating substantially significant explanatory power.

Assessing the predictive relevance of the model, Q-square values for both BI and PEB surpassed (0.353 for BI and 0.181 for PEB), establishing the predictive relevance of the model ranging from moderate to strong, and demonstrating a reliable out-of-sample prediction capability.

The overall findings affirm the reliability and practicality of the research model. Also, provides support for a significant and generalizable correlation between BI and PEB. Consequently, practitioners and researchers may benefit from the model by making predictions concerning these constructs.

5.4 Sociocultural factors, PN, and UP interaction to explain and predict PEB.

The research study investigates how sociocultural factors, personal norms, and university practices could predict as well as shape the PEB across students. It employs a broad approach encompassing personal perspectives, influence from peers, socioeconomic factors, and UP. The ultimate goal was to bridge the intention behavior gap with respect to validated theoretical frameworks to support effective intervention and facilitate policymaking processes.

The model value resides in the analysis of intricated interactions. PN is rooted in morality, and BI has been a powerful driver in highlighting the ethical facet of

environmentally friendly conduct. Addressing sociocultural factors, especially SN, challenges established beliefs and underscores the necessity of a wider perspective.

Delving into moderating relationships, the model sheds light on how scarce (O) might enhance environmental commitment within campuses.

The explanatory and predictive power statistics refers to the model reliability as a framework for assessing intention and behavior relationship and providing a valuable overview of the emotional, cognitive, and ethical aspects of ecologically aware actions.

CHAPTER 6: LIMITATIONS AND FUTURE RESEARCH RECOMMENDATIONS

The present study admits certain limitations and proposes recommendations for future research.

The self-reported data may introduce potential responses biases, stressing the relevance of future studies incorporating more objective measures of PEB. Furthermore, the study's specific pursuit of college students prompts concerns about the applicability and generalizability of its conclusions. To further enhance the external validity of this research, it is recommended that similar studies be conducted across diverse demographic groups, enabling broader understanding of PEB dynamics.

The relevance of BI as mediator underscores its impact on students' PEB. However, in the case of SN it does not function as mediator, suggesting potential overlooked variables or context related factors having an influence on PEB of the targeted population. Subsequent research needs to explore closely these possible constructs.

The partial mediation demonstrated the intricate relationship between PN and PEB. While PN has direct effect, the presence of BI reveals the involvement of additional factors. These unidentified contextual influences or factors deserve to be addressed in upcoming research to unveil the real dynamic between PEB and its predictors.

While (A) was not demonstrated as significant moderator, its importance should not be completely disregarded. In the context of university student's other variable might have greater impact on the association BI and PEB. Later research is likely to

concentrate on specific environmental abilities or knowledge having larger moderating significance.

It is essential to consider the temporal aspect, as the particular timing of data collection could affect the results, notably on (A) enhancement and is influence on PEB. Longitudinal studies offer valuable understanding of how evolving (A) affects PEB over time.

CHAPTER 7: THEORITICAL AND PRACTICAL IMPLICATIONS

The study's contribution to the understanding of the TPB, is the role of (M) as moderator in the correlation BI and PEB. It proposes (M) as key factor beside (EA), (SN), and (PBC). Additionally, it emphasizes either the significance or the key role of some selected predictors despite irrelevant statistics. Thus, it paves the way for future research through stimulating further exploration of predictive mechanisms and model refinement to strengthen predictive accuracy.

The practical implications inferred from the results and discussion underscore the importance of establishing motivating policies, regulations, and overall surrounding to engage students in PEB. Policymakers and educators have a fundamental role in cultivating and developing the motivation engage in PEB. Implementing strategies such as awareness campaigns, environmental educational programs, incentives, and interventions to augment motivation as well as intention are extremely important for substantial influence toward environmentally conscious behavior.

CHAPTER 8: CONCLUSION

In this comprehensive research study, we embarked on a quest to explore the intricate relation between students' PEB and the interaction of sociocultural factors, personal norms, and UP. Our primary objective was to address four key research questions that deeply investigate the core of this intricated phenomenon.

How do sociocultural factors influence PEB?

What is the impact of PN on students' PEB?

To what extent does UP facilitate students' PEB and address the intention-behavior gap?

How do sociocultural factors, PN, and UP interact and integrate into predicting PEB?

First and foremost, our research study has shed light on the vital role of BI as mediator in shaping PEB across university students. It demonstrates how important is understanding the psychological and cognitive processes driving their decisions, through a wholistic approach encompassing societal influences, personal values, and ethics to effectively promote PEB.

Additionally, we discovered that motivation is an essential noteworthy moderator in the association BI and PEB. Highlighting the significance of cultivating students' motivation to engage in environmentally friendly actions. Intriguingly, we found that opportunity has a significant adverse moderator effect on the relationship between BI and PEB. Suggesting that scarce opportunity led students to exercise personal agency by relying on their intentions and assuming personal responsibility.

Our research effectively integrated various theoretical perspectives. The combination of TPB and NAM theory surpasses the limitation of depending on a single theoretical

framework and provides a comprehensive understanding of the variables that affect the PEB among university students.

Furthermore, the formulation of clearly defined hypotheses grounded in comprehensive literature and reliable theoretical frameworks, has provided a clear and detailed strategy for exploring the relationship between selected variables and PEB. The conceptual model gains complexity leading to depth in research through the addition of A, M, and O as moderators, referred to as UP in the resulting model.

In order to accomplish the study objectives, a quantitative cross-sectional data collection approach was adopted , a diverse population sample of 641 participants were collected randomly and validated to gain better insight on university students PEB and justify the generalizability of our findings. The survey was thoughtfully designed to compile information on demographic characteristics, attitudes, and convictions concerning PEB. Reliability and validity of data was enhanced using previously established valid and reliable variables measures. Our adherence to research ethics, particularly protecting participants anonymity, confidentiality, and obtaining QU-IRB approval illustrates our commitment to conduct principled and rigorous research.

Looking ahead, the current research study proposes several avenues for further research. Broadening the demographic categories of participants could improve future research findings generalizability. Greater understanding is achievable through deeper exploration of the cultural and socioeconomic backgrounds influences on PEB.

Additionally, responses biases might be extensively mitigated by incorporating self-reported data procedure and objective measure analysis accuracy.

Taking into account the temporal dynamics, longitudinal studies are likely to enable determining the evolving nature of the association BI and PEB over time for more informed decision-making process and accurate interventions.

This research study advances our understanding and conception of PEB among higher education students, providing educators, researchers, and decision makers with valuable and practical insights to promote sustainable activities. Our research's results pose challenges on traditional assumptions more about the significance of external factors while simultaneously demonstrating the relevance of motivation and external agency in advancing pro-environmental actions. Accordingly, our study considerably contributes to the discipline of environmental sustainability and the broader concept of sustainability.

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APPENDICES

Appendix A: Arabic survey

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نموذج الموافقة المسبقة "النسخة العربية"

-موضوع البحث:

الفجوة بين النية السلوكية والسلوك المؤيد للبيئة لدى طلاب التعليم العالي:
دور الجامعة وتأثير العوامل الاجتماعية والثقافية والقيم الشخصية للطلاب

- نموذج الموافقة المسبقة:

نشكرك على المشاركة في الدراسة البحثية المتعلقة بسلوك طلاب التعليم العالي المؤيد للبيئة في قطر. مشاركتك طوعية تماما، ويمكنك الانسحاب في أي وقت تريده لا توجد إجابات صحيحة أو خاطئة على الأسئلة التي سنطرحها. نأمل أن تتمكن من مشاركتنا ردودك الصريحة أثناء الرد على أسئلة الاستبيان. يرجى أخذ الوقت الكافي لقراءة المعلومات أدناه.

الغرض من البحث وطبيعته:

العنوان: سلوك طلاب التعليم العالي المؤيد للبيئة: دور الجامعة وتأثير العوامل الاجتماعية والثقافية والقيم الشخصية للطلاب

طبيعة البحث: البحث كمي ويتم إجراؤه كجزء من متطلبات مشروع التخرج في برنامج ماجستير إدارة الأعمال في كلية الإدارة والاقتصاد بجامعة قطر.

الغرض من البحث: الغرض من الدراسة هو تقييم تأثير الممارسات الجامعية والعوامل الاجتماعية والثقافية والمعيارية على سلوك الطلاب المؤيد للبيئة، وكذلك دراسة الفجوة بين "النية والسلوك المؤيد للبيئة". تتضمن الدراسة استبيان موجه لجميع مستويات التعليم العالي.

وصف الدراسة:

إن التحديات المتصلة بأهداف الاستدامة تتطلب جهودا عالمية ترمي إلى "تلبية احتياجات الحاضر دون المساس بقدرة أجيال المستقبل على تلبية احتياجاتها الخاصة". وبما أننا نواجه تهديدات بيئية حقيقية ووشيكة، فقد سلطت الدراسة الضوء على الاستدامة البيئية، من منظور السلوك الداعم للبيئة لدى طلاب الجامعات، فيما يتصل بالممارسات الجامعية، والعوامل الاجتماعية الثقافية، والقيم الذاتية للطلاب. حيث أن الطلاب هم قادة المستقبل، والمهنيين، وأعضاء المجتمع المؤثرين بشكل فعال.

المخاطر و / أو الأضرار و / أو الفوائد المحتملة: لا يوجد أي ضرر أو مخاطر ذات صلة بموضوع الدراسة. قد تفيد النتائج الإجمالية الجهود الوطنية والدولية نحو الاستدامة البيئية من خلال تزويدهم برؤى حول الاستنتاجاتنا. لا توجد فائدة مباشرة للمشاركين للمشاركة في هذه الدراسة.

عدم الرغبة في المشاركة في الدراسة و / أو الانسحاب من الدراسة لن تأثر بأي شكل من الأشكال على العلاقة

بين الطالب والمدرس أو تؤثر على تقييم درجات الطلاب في المقرر الدراسي. وبالمثل، فإن المشاركة في

الدراسة لن تأثر بأي شكل من الأشكال على العلاقة بين الطالب والمدرس أو تؤثر على تقييم درجات الطلاب في

المقرر الدراسي.

</div>

Approved Date: May 1, 2023	
Qatar University Institutional Review Board (QU-IRB)	1

إجراء الموافقة: جميع المعلومات الضرورية المتعلقة بموافقتك للرد على الاستطلاع موجودة في نموذج الموافقة، في القسم الثاني من الاستبيان عبر الإنترنت، وسيتم التوقيع عليه افتراضيًا، إلكترونيًا عبر النقر على "موافق" أو لا أوافق" للمشاركة.

المشاركة والوقت المطلوب من المشارك:

الوقت المتوقع لإكمال الاستبيان هو حوالي 15 دقيقة أو أقل.

مصير العينة: سيتم تخزين جميع البيانات في جهاز كمبيوتر محمي بكلمة مرور. لذلك، سيتمكن الباحث فقط من الوصول إلى البيانات التي لن يتم مشاركتها مع الآخرين خارج المشروع تحت أي ظرف من الظروف. لن يتم إعادة استخدام البيانات في المستقبل. **قد يتم الاحتفاظ بالبيانات لمدة خمسة سنوات.**

حجم العينة: تقنية أخذ العينات العشوائية، بمستوى ثقة 95%، وحجم سكان 23000 (عدد الطلاب في جامعة قطر)، وحجم العينة المحسوب من خلال حاسبة حجم العينة Raosoft والمطلوب هو 377 مشاركًا.

معايير الشمول: يمكن لطلاب التعليم العالي، من جميع التخصصات والمجالات ومستويات الدراسة، الرد على الاستبيان. • الطلاب يجب أن يكون المشاركون أكبر من 18 عامًا. • سيكون الاستبيان متاحًا بلغتين "العربية والإنجليزية": يجب أن يكون الطلاب المشاركون قادرين على القراءة والفهم إما الإنجليزية أو العربية.

معايير الاستبعاد: المشاركون الذين لا يستوفون متطلبات العمر أو الذين تقل أعمارهم عن 18 عامًا. • المشاركون غير الملتحقين بمؤسسات التعليم العالي. • المشاركون الذين لا يستطيعون قراءة أو فهم اللغة الإنجليزية أو العربية.

السرية:

سيتم الحفاظ على سرية أي معلومات تعريف شخصية يتم الحصول عليها فيما يتعلق بهذه الدراسة ثم تحذف. استطلاع الرأي مجهول الهوية تماما. يمكن الاحتفاظ بالبيانات **لمدة خمسة سنوات.** إذا تم نشر نتائج البحث أو مناقشتها في المؤتمرات، فلن يتم تضمين أي معلومات من شأنها أن تكشف عن هويتك. سيتم تأمين المعلومات ولن يتمكن إلا الباحث من الوصول إليها. **بعد خمس سنوات، سيتم حذف البيانات نهائيًا من جهاز الكمبيوتر الآمن حيث تم تخزينها.**

ستتم إزالة جميع المعلومات الشخصية أو المعرفات مثل الأسماء وأرقام الهوية والبريد الإلكتروني وأرقام الهواتف. فقط إذا لزم الأمر، يمكن لجامعة قطر - مجلس المراجعة المؤسسية (QU-IRB)) ووزارة الصحة العامة الوصول إلى البيانات.

2

المشاركة والانسحاب - التكلفة و / أو التعويض عن المشاركة: إجابتك على الأسئلة الواردة في الاستبيان أساسية لإكمال الدراسة، ومشاركتك طوعية، وقد تسحب موافقتك في أي وقت وتتوقف عن المشاركة. لن يتم تكبد أي تكلفة. لن تحصل على تعويض عن المشاركة في هذه الدراسة.   إذا كان عمرك أقل من 18 عامًا، فيرجى عدم المشاركة في الاستبيان.

تمت الموافقة على الدراسة من قبل مجلس المراجعة المؤسسية بجامعة قطر برقم الموافقة ....؛ إذا كانت لديك أي أسئلة تتعلق بالامتثال الأخلاقي للدراسة، فيمكنك الاتصال بهم على **QU-IRB@qu.edu.qa.**

شكرا جزيلا لكم مقدما على مشاركتكم الكريمة في هذا الاستبيان. نحن نقدر وقتك وجهدك.

إذا كانت هناك أي أسئلة تتعلق بالاستطلاع أو ترغب في الحصول على مزيد من التفاصيل حول النتائج والاستنتاجات، فلا تتردد في الاتصال بي و / أو مشرفي على العناوين أدناه.

- "الدكتور": لنور شرف الدين.   - "الطالب": محمد الحمروني.

-البريد الإلكتروني: lcharfeddine@qu.edu.qa.   -البريد الإلكتروني: mh2000166@qu.edu.qa.

-الها تف: 974 4403 7764+   -الجوال: +974 5573 4810

يرجى الإشارة إلى أنك قد قرأت وفهمت ما ورد أعلاه إذا

:وافقت عل المشاركة

☐   إن لم توافق ☐علامة لا"   ضع علامة "نعم"

-موضوع البحث:

طلاب التعليم العالي، الفجوة بين النية السلوكية والسلوك المؤيد للبيئة:
دور الجامعة وتأثير العوامل الاجتماعية والثقافية والقيم الشخصية للطلاب

-القسم:1.
-معلومات عامة:

1-الفئة العمرية:

56=<	46-55	36-45	26-35	18-25
☐	☐	☐	☐	☐

2-الجنس:

أنثى	ذكر
☐	☐

3-الحالة الاجتماعية:

متزوج	أعزب
☐	☐

4-الجنسية:

غير قطري	قطري
☐	☐

5-المستوى التعليمي: درجة البكالوريوس — درجة الماجستير — درجة الدكتوراه

درجة الدكتوراه	درجة الماجستير	درجة البكالوريوس
☐	☐	☐

6- أي مما يلي يصف تخصصك الدراسي بشكل أفضل؟

> العلوم، الفنون، الفنون الجميلة، الأعمال التجارية، التقنية التطبيقية /
> المهنية، الصحة المساعدة، علوم الكمبيوتر، أخرى - حدد

7-التوظيف (هل تدرس وتعمل أم تدرس فقط):

طالب وموظف	طالب فقط.
☐	☐

8-المهنة (إذا كنت موظفا):

> اختر مهنة: على سبيل المثال: مصرفي.
> إذا لم يكن متاحا، فحدد "أخرى".

القسم:2. -عناصر الاستبيان:

أعزائي المشاركين، بما أن طلاب اليوم هم قادة المستقبل، فإن مساهمتهم في التنمية المستدامة وعلى وجه التحديد في الاستدامة البيئية، موضوع الدراسة الحالية، أمر بالغ الأهمية وأساسي. يهدف الاستطلاع إلى المساعدة في فهم سلوك طلاب التعليم العالي المؤيد للبيئة بشكل أفضل.

التعريفات التالية تساعد أثناء إكمال الاستبيان.

الاستدامة البيئية: القدرة على الحفاظ على التوازن البيئي في البيئة الطبيعية لكوكبنا والحفاظ على الموارد الطبيعية لدعم رفاهية الأجيال الحالية والمستقبلية.

السلوك المؤيد للبيئة: السلوك الذي يختاره الشخص بوعي لتقليل التأثير السلبي لأفعاله على البيئة.

يرجى الإشارة إلى عدد المرات التي تؤدي فيها كل من السلوكيات التالية
الردود: 0: أبدًا، 1: نادرًا جدًا، 2: نادرًا، 3: من حين لآخر، 4: كثيرًا جدًا، 5: دائمًا

5	4	3	2	1	0	السلوك المؤيد للبيئة	عدد
						أترك المياه جارية بينما أغسل أسناني	1
						أنسى إطفاء الضوء عندما أغادر غرفتي لأتناول الطعام	2
						أترك باب الثلاجة مفتوحًا بينما أفكر فيما سآكله	3
						في المنزل، أضع القمامة في صندوق إعادة التدوير المناسب	4
						استخدم كلا وجهي الورقة عندما أرسم أو أطبع مستندًا	5
						في الجامعة، أضع القمامة في سلة المهملات المناسبة	6
						أترك التلفاز مفتوحًا أثناء قيامي بأشياء أخرى في المنزل	7
						أطفئ التلفاز أو لعبة الفيديو عندما أذهب لتناول الطعام	8
						أستحم لأكثر من 20 دقيقة	9
						عندما أكون بالخارج، أتجنب إلقاء القمامة	10
						عندما أشعر بالبرد، أرتدي سترة بدلاً من استعمال الدفاية	11
						أقرأ وثائق أو كتبًا عن حماية البيئة أو الحيوان	12
						أنا أستهلك المنتجات البيولوجية	13

يرجى تقييم نيتك لأداء سلوك مؤيد للبيئة باستخدام الاستجابات التالية:
"1: بالتأكيد لا" - "2: على الأرجح لا" - "3: ربما لا" - "4: نعم ربما" - "5: نعم على الأرجح" - "6: نعم بالتأكيد

6	5	4	3	2	1	النية السلوكية	عدد
						أنا مصمم على أداء السلوكيات المؤيدة للبيئة بشكل منتظم	1
						لدي الإرادة لأداء السلوكيات المؤيدة للبيئة بانتظام	2

يرجى اختيار الإجابة القابلة للتطبيق عن طريق اختيار إجابة واحدة من الأسئلة التالية:
الردود: 1 لا على الإطلاق، 2: إلى حد ضئيل، 3: إلى حد ما، 4: إلى حد كبير، 5: إلى حد كبير جدا:

5	4	3	2	1	تعزيز قدرات الطالب	عدد
					أثمن مبادرات الاستدامة البيئية لجامعتي.	1
					جامعتي تشجع وتكافئ الطلاب الذين لديهم وعي بيئي.	2
					أفضل الدراسة في جامعتي بسبب أدائها البيئي.	3
					تقدم جامعتي برامج أو ورش عمل للتوعية البيئية لتحسين معرفتي البيئية.	4
					في جامعتي، يتم توفير تدريب متكامل لتعزيز رغبة الطلاب في المشاركة في الإدارة البيئية للحفاض على البيئة (برامج الاستدامة أو ورش العمل، وكيفية إعادة التدوير؛ إدارة النفايات، وتجنب أشياء ذات الاستعمال الواحد، وما إلى ذلك).	5
					جامعتي توفر معلومات حول البيئة لطلاب وإرشادات حول السلوك البيئي المستدام (مثل البرامج البيئية، وتوفير الطاقة، وملصقات توفرة المياه).	6

					تحفيز الطلبة	عدد
					في جامعتي، يمكن أن يؤدي عدم احترام قوانين البيئة أو عدم تحقيق الأهداف البيئية إلى نتائج سلبية (مثل ...)	1

						سبيل المثال، غرامة التدخين في الحرم الجامعي).	
						في جامعتي، هناك جوائز وحوافز مالية لتعزيز سلوكي البيئي.	2
						تحدد جامعتي المسؤوليات والالتزامات البيئية بالنسبة لي كطالب (على سبيل المثال، تقليل استخدام الورق المطبوع؛ قلل من النفايات البلاستيكية ذات الاستخدام الواحد، وأطفئ الأنوار).	3
						في جامعتي، يتم تقديم مزايا وسائل تنقل صديقة للبيئة (على سبيل المثال، أنظمة الاجتماعات عبر الإنترنت؛ عربات كهربائية، تتوفر الدراجات للتنقل داخل الحرم الجامعي).	4
						لدي مؤشرات أداء بيئي "خضراء" لتقييم مساهمتي في أهداف الاستدامة البيئية لجامعتي.	5
						في جامعتي، يتم تقديم مكافآت قائمة على تقدير وتشجيع مشاركتي في إدارة البيئة (على سبيل المثال، الجوائز أو الهدايا أو الشهادات).	6

5	4	3	2	1	توفير فرص للطلبة	عدد
					في جامعتي، يتم تشجيعي على المشاركة في تحسين الجودة وحل المشكلات المتعلقة بالقضايا البيئية.	1
					في جامعتي، لدي فرص للمشاركة في الإدارة البيئية مثل خطط الاقتراحات والبرامج المجتمعية للتوعية البيئية والمبادرات الخضراء).	2
					لدى جامعتي رؤية تنموية واضحة لتوجيه مشاركتي في إدارة البيئة.	3
					في جامعتي، أشارك في مناخ تعليمي تشاركي بين الطلاب من أجل السلوك والوعي البيئي المستدام (على سبيل المثال، حملات التنظيف، والمشاريع المجتمعية القائمة على البيئة).	4
					في جامعتي، لاحظت عددا من قنوات الاتصال الرسمية أو غير الرسمية لنشر الثقافة الخضراء واستدامة البيئة (على سبيل المثال، عبر البريد الإلكتروني والملصقات وما إلى ذلك).	5

يرجى الإشارة إلى درجة موافقتك أو عدم موافقتك على العبارات التالية.
"1: لا أوافق بشدة، 2 لا أوافق، 3 لا أوافق إلى حد ما، 4: محايد لا أوافق ولا نختلف)، 5: أوافق إلى حد ما،
6: أوافق، 7: أوافق بشدة".

7	6	5	4	3	2	1	المعايير الشخصية	عدد
							أشعر بالتزام أخلاقي لحماية البيئة.	1
							أشعر أنه يجب على حماية البيئة	2
							أشعر أنه من المهم أن يحمي الناس البيئة بشكل عام.	3
							بسبب قيمي / مبادئي الخاصة، أشعر بالتزام بالتصرف بطريقة صديقة للبيئة.	4

7	6	5	4	3	2	1	السيطرة السلوكية	عدد
							من السهل بالنسبة لي القيام بأنشطة مستدامة بيئيا (على سبيل المثال، الحفاظ على الطاقة وإعادة التدوير)	1
							لدي سيطرة على أفعالي لدعم البيئة	2
							إنه قراري المحض ما إذا كنت سأؤدي أنشطة مستدامة بيئيا أم لا.	3
							لدي القدرة على القيام بأنشطة مستدامة بيئيا.	4
							لدي قدرة وسيطرة على أداء الأنشطة المستدامة بيئيا.	5

7	6	5	4	3	2	1	القواعد الذاتية	عدد
							يعتقد معظم الأشخاص المهمين بالنسبة لي أنه يجب على الانخراط في النشاط البيئي.	1
							معظم الأشخاص المهمين بالنسبة لي يوافقون على دعمي للمجموعات البيئية.	2
							يعتقد معظم الأشخاص المهمين بالنسبة لي أنني يجب أن أصوت لصالح سياسات واعية بيئيا.	3

يرجى الإشارة إلى درجة موافقتك أو عدم موافقتك على العبارات التالية.
1: لا أوافق بشدة، 2 لا أوافق، 3: محايد لا أوافق ولا نختلف)، 4: أوافق، 5: أوافق بشدة.

الموقف تجاه السلوك المؤيد للبيئة	1	2	3	4	5	عدد
أنا أؤيد التصرف المؤيد للبيئة في مجتمعي.						1
أعتقد أنها فكرة جيدة أن يدعم كل مواطن السلوك المؤيد للبيئة.						
السلوك المؤيد للبيئة مهم بالنسبة لي.						

4	.أعتقد أنه يتم إيلاء اهتمام جيد للسلوك المؤيد للبيئة في مجتمعي					
5	.أعتقد أن السلوك المؤيد للبيئة في مجتمعي جيد					

Appendix B: English survey

The informed consent "English Version"

-Research Topic:

Higher education students' intention and pro-environmental behavior gap,

the role of university practices, sociocultural factors, and individual norms.

- Informed Consent form:

Thank you for agreeing to participate in the research study related to higher education students' pro-environmental behavior in Qatar. Your participation is completely voluntary, and you can withdraw at any time you wish. There are no right or wrong answers to the questions we will pose. We hope you can share with us your honest responses while responding to the survey questions. Kindly take your time to read the information below.

Purpose and Nature of the Research:

Title: Higher education students' Intention and pro-environmental behavior Gap, the Role of university practices, sociocultural factors, and Individual, norms.

Nature: The research is quantitative and being conducted as part of my graduation project requirements in an MBA program at the College of Business and Economics, Qatar University.

Purpose: The purpose of the study is to assess the influence of university Practices, sociocultural, and normative factors on students' pro-environmental behavior, as well as the gap between "intention, and pro-environmental behavior". The study involves surveying all levels of higher education students.

Description of the Study:

The challenging aspect of sustainability goals appeals to global efforts to "meet the needs of the present without compromising the ability of future generations to meet their own needs". Since we are facing real and imminent environmental threats, the study shed light on environmental sustainability, from the perspective of university students' pro-environmental behavior, with regard to university Practices, sociocultural, and normative factors. As Students are future leaders, professionals, and actively influential societal members.

Potential Risks, Harms, and/or Benefits:

There is no harm or possibly related risks that we can foresee to the subjects of the study. The overall results may benefit national and international efforts toward environmental sustainability by providing insights into our discoveries. There is no direct benefit to the participants for participating in this study.

Unwillingness to participate in the study and/or withdrawal from the study will not in any way interfere with the student-instructor relationship or affect students' course grades assessment. Similarly, participation in the study will not in any way interfere with the student-instructor relationship or affect students' course grades assessment.

Consenting Procedure: All the necessary information related to your consent to respond to the survey is within the consent form, in the second section of the online survey, and will be signed virtually, electronically via a click on YES "agree" or NO "disagree" to participate.

Approved Date: May 1, 2023

Qatar University Institutional Review Board (QU-IRB)

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Task and Time required from the participant: The expected time to complete the questionnaire is approximately 15 minutes or less.

The fate of the sample: All data will be stored in a password-protected computer. Therefore, only the researcher will have access to the data which will not be shared with others outside of the project under any circumstances. Data Will not be reused in the future. **Data will be kept for five years.**

Sample size: Random sampling technique, at the confidence level of 95% and population size of 23,000(number of students at Qatar University), the sample size calculated through the Raosoft Sample Size calculator and needed is 377 participants.

Inclusion criteria: Higher education students, from all majors, fields, and levels of study are able to respond to the survey. • Students Participants must be older than 18 years old. • The survey will be available in two languages "Arabic and English": Student participants must be able to read and understand either English or Arabic.

Exclusion Criteria: Participants who do not meet the age requirement or are younger than 18 years old. •Participants who are not enrolled in a higher education institution. • Participants who cannot read or understand English or Arabic languages.

Confidentiality: Any personally identifying information that is obtained in connection with this study will be kept confidential and removed. The survey is completely anonymous. **The data will be kept for five years**. If the results of the research are published or discussed at conferences, no information will be included that would reveal your identity. The information will be secured and only the researcher will have access to it. **After five years data will be deleted permanently from the secure computer where it was stored**.

all personal information or identifiers such as names, ID numbers, e-mails, and phone numbers will be removed.

Only if needed QU-IRB and the Ministry of Public Health can access the data.

Participation and Withdrawal - Cost and/or Compensation for Participation:

Your answer to the questions in the survey is fundamental to the completion of the study, your participation is voluntary, and you may withdraw your consent at any time and discontinue participation. no cost shall be incurred. You will not receive compensation for participating in this study. Please do not take the survey if you are less than 18 years old.

the study is approved by the Qatar University Institutional Review Board with the approval number.....................; If you have any questions related to the ethical compliance of the study you may contact them at **QU-IRB@qu.edu.qa.**

Thank you very much in advance for your kind participation in this survey. We do appreciate your time and effort.

If there are any questions concerning the survey or would like to receive more details about the results and conclusions, feel free to contact me and/or my supervisor at the addresses below.

-"Student": Mohamed Hamrouni.   -"Professor": Lanouar Charfeddine.

-Email: mh2000166@qu.edu.qa.   -Email: lcharfeddine@qu.edu.qa.

-Mobile: +974 5572 4810   -Phone: +974 4403 7764.

Approved Date: May 1, 2023

Qatar University Institutional Review
Board (QU-IRB)

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Please indicate that you have read and understood the above if you agree to participate:

Tick "Yes" ☐   **if not tick "No"** ☐

Approved Date:	May 1, 2023
Qatar University Institutional Review Board (QU-IRB)	

3

The questionnaire "English Version"

-Research Topic:

Higher education students' intention and pro-environmental behavior gap,

the role of university practices, sociocultural factors, and individual norms.

-Section:1.

-General Information;

1-Age Category:

18-25	26-35	36-45	46-55	>=56
☐	☐	☐	☐	☐

2-Gender:

Male	Female
☐	☐

3-Marital status:

Single	Married
☐	☐

4-Nationality:

Qatari	Non-Qatari
☐	☐

5-Educational Level:

Bachelor's degree	master's degree	Doctorate degree
☐	☐	☐

6- Which of the following best describes your program area?

Sciences, Arts, Fine Arts, Business, Applied Technical/Vocational, Allied Health, Computer Science, Other – Specify

7-Employment (are you a working student or studying only):

Employed	Only student.
☐	☐

8-Occupation (If you are employed):

Approved Date:	May 80 2023 Select an occupation: e.g.: Banker.
Qatar University Institutional Review Board (QU-IRB)	If not available, select "other".

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-Section:2.   -Questionnaire Items:

Dear participants, as today's students are our future leaders, their contribution to sustainable development and precisely to environmental sustainability, the topic of the current study, is critical and fundamental. The survey is intended to help better understand higher education students' pro-environmental behavior. The following definitions may help you as you complete the survey.

Environmental sustainability: The ability to maintain an ecological balance in our planet's natural environment and conserve natural resources to support the well-being of current and future generations.

Pro-environmental behavior: The behavior that a person consciously chooses to minimize the negative impact of their actions on the environment.

Please indicated how often you perform each of the following behaviors.
Responses: 0: Never, 1:Very Rarely, 2:Rarely, 3:Occasionally, 4:Very Frequently, 5:Always.

Num	Pro-environmental Behavior	0	1	2	3	4	5
1	I leave the water running while I brush my teeth						
2	I forget to turn off the light when I leave my room to go eat						
3	I leave the fridge door open while I think about what I go eat						
4	At home, I put my trash in the proper recycling bin						
5	I use both sides of the paper sheet when I draw or print a document						
6	At university, I put my trash in the proper recycling bin						
7	I leave the TV on while I'm doing other things in the house						
8	I turn off the TV or the video game when I go eat						
9	I shower for more than 20 min						
10	When I'm outside, I avoid littering						
11	When I'm cold, I put on a sweater instead of turning up the heat						
12	I read documents or books about environmental or animal protection						
13	I consume biological products						

Please rate your intention to perform pro-environmental behavior using the following responses:
"1:definitely not" – "2:Probably Not"-" 3:Possibly Not"- "4:Yes possibly"- "5:yes probably"- "6:Yes definitely"

Num	Behavioral Intention	1	2	3	4	5	6
1	I am determined to perform pro-environmental behaviors on a regular basis						
2	I have the will to perform pro-environmental behaviors on a regular basis						

Please choose the applicable answer by selecting one response from the bellow questions:
Responses: 1: Not at all, 2: To a little extent, 3:To some extent, 4:To a great extent, 5:To a very great extent.

Num	Ability	1	2	3	4	5
1	I am attracted by the environmental sustainability initiatives of my university.					
2	My university reward students who have environmental awareness.					
3	I prefer to study at my university because of its environmental performance.					
4	My university provides environmental awareness programs or workshops to improve my environmental knowledge.					
5	In my university, integrated training to create the emotional involvement of students in environmental management is provided (Sustainability programs or workshops, how to recycle; manage waste, avoid disposable items, etc.).					
6	My university has green knowledge sharing to guide me about environmental behavior (such as environmental programs, energy-saving, water-saving posters, etc.).					
Num	Motivation	1	2	3	4	5
1	In my university, non-compliance or not meeting environmental goals can bring dis-benefits for me (e.g. decline for looking a campus).					
2	At my university, there are financial incentives for me to promote my environmental behavior.					
3	My university sets environmental responsibilities for me (e.g., minimize the use of printed paper;					

	Reduce single-use plastic waste, and turn off the lights.).					
4	In my university, I am offered green travel benefits (e.g., online meeting systems; on car-free day buggies, shuttle service or bicycles are available to commute within campus).					
5	I have green performance indicators in my contribution to the green objective of my university.					
6	In my university, recognition-based rewards are offered to encourage my participation in environment management (e.g., public recognition, awards, gift, or certificates).					
Num	**Opportunity**	1	2	3	4	5
1	At my university, I am encouraged to involve in quality improvement and problem-solving on green issues.					
2	At my university, I have opportunities to participate in environmental management such as suggestion schemes, community programs for environmental awareness, and green initiatives).					
3	My university has a clear developmental vision to guide my actions in environmental management.					
4	In my university, I am involved in a mutual learning climate among students for green behavior and awareness (e.g., cleaning campaigns, and environmental-based community projects).					
5	In my university, I have observed a number of formal or informal communication channels to spread green culture (e.g., via email, posters, etc.).					

Please indicate the degree to which you agree or disagree with the following statements.
"1: Strongly Disagree, 2: Disagree, 3: Somewhat disagree, 4: Neutral (neither agree nor disagree), 5: Somewhat agree, 6: Agree, 7: Strongly agree".

Num	**Personal Norms**	1	2	3	4	5	6	7
1	I feel a moral obligation to protect the environment.							
2	I feel that I should protect the environment							
3	I feel it is important that people, in general, protect the environment.							
4	Because of my own values/principles, I feel an obligation to behave in an environmentally friendly Way.							
Num	**Perceived Behavioral Control**	1	2	3	4	5	6	7
1	It is easy for me to perform environmentally sustainable activities (e.g., energy conservation, recycling)							
2	I have control over my actions to support the environment							
3	It is my decision whether or not to perform environmentally sustainable activities.							
4	I have the ability to carry out environmentally sustainable activities.							
5	I have control over performing environmentally sustainable activities.							
Num	**Subjective Norms**	1	2	3	4	5	6	7
1	Most people who are important to me think that I should engage in environmental activism.							
2	Most people who are important to me would approve of my support of environmental groups.							
3	Most people who are important to me think that I should vote for environmentally conscious policies.							

Please indicate the degree to which you agree or disagree with the following statements.
1: Strongly Disagree, 2: Disagree, 3: Neutral (neither agree nor disagree), 4: Agree, 5: Strongly agree.

Num	**Attitude Toward Pro-Environmental Behavior**	1	2	3	4	5
1	I'm in favor of behaving pro-environmentally in my society.					
2	I think it's a good idea for each citizen to support pro-environmental behavior.					
3	The pro-environmental behavior is important to me.					
4	I think good attention is paid to pro-environmental behavior in my society.					
5	I think pro-environmental behavior in my society does good.					

Approved Date: May 1, 2023

Qatar University Institutional Review Board (QU-IRB)

Appendix C: QU-IRB Approval letter

Qatar University Institutional Review Board QU-IRB
QU-IRB Registration: IRB-QU-2020-006, QU-IRB, Assurance: IRB-A-QU-2019-0009

DATE:	May 1, 2023
TO:	Lanouar Charfeddine, Ph.D
FROM:	Qatar University Institutional Review Board (QU-IRB)
PROJECT TITLE:	2019875-1 Higher education students' intention and pro-environmental behavior gap: The role of university practices, sociocultural factors, and individual norms.
QU-IRB REFERENCE #:	QU-IRB 1847-E/23
SUBMISSION TYPE:	New Project
ACTION:	DETERMINATION OF EXEMPT STATUS
DECISION DATE:	May 1, 2023
REVIEW CATEGORY:	Exemption category # 2

Thank you for your submission of New Project materials for this project. The Qatar University Institutional Review Board (QU-IRB) has determined this project is EXEMPT FROM IRB REVIEW according to Qatar Ministry of Public Health regulations. Please note that exempted proposals do not require renewals however, any changes/modifications to the original submitted protocol should be reported to the committee to seek approval prior to continuation.
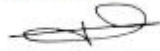
We will retain a copy of this correspondence within our records.

Documents Reviewed:

- Application Form - QU-IRB Check List.pdf (UPLOADED: 02/11/2023)
- Consent Form - Updated Informed consent Form in Arabic .docx (UPLOADED: 04/13/2023)
- Consent Form - Updated Informed Consent Form in English.docx (UPLOADED: 04/13/2023)
- Qatar University - IRB Application - Qatar University - IRB Application (UPLOADED: 04/13/2023)
- Questionnaire/Survey - Final survey format "Google Forms" PDF with consent in Arabic (UPLOADED: 04/13/2023)
- Questionnaire/Survey - Final survey format "Google Forms" PDF with consent in English (UPLOADED: 04/13/2023)
- Questionnaire/Survey - Questionnaire survey in Arabic (UPLOADED: 02/11/2023)
- Questionnaire/Survey - Questionnaire.docx (UPLOADED: 02/11/2023)
- Training/Certification - CITI SBE Completion Certificate (Student certificate) (UPLOADED: 03/19/2023)
- Training/Certification - CITI SBE Completion Certificate (Project supervisor) (UPLOADED: 03/19/2023)

If you have any questions, please contact QU-IRB at 4403 5307 or qu-irb@qu.edu.qa. Please include your project title and reference number in all correspondence with this committee.

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Best wishes,

Dr. Emad Abu Shanab
Chairperson, QU-IRB

Institutional Review Board
(IRB)
Office Of Academic Research

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Appendix D: Factor Loadings

	01. PBC	02. APB	03. SN	04. PN	05. BI	06. A	07. M	08. O	09. PEB
PBC1	0.839								
PBC2	0.908								
PBC3	0.794								
PBC4	0.905								
PBC5	0.878								
APB1		0.837							
APB2		0.883							
APB3		0.895							
APB4		0.685							
APB5		0.662							
SN1			0.890						
SN2			0.925						
SN3			0.930						
PN1				0.921					
PN2				0.949					
PN3				0.933					
PN4				0.922					
BI1					0.938				
BI2					0.934				
A1						0.722			
A2						0.764			
A3						0.725			
A5						0.823			
A6						0.799			
M1							0.733		
M2							0.762		
M3							0.842		
M4							0.709		
M5							0.723		
M6							0.782		
O1								0.823	
O2								0.857	
O3								0.862	
O4								0.797	
O5								0.844	
PEB1									-0.020
PEB2									0.046
PEB3									0.060

	01. PBC	02. APB	03. SN	04. PN	05. BI	06. A	07. M	08. O	09. PEB
PEB4									**0.416**
PEB5									**0.499**
PEB6									**0.734**
PEB7									0.126
PEB8									**0.461**
PEB9									0.347
PEB10									**0.457**
PEB11									**0.608**
PEB12									**0.403**
PEB13									**0.469**

Appendix E: Outer model collinearity

	VIF
SN3	**3.432**
SN2	**3.160**
SN1	**2.457**
PN4	**3.821**
PN3	**4.882**
PN2	5.948
PN1	**3.897**
PEB9	**1.211**
PEB8	**1.202**
PEB7	**1.369**
PEB6	**1.338**
PEB5	**1.169**
PEB4	**1.086**
PEB3	**1.264**
PEB2	**1.341**
PEB13	**1.244**
PEB12	**1.190**
PEB11	**1.245**
PEB10	**1.161**
PEB1	**1.187**
PBC5	**3.232**
PBC4	**3.662**
PBC3	**2.045**
PBC2	**3.548**
PBC1	**2.533**
O5	**1.874**
O4	**1.893**
O3	**2.622**
O2	**2.976**
O1	**2.619**
M6	**2.408**
M5	**1.986**
M4	**1.982**
M3	**1.868**
M2	**1.977**
M1	**1.397**
BI2	**2.296**
BI1	**2.296**
APB5	**1.896**
APB4	**2.016**
APB3	**2.969**
APB2	**3.103**

	VIF
APB1	**2.473**
A6	**2.234**
A5	**2.823**
A4	**2.638**
A3	**1.771**
A2	**1.994**
A1	**1.335**

Appendix F: Construct reliability analysis

	Cronbach's alpha	Composite reliability (rho-c)
01. PBC	**0.916**	**0.937**
02. APB	**0.857**	**0.897**
03. SN	**0.903**	**0.939**
04. PN	**0.949**	**0.963**
05. BI	**0.858**	**0.934**
06. A	**0.875**	**0.903**
07. M	**0.862**	**0.888**
08. O	**0.896**	**0.920**
09. PEB	0.539	**0.757**

Appendix G: Construct reliability analysis

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)
01. PBC	**0.916**	**0.927**	**0.937**
02. APB	**0.857**	**0.893**	**0.897**
03. SN	**0.903**	**0.907**	**0.939**
04. PN	**0.949**	**0.949**	**0.963**
05. BI	**0.858**	**0.859**	**0.934**
06. A	**0.875**	**0.912**	**0.903**
07. M	**0.862**	**0.928**	**0.888**
08. O	**0.896**	**0.987**	**0.92**
09. PEB	0.539	**0.617**	**0.757**

Appendix H: Cross loading for discriminant validity

Items	01. PBC	02. APB	03. SN	04. PN	05. BI	06. A	07. M	08. O	09. PEB
PBC1	**0.839**	0.507	0.521	0.676	0.395	0.351	0.243	0.305	0.331
PBC2	**0.908**	0.612	0.606	0.761	0.492	0.358	0.256	0.312	0.332
PBC3	**0.794**	0.458	0.510	0.561	0.361	0.302	0.202	0.275	0.238
PBC4	**0.905**	0.552	0.610	0.697	0.482	0.352	0.204	0.322	0.323
PBC5	**0.878**	0.569	0.609	0.668	0.442	0.349	0.228	0.326	0.278
APB1	0.513	**0.837**	0.400	0.613	0.471	0.305	0.141	0.209	0.311
APB2	0.556	**0.883**	0.394	0.644	0.499	0.345	0.159	0.215	0.405
APB3	0.578	**0.895**	0.439	0.665	0.538	0.394	0.200	0.253	0.376
APB4	0.408	**0.685**	0.406	0.373	0.316	0.455	0.360	0.334	0.218
APB5	0.422	**0.662**	0.456	0.345	0.304	0.381	0.343	0.348	0.197
SN1	0.598	0.449	**0.890**	0.478	0.321	0.386	0.379	0.392	0.171
SN2	0.632	0.481	**0.925**	0.540	0.360	0.371	0.288	0.362	0.246
SN3	0.588	0.475	**0.930**	0.506	0.339	0.403	0.308	0.411	0.213
PN1	0.713	0.651	0.518	**0.921**	0.522	0.401	0.179	0.292	0.354
PN2	0.729	0.630	0.517	**0.949**	0.508	0.356	0.152	0.265	0.370
PN3	0.714	0.638	0.500	**0.933**	0.496	0.358	0.146	0.252	0.369
PN4	0.751	0.638	0.534	**0.922**	0.519	0.360	0.190	0.278	0.400
BI1	0.472	0.522	0.356	0.508	**0.938**	0.389	0.159	0.254	0.435
BI2	0.476	0.505	0.341	0.520	**0.934**	0.345	0.150	0.243	0.404
A1	0.432	0.467	0.344	0.458	0.462	**0.724**	0.346	0.348	0.318
A2	0.251	0.256	0.299	0.214	0.220	**0.775**	0.569	0.592	0.172
A3	0.250	0.312	0.341	0.223	0.249	**0.724**	0.529	0.541	0.130
A4	0.252	0.329	0.319	0.278	0.261	**0.837**	0.553	0.621	0.202
A5	0.251	0.299	0.294	0.235	0.220	**0.819**	0.584	0.645	0.180
A6	0.298	0.350	0.353	0.297	0.282	**0.792**	0.603	0.649	0.190
M1	0.204	0.236	0.252	0.155	0.139	0.481	**0.743**	0.450	0.089
M2	0.138	0.142	0.196	0.052	0.061	0.508	**0.767**	0.553	0.057
M4	0.195	0.219	0.316	0.159	0.135	0.491	**0.712**	0.576	0.043
M5	0.224	0.248	0.331	0.161	0.172	0.526	**0.705**	0.577	0.036
M6	0.188	0.169	0.266	0.101	0.101	0.499	**0.750**	0.629	0.025
O1	0.266	0.265	0.341	0.208	0.181	0.586	0.640	**0.835**	0.076
O2	0.297	0.266	0.375	0.232	0.195	0.635	0.652	**0.860**	0.094
O3	0.290	0.268	0.372	0.227	0.220	0.614	0.642	**0.853**	0.096
O4	0.277	0.201	0.338	0.157	0.190	0.522	0.635	**0.761**	0.066
O5	0.332	0.300	0.353	0.320	0.276	0.580	0.516	**0.862**	0.162
PEB11	0.245	0.271	0.133	0.276	0.304	0.156	0.054	0.061	**0.724**
PEB5	0.162	0.207	0.099	0.225	0.206	0.128	0.047	0.076	**0.544**
PEB6	0.317	0.347	0.234	0.349	0.417	0.280	0.094	0.134	**0.855**