Sustainable Growth Through Consumers Water Conservation in Malaysian Private Higher Institutions

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ABSTRACT

This paper aims to investigate the customers' attitude and behaviour in decision-making for water conservation in Malaysians private higher learning institutions. The study managed with convenience-sampling with quantitative research design technique using 400 respondents. In Malaysia, there have been limited studies conducted on water consumption in public universities, but there is no clear study conducted on private higher learning institutions students on water conservation effect relating to institution profitability effort. This study relates to businesses, especially for higher education institutions in identifying the factors that influence water conservation amongst students, and the efforts to encourage water conservation practice. By understanding what spurs students to practice water conservation, higher learning institutions could have a clearer perspective on the areas which require investments for profitability. Based on the findings, this study revealed that there is a significant relationship between mass media, social responsibility, self-monitoring, self-preference, self-efficacy, with water conservation for outcome of efficient business.

1. INTRODUCTION

Water is a requisite resource for business as plays a pivotal role in daily activities. Many businesses are still not aware of the importance of sustainable water management because of its low cost, although it can equate to 1 to 2% of yearly turnover [1]. Water mismanagement can put a business in a bind, whether through a faulty supply chain or negative press, but a sustainable water programme can save operating costs [1]. Businesses that are looking for methods to cut costs could also save money by deploying water-saving strategies and technologies [2].

Altering the mentality of the people so that they make more effective use of water is one way to accomplish the goal of water conservation [3, 4]. An educational environment program is one of the techniques that may be utilized. This program offers exceptional opportunity to adopt an approach that is focused on water conservation. Students will be more likely to notice that water conservation has become the norm, which will increase the likelihood that there will be a change in the way that water is used across society.

The consumption of water is one area that appears to be neglected by educational institutions of higher learning as they search for methods to cut costs and become more responsible with their personal finances. Every day, a substantial amount of water is consumed by a variety of facilities, including but not limited to: heating and cooling systems, bathrooms, water taps, cafeterias, laboratories, outdoor playgrounds, and landscaping. The process of pumping and processing water also requires a significant amount of energy, which results in high water bills. In the year 2017, research was conducted on the utilization of water at the University of Kebangsaan Malaysia (UKM). It was discovered that the annual consumption of the entire premises amounts to approximately RM500,000 [5]. Unreasonable water consumption on the part of students and staff members, in addition to water loss as a consequence of leaks, was one of the contributing factors to large water consumption [5]. The findings of the investigation indicate that if appropriate water management is implemented, it is possible to save RM200,000 annually [5].

A study on examining the pro-environmental behaviours of undergraduate students conducted by Dewi [4] shows that students in the university premises do not have a strong sense of environmental protection, which includes conserving water. It is critical to understand how students utilize water in their daily lives in the premises of the university in order to improve water management as students spends most of their time in the campus grounds, calling it their second home.

In Malaysia, there have been limited studies conducted on water consumption in universities but there has been no study so far in Malaysia that analyses the higher learning institutions profitability based on water conservation amongst the public and private universities students in Malaysia. The paper aims to investigate the consumers (students) attitude and behaviour in decision-making for water conservation in higher learning institutions.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Environmental behaviour

Environmental behavior is characterized as any action that exerts a substantial environmental influence, regardless of its magnitude or nature, whether beneficial or detrimental [6]. Environmental behaviour encompasses a broad spectrum of actions, including private activities like sustainable purchasing, resource conservation, waste management, and urban transit use, alongside public actions such as environmental citizenship and policy advocacy [6]. Environmental behaviors can be assessed based on ecological knowledge, determining their impact on the ecosystem and categorizing them as ecologically friendly or unfriendly. Human behavior towards the environment is shaped by external variables (the individual's surroundings) and internal elements (the individual's physical and mental attributes). Certain factors affect large social groups, whereas others influence only a few individuals. A study conducted by Huang, and Lamm [7] indicates that variations in experience and exposure to water concerns affect persons' attitudes and behaviors toward water conservation.

The concept of environmental behavior encompasses all behaviors that fluctuate according to the availability of resources in the environment [8]. Studies indicate that individuals' environmental considerations, including biospheric values and environmental self-identity, correlate with pro-environmental behavior. Pro-environmental behavior encompasses any behaviors intended to prevent damage to and/or protect the environment [8, 9]. Understanding that water is a limited resource is crucial; therefore, it is the duty of each individual to strive for effective conservation solutions. Emphasizing a pro-environmental perspective or initiating actions that encourage such an approach among students will provide beneficial outcomes and aid in water conservation on the premises. A robust feeling of community should be cultivated among pupils to convey that water wastage adversely affects the entire community [10].

Aprile and Fiorillo [11] found that a high degree of pro-environmental behavior significantly motivated individuals to engage in actions aimed at environmental protection, including water conservation and resource depletion prevention. Consequently, the subsequent hypothesis is posited:

H1: *Consumers (Students) environmental behaviour is positively associated with efficiency in water conservation for business profitability.*

2.2 Mass media

Mass media encompasses the various technological platforms employed to convey information to a broad audience swiftly, facilitating the exchange and sharing of knowledge. The predominant mediums include newspapers, magazines, radio, television, and the Internet (SendPulse, 2021). The notion of mass education is markedly distinct and hinges upon the principle of disseminating knowledge, enabling individuals to contribute meaningfully to society [12].

As indicated by Roberts [13], when apprehensions are associated with regulations on water conservation, individuals tend to exhibit heightened awareness regarding their water consumption. In a similar vein, Bandura [14] posited that the media possesses the capacity to shape human cognition, preferences, and behaviors via two distinct mechanisms: the first involves utilizing media to steer individuals towards transformation through the dissemination of information, stimulation, and guidance; the second facilitates the formation of social networks and communities, offering intrinsic incentives and continuous personalized direction to foster the desired change.

It has been posited that a significant correlation exists between heightened news coverage and a reduction in water consumption. Individuals began to conserve water as the signs of drought became increasingly evident [15]. Research indicates that public awareness of environmental issues plays a crucial role in shaping future decision-making processes. The mass media serves as a crucial conduit for the education and transformation of environmental behavior [7, 16]. In a similar vein, Aprile and Fiorillo [11] observed that an increased awareness of environmental issues, coupled with strong social connections and religious norms, significantly influences water conservation behavior [3, 17].

It is crucial to recognize that the notion of mass education can profoundly influence both society and individuals by enhancing their understanding of water waste management. Research indicates that individuals who acquire greater knowledge tend to adopt new behaviors that align with their existing beliefs [18-21].

The role of mass media is pivotal in advancing sustainable water conservation practices within institutions, including universities and public organizations. Enhancing awareness and fostering behavioral modifications via mass media initiatives can play a crucial role in diminishing water usage and advancing environmental sustainability [22, 23]. One viewpoint posits that alterations in behavior are influenced by the growing public understanding and consciousness surrounding environmental matters [24]. Institutions of higher learning possess a unique capacity to enlighten the youth and advocate for environmental sustainability via their educational frameworks, curricular offerings, and operational practices on campus. Social media serves as a potent instrument in this context, enabling the distribution of information pertaining to environmental sustainability and fostering behavioral transformations among both students and staff [24].

Campaigns utilizing mass media to mitigate high-risk behaviors, including the overconsumption of water, have been effectively executed across diverse environments. A study examining the impact of mass media campaigns on mitigating high-risk drinking among college students revealed that an integration of campus-based initiatives and regional/national media efforts can significantly affect student behaviors [23]. Consequently, the subsequent hypothesis is put forth:

H2: *Consumer (Students) exposure to mass media is positively associated with efficiency in water conservation for business profitability.*

2.3 Social responsibility

Social responsibility is described as a process in which individuals recognize their accountability for their acts and evaluate their effects on the surrounding community [25].

Social responsibility significantly influences organizations by enhancing shareholder value and encouraging sustainable practices that benefit society.

Social responsibility can be understood as an ethical framework wherein judgments and actions must be justifiable. An activity or choice that adversely affects society or the environment is considered socially irresponsible. Individuals with a robust foundation in social responsibility will possess a heightened sense of moral obligation and an increased willingness to engage in water conservation.

Similarly, Huang and Lamm [7] indicated that water conservation efforts are thought to be influenced by individuals possessing knowledge and expertise regarding water and related issues. Individuals are more inclined to engage in water conservation and perceive personal responsibility for it due to the influence of perceived moral responsibilities on their behavioral intentions [5, 6, 11].

Kantola et al. [26] found that messages highlighting a citizen's duty significantly influenced respondents' desire to save water. The findings indicate that an individual's perception of moral obligations significantly influences their moral intentions. This is particularly applicable when the conduct entails conflicts of self-interest and public interest. Moreover, as water conservation represents a social dilemma—where unrestricted water usage offers individual comfort and convenience at the expense of communal welfare—perceived moral responsibilities are likely to affect individuals' propensity to save. An individual with a robust sense of social responsibility for water conservation can effectively reduce water consumption, leading to diminished unnecessary expenditures [6, 11].

The social duty of a student is to be accountable for their activities. To enhance the effectiveness and efficiency of water conservation, the institution should prioritize social responsibility, thereby elevating student morale and encouraging water-saving practices while mitigating waste.

Sustainable water management has emerged as a critical issue for global organizations, as population increase and climate change have intensified water scarcity in numerous areas. Effective water resource management necessitates the integration of several disciplines and the evaluation of multiple elements, including water quality, quantity, environmental implications, and socioeconomic aspects [27]. Conventional methods of water management frequently neglect the intricate and interrelated aspects of these challenges, underscoring the necessity for more comprehensive and sustainable solutions [28]. A viable approach to enhancing sustainable water conservation is the integration of social responsibility activities within organizations. Social responsibility, involving the voluntary measures organizations choose to tackle environmental and societal issues, is crucial in promoting sustainable water practices. By adopting social responsibility, institutions can establish themselves as custodians of natural resources, promoting environmental consciousness and advocating for sustainable water conservation practices. Consequently, the third hypothesis is posited:

H3: *Consumers (Students) social responsibility is positively associated with efficiency in water conservation for business profitability.*

2.4 Self-monitoring

As noted by Bandura [29], the idea of self-regulation or self-monitoring is facilitated by a series of psychological sub-functions that must be cultivated and activated to achieve a self-directed transformation. Understanding that intention and desire alone lack significant impact is crucial if individuals do not possess the ability to exert strong influence and facilitate a change in their motivation and behavior [5, 6]. Self-monitoring is described as an individual's confidence in their ability to achieve success in a specific context. This indicates that it is the students' responsibility to actively seek out an effective method for managing their water usage and minimizing waste.

Self-monitoring can be understood as the cognitive abilities that a person employs to modify or refine their behavior based on the actions of others, including personal knowledge, skills, or capacities [30]. The capacity to observe and adjust self-presentation, emotions, and behaviors according to social contexts and events is a significant factor in water conservation.

Research indicates that individuals who exhibit high levels of self-monitoring demonstrate superior abilities in recognizing environmental cues and making judgments compared to those with lower levels of self-monitoring [29, 31]. In the realm of water conservation, the practice of self-monitoring water usage plays a crucial role in minimizing water expenses. It is crucial to emphasize that in the pursuit of water conservation and fostering sustainable change, students possess the ability to take initiative and establish a robust framework that will enable them to effectively reach this objective of conserving water.

Organizations, including those in education, government, and commerce, are essential in promoting effective water conservation strategies. A key element of this effort is the recognition and comprehension of water institutions by those who use and oversee water resources within these organizations [32, 33]. The ability to monitor and regulate one's own behavior, known as self-monitoring, has been recognized as a vital element in fostering sustainable water conservation practices. By promoting self-monitoring, institutions can enable individuals to take responsibility for their water consumption and make knowledgeable choices that enhance overall water sustainability. The investigation conducted in Tanzania's Mbarali District highlights the significance of groundwater users' understanding of water institutions for the effective governance of water resources [32]. In a similar vein, the study carried out in Australia underscores the importance of comprehending the elements that influence water conservation behavior in individuals [34]. Additionally, the article regarding water optimization at the University of Sonora in Mexico offers important perspectives on how institutions can position themselves as accountable stewards in the utilization and preservation of natural resources, thereby enhancing collective understanding aimed at attaining sustainability [35]. Consequently, the fourth hypothesis is put forward:

H4: *Consumers (Students) self-monitoring is positively associated with his/her water conservation self-efficacy for business profitability.*

2.5 Self-preference

Despite concerns about water shortages and calls for conservation, altering lifestyles and consumer habits that negatively impact the ecosystem proves to be quite

challenging, particularly when adopting a new way of living. The 1828 English dictionary by Webster defines self-preference as 'the preference of one's self to others'. Various individuals adopt distinct practices and lifestyles regarding water conservation. Examples include taking short showers, turning off the water while brushing teeth, and using the washing machine only when fully loaded, reflecting personal preferences [36]. Research indicates that water conservation practices associated with personal hygiene, which are significantly pertinent to daily life, are more impactful than those related to landscaping [7]. The concept of self-preference is significant as it will clarify the necessary actions students must undertake to effectively conserve water on campus.

Implementing sustainable water conservation practices is essential for tackling the global water scarcity crisis [37]. Organizations, including academic institutions and businesses, have a crucial influence in advancing these practices and serving as a model for their communities. This study investigates how self-preference, characterized by the inclination to prioritize personal interests over communal or ecological considerations, influences water conservation practices in institutional contexts. The current body of work emphasizes the significance of behavior modification and persuasive techniques rather than coercive methods in promoting sustainable water usage [36].

A study on water conservation behavior in Australia revealed that understanding the factors that influence water-saving practices can provide valuable insights for water managers and policymakers [34]. This knowledge can help promote these behaviors, ultimately minimizing the necessity for increasing water supplies [34]. In a similar vein, a study focused on water conservation in Botswana highlighted the importance of comprehending the factors influencing residential water conservation [33]. This understanding is essential for crafting effective campaigns aimed at promoting behavior change, which is vital for attaining ecologically sustainable water use [37]. Consequently, the fifth hypothesis is put forward:

H5: *Consumers (Students) self-preference is positively associated with his/her water conservation self-efficacy for business profitability.*

2.6 Water conservation self-efficacy

Self-efficacy denotes an individual's conviction in their capacity to regulate their motivation, behavior, and social context. Self-efficacy influences the effort exerted to alter dangerous behavior and the persistence maintained in the face of challenges and setbacks that may undermine motivation [38].

Empirical research in clinical, educational, and organizational contexts demonstrates a positive correlation between self-efficacy and diverse motivational and behavioral outcomes [39]. Bandura [14] has examined several extensive meta-analyses that support this assertion across multiple domains, including personal health management, athletic performance, and occupational performance [40, 41].

Enhancing self-efficacy involves instilling confidence in end-users on their capability to perform their intended behavior. A personal sense of control promotes behavioral change, as noted by Bandura [31]. In this situation, an individual with elevated self-efficacy is likely to exhibit

increased proactivity and dedication to environmental protection. Consequently, the sixth hypothesis is posited:

H6: *Consumers (Students) self-efficacy is positively related to efficiency in water conservation for business profitability.*

2.7 Research framework

Figure 1 illustrates the conceptual framework underpinning this study, which examines the relationships among (i) environmental factors towards effiency in water conservation, (ii) public factors towards self-efficacy leading to effiency in water conservation.
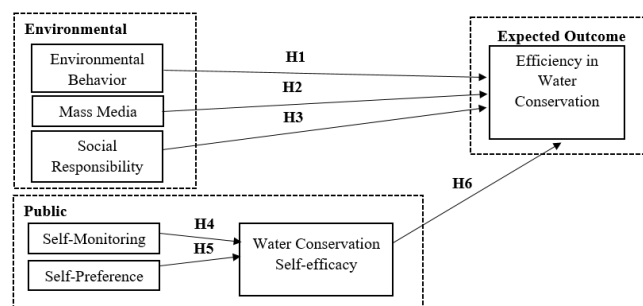

Figure 1. The research framework

3. SAMPLING TECHNIQUES AND DATA COLLECTION METHODS

Previous studies have shown that the number of residents or respondents in a given area is a significant contextual factor in evaluating water consumption [42]. Larger households or individuals who utilize water can be pertinent to the research [42]. This guidance is utilized in implementing a convenience-sampling design technique for the study at hand. The selection of participants is determined by their availability and accessibility, providing several benefits for research focused on water conservation within educational institutions.

Convenience sampling presents a cost-effective and time-efficient method, rendering it especially appropriate for research conducted within institutions that have constrained resources. This can be particularly advantageous in the realm of water conservation studies, where financial limitations and strict deadlines frequently pose challenges.

Moreover, the accessibility and availability of participants in convenience sampling can aid in recruiting a varied group of individuals from diverse demographic and socioeconomic backgrounds within the institution, despite the involvement of students [34, 37]. The variety present can offer significant understanding of the intricate elements that affect water conservation practices, including cultural norms, economic circumstances, and availability of water infrastructure [34]. Although convenience sampling presents challenges regarding representativeness and the capacity to draw conclusions about the larger population, it can nonetheless be an effective method for exploratory investigations in the area of water conservation [34]. Convenience sampling offers a foundational perspective on the elements influencing water conservation behaviors, which can guide the creation of more precise and focused research methodologies moving forward.

The selection of respondents and the sampling technique was determined by the overall size of the population as

referenced by Chin [43]. The data collection methods employed for this correlational study involved a structured questionnaire, applied uniformly across both local and foreign participants, regardless of gender. The data was gathered through an online questionnaire utilizing Google Form, from which the results were subsequently downloaded and analyzed. The data transfer was completed without any missing values. The research successfully gathered 400 completed samples.

An adapted form of a questionnaire was utilized from various empirical studies [2-4, 7, 30, 40, 44] for this study. A systematic approach was utilized to modify the questionnaire based on a prior study. Initially, the essential aspects of questionnaire design are examined, highlighting the significance of precisely articulating the research question and its objectives [45]. The subsequent phase involves an examination of the selection, design, and development of the adapted questionnaire. This entails examining pertinent literature to pinpoint and integrate possible survey items [46]. Special emphasis is placed on guaranteeing that the modified questionnaire upholds content validity and reliability, utilizing expert panels, cognitive interviews, and pilot testing.

4. FINDING

4.1 Cronbach's alpha and composite reliability

As shown in Table 1, the result of Cronbach's alpha and composite reliability are above 0.70, hence the measurement model is reliable and valid [47, 48].

Table 1. Cronbach's alpha and composite reliability

Variable	Constructs	Number of Items	Cronbach's Alpha	rho_ A	Composite Reliability
IV1	Environmental Behaviour	7	0.894	0.853	0.873
IV2	Mass Media	6	0.935	0.936	0.949
IV3	Social Responsibility	6	0.928	0.929	0.943
IV4	Self-Monitoring	6	0.89	0.893	0.916
IV5	Self-Preference	6	0.926	0.926	0.942
IV6	Self-Efficacy	6	0.898	0.901	0.922
IV7	Efficiency in Water Conservation	6	0.935	0.936	0.949

Cronbach's alpha, and composite reliability result of each variable are shown in Table 1. The range for Cronbach's alpha from 0.894 to 0.935, all results are higher than 0.7, the items are reliable [47, 48]. All rho_A values are higher than 0.7 which ranges from 0.853 to 0.936, which proves exogenous and endogenous constructs are reliable [49, 50]. The composite reliability ranges from 0.873 to 0.949 indicates good reliability levels [51].

The convergent validity standard indicated by average variance extracted (AVE) Table 2 and factor loadings produced each variable is higher than 0.5 (AVE) and all

individual construct's outer loadings higher than 0.706 respectively as recommended by Hair et al. [47]. Hence, the convergent validity has been achieved.

Based on Table 3 the discriminant validity has been achieved. It shows that all individual constructs' outer loadings are higher than all the cross loadings with other constructs as recommended by Hair et al. [47].

Table 2. Average variance extracted (AVE)

	EB	EIWC	MM	SE	SM	SP	SR
EB	**0.713**						
EIWC	0.157	**0.869**					
MM	0.058	0.73	**0.869**				
SE	0.105	0.843	0.714	**0.865**			
SM	0.16	0.817	0.746	0.846	**0.874**		
SP	0.189	0.782	0.723	0.808	0.85	**0.864**	
SR	0.189	0.784	0.82	0.759	0.808	0.816	**0.857**

Table 3. Fornell-larcker test

Variable	Constructs	Items	AVE
IV1	Environmental Behaviour	7	0.509
IV2	Mass Media	6	0.755
IV3	Social Responsibility	6	0.735
IV4	Self-Monitoring	6	0.647
IV5	Self-Preference	6	0.73
IV6	Self-Efficacy	6	0.664
IV7	Efficiency in Water Conservation	6	0.755

The bootstrapping of PLS-SEM is used to determine statistical significance [52]. The p-value of less than 0.05 as a threshold to declare statistical significance [47, 53]. Table 4 shows that 5 out of 6 hypotheses are supported. MM ($\beta = 0.122$, p = 0.012), SR ($\beta = 0.249$, p < 0.001) have a significantly positive relationship with efficiency in water conservation. Thus, H2 and H3 are supported. SM ($\beta = 0.579$, p < 0.001) and SP ($\beta = 0.310$, p < 0.001) have a significantly positive relationship with a student's water conservation self-efficacy. Thus, H4 and H5 are supported. SE ($\beta = 0.562$, p < 0.001) also has a significant positive relationship with efficiency in water conservation. Thus, H6 is supported. Conversely, Environmental Behaviour ($\beta = 0.044$, p = 0.077) does not have a significantly positive relationship with efficiency towards water conservation thus, H1 is not supported. Closer to the finding, a representative sample of Italian households also found that while environmental concerns were linked to water conservation behavior, the strength of this relationship was relatively modest [11]. One possible explanation for this finding is that water conservation behavior is influenced by a complex interplay of contextual factors, such as the number of residents in a household or in a specific location, as well as individual-level variables like knowledge and social capital.

Table 4. Hypothesis testing

Hypotheses	Relationships	Path Coefficients	Confidence Interval (2.5%)	Confidence Interval (97.5%)	t Statistics (|O/STDEV|)	p Value
H1	EB → EIWC	0.044	-0.008	0.089	1.771	0.077
H2	MM → EIWC	0.122	0.024	0.213	2.506	0.012
H3	SR → EIWC	0.249	0.152	0.347	4.905	0.000
H4	SM → SE	0.579	0.46	0.693	9.839	0.000
H5	SP → SE	0.310	0.189	0.43	4.998	0.000
H6	SE → EIWC	0.562	0.465	0.659	11.316	0.000

Table 5. R-square

Variables	R-square
Efficiency in Water Conservation	0.763
Self-Efficacy	0.739

R-square is the most widely used criteria for assessing the model is well-fitted [10]. The R-square value ranges from 0 to 1, with higher levels indicating higher levels of predictive accuracy [47]. Table 5 shows that the value of R-square ranges from 0.739 to 0.763. This suggests that the empirical data fit the model satisfactory.

The Stone-Geisser's Q^2 value is used to check if the exogenous constructs have predictive relevance to explain the endogenous variable. This value is generated by using the blindfolding method. According to Hair et al. [47], if the Q^2 value is larger than zero, it implies that the model exhibits predictive relevance. Based on Table 6, the Q-square value of EIWC and SE all exceed zero which means structural model predictive relevance.

Table 6. Q-square

	Q² Predict
EIWC	0.715
SE	0.738

Reliability and validity are tested for the outer measurement models. For reliability, Cronbach's alpha, rho_A, and composite reliability for all constructs are above 0.70 that proves exogenous and endogenous constructs are reliable [44, 54, 55]. For validity, the AVE for each item over 0.5, while factor loading for each item higher than 0.706, that the convergent validity has achieved [47]. Each construct has the highest square root of AVE on its own, and HTMT inference shows none value of the confidence intervals (2.5% and 97.5%) exceed 1, so the discriminant validity has been achieved [47].

As for the SRMR values for both the saturated model and estimated model are less than 0.08 which means a good model fit [47]. There is no multicollinearity problem in this study since all VIF values are under 5 [10]. The hypothesis testing shows 5 of 6 hypotheses are supported, in which H2, H3, H4, H5, H6 are supported and only H1 is not supported. In addition, the R-square indicates it is a moderate predictive model, which is able to predict 76.3% and 73.9% of changes in the endogenous variable (SE and EIWC). F-square shows other path coefficients all have different size of effects. Moreover, the structural model has predictive relevance since all values of Q-square exceeding zero [56].

5. DISCUSSION

5.1 Environmental behavior and efficiency in water conservation

The findings indicate that there is no direct significant relationship between EB and EIWC, as evidenced by a P-Value exceeding 0.05, which leads to the view that H1 is not supported (Table 4). The result, indicated by P = 0.77, contradicts findings from Lin and Hsu [52], which suggest that a solid foundation in green environmental behavior can enhance an individual's efficiency in water conservation. This also conflicts with the findings of Aprile and Fiorillo [11],

which indicate that a high level of environmental behavior is a significant factor in motivating individuals to take action for environmental protection. The findings supported the study, which indicated that some individuals' environmental responsibility behaviors may not align with their intention to protect the environment. This study revealed a scenario where the general population might struggle to link their water usage behaviors with their experiences related to water issues, or may prioritize other factors, such as time and effort, over the necessity to conserve water.

5.2 The role of mass media in enhancing water conservation efficiency

The study reveals a notable correlation between MM and EIWC, as evidenced by the P-Value being less than 0.05, thus supporting H2 (Table 4). The value of β = 0.122 suggests that a student's engagement with mass media regarding water conservation initiatives could significantly impact their effectiveness in conserving water. This finding aligns with earlier research [12, 13] indicating that regular media exposure enhances individuals' motivation to conserve water and safeguard the environment. It was also suggested that media has the capacity to shape human cognition, preferences, and behavior through two primary mechanisms: the first involves utilizing media to encourage individuals to change by means of information, stimulation, and guidance; the second focuses on leveraging media to bring individuals together into social networks and communities, offering intrinsic incentives and continuous personalized support to facilitate the desired transformation. In the study of coastal and estuarine protection, Tunstall [57] found that public awareness of environmental issues served as a vital initial step in shaping subsequent decision-making. Consequently, mass media will serve as a crucial avenue for educating individuals about environmental behavior by disseminating information on conservation efforts.

5.3 Social responsibility and effectiveness in water conservation

In analysing the study it shows a notable correlation between SR and EIWC, as the P-Value is less than 0.05, thus supporting H3. The value of β = 0.249 suggests that a student's sense of social responsibility regarding water conservation efforts has a significant impact on the effectiveness of these conservation initiatives. Research indicates that water conservation activities are often motivated by a sense of social responsibility among individuals who possess knowledge and experience related to water and its associated challenges. Kantola et al. [26] similarly found that communications highlighting an individual's duty significantly influenced participants' intentions to conserve water. The findings indicate that an individual's perception of moral obligations profoundly influences their moral intentions. We believe this is particularly relevant when the action pertains to conflicts between personal and public interests. Moreover, viewing water conservation as a social dilemma highlights the tension between individual comfort and the collective good. The ease of using water without restraint may appeal to personal convenience, yet it poses risks to public interests. Consequently, perceived moral obligations may significantly shape individuals' willingness to engage in conservation efforts. An individual who is deeply committed to social responsibility regarding water conservation can effectively reduce water usage, leading to lower expenses.

5.4 Self-monitoring and self-efficacy

Findings indicates a notable correlation between SM and SE, as evidenced by the P-Value being less than 0.05, thus supporting H4 (Table 4). The value of $\beta = 0.579$ suggests that students' self-monitoring practices have an impact on their self-efficacy regarding water conservation. The notable connection between self-monitoring and self-efficacy aligns with earlier research [40], reinforcing the idea that successful self-monitoring relies on maintaining an appropriate level of self-efficacy in relation to specific tasks. As noted by Bandura [29], individuals who exhibit high levels of self-monitoring demonstrate greater skill than those with lower levels in detecting cues within their environment. It was also suggested that individuals who exhibit a high degree of self-monitoring, along with a strong sense of self-efficacy, are likely to perform tasks more readily, exert greater effort, persist longer when faced with challenges, and achieve at elevated levels.

5.5 Self-preference and self-efficacy

The findings indicate a notable correlation between SP and SE, as evidenced by the P-Value being below 0.05, thus supporting H5 (Table 4). According to $\beta = 0.31$, it suggests that a student's self-preference has an impact on their self-efficacy regarding water conservation. This result aligns with a study by Reed et al. [58], which theorizes a connection between SP and SE, suggesting that SE involves confidence in an individual's capacity to make effective decisions, thereby influencing their preferences for choice. Those with greater confidence in their decision-making skills sought more options compared to those who were less assured. An individual's lifestyle can vary significantly from those who do not implement specific environmental protection practices in their daily routines, including sorting waste, recycling, purchasing locally sourced products, and opting for energy-efficient appliances that help lower carbon emissions and water conservation.

5.6 Self-efficacy and efficiency in water conservation

The study reveals a notable connection between SE and EIWC, as indicated by the P-Value being below 0.05, thus supporting H6 (Table 4). The value of $\beta = 0.562$ suggests that a student's self-efficacy regarding water conservation efforts has a significant impact on their efficiency in conserving water. This aligns with a study conducted [39] that demonstrates a positive relationship between self-efficacy and several motivational and behavioral outcomes. An individual exhibiting strong self-efficacy is likely to engage more actively and commit to efforts in environmental conservation [59]. Individuals behave in specific manners based on their expectations of outcomes, as they anticipate these outcomes will be beneficial to them. The findings of our study indicate a significant relationship between self-efficacy and effectiveness in water conservation, supporting previous studies that highlighted the role of self-efficacy in influencing decision-making and actions. If individuals cultivate confidence in their capacity to engage in water conservation, then efficiency in this practice would follow, allowing higher learning institutions to decrease costs associated with excessive water usage. Ultimately minimizing costs and enhancing financial performance in business.

6. IMPLEMENTATION OF SOCIAL COGNITIVE THEORY

The findings of the study strongly endorse the use of Social Cognitive Theory (SCT) to enhance understanding and effectiveness in water conservation initiatives. SCT posits that human behavior is shaped by a dynamic and reciprocal interplay among personal factors, environmental influences, and the behavior itself. The hypotheses examined in this study illustrate this interaction, emphasizing various important findings and constraints.

In looking into the essential function of Self-Efficacy, the findings reveal a robust and significant correlation between self-efficacy and efficiency in water conservation (H6, path coefficient = 0.562, p < 0.001), highlighting the importance of self-efficacy as emphasized by SCT. This reinforces the idea that those who have confidence in their capacity to perform certain actions are more inclined to participate in and achieve success in those actions. The robust connections observed between self-monitoring and self-efficacy (H4, path coefficient = 0.579, p < 0.001) and between self-preference and self-efficacy (H5, path coefficient = 0.310, p < 0.001) reinforce the notion that psychological constructs play a crucial role in shaping behavior.

Additionally, the significance of social and environmental factors cannot be overlooked. The results indicate that social and environmental elements, including mass media (H2, path coefficient = 0.122, p = 0.012) and social responsibility (H3, path coefficient = 0.249, p < 0.001), significantly influence water conservation efficiency. This is consistent with the principle that external influences, such as social norms and communication channels, play a significant role in shaping individual behaviors. The influence of mass media, while less potent than that of social responsibility, underscores the significance of utilizing communication channels to shape public perceptions and actions.

Third, Practical Implications for Interventions. The focus on modeling and observational learning indicates that strategies for behavior change ought to incorporate clear demonstrations of successful water conservation practices. This may involve initiatives that highlight community figures or relatable individuals who are engaged in water conservation, thus motivating others through social learning. The important function of social responsibility suggests that interventions focused on the community, which highlight the shared advantages of water conservation and social accountability, can yield positive outcomes.

Fourth, there is a limited impact of Environmental Behavior. The connection between environmental behavior and the efficiency of water conservation (H1, path coefficient = 0.044, p = 0.077) does not reach statistical significance. This prompts an inquiry into SCT's premise that every environmental factor exerts a direct and significant influence on behavior. This indicates that the context or assessment of environmental behavior might require adjustment, or that other unmeasured mediating variables could be influencing the results. This limited influence suggests a possible gap in the theory, as not all environmental behaviors appear to convert effectively into conservation outcomes, potentially due to external barriers or conflicting priorities.

Fifth, the influence of mass media is moderate. Although the influence of mass media is statistically notable, the comparatively modest path coefficient (0.122) suggests that media initiatives by themselves may not yield substantial

effectiveness without additional strategies in place. This indicates a constraint in SCT's relevance in situations where media impact is overshadowed by more dominant social or structural elements. The potential of mass media can be improved by combining it with additional social reinforcement strategies or by emphasizing content that fosters self-efficacy, like narratives of successful conservation initiatives.

This study utilizes Social Cognitive Theory as a framework to effectively understand and encourage water conservation behavior. The significant focus on self-efficacy is consistent with the theoretical underpinnings of SCT, highlighting that personal psychological empowerment is essential for facilitating behavior change.

7. CONCLUSIONS

From a business contribution perspective, these findings prompt Higher Learning Institutions (HLI) to consider the factors that influence water conservation among their customers (students). By examining the factors that drive water conservation practices, HLI could explore initiatives aimed at promoting water-saving behaviors among students, ultimately leading to a reduction in water wastage and an increase in financial reserves. The administration of the HLI might explore the promotion of diverse initiatives through mass media, including the installation of water conservation advertisements on campus in the form of posters, banners, or brief advertisements. HLI ought to persist in its investment in these initiatives to promote awareness and understanding among students regarding the significance of water conservation and its impact on the campus, the environment, and the broader world they inhabit. This investigation will assist the management of HLI in formulating policies and programs focused on water conservation. The concept of sustainable water management, including water conservation, seeks to preserve and improve the environment while optimizing the management and utilization of water resources to foster social and economic development. By understanding the factors influencing students' water conservation efforts in HLI, management will gain a more informed and precise approach to effectively promote water conservation among students.

In addition to the value presented in this study, there are several considerations to keep in mind regarding this finding. Initially, the focus of this study was on the outcome expectations. Findings can also uncover actual behavior that was not included in the research framework. Additionally, there may be other variables influencing individual behavior, such as economic and psychological factors. This results in the possibility that the assurance of all pertinent contextual variables in the equation may be insufficient. This study utilizes cross-sectional data for its analysis. A longitudinal study utilizing a qualitative approach would provide significant insights into student behavior, as temporal comparisons can uncover behavioral changes and address various uncertainties.

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