Business Research Methods - MGT312.

Project Titel: Assessing Climate Change Awareness, Knowledge, Perception, and Attitudes Among University Students.

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*Abstract:

This research paper delves into the multifaceted landscape of climate change awareness among university students, focusing on the intertwined dimensions of knowledge, perception, and attitude. Our research was designed around three main questions that we where to answer if we wanted to draw a reasonable conclusion. The first question discusses what the overall levels of knowledge students possess regarding the topic, the second question analyses the perceptions and attitudes of students regarding the topic, the third explores connections between the three main variables of the research and their respective sources of influence. The importance of these questions lies in their ability to establish a more inclusive perspective for all related parties. It also bridges the gap between pre-existing assumptions and the actual reality.

The way we answered the three questions was by, firstly developing four hypothesizes that where drawn from the research questions themselves, followed by conducting an online questionnaire featuring a set of tailored questions directed at assessing the demographic, knowledge, perceptions, and attitudes of forty participants. its main advantage being easily accessible regardless of physical, geographical location or time frame while at same time insuring the secrecy of participants, making them comfortable to answer questions in a credible manner and without fear of judgment. After which, we undergone a process of converting the data gathered from the responses of participants to a quantitative form which was easier to analyze and interpret using the software tools. And then lastly testing the hypothesis using the variables calculated and collected from the questionnaire.

The result we got from the data analysis process showed that the discrepancies among students in respect to the three spheres of knowledge, perception, and attitude where nonexistent or minimal / negligible at best. Although different in educational background or demographic characteristics, the majority shared almost the same results across the board. Additionally, the tests showed that the majority of respondents showed little interest in the topic of climate change. We were, however, successful at answering the three research questions. We found that the majority of the respondents possessed sufficient levels of knowledge, they also hade the correct perceptions, and yet did not showcase the appropriate attitude regarding the topic of climate change.

The main conclusion to draw from this is that university students in the UAE, although knowledgeable, lack motivation and incentive to behave in a more positive manner. The may perhaps be attributed to reasons outside the norm or other unknow variables that were not included in this study. And in the process of raising awareness regarding this particular topic or any other moder-day problems among youth, increasing knowledge is just simply not sufficient enough.

*Introduction:

Climate change is one of the most important topics in our modern history, in simple terms, it refers to the ever-changing climate conditions around the globe. Mainly due to the increase in temperature caused by the excessive release of CO2 and other greenhouse gases into the atmosphere, a byproduct of burning fossil fuels (crude oil, liquid gas, coal) or other types of fuels such as nuclear and Biofuels for energy purposes. A trend that started during the first industrial revolution around the 1760s and continued up until the 1820s & 1840s. Although necessary at the time, the resulting long-term harmful effects of such practices included, air pollution, raise in the air temperatures that caused increase in summer temperatures, raise of see levels due to melting of the ice poles, unpredictability of climate condition, puncturing of the ozone layer in the atmosphere which resulted in an increase in levels of ultraviolet waves and harmful soler radiation leaking through the atmosphere. In addition to many other negative effects, it has on the economy, our way of life, and the overall health and well-being of the populace. For example, one the things climate change has triggered is the increase in migration of peoples from hot and dry climates to a more cooler environments suitable for life, due to the reduction of rain levels in regions and countries that fall between the Tropic of Cancer and the Equator like the regions of the Middle East, the Arabian peninsula, North Africa, and the Horn of Africa.

This new migration trend came along with a set of new challenges presented to hosting nations, such as financial & economic burden, added pressure on its infrastructure and health system, its local job market, schooling system, national security risks. This could theoretically allow us to argue that the impact of climate change extends to negatively influencing states economical statues. Which in turn can to some degree effect people's way of living on a whole different scale to that of living conditions.

On the other hand, we've witnessed an increase in efforts made to fight back this problem. More initiatives and measures put forth on both international and local states level, such as emissions control mechanisms that forces organization especially those in industrial sectors to be more mindful of their carbon footprint, biological and other types of wastes.

Our main goal regarding this research is to assess whether university students in general possess the correct views, attitudes, and information related to the issue of climate change. In addition to measuring the level of impact it has on the educational environment and the well-being of university students. Moreover, we also hope to contribute to the prosses of shedding light on this problem.

Through this research we will attempt to answer three main questions which are, I. What could be the main factors contributing to the overall level of knowledge students possess surrounding the topic of climate change, II. What are the perceptions and attitudes of university students regarding the topic of climate change, and III. What is the extent of the influence exerted by changes in students' knowledge levels on their respective attitude and perception toward climate change. With the ultimate goal of discovering ways to enhance the level of awareness amongst university students when it comes the topic of climate change.

We will employ the use of hypothesis to test the possible outcomes of these questions and study actual beliefs, opinions, and perspectives of the study subjects. These hypotheses are, I. do university students possess sufficient levels of knowledge regarding the topic of climate change, II. do university students showcase the appropriate attitude when dealing with the topic of climate change, III. do university students possess the correct assumptions and perceptions in relation to the topic of climate change, IV. are the perceptions and attitudes of university students about climate change influenced by their respective levels of knowledge regarding the same topic.

*Literature Review:

1. **Awareness and knowledge of university students in the UAE regarding the topic of climate change.**

Awareness and knowledge of a particular topic is generally considered the foundation for informed decision making and choosing the most appropriate solution. It indicates a deep level of understanding which comes in handy in times of need, especially when responding to recuring problems. When it comes to a major and highly critical topic like climate change, we should put even more emphasis on the importance of having a well-educated population if we were to attempt and solve this problem or at the very least try to mitigate the negative impacts resulting from it.

climate change awareness should incorporate all relevant aspects of understanding and comprehending the causes, understanding the consequences which will hopefully lead us to come up with better solutions.

But in order to effectively implement counter measures or seek adequate solutions, we must first evaluate the level of awareness regarding this topic. This leads us to question what actually influences levels of knowledge amongst universities students, most of which are born anywhere between the late 1990s and early 2000s. Which effectively categorizes them amongst the gen Z's. understanding this will ultimately assist us in simplifying the research process and narrowing the scope of our search.

According to research done on modern day methods of education and sources of knowledge by (Szymkowiak & et al, 2021), it was stated that "Technological progress has influenced the way we acquire knowledge and learn. On the other hand, the Internet provides fast access to information technology in different fields and thus, improves efficiency and saves time" . according to the writers of the article, this is particularly important amongst gen Z students, who as per the description of the writers, derived knowledge mainly through the use of internet and other technologies in addition to being heavily focused on quick searches for information indicating perhaps signs of low attention span and negligent toward topic that does incorporate some sort of modern/trendy cultural phenomenon.

This leads us to assume that climate change awareness among university students, young adults, and teenagers is mostly build on false pretense and at the same time being highly influenced by mass media, this claim is supported by another research caried by (Rousell & Cutter-Mackenzie-Knowles, 2019). Which was aimed at evaluating climate change education amongst young people.

We also believe that subsequent issues will result in an added layer of complexity, in the sense that, any initiatives undertaken by educational, non-profit, or organizational bodies or any other interested parties, in hopes of enhancing awareness levels among the populace will have to be preceded by a wide range corrective procedure.

Additionally, the writers criticized preexisting approaches of climate change education, describing them as ineffectual at altering students' attitudes and behaviors in any shape of form. Moreover, during our search we've stumbled upon a study by (Barreda, 2018) conducted on the levels of awareness among student at a state university in Philippine regarding climate change and sustainability education. In which, the writer of the paper shared one of her findings after carrying out a survey that included 247 respondents. She claimed that after reviewing the results from the survey, it was noticeable that on average the degree of awareness was higher amongst those students is senior years regardless of major. She also stated that these respondents were selected at random from the undergraduate student's pool and that she was satisfied with their year level.

2. Attitudes and perceptions of university students in the UAE regarding the topic of climate change.

Understanding the relationship between attitudes and perceptions is essential for gaining insights into how individuals form opinions, make decisions, and engage with their surroundings. In our research, we aim to establish a clear correlation between the level of knowledge on a specific subject and the potential changes in the attitudes and perceptions of our research participants.

To arrive at a precise assessment, it is imperative to distinguish the inherent nature of both attitudes and perceptions and discern the factors that influence them. When it comes to individuals' attitudes, we are referring to their evaluations, emotions, and judgments concerning specific objects, people, ideas, or situations. These attitudes are heavily shaped by personal beliefs, emotional responses, past experiences, and the sway of social influences. On the other hand, perceptions predominantly pertain to the manner in which individuals interpret and make sense of sensory information derived from their surroundings through their sensory faculties (sight, hearing, taste, smell, touch), commonly known as sensory data. Variations in sensory processing within a particular group, population, or test group generally stem from disparities in how each individual interprets sensory data

The challenge here is to propose a set of effective measures aimed at fostering a significantly more positive response and changing the attitudes and perceptions of university students concerning the issue of climate change. We believe that the three primary components: knowledge, attitudes, and perceptions, mutually influence one another. For instance, individuals' attitudes are shaped by various factors, including their past experiences. These experiences

encompass a broad spectrum of knowledge across different aspects of life, including science, art, and more. This knowledge, which we are certain is processed and interpreted through the five senses, forms the foundation for the assumptions and beliefs that each of us holds regarding the functioning of the universe.

According to (Pandve et al., 2009), the inclusion of youth in planning and combating climate change is very important since they will be affected the most by it. He also argued that young influential people who have the skills to spread new trends, habits, and technologies could contribute to the fight against climate change. Influencers, internet personalities, athletes, famous content creators and so on. Additionally, United Nations International Strategy for Disaster Reduction, during its 2000 World Disaster Reduction Campaign suggested that "youth can aid in the development and implementation of disaster prevention and risk management strategies because they can promote the necessary change in behaviors and a shift in mentalities. This is possible because they are adaptable as well as able to quickly make low-carbon lifestyles and career choices".

Manny research believe that the promotion of disaster mitigation strategies should be carried out using modern method, that employ technologies, and are susceptible to trend and cultural changes. According to (Rousell & Cutter-Mackenzie-Knowles, 2019), young people's understanding is mainly influenced by mass media resulting in a set of general assumptions that may not be accurate, the same assumptions which goes on to form out the behavioral foundations within these youth.

And so, it becomes clear that in order to realize a positive change in attitudes and perception of university students and youth in general we must first understand the where about of their preferred sources of knowledge and information, and then assess whether these sources are sufficient, accurate, and credible. Moreover, it's important to emphasize giving young people the opportunity to contribute and participate in planning and strategizing, given the fact that, thy are the most important stakeholders in this matter.

3. Gaps in literature.

In this part we will analyze the aspects of research neglected by previous work carried by researchers. But first, we would like to commend their efforts to shed light on the importance of this particular topic and other related matters. We believe that without their work we would've lacked the required guidance on things where to direct our attention and how to carry this research. We believe that the vacuity left behind is that of a substantive gap, where a specific aspect of a topic has not been adequately researched or is poorly understood. In our opinion, we believe that in this setting this happens to be the overall view of university students in relation to the topic of climate change. We speculate that the existence of this gap specifically is due to evolving knowledge and technologies, compared to what past researchers had access to. We believe that our work has the potential to at the very least provide a foundation for future research to hopefully fill this void. Moreover, we claim our research objective and question are directed at giving students the platform to express their thoughts and opinions, our three questions directed at, one, assessing the level of knowledge among students in relation to the topic of climate change, two, capturing the perception of the students, and three, discussing potential solutions and measurement to be implemented at university level to promote a more positive outcome. Consequently, this happens to be aligned with the gape itself, we are confident that our work may possibly have a great influence on the landscape of this research topic.

Additionally, while reviewing the literature, we couldn't help but feel a sense of frustration regarding the fact that there was so little care on the point of view of students when it came to discussing the problem of climate change and its negative effects. There were however attempts made by some researcher designated at evaluating the levels of knowledge among youth and young people, for example (Barreda, 2018) and (Rousell & Cutter-Mackenzie-Knowles, 2019) both had similar interests/ objectives. And yet, we believe both their work lacked a satisfying level of inclusion and details and was a bit vague at times. One the other hand, (Pandve et al., 2009) did suggest the inclusion of youth in the process decision-making and planning but only as means of propagating new strategies. But did not mention the importance of actually considering the meaningful input the could be provided by youth.

In conclusion, The importance of our research in our opinion comes in the form of establishing a foundation upon which future research could be built on. In addition to serving as a base for information and guidance on where to look, and most importantly filling existing gaps in the knowledge regarding this topic. we claim our research objective and question are directed at giving students the platform to express their thoughts and opinions which in turn will provide us with much viewpoint, our three questions directed at, one, assessing the level of knowledge among students in relation to the topic of climate change, two, capturing the perception of the students, and three, discussing potential solutions and measurement to be implemented at university level to promote a more positive outcome

* Methodology:

1. <u>Introduction to the methodology section:</u> In this part, we'll go over the method we used in our study to evaluate UAE university students' views, comprehension, and opinions regarding climate change. Our study is to comprehend the variables that impact students' knowledge of climate change, their perspectives on the matter, and the ways in which academic institutions might support constructive behavior and awareness.

2. <u>Research design:</u> we choose to conduct our research using the Quantitative design, since our main objective is to study characteristics of university students when it comes to awareness regarding a particular topic, followed by recognizing the behavioral patterns students follow when dealing with this topic. Hence why we believe this design to be the most appropriate for our research. Additionally, our research follows the deductive approach of developing and testing hypothesis for the sake of answering the research questions.

3. <u>Questioner design</u>: the demographic of the target population for our study consists primarily of university students between the ages of 18 and 25, it employes the convenience non-probabilistic sampling technique. The selection of participants is systematically hand-picked by our group members from the nearby pool of students (aka, friends, and colleagues in the same university) and the size of sample is n=40.

4. <u>Data collection method</u>: To collect thorough data for our study, we used a mixture of methods that included both qualitative and quantitative approaches. By taking this approach, we can guarantee the validity and dependability of our findings while also gaining a deeper grasp of the study issues.

5. <u>Procedures:</u>
   1- Survey Form: To collect data in quantitative form, an organized survey questionnaire was created. The questionnaire evaluated students' knowledge, comprehension, views, and opinion on climate change. A scale called Likert was used for assessing results in order to quantify views.

   2- Distribution: To ensure maximum accessibility, the poll was distributed online via a combination of social and academic networks.

   3- Data collection: Respondents answered questions about comprehension of climate change, sources of knowledge, attitudes, and views using a digital questionnaire.

6. <u>Materials</u>:
    1- Survey Form: In order to gather quantitative data, we created an organized questionnaire. Questions about comprehension of climate change, sources of information, opinions, and views were included in the survey.

    2- Conversation Guide for Target Groups: To facilitate the talks in our focus groups, we created a conversation guide with questions that are open-ended. This guide guaranteed clarity and applicability for various populations.

7. <u>Ethical Considerations</u>: when it comes to our ethical responsibility toward both participants and related parties, we promise that we will be neutral in our work, and to not use it for personal gains or to propagate any sort of agenda or personal bias or to violate any ethical codes of conduct or betray the trust of the participants by exposing them to scrutiny and harassments and to assure that the questioner is to serves as a safe space for them to share their true opinions and ideologies.

8. <u>Data analysis</u>: data gathered from the survey was analyzed based on type of responses. Whereby, the first category of included a multiple chois question out of 2 to 4 choices that where meticulously selected, the second category featured true and false questions, where each of the answers was represented by a numerical value (true = 1, false = 0). The responses for the fourth category questions served as a tool for measurement of participants willingness to partake in a said activity, ranging between Never, Rarely, Sometimes, Often, Always. Additionally, each of those choices is represented by a number from 1 to 5. The last category included questions aimed at capturing the level of participants' agreeableness with a statement that was presented to them. The provided answers ranged from Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree. Moreover, during the data analysis we employed the use of the Jamovi software to analyze the data collected from the questionnaire and test the three hypotheses developed from the research questions. The tests used to conduct the study included the descriptive test of variables, reliability analysis for testing the validity of the variables used, one sample t-test used for testing the hypothesis, independent sample t-test for studying the variation in outcomes between different groups of the study sample, and confirmatory factor analysis for evaluating the levels of influence exerted between the three main research variables.

In conclusion: the methodology employed in this study provided a comprehensive and well-rounded approach to understanding UAE university students' perspectives on climate change. The use of quantitative methods allowed us to gather data in a more streamlined fashion, which was not only robust but also rich in context. The use of a structured survey questionnaire ensured a systematic evaluation of students' knowledge, perceptions, and attitudes on climate change. Additionally, the distribution of the survey via various social and academic networks helped maximize accessibility and reach a diverse group of respondents, which also insured the transparency and animosity for survey participants in response to their concerns.

*Data Analysis:

The data analysis phase of any research is a pivotal stage that transforms collected data into meaningful insights and conclusions. In this section, we will delve into the data obtained from our study on UAE university students' perceptions of climate change. Our analysis will aim to uncover patterns, relationships, and trends within the data, shedding light on the variables that impact students' knowledge, attitudes, and awareness of this critical issue. And through the use of a set of personalized hypotheses, we intend to thoroughly test all relevant variables. These include:

- H1: Do university students possess sufficient levels of knowledge regarding the topic of climate change
    - *Null hypothesis (H0): Yes, university students do possess the necessary level of knowledge regarding climate change.*

    - *Alternative hypothesis (H1): No, university students do not possess the necessary level of knowledge regarding climate change.*

- H2: Do university students showcase the appropriate attitude when dealing with the topic of climate change.
    - *Null hypothesis (H0): Yes, university students do indeed showcase the appropriate attitude when it comes to dealing with climate change .*

    - *Alternative hypothesis (H1): No, university students do not showcase the appropriate attitude when it comes to dealing with climate change.*

- H3: Do university students possess the correct assumptions and perceptions in relation to the topic of climate change.
    - *Null hypothesis (H0): Yes, university students do possess the correct assumptions and perceptions in relation to the topic of climate change.*

    - *Alternative hypothesis (H1): No, university students do not possess the correct assumptions and perceptions regarding the topic of climate change.*

- H4: Are the perceptions and attitudes of university students about climate change influenced by their respective levels of knowledge regarding the same topic.
    - *Null hypothesis (H0): Yes, the perceptions and attitudes of university students about climate change are influenced by their levels of knowledge.*

    - *Alternative hypothesis (H1): No, the perceptions and attitudes of university students about climate change are not influenced by their levels of knowledge.*

1- Interpretation of the analysis:

- Descriptive: we will initiate our data analysis with a descriptive overview of the data collected from the questionnaire.

Descriptives

	Sum of Knowledge.	Average of perception.	Average of Attitude.
Mean	4.22	3.92	3.13
Median	5.00	4.00	3.17
Mode	5.00	4.00	3.00 ᵃ
Sum	169	157	125
Standard deviation	1.12	0.892	0.907
Variance	1.26	0.796	0.822
Minimum	1.00	1.60	1.50
Maximum	5.00	5.00	5.00

ᵃ More than one mode exists, only the first is reported

We opted to present the collected date by combining the sub variable from each category into a form of a summarized group for the sake of simplicity. for example, the sum of knowledge group created from combining the gathered result from each item under the knowledge category, each knowledge item holds a value of either 1 or 0 for. There were five knowledge questions in total which means that the maximum score one participant could muster from answering all five questions is 5, and the lowest score is 0. In the case of our study group, the mean for the sum of knowledge group was around 4.22, while the standard deviation was around 1.12.

For the other two groups (Avg of perception, and Avg of Attitude), they serve as a summary for the items mentioned in both the perception and attitude. Both categories featured similar value system corresponding with each available option in the questions. The two categories had six and five questions respectively. The options in the perception items ranged from Never, Rarely, Sometimes, Often, Always. With each holding value of either 1,2,3,4, and 5. This means that the maximum one participant could score after answering all six questions is 30, and lowers being 6. For the attitude items, the featured options ranged from Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree. The highest score participants could muster from answering all five questions is 25, and lowest is 5. The mean value for the avg of perception group is 3.92 and the SD is 0.89, while the avg of attitude group had a mean of 3.13 and a SD of 0.907.

2- Findings of data analysis:

In this part we will discuss the findings of the data analysis process carried out on data collected from the questionnaire. We will use a number of tests and techniques to examine the validity of the variables, measure the differences among categories of data and participant responses, and relation

- Reliability analysis: for this section, we analyzed how reliable were the questions used in the questionnaire and the resulting variable for each of the three categories of knowledge, perceptions, and attitudes.

   a. Starting with knowledge: the mean Cronbach's alpha for the knowledge variables was around 0.586 which is less that the standard average of 0.7. This means that, the questions used in the knowledge part of the questionnaire is not a reliable tool of measurement for assessing the level of knowledge of the participant. Due to, either an insufficient number of questions used, or a narrow scale of options, or perhaps due to an insufficient sample size.
   Additionally, the Cronbach's alpha value for each individual knowledge item were as follows: (k1: 0.511), (k2: 0.530), (k3: 0.545), (k4: 0.455), (k5: 0.595).

   b. For the attitude: it had a mean Cronbach's alpha of 0.803, which qualifies it to become a reliable measurement tool for examining the attitudes of participants toward the topic.
   The alpha value for each individual attitude item were as follows: (a1: 0.837), (a2: 0.760), (a3: 0.784), (a4: 0.731), (a5: 0.763), (a6: 0.741).

   c. For the perception: the mean Cronbach's alpha for the perception category was 0.903. which similar to the attitude category, is also qualified as a reliable tool for us to use while conducting our study, especially when it comes to assessing the perception of the research subjects regarding climate change.
   The Cronbach's value for each individual variable is as follows:
   (p1: 0.874), (p2: 0.874), (p3: 0.915), (p4: 0.871), (p5: 0.8720).

- Test of Hypothesis: for this part we will test the hypothesis extracted from the research questions using analytical procedures carried out on the date gathered from the study subjects. This will also serve as our main study findings and as the answer for the research questions.

1. First hypothesis: Do university students possess sufficient levels of knowledge regarding the topic of climate change. *(this hypothesis answers the first research question)*

   Using the one sample t-test to test the summary group (sum of knowledge),
   Our H0: $\mu > 3$.
   Our P-value was (<0.01) which is less that our a = 0.05.
   So, except H0 (*Yes, university students do possess the necessary level of knowledge regarding climate change).*

   And thus, we can say that we are 95% confident that university students possess sufficient levels of knowledge regarding climate change.

   One Sample T-Test

		Statistic	df	p
Sum of Knowledge.	Student's t	6.91	39.0	< .001

   Note. H₂ $\mu > 3$

2. Second hypothesis: Do university students showcase the appropriate attitude when dealing with the topic of climate change. *(this hypothesis answers part of the second research question)*

   Using the one sample t-test to test the summary group (Average of Attitude),
   Our H0: $\mu > 3$.
   Our P-value was (0.179) which is more that our a = 0.05
   So, reject H0, except H1 (No, university students do not showcase the appropriate attitude when it comes to dealing with climate change).

   And thus, we can say that we are 95% confident that university students do not possess the appropriate attitude toward climate change.

   One Sample T-Test

		Statistic	df	p
Average of Attitude.	Student's t	0.930	39.0	0.179

   Note. H₂ $\mu > 3$

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3. Third hypothesis: Do university students possess the correct assumptions and perceptions in relation to the topic of climate change. *(this hypothesis answers the other part of the second research question)*

Using the one sample t-test to test the summary group (Average of Perception),
Our H0: $\mu > 3$.
Our P-value was (<0.01) which is less that our a $= 0.05$
So, except H0 *(Yes, university students do possess the correct assumptions and perceptions in relation to the topic of climate change)*.

And thus, we can say that we are 95% confident that university students have accurate perceptions regarding climate change.

One Sample T-Test

		Statistic	df	p
Average of perception.	Student's t	6.49	39.0	< .001

Note. H, $\mu > 3$

4. Forth hypothesis: Are the perceptions and attitudes of university students about climate change influenced by their respective levels of knowledge regarding the same topic. *(this hypothesis answers the third research question)*

But before we analyze the variables, we first need to test whether they fit to compare between each other *(referring to the three variables knowledge, perception, attitudes)*.

Using the model fit test, we analyze all variables available for testing under the three categories of knowledge, attitudes, and perceptions.
Our P-value was (<0.01) which is less than our a $= 0.05$
Which means that yes, the variables do fit for comparison.

Test for Exact Fit

χ^2	df	p
203	101	< .001

Now we can test the hypothesis, using the factor estimates test we noticed that,
The connection between knowledge factors and attitudes factors had a P-value of 0.910 which is greater than a $= 0.05$.
The connection between knowledge factors and perception factors had a P-value of 0.605 which is greater than a $= 0.05$.

This means that knowledge does not influence the perceptions and attitudes of students regarding climate change.

On the other hand, the connection between attitude factors and perception factors had a P-value of (<0.01) which is less than a = 0.05.

Reject H0, except H1 *(No, the perceptions and attitudes of university students about climate change are not influenced by their levels of knowledge)*

And thus, we can say that we are 95% confident that university students' perceptions and attitudes are not influenced by their knowledge levels.

Additionally, from these findings we concluded that, the perception of university students is highly influenced by their attitudes and behaviors when dealing with the topic of climate change, regardless of their level of knowledge.

Factor Covariances

		Estimate	SE	Z	p
knowledge	knowledge	1.0000 [a]			
	Attitude	−0.0234	0.206	−0.114	0.910
	perception	0.1059	0.204	0.518	0.605
Attitude	Attitude	1.0000 [a]			
	perception	0.5011	0.139	3.594	< .001
perception	perception	1.0000 [a]			

[a] fixed parameter

- Additional tests: we also analyzed the variation in the responses/variables among different clusters of the study sample. For example, the differences in the mean responses between male and female responders/ students in regard to the three questioner categories.

    And for that we developed three new hypotheses, those being:
    i. Is there a difference in levels of knowledge between male and female.
       (H0: yes, there is a difference, H1: no, there is no difference).
    ii. Is there a difference in perceptions between male and female.
       (H0: yes, there is a difference, H1: no, there is no difference).
    iii. Is there a difference in attitudes between male and female.
       (H0: yes, there is a difference, H1: no, there is no difference).

To test these hypotheses, we use independent sample t-tests.

   a. Starting with the first hypothesis, is there a difference in levels of knowledge between male and female.

Our H0: Male ≠ Female
Our P-value was (0.928) which is greater than a = 0.05

So, Reject H0, except H1 *(No there is no difference in knowledge levels between male and female).*

Independent Samples T-Test

		Statistic	df	p
Sum of Knowledge.	Student's t	0.0912	38.0	0.928

Note. H₀ μ Female ≠ μ Male

   b. The second hypothesis is, is there a difference in perception between male and female participants.

Our H0: Male ≠ Female
Our P-value was (0.281) which is greater than a = 0.05

So, Reject H0, except H1 *(No there is no difference in perceptions between male and female).*

Independent Samples T-Test

		Statistic	df	p
Average of perception.	Student's t	1.09	38.0	0.281

Note. H₀ μ Female ≠ μ Male

    c.   The third hypothesis is, is there a difference in attitudes between male and female responders.

Our H0: Male ≠ Female
Our P-value was (0.275) which is greater than a = 0.05

So, Reject H0, except H1 *(No there is no difference in attitudes between male and female responders)*.

Independent Samples T-Test

		Statistic	df	p
Average of Attitude.	Student's t	1.11	38.0	0.275

Note. H_a $\mu_{Female} \neq \mu_{Male}$

In conclusion our data analysis has unveiled crucial insights into the perceptions of UAE university students regarding climate change. Through a meticulous examination of the quantitative survey responses, we have gained a nuanced understanding of the variables influencing students' knowledge, attitudes, and perceptions of this pressing global issue.

The online distribution of the survey ensured a diverse and representative sample, enriching the generalizability of our findings. However, we did face some limitations in the form of limited time frame, sample size small in comparison with the total population size, inconsistent sampling technique that was not capable of fair representation and inclusion, unreliable variables in the questioner, narrow/ inflexible response range.

*Research conclusion:

At the end of this research and after we analyzed all relevant aspects to the main topic of this paper, we conclude that university students in the UAE and in Ajman university in particular do indeed have sufficient amounts of knowledge, and accurate assumptions regarding the topic of climate change. This claim supported by the findings of the data analysis process carried out against the responses of the questioner participants.

This also qualifies as an answer for the first question and one part of the second question. Additionally, we also conclude that although students do indeed possess the necessary knowledge required for informed decision making on top of an accurate set of perceptions, assumptions, and beliefs. They lack both the motivation and the willingness to showcase the appropriate attitudes and behaviors when it comes to dealing with climate change. Perhaps due to cultural, ideological, or psychological reasons. This also might extend to a possible deficiency in self-awareness toward one's own actions. Moreover, we also found that contrary to the general belief and the first assumption we had before conducting the research, university students' perceptions and attitudes we not influenced by how much knowledge they possessed. For perceptions we found that it was mainly influenced by their attitudes. While their knowledge levels were influenced mainly by social media, the internet, and other modern-day technologies. Their absolutely no connection between how much knowledge student hade encompassed regarding the topic and their choice of behavior when dealing with it

The main goals of this research were and still is, firstly to contribute to the prosses of shedding light on this problem, secondly to provide a platform upon which future work will be based on, and thirdly to provide students with platform to voice their opinions.

Additionally, the limitations we faced while conducting this research include time limitation, fair and inclusive sampling process, fund limitations, and lack of expertise.

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