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STUDYING THE EDUCATION OF STUDENTS OF PRINCE SETAM BIN ABDULAZIZ UNIVERSITY, AL-KHARJ PROVINCE, REGARDING ENVIRONMENTAL ISSUES[1]

ESTUDANDO A EDUCAÇÃO DE ALUNOS DA UNIVERSIDADE PRÍNCIPE SETAM BIN ABDULAZIZ, PROVÍNCIA DE AL-KHARJ, EM RELAÇÃO A QUESTÕES AMBIENTAIS

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ABSTRACT

Education of environmental awareness of climate change and promoting positive environmental behaviors across all aspects of life are crucial for fostering sustainable practices. Individuals with a good understanding of climate change are more likely to engage in environmentally supportive behaviors and maintain positive attitudes, thus contributing to a sustainable future. This research aimed to education of students of Prince Setam bin Abdulaziz University, Al-Kharj province, regarding environmental issues. Additionally, it sought to examine the relationship between climate change awareness and positive environmental attitudes and explore the possibility of predicting climate change awareness based on positive thinking. A total of 388 students participated in the study. Researchers administered a climate change awareness questionnaire and a positive environmental attitudes scale. They employed a descriptive-analytical method, specifically the predictive correlational approach, to illuminate the relationship patterns among the research variables and predict their associations. The findings revealed a high level of climate change awareness and positive environmental attitudes among the sample. Moreover, statistically significant positive correlations were found between climate change awareness and positive thinking. Additionally, the results demonstrated the potential to predict climate change awareness from positive environmental attitudes within the sample. According to the results, it can be said that the education of students can be useful in improving the productivity of the environment.

Keywords: Education, Climate change awareness, Positive environmental attitudes, University Students, Al-Kharj Governorate.

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RESUMO

A educação da conscientização ambiental sobre as mudanças climáticas e a promoção de comportamentos ambientais positivos em todos os aspectos da vida são cruciais para promover práticas sustentáveis. Indivíduos com uma boa compreensão das mudanças climáticas são mais propensos a se envolver em comportamentos de apoio ambiental e manter atitudes positivas, contribuindo assim para um futuro sustentável. Esta pesquisa teve como objetivo educar alunos da Universidade Prince Setam bin Abdulaziz, província de Al-Kharj, sobre questões ambientais. Além disso, buscou examinar a relação entre a conscientização sobre as mudanças climáticas e atitudes ambientais positivas e explorar a possibilidade de prever a conscientização sobre as mudanças climáticas com base no pensamento positivo. Um total de 388 alunos participaram do estudo. Os pesquisadores administraram um questionário de conscientização sobre as mudanças climáticas e uma escala de atitudes ambientais positivas. Eles empregaram um método descritivo-analítico, especificamente a abordagem correlacional preditiva, para iluminar os padrões de relacionamento entre as variáveis da pesquisa e prever suas associações. As descobertas revelaram um alto nível de conscientização sobre as mudanças climáticas e atitudes ambientais positivas entre a amostra. Além disso, correlações positivas estatisticamente significativas foram encontradas entre a conscientização sobre as mudanças climáticas e o pensamento positivo. Além disso, os resultados demonstraram o potencial de prever a conscientização sobre as mudanças climáticas a partir de atitudes ambientais positivas dentro da amostra. De acordo com os resultados, pode-se dizer que a educação dos alunos pode ser útil para melhorar a produtividade do ambiente.

Palavras-chave: Educação, Conscientização sobre mudanças climáticas, Atitudes ambientais positivas, Estudantes universitários, Província de Al-Kharj.

Introduction

Climate change stands as one of the most critical issues of the twenty-first century, garnering attention from nations, governments, organizations, and scientists alike. Its gravity is underscored by the severe consequences it brings, including rainfall-induced flooding, heatwaves, droughts, epidemics, and diseases, resulting in mass displacement and homelessness (Class, 2023; Mohsin et al., 2022). These impacts are unmistakably evident in the rapid fluctuations in temperature, heightened hurricane activity, altered wind patterns, and the emergence of phenomena like global warming, droughts, and floods, all of which significantly affect human life (Imam, 2023; Marzouk, 2023). At present, climate change ranks among the most pressing environmental concerns due to its direct influence on vital sectors such as agriculture, water and energy resources, public health, transportation, coastal regions, marine ecosystems, and sustainable development initiatives (Abdul Raouf, 2022; Maartensson & Loi, 2022).

Human activities have a significant impact on ecosystem functions, often resulting in environmental disruption due to improper practices and overexploitation of natural resources. One of the earliest signs of this disruption is the extinction of numerous animal species and the widespread loss of trees, crucial for maintaining environmental equilibrium, thus diminishing biodiversity (Kamal & Abdel Samea, 2022). Irresponsible human behavior stands as the primary driver behind the escalation of temperatures beyond their natural averages and the onset of various climate-altering phenomena. This is exacerbated by scientific advancements and the introduction of factors purported to enhance human welfare, ultimately leading to heightened levels of greenhouse gases in the atmosphere (Ojala, 2023).

Climate change denotes the modification in the climate that results in alterations in the global atmospheric composition, directly or indirectly attributed to human activities (Australian Academy of Science, 2015). It represents a disturbance in the prevailing balance of climatic conditions, stemming from either natural causes, such as fluctuations in the climate, or human-induced causes resulting from negative behaviors towards the environment (Abdul Rahman & El-Sayed, 2023). Sarsak (2011) defines climate change as alterations in the climate due to both intentional and unintentional human activities. Similarly, Soliman (2020) perceives it as a disruption in various climatic elements, including temperature increase, wind patterns, and rainfall distribution across the Earth's surface.

This issue has garnered significant attention from experts in environmental science, policymakers, and the public worldwide, leading to a rise in seminars and conferences addressing environmental issues and climate change (Imam, 2023). Environmental problems are prevalent globally, arising from various factors, including limited environmental awareness among community members (Aminrad et al., 2012). These problems manifest from a range of behavioral issues, such as unsustainable consumption habits and inadequate waste management practices (Al-Ahmadi, 2019).

Climate change and its impacts are recognized as critical environmental issues confronting the world, driven by human activities rather than solely natural

weather phenomena. The fate of humanity and various aspects of life on the planet are intricately linked to this phenomenon. Education is widely regarded as a crucial tool for raising awareness of climate change through a comprehensive approach to learning (Abdul Kader, 2023; Maartensson & Loi, 2022). UNESCO underscores the pivotal role of education in advancing climate action, empowering learners to comprehend and mitigate the impacts of the climate crisis. Education provides them with the requisite knowledge, skills, values, and attitudes to become agents of change (UNESCO, 2022). Individuals at all levels of education in our contemporary era urgently need to grasp the intricacies of climate change, enhance their knowledge and skills, and raise awareness of environmental issues, climate change, its impacts, mitigation strategies, and the pursuit of sustainable development (Abdul Salam, 2022).

Climate awareness encompasses the learner's perception, drawing from both sensory experiences and cognitive knowledge, regarding the effects of climate change and strategies for addressing it through procedural mechanisms, thus safeguarding the environment and its diverse resources (Abdul Kader, 2022; Van Valkengoed et al., 2021). Climate change, often elucidated through the greenhouse effect, refers to the long-term alterations in temperature and weather patterns observed either locally or globally. This phenomenon stems from human activities, such as the combustion of fossil fuels like natural gas, oil, and coal, resulting in the release of numerous harmful gases into the Earth's atmosphere. These gases trap solar heat, thereby contributing to the overall warming of the planet (Forchtner, 2019).

There are several compelling reasons to raise awareness about climate change, including the ongoing rise in Earth's surface temperatures, which disrupts the life patterns of living organisms as they struggle to adapt to these changes. The impacts of climate change on key sectors like agriculture, water resources, and environmental displacement are also profound. Moreover, the effects of climate change on health, including the prevalence of climate-sensitive diseases, psychological and cardiovascular ailments, and its broader influence on individuals' mental well-being, are significant (Ghanem, 2022; Singh et al., 2017; Steg, 2018).

The significance of fostering awareness about climate change lies also in cultivating values among students, empowering them to respect and uphold the rights of others, while also enhancing their understanding of the climate system and its interconnectedness with environmental, technological, economic, and social systems. This process entails acquiring deeper knowledge about climate change issues and fostering desirable attitudes and behaviors (Abdul Kader, 2022; Ghanem, 2021; Forchtner, 2019; Perlaviciute & Squintani, 2020).

Environmental awareness represents a product of multiple dimensions, as identified by Al-Ziyadat (2013): environmental knowledge, environmental skills, and environmental attitudes. Furthermore, according to Jassim and Mahdi (2017) and Khalf (2021), it encompasses three dimensions: knowledge of environmental information, attitudes toward the environment, and behavioral stances toward the environment. Handoyo et al. (2020) also categorize it into environmental knowledge, environmental skills, and motivation for environmental conservation. Additionally, Nasser and Al-Atar (2016) condense the dimensions of environmental awareness into two aspects: environmental information and attitudes toward the environment. Lastly, Hamdy (2023) delineates the dimensions of environmental awareness in light of the environmental sustainability requirements as knowledge, positive attitudes, and responsible behaviors.

In this study, awareness of climate change encompasses three dimensions, as outlined in various literature and related studies (Calculli et al., 2021; Class, 2023; Mohsin et al., 2022):

a. Cognitive Dimension: This dimension pertains to students' knowledge of climate change. Climate change awareness begins with learners' understanding of the components of their aquatic environment, as well as the concepts and events related to it. It considers their previous experiences and acquired information while interacting with others and their environment. This implies that individuals with broader experiences and richer information are better equipped to have a deeper awareness of climate issues and problems.

b. Affective Dimension: This dimension concerns students' attitudes toward climate change and its impact on their feelings and emotions. These attitudes influence the formation of their values regarding the issue. It underscores the necessity for the acquired information to be truthful and objective.
c. Behavioral (Applied) Dimension: This dimension refers to students' behaviors in real-life situations regarding climate change. It represents the culmination of the previous two dimensions, wherein learners exhibit positive behavior towards the environment. This behavior stems from their conscious knowledge and deep sense of climate issues and problems, as well as their responsibility toward addressing these problems.

The National Environmental Awareness and Sustainable Development Program in Saudi Arabia focuses on raising awareness of environmental issues and climate change. Its goals include instilling individual and collective responsibility for conservation and improvement among various segments of society, rationalizing the use of natural resources, minimizing pollution, and fostering active community participation in environmental protection (National Center of Meteorology, 2021). Additionally, the Ministry of Environment, Water, and Agriculture launched an environmental awareness initiative on the "X" platform, under the slogan "Your Environment, Your Priority," to promote awareness and encourage positive behaviors towards environmental protection (Ministry of Environment, Water, and Agriculture, 2024).

Thinking is a fundamental factor in shaping one's direction toward the future, as it helps individuals steer and advance their lives (Sedkhan, 2015). The importance of positive thinking lies in its role as a source of strength and freedom. It serves as a source of strength because it assists individuals in contemplating solutions until they find them, thus increasing their strength and confidence (Al-Faqi, 2013). Individuals should always cling to positive thoughts by anticipating success, engaging in positive self-talk to build self-confidence, and fostering happy thoughts to alleviate stress and anxiety (Andrade, 2019).

For students to be aware of climate change, environmental issues, and disasters, they must possess various thinking skills that enable them to find solutions to these challenges. Sustainable solutions are crucial for addressing these environmental and climate-related issues. Reshaping awareness through the development of thinking skills, with positive environmental thinking being a key component, is essential. Constructive hope and optimism are not merely pleasant feelings but can also serve as motivational forces with a significant positive impact on environmentally supportive behavior and climate change responses (Maartensson & Loi, 2022; Ojala, 2023). Additionally, seeking quality thinking has become a requirement of contemporary education, which involves learners' engagement with real-life problems and contemporary changes, fostering positive decision-making (Mahmoud, 2023). Among the types of thinking that facilitate this is positive thinking.

Preparing and educating a generation with positive thinking is imperative for building a healthy and secure society capable of making future decisions and acting positively toward environmental and societal problems (Imam, 2023). Previous studies have indicated that education and the development of thinking skills are among the most important scientific methods for predicting and assessing students' knowledge and behaviors. They increased awareness of environmental changes and encouraged individuals to change activities that may contribute to those changes, especially as students represent the most influential and prevalent group in societies (Boon, 2016; Karami et al., 2017). Various educational institutions bear the responsibility of developing positive concepts, knowledge, and behaviors related to climate change as part of preparing and modifying students' behavior during different stages of education, from kindergarten to university (Ghanem, 2020). University students' thinking skills enable them to analyze environmental situations and make positive decisions, with positive thinking being one of the types of thinking that facilitates this (Mohammed, 2020).

Positive thinking is characterized by a set of positive personality traits, encompassing six core virtues: courage, love, knowledge, social interaction, spirituality and religiosity, self-regulation, and justice (Seligman, 2004). It reflects a

cognitive model that entails a positive assessment of oneself, the world, and the future (Davies, 2009). A positive thinker consciously chooses what suits him, focuses on the bright side of things, demonstrates self-love (signifying reconciliation and satisfaction with oneself), exhibits love towards others, cares about their well-being, worries less, and enjoys life more (Bayfer, 2011). Positive thinking illustrates the individual's volitional ability to evaluate their thoughts and beliefs, control them, and direct them towards achieving the successful outcomes they anticipate, reinforcing problem-solving through the formation of logical mental frameworks with an optimistic outlook aimed at problem-solving (Al-Tmawi, 2017). It is a positive orientation in which the individual evaluates their perceptions and knowledge, converts them into positive expectations, and directs them toward the successful outcomes they anticipate (Al-Jadaani& Khalifa, 2021).

Positive thinking centers on the learner's ideas and beliefs about their ability to confront challenges, navigate various life situations, cope with surrounding circumstances—whether favorable or adverse—evaluate situations realistically, seek ways to improve them, and learn from past experiences (Kendra, 2012). It denotes the use or focus of an individual's mind on constructive and favorable outcomes, aiming to replace harmful or negative thoughts with positive ideas and emotions (Seligman & Pawelski, 2003). Additionally, positive thinking is typically a subconscious mindset practiced by individuals, harnessing their energies and latent potentials to construct and organize their thoughts, knowledge, and experiences, guiding their behaviors toward achieving future goals (Mohammed, 2014). It embodies optimism in its fullest sense, as well as the inclination to seek the positive aspects of everything and embrace the exciting moments of life, even if they are fleeting (Bayles & Seligman, 2009).

Numerous studies have shed light on the characteristics of individuals who maintain a positive outlook, drawing from various scholarly sources. Such individuals, commonly termed positive thinkers, exhibit a continuous propensity for problem-solving, generating a plethora of ideas and actively seeking resolutions to encountered challenges, all while fostering hope and optimism among others. Moreover, they display resilience and adaptability in confronting obstacles,

displaying a willingness to explore new information irrespective of its alignment with their preconceived notions. Engaging in academic discourse, they exhibit both receptiveness to and active participation in scholarly conversations, demonstrating a firm belief in the solvability of every problem. Additionally, they maintain a positive and forward-looking attitude, effectively managing crises and setbacks by employing various coping strategies and techniques for regulating their thoughts and emotions (Abdullayeva, 2021; Al-Faqi, 2009; Andrade, 2019; Awdah, 2020; Bekhet et al., 2020; Darabi et al., 2017; Ghahremani et al., 2022; Seligman, 2004).

In the current era, positive thinking skills play a crucial role in preparing individuals to confront future challenges. By assisting individuals in navigating crises, controlling negative thoughts, and fostering optimism, positive thinking equips them with the necessary beliefs and convictions to succeed in problem-solving (Mohammed, 2020). Furthermore, positive thinking promotes confidence in one's abilities, self-acceptance, and acceptance of others. It imbues individuals with optimism, enthusiasm, self-satisfaction, and a predisposition to expect success. It instills a belief in one's abilities and skills, along with the capacity to recognize strengths and weaknesses, facilitating behavioral and cognitive change. Additionally, positive thinking enables individuals to adopt a favorable outlook on life and maintain optimistic expectations for the future (Metwally, 2021).

Through reviewing several measures of positive thinking as observed in studies, researchers have identified these dimensions corresponding to positivity in addressing contemporary climate change (Chan et al., 2021; Darabi et al., 2017; Ela & Bouzad, 2016; Ibrahim, 2008; Popov & Popov, 2013):

a. Optimism and Positive Expectations: This dimension entails the inclination to maintain positive thoughts about the future of the environment and the world, anticipating the best possible outcomes rooted in optimism and alignment with various life goals. It involves shifting away from negative expectations and pessimism.
b. Emotive Control: This dimension encompasses an individual's capacity to direct attention, memories, and abilities toward imagining and developing cognitive, emotional, and behavioral reserves conducive to

psychological and social harmony. It entails making informed and beneficial decisions concerning the environment and climate that align with requirements for health and environmental sustainability, moving away from rigidity and binary views of people, events, and situations associated with climate change.

c. Accepting Personal Responsibility: This dimension involves courageously fulfilling obligations and tasks without hesitation, to benefit oneself and others. It encompasses taking accountability for one's actions without making excuses, attributing blame to others, or shirking responsibility.

Despite the importance of positive thinking, a significant proportion of university students lack it. A study by Ghanem (2006) indicated that 40.5% of male and female students exhibit a pattern of positive thinking, while 59.5% demonstrate negative thinking. Furthermore, Abdellatif (2022) highlighted that more than 50% of university students display negative thinking. Given the seriousness of climate change on the global and local environment and the importance of students' awareness level to confront these risks, previous studies have found a low level of awareness among students (AlAhmad, 2021; Abdul Aziz, 2020; Al-Sebai, 2021; Boon, 2009; Papadimitriou, 2004). These studies have demonstrated a decline in students' awareness of climate change and related concepts, along with misconceptions about scientific concepts and their relationship to climate change. Students fail to grasp the dangers associated with climate change, leading to inappropriate behaviors that harm the climate. Previous studies have recommended the necessity of assessing students' awareness of climate change and exploring ways to enhance it.

Despite many young people considering climate change an important societal issue, studies indicate widespread pessimism. Therefore, finding ways to instill hope is vital (Ojala, 2023). No study has directly linked awareness of climate change with positive thinking. Instead, researchers examine the relationship between awareness of climate change and thinking in general. Some studies have linked certain dimensions of positive thinking with awareness of climate change (Maartensson &

Loi, 2022; Ojala, 2023). These studies suggest that optimism and constructive hope can serve as motivating forces, positively influencing environmentally supportive behavior and responses to climate change.

Furthermore, some studies have linked green economic orientations with positive thinking. For example, Fouad's (2020) study aimed to develop environmental awareness and positive thinking among college students based on green economic orientations. The results demonstrated the effectiveness of the proposed program in cultivating positive thinking among the experimental group compared to the control group. Additionally, studies have connected environmental awareness with sustainable thinking. For instance, Bascoul et al. (2013) aimed to enhance students' sustainable thinking by implementing an educational program focused on the product life cycle. Their findings indicated an enhancement in students' appreciation and comprehension of environmental sustainability concepts, as well as the cultivation of their sustainable thinking.

The study by Deniz (2016) addressed the relationship between environmental awareness and sustainable thinking in environmental issues and found a positive correlation between them. Ahmed's study (2020) concluded the effectiveness of implementing a science unit incorporating dimensions of education for sustainable development in developing sustainable thinking skills and environmental responsibility among middle school students. Additionally, the results of Mohammed and Ahmed's research (2022a) revealed a statistically significant positive correlation between sustainable thinking and environmental advocacy skills.

Metwalli’s study (2022) showed the effectiveness of a program based on green innovation concepts in developing sustainable thinking and increasing environmental citizenship among the research participants. Furthermore, Mohammed and Ahmed's study (2022b) demonstrated the effectiveness of a proposed environmental education program based on contemporary public issues, using differentiated instruction in developing green economic concepts, sustainable thinking, and environmental advocacy among female education college students. In light of these previous studies, it becomes evident that there is a logical relationship

between awareness of climate change, thinking in general, and positive thinking in particular. Positive thinking skills can contribute to finding solutions to individual environmental challenges and enable individuals to confront climate change by analyzing environmental situations and making positive decisions.

In light of previous studies, there exists a logical relationship between awareness of climate change, general thinking, and positive thinking in particular. Positive thinking skills can play a significant role in finding solutions to the environmental challenges individuals face. Additionally, they can aid individuals in confronting climate change by enabling them to analyze environmental situations and make positive decisions. While the literature review reveals logical correlations between the research variables (awareness of climate change and positive thinking toward the environment), there is currently no research addressing the specific relationship between these variables. Therefore, due to the absence of previous studies on this topic, the research problem can be identified as verifying the level of awareness of climate change and examining its relationship with positive thinking toward the environment among the research sample. In light of the research objectives, the following research hypotheses were developed:

- There is a low level of awareness of climate change among the participating students.
- There is a low level of positive thinking toward the environment among the participating students.
- There is no statistically significant correlation between the scores of the students in the research sample on the climate change awareness questionnaire and their scores on the positive thinking towards the environment scale.
- The level of climate change awareness cannot be statistically predicted by the scores of the students on the positive thinking towards the environment scale.

Methodology

Research Design

Considering the objectives and hypotheses of the current research, the researchers will utilize the descriptive-analytical method, specifically employing the predictive correlational approach. This approach aims to elucidate the pattern of the relationship between the research variables and to predict the relationships between them.

Participants

The researcher initially administered the research instruments to 115 male and female students at Prince Sattam bin Abdulaziz University (mean age 20.34; SD 2.06) to confirm the psychometric properties of the research instruments. Subsequently, the instruments were applied to a larger sample comprising 388 male and female students from the same university, including 209 male students and 179 female students, all at their final academic levels (mean age 21.17; SD 2.78), to verify the research hypotheses.

Data Collection Tools

Climate Change Awareness Questionnaire

The Climate Change Awareness Questionnaire was developed by the researchers after reviewing theoretical frameworks related to climate change awareness and its components, as well as consulting previous studies to identify methods and determinants of measuring climate change awareness (Al-Ahmadi, 2019; Al-Ruqai, 2022; Balochi & Balochi, 2013; Imam, 2023; Malkus, 1995). The questionnaire encompasses three key components: evaluating students' knowledge of climate change (cognitive dimension), assessing their attitudes towards climate and its changes (affective dimension), and examining their behaviors in real-life situations about climate change (behavioral dimension).

The initial version of the questionnaire comprised 15 items distributed across three components, with each component containing five items. Participants

were required to rate each statement according to five alternatives ranging from strongly agree to strongly disagree (5-4-3-2-1). Higher scores indicated a higher level of climate change awareness, with all items being positively phrased. The scores on the questionnaire ranged from 15 to 75. The content validity of the questionnaire was verified by presenting it to five faculty members in psychology education. The raters demonstrated agreement rates ranging from 80% to 100% on the scale's items, indicating content validity.

To calculate the internal consistency of the questionnaire, Pearson correlation coefficients were computed between the score of each item and the total score of the component it belongs to, after excluding the item's score from the total component score, for a total of 115 male and female students. Additionally, correlations between the score of each component and the total score of the questionnaire were calculated. All correlation coefficients were statistically significant at the 0.01 level, ranging from 0.530 to 0.789, confirming the internal consistency of the items with their components and the components with the total score of the Climate Change Awareness Questionnaire.

To ensure the reliability of the Climate Change Awareness Questionnaire, both Cronbach's alpha coefficient and Guttman's split-half reliability equation were utilized. Due to the lack of variance homogeneity between the halves of the scale, these reliability measures were applied after administering the questionnaire to the participants in the survey research. By calculating the reliability coefficients using Guttman's split-half reliability equation (0.794) and Cronbach's alpha coefficient (0.716), it was found that all reliability coefficients exceeded 0.7. This indicates a high level of reliability for the Climate Change Awareness Questionnaire.

Positive Environmental Thinking Scale

The Positive Environmental Thinking Scale was developed by the researchers after reviewing theoretical frameworks addressing positive environmental thinking and its components, as well as reviewing previous studies to identify methods and determinants of measuring positive environmental thinking. The scale comprises the following three components: Optimism and Positive Expectations, Emotive Control, and Acceptance of Personal Responsibility.

It consists of 15 items distributed across these three components, with each component containing six items. Participants were required to rate each item according to five alternatives ranging from strongly agree to strongly disagree (5-4-3-2-1). Higher scores indicate a higher level of positive thinking, with all items being positively phrased. Scores on the scale ranged from 15 to 75. The content validity of the scale was verified by presenting it to five faculty members in psychology education. The raters showed agreement rates ranging from 80% to 100% on the scale's items, indicating content validity.

To calculate the internal consistency of the scale, Pearson correlation coefficients were computed between the score of each item and the total score of the component it belongs to, after excluding the item's score from the total component score, for a total of 115 male and female students. Additionally, correlations between the score of each component and the total score of the scale were calculated. All correlation coefficients were statistically significant at the 0.01 level, ranging from 0.611 to 0.859, confirming the internal consistency of the items with their components and the components with the total score of the Positive Environmental Thinking Scale.

To ensure the reliability of the Positive Environmental Thinking Scale, both Cronbach's alpha coefficient and Guttman's split-half reliability equation were utilized. Due to the lack of variance homogeneity between the halves of the scale, these reliability measures were applied after administering the scale to the participants in the survey research. By calculating the reliability coefficients using Guttman's split-half reliability equation (0.872) and Cronbach's alpha coefficient (0.717), it was found that all reliability coefficients exceeded 0.7. This indicates a high level of reliability for the Positive Environmental Thinking Scale.

Results

The First Hypothesis Results

To verify the validity of the hypothesis "There is a low level of awareness of climate change among the participating students," a One-Sample t-test was employed for a single sample. This test compared the hypothetical mean of the climate change awareness questionnaire and its dimensions with the mean scores of the students in the research sample on the climate change awareness questionnaire and its dimensions as illustrated in Table (1).

Table 1 – Results of One-Sample Statistics t-test for detecting the significance of differences between the hypothetical mean and the mean scores of the students in the research sample on the climate change awareness questionnaire and its dimensions

Awareness of Climate Change	Test Value	Mean	Std. Deviation	Mean Difference	df	t	Sig.
Cognitive Dimension	15	19.22	1.14	4.22	387	72.524	.000
Affective Dimension	15	19.78	1.48	4.78	387	63.530	.000
Behavioral Dimension	15	19.03	1.64	4.03	387	48.176	.000
Total Score	45	13.04	3.60	58.04	387	235.040	.000

(Test Value) * The hypothetical mean for each dimension: The maximum value for each item is 25 + the minimum value 5 / 2 = 15 and in the total score 75 + 15 / 45

From Table (1), it is evident that there are statistically significant differences at a level of 0.01 in the t-values, ranging between 48.176 and 235.040. This indicates differences favoring the higher mean of the actual students' scores compared to the hypothetical mean.

Additionally, there are differences between the hypothetical mean (15) and the mean scores of the students in the research sample on the dimensions of the climate change awareness questionnaire (cognitive dimension, affective dimension, behavioral dimension, total score). Notably, the mean scores of the research sample

on all dimensions were higher than the hypothetical mean, suggesting a high level of climate change awareness among the participating students in the research.

The Second Hypothesis Results

To verify the validity of the hypothesis "There is a low level of positive thinking towards the environment among the participating students," a One-Sample t-test was employed for a single sample. This test compared the hypothetical mean of the positive thinking toward the environment scale and its dimensions with the mean scores of the students in the research sample on the positive thinking towards the environment scale and its dimensions as summarized in Table (2).

Table 2 – Results of One-Sample Statistics t-test for detecting the significance of differences between the hypothetical mean and the mean scores of the students in the research sample on the positive thinking towards the environment scale and its dimensions

Positive Thinking Towards the Environment	Test Value	Mean	Std. Deviation	Mean Difference	df	t	Sig.
Optimism and Positive Expectations	15	18.64	1.33	3.64	387	53.746	.000
Emotional Regulation	15	18.78	1.33	3.78	387	55.782	.000
Acceptance of Personal Responsibility	15	18.64	1.40	3.64	387	51.039	.000
Total Score	45	56.08	3.93	11.08	387	205.597	.000

Table (2) indicates that there are statistically significant differences at a level of 0.01 in the t-values, ranging between 51.039 and 205.597. This indicates differences favoring the higher mean of the actual students' scores compared to the hypothetical mean. Besides, there are differences between the hypothetical mean (15) and the mean scores of the students in the research sample on the dimensions of positive thinking towards the environment scale (optimism and positive expectations, emotional regulation, acceptance of personal responsibility, total

score). The mean scores of the research sample on all dimensions were higher than the hypothetical mean, suggesting a high level of positive thinking toward the environment among the participating students in the research.

The Third Hypothesis Results

To verify the validity of the hypothesis "There is no statistically significant correlation between the scores of the students in the research sample on the climate change awareness questionnaire and their scores on the positive thinking towards the environment scale," the researcher calculated the Pearson correlation coefficient between the scores of the students on both measures as presented in Table (3).

Table 3 – Pearson Correlation Coefficients between the scores of the students in the research sample on the climate change awareness questionnaire and their scores on the positive thinking towards the environment scale

Variables		climate change awareness questionnaire			
		Cognitive Dimension	Behavioral Dimension	Emotional Dimension	Total Score
Positive Thinking Scale	Optimism and Positive Expectations	.688**	.481**	.563**	.674**
	Emotive Control	.792**	.555**	.632**	.769**
	Acceptance of Personal Responsibility	.702**	.568**	.595**	.728**
	Total Score	.754**	.554**	.619**	.751**

** Significant at 0.01

Table (3) points out that there is a statistically significant positive correlation at a level of 0.01 between the scores of the research sample on the positive thinking towards the environment scale (including optimism and positive expectations, emotional regulation, acceptance of personal responsibility, and total score) and their scores on the climate change awareness questionnaire (including cognitive

dimension, affective dimension, behavioral dimension, and total score). The correlation coefficients ranged between 0.481 and 0.792, all of which are statistically significant at a level of 0.01.

This suggests that there is a meaningful and positive relationship between students' positive thinking towards the environment and their awareness of climate change. As positive thinking increases, so does their awareness of climate change, indicating that individuals with higher levels of positive thinking tend to have greater awareness of climate change issues.

The Fourth Hypothesis Results

To verify the validity of the hypothesis "The level of climate change awareness cannot be statistically predicted by the scores of the students on the positive thinking towards the environment scale," a Simple Linear Regression analysis was conducted. In this analysis, the total score of the climate change awareness scale served as the dependent variable, while the total score of the positive thinking towards the environment scale was used as the independent variable. The results of the regression analysis are summarized in Table (4).

Table 4 – Results of Simple Linear Regression Analysis for predicting climate change awareness through the scores of the students in the research sample on the positive thinking towards the environment scale

Variables	B	Std. Error	Beta	f value	Sig.	t value	Sig.	R	R2	Adjusted R2
(Consta)	19.462	1.733		498.23**	.000b	11.232**	.000	.751a	.563	.562
DC	.688	.031	.751			22.321**	.000			

From Table 4, it is evident that the F-value used to determine the predictability of climate change awareness through the scores of the students on the positive thinking towards the environment scale is 498.23, which is statistically significant at a significance level of 0.01. This indicates a significant relationship between positive thinking towards the environment and climate change awareness.

Moreover, the multiple correlation coefficient R is 0.751, indicating a strong positive correlation between the independent variable (positive thinking towards the environment) and the dependent variable (climate change awareness). Furthermore, the coefficient of determination (R-squared) is 0.563, meaning that the independent variable explains 56.3% of the total variance in the dependent variable. This suggests that positive thinking toward the environment can predict 56.3% of the variability in climate change awareness among students.

In light of the foregoing, the simple linear regression equation can be formulated as follows:

Awareness of Climate Change= 19.462+ (.688) × Positive Thinking towards Environment

Discussion

Through examining the research hypotheses and outcomes, we aim to gain a deeper understanding of the relationship between climate change awareness and positive environmental thinking, as well as their implications for environmental education and sustainable practices. The first hypothesis outcome indicates a high level of climate change awareness among the sampled students, corroborating findings from various studies (Al-Sha'ili & Al-Ruba'ani, 2010; Al-Hamdan& Al-Azmi, 2022), which identified heightened environmental awareness regarding climate change. Conversely, this contrasts with other studies (Al-Ghaithi, 2003; Al-Banna, 2011; Ekpoh & Ekpoh, 2011; Jekayinfa & Yusuf, 2008), which reported a lower level of environmental awareness. Researchers attribute this outcome to university students typically receiving profound knowledge about climate change through environmental science, geography, and environmental studies courses. Educational attainment significantly influences environmental awareness due to the knowledge, attitudes, and behaviors students acquire.

Additionally, university research and publications can deepen students' understanding of climate change effects. Social and cultural values also play a significant role in shaping students' perspectives on environmental issues and

climate change. If cultural values promote environmental care and sustainable development, students are likely to exhibit heightened climate change awareness. Media and technology can further disseminate climate change awareness by providing information, reports, and news about environmental phenomena and their global impact.

Furthermore, efforts in environmental protection and climate change awareness, through initiatives like the National Environmental Awareness and Sustainable Development Program in Saudi Arabia have contributed to raising environmental awareness among university students. This finding aligns with the study by Calculli et al. (2021), which highlighted that despite a seemingly pessimistic view towards environmental and climate crises, younger generations exhibit deeper environmental consciousness and commitment to environmental recovery through the adoption of "good environmental practices" and "active environmental behaviors".

The second hypothesis outcome reveals a high level of positive environmental attitudes among the sampled students. This can be interpreted as university students exhibiting a positive outlook, enabling them to better adapt to challenging situations, with broad exposure aiding them in handling problems flexibly. Extensive social networks assist them in accepting others, harboring positive sentiments towards the environment, and helping others. Researchers attribute the elevated level of positive thinking among students at Prince Sattam bin Abdulaziz University to a sense of social stability and the availability of a secure educational environment characterized by diverse educational activities and teaching strategies that afford students freedom of expression and collaboration in group work. Such education can enhance their understanding of the environment and climate change, broadening their horizons and facilitating the development of positive, responsible, and optimistic perspectives towards climate change challenges.

The university also provides opportunities for students' personal growth and professional development through extracurricular activities, internships, and specialized educational programs, fostering self-confidence and positive thinking

regarding personal and professional capabilities. Moreover, university students are typically internally driven to achieve success and pursue their personal and professional goals, which internal motivation can propel them towards positive thinking and initiative in goal achievement. Furthermore, this can be interpreted in the context of social interaction, as students' presence in a university environment encourages social interaction and collaboration, fostering a sense of shared responsibility and mutual support, thereby promoting positive thinking and optimism. Facing academic challenges in university can also contribute to the development of resilience, emotional regulation, determination, and positive thinking, as students need positive thinking to overcome these challenges.

The outcomes of the third and fourth hypotheses reveal a statistically significant positive correlation between positive environmental thinking skills and awareness levels of climate change among the participating students. This implies that an increase in positive environmental thinking skills corresponds to an elevation in climate change awareness among the students, indicating a strong direct relationship between these variables where an increase in one leads to an increase in the other, and vice versa. This can be attributed to positive thinking empowering individuals to engage with environmental issues constructively, reflecting on their environmental awareness and commitment to environmental conservation. The results of the fourth assumption further support this by suggesting the predictive ability of climate change awareness through positive environmental thinking. This finding aligns with different studies (Al-Baz, 2019; Al-Ahmadi, 2019; Ahmed, 2020; Bascoul et al., 2013; Bourzik, 2022; Deniz, 2016; Erkal & Gürsoy, 2013; Srivastava et al., 2016), which confirmed a relationship between environmental awareness of climate change and positive thinking in general.

Considering the lack of directly relevant studies on the relationship between positive thinking and climate change awareness, the predictive capacity of positive thinking for climate change awareness can be interpreted based on the theoretical framework of positive thinking and the positive relationship dynamic between them. Moreover, the development of climate change awareness cannot occur without the prior growth of positive thinking. Researchers attribute this outcome to

students who possess positive thinking, often being enthusiastic about contributing to improving the world around them, including environmental protection, as they feel responsible for their surrounding environment. They may be motivated to take positive actions characterized by optimism and positive expectations to address environmental challenges. Additionally, climate change and its potential impact on the world may evoke concern and interest among students, but positive thinking, including responsibility, optimism, and emotional regulation, may help them channel these feelings into positive action and effective work for change.

University students with positive thinking are typically characterized by responsibility, optimism, and emotional regulation, guiding them towards preserving environmental resources and adopting a conscious, future-oriented perspective towards the environment with positive expectations for the future (Deniz, 2016; Abdellatif, 2022). Moreover, positive thinking can enhance openness to new ideas and continuous learning, establishing a positive correlation between positive thinking and climate change awareness among university students. This contributes to broadening their understanding and capabilities to adapt to future challenges and participate in global efforts to address climate change (Maartensson & Loi, 2022; Ojala, 2023; Abdullah, 2023). Positive hope and optimism, as dimensions of positive thinking, can also act as motivational forces and uniquely positively influence pro-environmental behavior and climate change support, indicating that positive thinking skills can assist university students in analyzing environmental situations and making decisions positively (Mohamed, 2020).

Conclusion

The study conducted at Prince Sattam bin Abdulaziz University in Al-Kharj Governorate delved into the levels of education in climate change awareness and positive environmental attitudes among students. Using a climate change awareness questionnaire and a positive environmental attitudes scale, researchers found that the sampled students exhibited notable awareness of climate change and maintained favorable attitudes toward environmental concerns, contrary to

previous research suggesting lower awareness levels. The findings underscored the influence of educational attainment and cultural values on environmental consciousness, emphasizing the role of university education and initiatives like the National Environmental Awareness and Sustainable Development Program in Saudi Arabia in bolstering students' comprehension of climate change. Furthermore, a significant positive correlation was identified between positive environmental thinking skills and climate change awareness among university students, highlighting the interconnectedness of these factors. The study stresses the importance of integrating environmental education into university curricula and nurturing positive thinking skills among students to cultivate a generation actively engaged in sustainable practices.

Recommendations and Further Research

Based on the study's findings, recommendations to enhance climate change awareness and positive environmental attitudes among university students include integrating environmental education into curricula across disciplines to foster a comprehensive understanding of climate change, promoting positive thinking skills through various initiatives to equip students with resilience and optimism, encouraging community engagement in local environmental conservation efforts to instill a sense of environmental stewardship, conducting longitudinal studies to assess the long-term impact of interventions on students' attitudes and behaviors, and conducting cross-cultural studies to understand the influence of cultural values on climate change awareness. Implementing these recommendations can empower educational institutions to cultivate environmentally conscious and socially responsible citizens capable of addressing the challenges posed by climate change.

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