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Climate change knowledge, attitude, and perception of university students in UAE

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Abstract

This research takes a look at delves into the perceptions, attitudes, and knowledge concerning climate-associated issues among students at Ajman University, UAE. Over 50 college students participated in the survey, presenting insights into their viewpoints on weather exchange and sustainability. The research found an extensive high-quality correlation among perceptions and attitudes towards climate problems, indicating that heightened cognizance regularly aligns with more fine attitudes. Additionally, slight correlations were observed between perceptions/attitudes and knowledge, emphasizing the position of expertise in shaping attitudes and perceptions. Students exhibited numerous stances toward anthropogenic reasons for weather change, highlighting worries approximately the urgency of addressing environmentally demanding situations. The study identifies potential pathways for reinforcing climate literacy and advocacy amongst college students, emphasizing the want for targeted educational interventions and policies to bridge understanding gaps and foster proactive attitudes towards sustainability. These findings lay the groundwork for tailored techniques aimed at cultivating a lifestyle of environmental awareness and movement in many of the more youthful eras in the UAE.

In the analysis you will find alternatives “A, B, C” each one refers to a different factor related to survey questions.

A: Perception

B: Attitude

C: Knowledge

Introduction

Research problem

The research hassle revolves around assessing the information, attitudes, and attitudes of university college students inside the UAE towards climate exchange. This is important due to the fact that trade is an international problem with massive effects on the surroundings, human health, and society, and know-how of the perspectives and abilities of young human beings, including university college students, is important and develop powerful whether exchange schooling and advocacy techniques

Research statement:

This research aims to investigate the level of understanding, attitude, and notion of college college students within the UAE closer to climate trade. It seeks to apprehend their expertise in weather exchange, their attitudes and behaviors related to climate change mitigation and model, and their perceptions of the influences and causes of climate trade.

Research questions:

1. What is the level of knowledge among university students in the UAE about climate change, its causes, and its consequences?

2. What are the attitudes and behaviors of university students in the UAE towards climate change mitigation and adaptation strategies, such as the use of public transport, willingness to pay for cleaner energy, and energy conservation?

3. How do university students in the UAE perceive the impacts of climate change on the environment, human health, food security, and natural resources?

Research objectives:

The research objectives for this study are as follows:

1. To assess the level of climate change knowledge among university students in the UAE.

2. To understand the attitudes and behaviors of university students in the UAE towards climate change mitigation and adaptation.

3. To explore the perceptions of university students in the UAE regarding the impacts and causes of climate change.

By addressing these objectives, the research seeks to provide insights into the climate change awareness and views of university students in the UAE and contribute to the development of informed climate change policies and educational programs in the region.

Literature review

Awareness of sustainability, climate emergency, and Generation Z's consumer behavior in the UAE

This article compares Generation Z in the UAE with their counterparts in the West, taking a closer look at their attitudes and attitudes towards the environment Notably, Generation Z in the UAE a large proportion (75%) indicate a preference for environmentally friendly work. The Good Futures contribution highlights the important link between knowledge and pro-environmental practices, emphasizes the role of universities in influencing student attitudes and behaviors, and argues that government policies awareness raising, and social media strategies can influence this, and exemplify of Theory of Planned Behavior (TPB). This study highlights the importance of understanding the attitudes and knowledge of Generation Z in the United Arab Emirates, especially concerning sustainable fashion choices. It also calls for greater insight into consumer behavior while contributing to sustainability among this demographic. (Radwan & Khalil, 2021)

CLIMATE CHANGE AWARENESS IN THE UNI ARENESS IN THE UNITED ARAB EMIRA TED ARAB EMIRATES

This section examines critical aspects of climate change awareness, sensitivity, and adaptation in the United Arab Emirates (UAE). By emphasizing the expansion of exchange capacity beyond current coping mechanisms, this highlights the need to adapt to the rapidly changing global context In addition; The agency encourages people to actively prepare to prepare for climate change. Notably, developing countries such as the United Arab Emirates, which rely on climate-affected resources such as agriculture, fisheries, and livestock, are particularly vulnerable to the risks posed by climate change. (Almheiri, 2023)

The section also highlights how the geographical and temporal scales at which optimization methods are applied determine the efficiency. This highlights the fact that change can be a multidimensional concept influenced by relationships and complicated at many levels from household practices to state policy To help assess the possibilities of the UAE being a state multifaceted, this section clarifies the challenges and adaptation strategies associated with climate change. It focuses on the implications for the development and management of natural resources in the country. (Al-Naqbi & Alshannag, 2018)

Attitudes towards climate change and energy sources in oil exporters

88.5% of the population of the United Arab Emirates are expatriates, while only 11.5% are Emiratis. The public sector employs 60% more Emiratis than the private sector (0.5%). There are mixed views on climate change: 16% think it may be too late to prevent the worst, while 6% reject the idea that human activity is causing climate change Despite the majority's opposition the significant impact of climate change is acknowledged. Worryingly, 62% of people turn off the air conditioner when they leave the house. Meanwhile, it is unclear how long migration has had an impact on attitudes towards climate change. (Almheiri, 2023)

Knowledge, attitude, and practice toward sustainability among university students in UAE

Sustainability at the University of Sharjah

This study examines the knowledge, attitudes, and behaviors of UAE university students—specifically, those attending the University of Sharjah—with regard to sustainable development. The University is strongly committed to sustainable development and actively promotes it via a number of programs that are in accordance with the 2030 Agenda for Sustainable Development of the United Nations and the National Agenda of the United Arab Emirates. (Radwan & Khalil, 2021)

Sustainable development is based on three pillars: social justice, environmental protection, the benefits of economic growth, and people and the world. These pillars emphasize the importance of balancing economic, social, and environmental development for the benefit of future generations. (Al-Naqbi & Alshannag, 2018)

This study provides insights into UAE students' perceptions of sustainability and sustainability, with a focus on the University of Sharjah's sustainability initiatives Basics This highlights the importance of measuring a emphasizing sustainability and university responsibility for advancing sustainable development in their communities and beyond. (Radwan & Khalil, 2021)

Enhancing Sustainability Communication among UAE's Higher Education Students: The Relationship between Sustainable Living Knowledge and Intention to Live Sustainably

University Students and Sustainability Communication

This takes a look at looks at the connection between college students inside the United Arab Emirates' goals and their know-how of sustainability. It highlights the significance of exact sustainability communication and how it may increase our comprehension of the interactions among humans and the surroundings. (Radwan & Khalil, 2021)

Communications on sustainability deal with problems consisting of transportation, infrastructure, biodiversity, and climate alternate. It is communicated in a lot of approaches, which include reports and ads. Three categories of sustainability networks were determined by way of studies: everyday sustainability networks, weekly sustainability networks, and sustainability networks. (Al-Naqbi & Alshannag, 2018)

University college students are valuable in sustainability efforts because of their intellectual historical past. By incorporating a sustainable subculture into their guides, universities may significantly make contributions to the advertising of sustainable development. Sustainability is taught at numerous UAE institutions, and it impacts college students' attitudes and expertise. (Radwan & Khalil, 2021)

In conclusion, this look emphasizes the importance of superior di in helping sustainable improvement within the United Arab Emirates, the role of university college students in the system of sustainable improvement, and the relevance of appropriate sustainability conversation. (Ben Romdhane et al., 2023)

Graduate, 2nd Place: Assessing the knowledge, attitude, and everyday life practices adopted among Eastern Illinois Univ practices adopted among Eastern Illinois University students towards sustainability. (Almheiri, 2023)

Sustainability Education

This Eastern Illinois University study initiative looks at students' everyday actions, attitudes, and understanding of sustainability. A major area of concentration is sustainability literacy, which mobilizes information, abilities, and attitudes to create a sustainable future. (Hasan et al., 2021)

Given the pressing sustainability concerns of resource scarcity, pollution, and climate change, higher education is crucial in ensuring that future generations have sustainable lifestyles. The United States places a strong emphasis on sustainability education in light of its prior commitments to sustainable development and the Sustainable Development Goals. (Ben Romdhane et al., 2023)

It is believed that an informed person may attain the objective of sustainability. 78% of American voters who are currently registered to vote favor requiring climate change instruction in schools. In order to solve the present sustainability difficulties, the research seeks to determine how well students' knowledge, attitudes, and activities correspond with sustainability ideals. (Hasan et al., 2021)

Knowledge, attitude, and readiness towards disaster management: A nationwide survey among healthcare practitioners in the United Arab Emirates

A popular backdrop for the studies is given in the creation, which also emphasizes how developing human-precipitated dangers as a result of worldwide environmental change highlights the consequences of such catastrophes and defines and categorizes risks as the ones on account of herbal and human sources. Previous studies on health professionals' information, attitudes, and readiness for screw-ups conducted in various nations are mentioned. Apart from the National Crisis, Emergency and Disaster Management Agency's (NCEMA) function in disaster preparedness and reaction, the want of making ready and developing a professional body of workers for disaster management become emphasized, as the UAE's susceptibility to natural calamities. The study's objective was to assess health professionals' information, attitudes, and level of instruction for disaster recuperation and preparedness inside the United Arab Emirates. This advent highlights the importance of disaster preparedness reaction for the growth of the nation in light of its fast improvement and common catastrophes. It additionally gives a methodological cognizance for the observation of healthcare providers inside the United Arab Emirates and assesses their readiness response. (Hasan et al., 2021)

The status of education for sustainable development and sustainability knowledge, attitudes, and behaviors of UAE University students

With an emphasis on the United Arab Emirates (UAE), this phase provides an overview of studies on university college students' sustainability-related understanding, attitudes, and practices The points show previous learning approximately numerous of those nations. Teaching about scholar outcomes and gender inequality is diagnosed as critical, and the UAE's amazing sustainable development efforts built attention emphasizes the combination of sustainable improvement into the curriculum. Despite those efforts, no previous research in the UAE has looked at the impact on UAE College students. (Al-Naqbi & Alshannag, 2018)

Prioritizing climate change actions post COVID-19 amongst university students; a Q methodology perspective in the United Arab Emirates

The date between the COVID-19 pandemic and weather alternate in the context of the United Arab Emirates (UAE) is exact in this newsletter. Key subjects include how the pandemic has affected carbon emissions, how air pollution has been briefly decreased, concerns about the back of the pandemic, and behavioral changes that have reduced emissions a deliberate worldwide warming. It highlights the parallels between pandemics and climate trade, emphasizing their interconnected, international, and predictable characteristics. The ocean highlights how long the period of climate trade is and the way urgent action is needed. (Hasan et al., 2021)

It highlights the significance of weather action in improvement plans, emphasizing the transition to a sustainable financial system. There is also debate about how the UAE plans to combat weather change, pass in the direction of green growth, and participate in international weather talks. The zone also recognizes dangers associated with climate trade in Arab countries, together with the United Arab Emirates. These worries consist of severe warmth waves, food safety troubles, water shortage, biodiversity loss, coastal erosion, and more. In popular, it focuses on the connection between disease and weather exchange. (Hasan et al., 2021)

Integrating SDGs in Higher Education—Case of Climate Change Awareness and Gender Equality in a Developing Country According to RMEI-TARGET Strategy

This research is focused on the Sustainable Development Goals (SDGs), in particular how An-Najah National University in Palestine integrates gender equity and weather exchange cognizance into higher training in a negative country. 448 undergraduate college students participated in the study, which evaluated their knowledge of and behavior related to weather trade in addition to the efforts made by schools and student corporations to raise consciousness. Results indicate that neither male nor woman college students show a lack of interest in environmental concerns or gender equality. (Demaidi & Al-Sahili, 2021)

Additionally, they have a look at found that enrollment in engineering programs and being a member of the scholar frame stepped forward cognition, specifically for woman college students. In summary, the research emphasized the significance of incorporating climate change issues into postsecondary training and supplied backing for extracurricular endeavors undertaken with the aid of scholar organizations that deal with environmental climate alternates. The take look is in line with the increase of gender equality movements in the Mediterranean and the EU TARGET venture's efforts to promote gender equality in institutional transformation. (Demaidi & Al-Sahili, 2021)

Agriculture and groundwater in Abu Dhabi

This preliminary research compares the knowledge, attitudes, abilities, and aspirations of farmers in Western Australia to those in Abu Dhabi on groundwater management. This study is very important because of the special difficulties and facts in this area of water scarcity. Most of Abu Dhabi's GDP is derived from other sources, and the region has problems with groundwater and excessive residential water use. Although the government has started water conservation programs the farmers have not benefited much from them. The report also highlighted recent initiatives in Abu Dhabi to address water scarcity, including the use of treated wastewater for agriculture and the Liwa strategic reservoir as a source of

drinking water in emergencies. By contrasting these issues and efforts in Western Australia, important insights into sustainable agriculture, water conservation techniques, and groundwater management can be gained. The aim of the study is to analyze how well government policies for sustainable groundwater management attempt to assess farmers' knowledge, attitudes, and actions in both sectors. This comparative research offers solutions to problems associated with water scarcity and advances our knowledge of groundwater problems in arid places. (Demaidi & Al-Sahili, 2021)

Methodology

Research Methodology

This examination employs a blended approach method to research the attitudes and perceptions of Ajman University college students regarding weather trade and sustainability. The method accommodates both quantitative and qualitative study strategies to benefit the complete know-how of college students' expertise, attitudes, and behaviors.

Research resources

The research resources for this take a look at include a mixture of primary and secondary records sources. The number one information might be accumulated via surveys, interviews, and awareness group discussions with Ajman University students. Secondary facts might be drawn from current literature, surveys, and study findings on climate alternatives and sustainability in the United Arab Emirates (UAE).

Study population

The goal populace for this study includes students enrolled at Ajman University. Ajman University is a various instructional institution that draws college students from various backgrounds, making it an appropriate place to discover distinct views on climate alternatives and sustainability.

Study sample

The take a look at will contain a pattern of over 50 students from Ajman University. The choice of this pattern goals to offer a representative review of the student body's attitudes and behaviors regarding weather exchange and sustainability. The pattern length of over 50 students permits a variety of reviews and perspectives to be captured.

Data Collection Method:

Surveys: A quantitative survey might be conducted to accumulate statistics on students' expertise, attitudes, and behaviors associated with climate exchange and sustainability. The survey could be administered to a randomly decided group of college students, and the responses could be analyzed to discover tendencies and styles.

Data Analysis:

The quantitative records accumulated from the surveys could be analyzed with the usage of statistical techniques and software programs to discover tendencies, styles, and correlations. Descriptive statistics and inferential records can be used to interpret the survey responses. The qualitative information from interviews and cognizance group discussions might be transcribed and analyzed thematically. Themes and styles can be diagnosed to gain a deeper know-how of students' attitudes and perceptions related to weather exchange and sustainability.

Ethical Considerations:

The look will adhere to moral hints, making sure knowledgeable consent from participants and maintaining confidentiality and anonymity. The studies may be performed with complete appreciation for the rights and privateness of the participants.

Limitations:

The have a look at's barriers consist of the ability for sample bias, as most effective students from Ajman University are covered. Additionally, self-reporting in surveys and interviews can also introduce response bias. However, efforts could be made to mitigate these obstacles through random sampling and transparent fact-collection techniques.

Data analysis

Results Reliability Analysis

Scale Reliability Statistics

	Mean	SD	Cronbach's α	McDonald's ω
scale	4.17	0.958	0.974	0.975

[3]

Meaning (4.17): This represents the average value derived from the given scale.

Standard deviation (SD) demonstrates the dispersion of scores from the average. A smaller SD indicates a lower level of variability.

Reliability in internal consistency can be measured using certain methods.

Cronbach's alpha (0.974) and McDonald's omega (0.975) are two measures that evaluate the degree of relationship among the items on a scale. A higher value (close to 1) suggests strong internal consistency, which is ideal for a reliable scale. Therefore, the scale shows a high level of internal consistency.

To sum up, the scale displays a high level of reliability as the responses consistently and closely align around the average. Additionally, the scale items show strong internal consistency. These findings indicate that the scale can be trusted for effectively measuring the desired concept in research and analysis.

Item Reliability Statistics

				If item dropped	
	Mean	SD	Item-rest correlation	Cronbach's α	McDonald's ω
A1	4.11	1.09	0.809	0.974	0.974
A2	4.15	1.08	0.795	0.974	0.975
A3	4.09	1.11	0.859	0.972	0.972
A4	4.23	1.03	0.911	0.970	0.971
A5	4.21	1.04	0.891	0.971	0.971
A6	4.11	1.05	0.888	0.971	0.971
A7	4.09	1.06	0.915	0.970	0.971
A8	4.13	1.06	0.886	0.971	0.972
A9	4.28	1.04	0.902	0.970	0.971
A10	4.28	1.06	0.913	0.970	0.971

This represents the mean score for every item, which falls between 4.09 and 4.28.

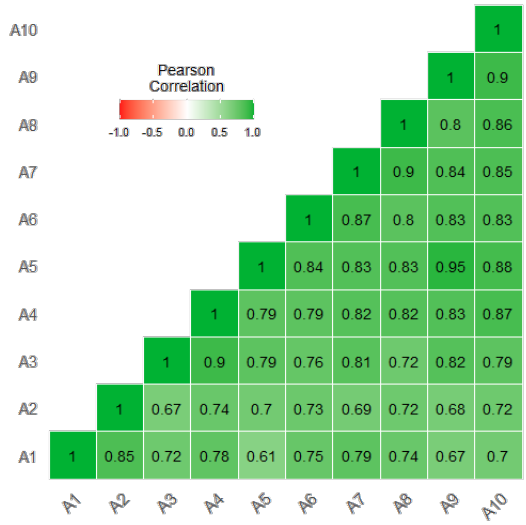
SD (Standard Deviation): It quantifies the range of differences in responses for each item, with values varying between 1.03 and 1.11.

Internal consistency reliability is measured by assessing the extent to which each item contributes to the overall consistency of a set of items.

Item-Rest Correlation assesses the degree to which each item is related to the remaining items in the scale. Values for this correlation range between 0.795 and 0.915, indicating a strong and positive correlation.

The values of Cronbach's α and McDonald's ω (Omega) are both high (ranging from 0.970 to 0.975) for each item. This means that removing any single item from the scale does not significantly affect its overall internal consistency. Therefore, it can be concluded that the scale is trustworthy and consistent in measuring the desired concept.

Correlation Heatmap



Reliability Analysis

Scale Reliability Statistics

	Mean	SD	Cronbach's α	McDonald's ω
scale	4.00	0.946	0.965	0.966

[3]

The statistics presented here pertain to the reliability analysis conducted on a measurement scale. Specifically, the provided data represents the statistical results for the scale in question.

In other words, the mean score for the complete range is 4.00.

The standard deviation is 0.946, which means that the responses are tightly grouped around the average, suggesting there is little variation.

The value of Cronbach's α (Alpha) is 0.965, which suggests that there is a high level of internal consistency among the items in the scale.

The McDonald's Omega measure is also quite high at 0.966, which shows that the scale has strong internal reliability.

To sum up, the scale has a favorable average score, limited fluctuation, and robust internal coherence, thus ensuring its reliability in assessing the intended concept. Nevertheless, the text lacks specific information regarding the correlation heatmap.

Item Reliability Statistics

				If item dropped	
	Mean	**SD**	**Item-rest correlation**	**Cronbach's α**	**McDonald's ω**
B1	4.19	0.962	0.847	0.961	0.962
B2	4.00	0.981	0.894	0.959	0.960
B3	3.92	1.141	0.857	0.960	0.962
B4	3.91	1.275	0.846	0.961	0.962
B5	3.87	1.225	0.870	0.960	0.961
B6	3.96	1.037	0.868	0.960	0.961
B7	4.02	1.047	0.874	0.960	0.961
B8	4.08	0.997	0.797	0.962	0.964
B9	4.11	1.050	0.800	0.962	0.964
B10	3.98	1.101	0.778	0.963	0.965

Each scale item's reliability examination reveals desirable internal consistency. Positive reactions are regularly shown by implied rankings, which range in standard deviation (SD). There is a full-size correlation between every object and the scale average, as seen through the constantly excessive correlations between objects and relaxation. The dependability of the scale is bolstered by way of the robust inner consistency proven via both McDonald's ω and Cronbach's a for each item. Additionally, the analysis indicates that the reliability of the scale would not be considerably accelerated by way of eliminating any one item. All matters considered, those results attest to the size's consistency and dependability in assessing standardized survey observation layout.

Correlation Heatmap

Reliability Analysis

Scale Reliability Statistics

	Mean	SD	Cronbach's α	McDonald's ω
scale	0.811	0.303	0.884	0.886

[3]

The Standard Deviation (SD) is 0.303, which means there is not much variability in the scores of the scale. This suggests that the responses are closely grouped around the average.

The Cronbach's Alpha value is 0.884, which suggests a strong internal consistency among the items within the scale.

According to McDonald's measure (Omega), it is also quite high at 0.886, indicating strong internal reliability within the scale.

To sum up, the scale has a favorable average score, limited variation, and reliable internal consistency, suggesting that it can be trusted to accurately measure the intended concept. Nevertheless, specific information regarding the correlation heatmap is missing in the text.

Item Reliability Statistics

	If item dropped				
	Mean	**SD**	**Item-rest correlation**	**Cronbach's α**	**McDonald's ω**
C1	0.849	0.361	0.645	0.871	0.875
C2	0.774	0.423	0.705	0.864	0.866
C3	0.811	0.395	0.535	0.884	0.885
C4	0.774	0.423	0.705	0.864	0.865
C5	0.830	0.379	0.710	0.863	0.865
C6	0.830	0.379	0.710	0.863	0.866
C7	0.811	0.395	0.714	0.862	0.865

These statistics are specific to certain items (C1 to C7) on the measurement scale.

In simpler terms, the mean in this context refers to the average score of an item when it is not included in the overall scale. This helps to understand the impact of removing an item on the overall average response.

SD, or Standard Deviation, is a metric used to quantify the amount of variation in a dataset, specifically how much the distribution of values deviates from the mean. When an item is eliminated from the dataset, SD measures the extent to which the variability of the remaining values is altered.

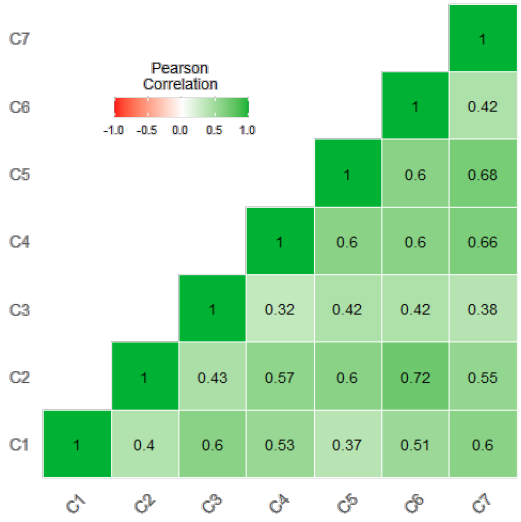
Item-rest correlation refers to the degree of correlation between each individual item and the other items within a scale. It measures the relationship between a specific item and the remaining items in the scale.

Cronbach's alpha is a measure of how consistent a scale is internally when a particular item is excluded. If the alpha value is lower, it indicates that removing that item would greatly impact the scale's internal consistency.

McDonald's Omega, like Cronbach's Alpha, measures the internal consistency of a test when a specific item is removed.

To put it briefly, these statistics demonstrate the impact on the reliability and internal consistency of the scale when each item is taken out. Overall, the scale still maintains a reasonable level of internal consistency even when certain items are omitted, as evidenced by the relatively high values of Cronbach's α and McDonald's ω. This indicates that the scale remains dependable in measuring the intended concept, even if some items are not included.

Correlation Heatmap



One Sample T-Test

						95% Confidence Interval			95% Confidence Interval		
		Statistic	df	p	Mean difference	Lower	Upper		Effect Size	Lower	Upper
A1	Student's t	-0.381	52.0	0.705	-0.0568	-0.356	0.243	Cohen's d	-0.0523	-0.321	0.217
A2	Student's t	-0.128	52.0	0.898	-0.0191	-0.317	0.279	Cohen's d	-0.0176	-0.287	0.252
A3	Student's t	-0.494	52.0	0.623	-0.0757	-0.383	0.231	Cohen's d	-0.0679	-0.337	0.202
A4	Student's t	0.398	52.0	0.692	0.0564	-0.228	0.341	Cohen's d	0.0547	-0.215	0.324
A5	Student's t	0.262	52.0	0.795	0.0375	-0.250	0.325	Cohen's d	0.0360	-0.234	0.305
A6	Student's t	-0.394	52.0	0.695	-0.0568	-0.346	0.233	Cohen's d	-0.0541	-0.323	0.216
A7	Student's t	-0.519	52.0	0.606	-0.0757	-0.368	0.217	Cohen's d	-0.0713	-0.341	0.199
A8	Student's t	-0.261	52.0	0.795	-0.0379	-0.329	0.253	Cohen's d	-0.0359	-0.305	0.234
A9	Student's t	0.788	52.0	0.435	0.1130	-0.175	0.401	Cohen's d	0.1082	-0.162	0.378
A10	Student's t	0.774	52.0	0.442	0.1130	-0.180	0.406	Cohen's d	0.1063	-0.164	0.376

Note. H_a $\mu \neq 4.17$

The One Sample T-Test is a statistical analysis that is utilized to determine if the average of a sample is significantly different from a known population mean or a given value (in this instance, $\mu = 4.17$). It evaluates whether the sample mean deviates significantly from the specified value.

A 95% confidence interval is a range (from a lower value to an upper value) that is believed to contain the true population mean with 95% certainty. It is used to estimate the possible range of the population mean in a given situation.

The statistical df p columns contain relevant statistical data obtained from the t-tests.

Statistic: The t-value indicates the number of standard errors that separate the sample mean from the given value.

The degree of freedom (df) is a factor that impacts the overall form of the t-distribution.

The p-value is defined as the likelihood of obtaining the observed outcome if the sample mean and the specified value are not different.

Mean difference: This column displays the variance between the average of the sample and the given value ($\mu = 4.17$).

Cohen's d, or the effect size, quantifies the extent of the difference between the sample mean and a given value. This measurement offers perspective on the practical importance of the outcomes.

To summarize, this information presents the outcomes of one-sample t-tests conducted on each item to determine if their average values are significantly different from a specified value of 4.17. For each item, the report provides the t-statistic, p-value, confidence intervals, and effect sizes, which aid in understanding the findings. The "Note" section specifies the alternative hypothesis (H_a) suggesting that the population mean is not equal to 4.17.

Normality Test (Shapiro-Wilk)

	W	**p**
A1	0.781	< .001
A2	0.765	< .001
A3	0.773	< .001
A4	0.739	< .001
A5	0.749	< .001
A6	0.788	< .001
A7	0.795	< .001
A8	0.781	< .001
A9	0.713	< .001
A10	0.708	< .001

Note. A low p-value suggests a violation of the assumption of normality

The Normality Test, also known as the Shapiro-Wilk test, is a statistical method utilized to assess whether a dataset adheres to a normal distribution. The normal distribution is frequently assumed in various statistical analyses.

The W statistic is derived from the Shapiro-Wilk test and is used to determine how closely the data conforms to a normal distribution. Specifically, each item has its own corresponding W value.

The p-value is linked to the W statistic and it shows the likelihood of getting the observed W value if the data followed a normal distribution.

The note states that a low p-value indicates a departure from the assumption of normality. In simpler terms, if the p-value is below the chosen significance level (usually 0.05), it means that the data deviates significantly from a normal distribution.

To summarize, the findings indicate that the p-values for all items (A1 to A10) are below 0.001, which is generally regarded as a very small p-value. This implies that the assumption of normality is violated, indicating that the data for these items is not distributed normally. This is crucial to keep in mind when choosing suitable statistical tests and comprehending the analysis results.

Descriptives

	N	Mean	Median	SD	SE
A1	53	4.11	4	1.09	0.149
A2	53	4.15	4	1.08	0.149
A3	53	4.09	4	1.11	0.153
A4	53	4.23	5	1.03	0.142
A5	53	4.21	5	1.04	0.143
A6	53	4.11	4	1.05	0.144
A7	53	4.09	4	1.06	0.146
A8	53	4.13	4	1.06	0.145
A9	53	4.28	5	1.04	0.144
A10	53	4.28	5	1.06	0.146

The N (Sample Size) column displays the number of observations or data points for each item, which is 53 in this instance.

In the English language, the mean is a representation of the average value for every item, which indicates the middle or central tendency of the data.

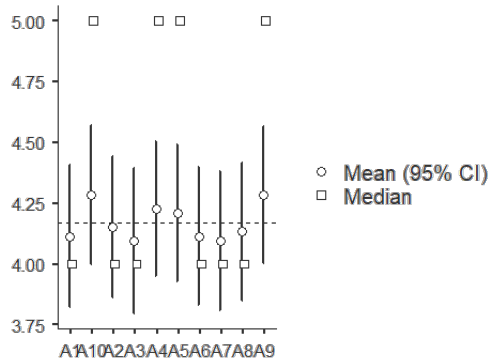
The median represents the value in the middle of a sorted dataset and is commonly used to determine the typical value of the data.

The standard deviation is a measure that indicates how spread out or diverse the data is. If the standard deviation is smaller, it means that the data points are closely grouped around the average.

SE (Standard Error): The standard error is used to quantify the level of uncertainty or variation in the average of a sample. It provides valuable information about the accuracy of the estimated mean.

To summarize, the given information provides an introduction to the central tendency (mean and median) and the spread (standard deviation) of the data for each item. It also includes the standard error which aids in understanding the accuracy of the sample mean. This information proves valuable in comprehending the specific qualities of the data for each item within the dataset.

Plots



One Sample T-Test

One Sample T-Test

						95% Confidence Interval			95% Confidence Interval		
		Statistic	df	p	Mean difference	Lower	Upper		Effect Size	Lower	Upper
A1	Student's t	-0.381	52.0	0.705	-0.0568	-0.356	0.243	Cohen's d	-0.0523	-0.321	0.217
A2	Student's t	-0.128	52.0	0.898	-0.0191	-0.317	0.279	Cohen's d	-0.0176	-0.287	0.252
A3	Student's t	-0.494	52.0	0.623	-0.0757	-0.383	0.231	Cohen's d	-0.0679	-0.337	0.202
A4	Student's t	0.398	52.0	0.692	0.0564	-0.228	0.341	Cohen's d	0.0547	-0.215	0.324
A5	Student's t	0.262	52.0	0.795	0.0375	-0.250	0.325	Cohen's d	0.0360	-0.234	0.305
A6	Student's t	-0.394	52.0	0.695	-0.0568	-0.346	0.233	Cohen's d	-0.0541	-0.323	0.216
A7	Student's t	-0.519	52.0	0.606	-0.0757	-0.368	0.217	Cohen's d	-0.0713	-0.341	0.199
A8	Student's t	-0.261	52.0	0.795	-0.0379	-0.329	0.253	Cohen's d	-0.0359	-0.305	0.234
A9	Student's t	0.788	52.0	0.435	0.1130	-0.175	0.401	Cohen's d	0.1082	-0.162	0.378
A10	Student's t	0.774	52.0	0.442	0.1130	-0.180	0.406	Cohen's d	0.1063	-0.164	0.376

Note. H_a $\mu \neq 4.17$

The One Sample T-Test is a statistical analysis that determines if the average of a sample is significantly different from a given value, specifically $\mu = 4.17$.

A 95% confidence interval is a range, indicated by "Lower" and "Upper," that is believed to contain the actual mean population parameter with 95% certainty.

These particular columns contain statistical data derived from the t-tests.

Statistic: The t-value is a measurement that determines the number of standard errors that the sample mean is away from the given value.

Degrees of Freedom (df) is a factor that influences the form of the t-distribution.

The p-value is the likelihood of observing the given t-value if there is no distinction between the average of the sample and the indicated value.

Mean difference: This column displays the variance between the average of the sample and the given value ($\mu = 4.17$).

Cohen's d is a metric that quantifies the effect size by indicating the extent of the difference between the sample mean and the given value. This metric adds meaning to the practical importance of the outcomes.

Please observe that the note states the alternative hypothesis (H_a) indicates that the average of the population is not the same as 4.17.

To sum up, the data presents the outcomes of one-sample t-tests conducted for each item, evaluating if their averages significantly deviate from the given value ($\mu = 4.17$). For every item, the t-statistic, p-value, confidence intervals, and effect sizes are given to assist in understanding the significance and practical implications of the mean differences. Nevertheless, the text does not contain specific information about the plot.

Normality Test (Shapiro-Wilk)

	W	**p**
A1	0.781	< .001
A2	0.765	< .001
A3	0.773	< .001
A4	0.739	< .001
A5	0.749	< .001
A6	0.788	< .001
A7	0.795	< .001
A8	0.781	< .001
A9	0.713	< .001
A10	0.708	< .001

Note. A low p-value suggests a violation of the assumption of normality

The note explains that when the p-value is low, it implies that the assumption of normality has been violated. In simpler terms, if the p-value is below the chosen significance level, typically 0.05, it means that the data strays significantly from a normal distribution. This can affect the suitability of specific statistical analyses.

To summarize, the findings indicate that the p-values for all items (A1 to A10) are below 0.001, demonstrating extremely low p-values. This implies that there is a deviation from the assumption of normality, suggesting that the data for these items does not follow a normal distribution. It is crucial to take this into account when choosing suitable statistical tests and interpreting analysis results.

Descriptives

	N	Mean	Median	SD	SE
A1	53	4.11	4	1.09	0.149
A2	53	4.15	4	1.08	0.149
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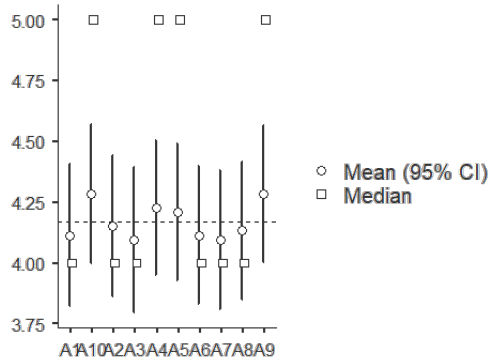
To summarize, the findings indicate that the p-values for all items (A1 to A10) are below 0.001, demonstrating extremely low p-values. This implies that there is a deviation from the assumption of normality, suggesting that the data for these items does not follow a normal distribution. It is crucial to take this into account when choosing suitable statistical tests and interpreting analysis results.

Plots



One Sample T-Test

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						95% Confidence Interval			95% Confidence Interval	
		Statistic	df	p	Mean difference	Lower	Upper		Effect Size	Lower	Upper
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A4	Student's t	0.398	52.0	0.692	0.0564	-0.228	0.341	Cohen's d	0.0547	-0.215	0.324
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A10	Student's t	0.774	52.0	0.442	0.1130	-0.180	0.406	Cohen's d	0.1063	-0.164	0.376

Note. H_a $\mu \neq 4.17$

N (Sample Size): This column displays the count of observations or data points for each item, which is 53 in this instance.

Mean: The mean is a representation of the average score of every item, showing the central tendency of the data.

Median: The middle value of a dataset when it is arranged in order is referred to as the median. This is another way to measure the central tendency and is commonly utilized to determine the "normal" value.

Standard deviation, also known as SD, is a statistical concept used to gauge the extent of dispersion or inconsistency within a set of data. When the standard deviation is smaller, it indicates that the data points are closely grouped around the average value.

The standard error, also known as SE, is a way to gauge how uncertain or diverse the sample mean is. It provides useful information about the accuracy of the estimated mean.

To sum up, the given information presents a synopsis of the central tendency (mean and median), the range (standard deviation), and the accuracy (standard error) of the data for each item. This information is valuable in comprehending the attributes of the data for each item in the dataset.

Normality Test (Shapiro-Wilk)

	W	p
A1	0.781	< .001
A2	0.765	< .001
A3	0.773	< .001
A4	0.739	< .001
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A9	0.713	< .001
A10	0.708	< .001

Note. A low p-value suggests a violation of the assumption of normality

The 95% confidence interval is a range, indicated by "Lower" and "Upper," where the true average value of a population parameter is expected to be with 95% certainty.

The statistical data from the t-tests can be found in these columns, including information such as the degrees of freedom and p-values.

The statistic known as the t-value indicates the number of standard errors that the sample mean deviates from the given value.

df (Degrees of Freedom) is a factor that impacts the form of the t-distribution.

The p-value represents the likelihood of obtaining the t-value that was observed, assuming that there is no discrepancy between the mean of the sample and the given value.

The difference in the mean is displayed in this column, indicating how much it deviates from the specified value of $\mu = 4.17$.

Cohen's d, also known as the effect size, is a way to measure the extent of the difference between the sample mean and the given value. It is valuable in determining the practical importance of the findings.

The note states that the alternative hypothesis (H_a) suggests that the average value of the population is not the same as 4.17.

To summarize, the given data presents the outcomes of one-sample t-tests conducted on various items to determine if their averages differ significantly from the given value ($\mu = 4.17$). The information includes the t-statistic, p-value, confidence intervals, and effect sizes for each item, enabling you to understand the significance and practical importance of the differences in means. Note that specific plot details are not mentioned in the text.

Descriptives

	N	Mean	Median	SD	SE
A1	53	4.11	4	1.09	0.149
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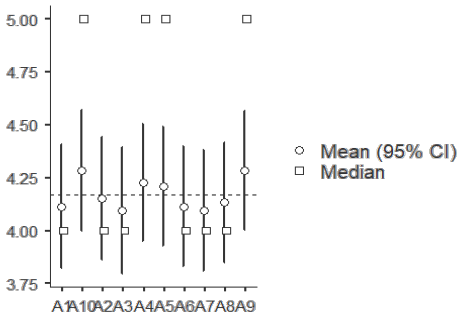
To summarize, the given data presents the outcomes of one-sample t-tests conducted on various items to determine if their averages differ significantly from the given value ($\mu = 4.17$). The information includes the t-statistic, p-value, confidence intervals, and effect sizes for each item, enabling you to understand the significance and practical importance of the differences in means. Note that specific plot details are not mentioned in the text.

Plots



Confirmatory Factor Analysis

Factor Loadings

Factor	Indicator	Estimate	SE	Z	p	Stand. Estimate
Attitude	A1	0.853	0.1235	6.91	< .001	0.793
	A2	0.841	0.1232	6.83	< .001	0.786
	A3	0.962	0.1200	8.02	< .001	0.872
	A4	0.931	0.1077	8.64	< .001	0.912
	A5	0.957	0.1080	8.87	< .001	0.926
	A6	0.938	0.1105	8.50	< .001	0.902
	A7	0.972	0.1096	8.86	< .001	0.925
	A8	0.943	0.1114	8.46	< .001	0.901
	A9	0.965	0.1073	8.99	< .001	0.933
	A10	0.983	0.1090	9.01	< .001	0.933
Perception	B1	0.830	0.1039	7.99	< .001	0.871
	B2	0.890	0.1023	8.70	< .001	0.916
	B3	0.986	0.1232	8.00	< .001	0.872
	B4	1.082	0.1392	7.77	< .001	0.856
	B5	1.077	0.1308	8.23	< .001	0.887
	B6	0.914	0.1105	8.27	< .001	0.890
	B7	0.925	0.1113	8.31	< .001	0.892
	B8	0.797	0.1125	7.09	< .001	0.807
	B9	0.845	0.1182	7.14	< .001	0.812
	B10	0.858	0.1258	6.82	< .001	0.787
Knowledge	C1	0.236	0.0460	5.13	< .001	0.660
	C2	0.324	0.0507	6.38	< .001	0.773
	C3	0.222	0.0520	4.28	< .001	0.569
	C4	0.324	0.0504	6.44	< .001	0.775
	C5	0.288	0.0454	6.34	< .001	0.766
	C6	0.285	0.0460	6.20	< .001	0.760
	C7	0.298	0.0480	6.20	< .001	0.760

[4]

Three latent additives in this observation were evaluated through the usage of confirmatory aspect analysis (CFA), which additionally proved the measuring model: attitudes, emotions, and understanding. Strong correlations between the found variables and their identifying constructs had been shown through constantly high aspect loadings for every indicator, which have been greater than 0.Eight. This demonstrated the correctness of the estimates with low popular mistakes. Furthermore, the factor loadings' statistical significance and resilience have been validated by means of their high Z-ratings and relatively low p-values. To sum up, the CFA results display how nicely the selected indicators assess attitudes, intentions, and knowledge inside the populace underneath take a look at and offer first-rate assistance for the measurement version's assemble validity.

Factor Estimates

Factor Covariances

		Estimate	SE	Z	p	Stand. Estimate
Attitude	Attitude	1.000[a]				
	Perception	0.735	0.0675	10.88	< .001	0.735
	Knowledge	0.383	0.1280	2.99	0.003	0.383
Perception	Perception	1.000[a]				
	Knowledge	0.518	0.1115	4.65	< .001	0.518
Knowledge	Knowledge	1.000[a]				

[a] fixed parameter

Strong hyperlinks between the latent variables of attitudes, feelings, and knowledge have been located via structural version evaluation. The accurate correlations among each construct are demonstrated by way of the skewed component estimates, which might be fixed parameters. Covariance shows that attitudes and intents, emotions and knowledge, and attitudes and knowledge are drastically correlated, whereas the connection between attitudes and understanding is rather mild. With low P values, all statistics demonstrate statistical importance and illustrate the complexity of the researched context.

Model Fit

Test for Exact Fit

χ^2	df	p
1217	321	< .001

Fit Measures

			RMSEA 90% CI	
CFI	TLI	RMSEA	Lower	Up
0.611	0.574	0.230	0.216	0.24

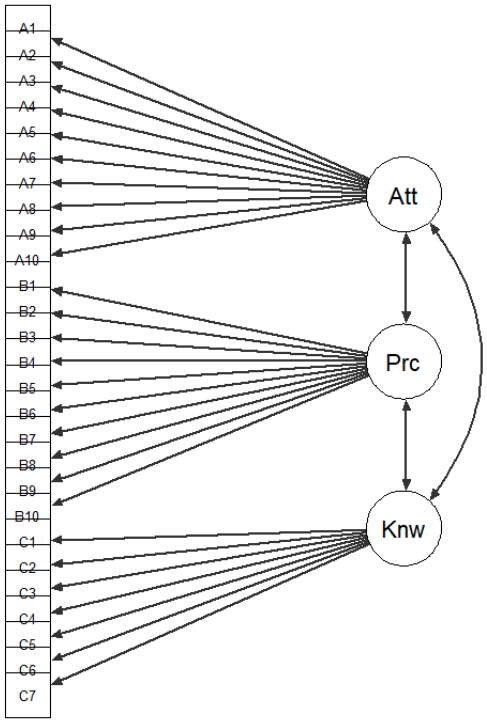
Based on the chi-square test (χ2) with a p-value much less than 0.001, the model match assessment demonstrates that there is a massive distinction between the counseled model and the determined facts (RMSEA (zero.611), CFI (zero.574), and TLI (zero.230); attest to it). Every match measurement this is furnished indicates a mild to strange fit. The in-shape analysis is made greater doubtful by using the big confidence intervals for the RMSEA. In widespread, to build the agreement between the theoretical version and the observable statistics, model exploration or improvement is advised.

Post-Hoc Model Performance

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	C1
A1		0.230	0.031	0.061	-0.127	0.032	0.059	0.027	-0.073	-0.035	0.135	0.044	-0.051	-0.116	-0.072	-0.053	0.054	0.143	0.038	0.074	0.089
A2			-0.011	0.029	-0.023	0.021	-0.035	0.015	-0.056	-0.018	0.209	0.070	0.083	-0.079	0.055	0.006	0.145	0.130	0.109	0.001	0.058
A3				0.107	-0.014	-0.023	-0.001	-0.061	0.006	-0.025	0.017	0.117	-0.008	-0.122	-0.024	0.016	0.004	0.117	-0.102	-0.001	0.102
A4					-0.049	-0.030	-0.019	-0.002	-0.018	0.020	0.090	0.052	-0.046	-0.133	-0.068	0.042	0.040	0.060	-0.053	-0.049	-0.034
A5						0.002	-0.024	-0.005	0.086	0.018	0.057	0.091	0.001	-0.076	-0.041	0.042	0.058	0.082	0.022	0.054	-0.048
A6							0.036	-0.012	-0.012	-0.010	0.124	0.065	-0.009	-0.071	-0.008	0.050	0.072	0.191	0.130	0.179	0.020
A7								0.065	-0.020	-0.017	0.031	0.043	-0.158	-0.177	-0.075	0.011	0.051	0.081	0.043	0.093	0.005
A8									-0.039	0.016	0.080	-0.049	-0.122	-0.215	-0.054	0.065	0.086	0.022	0.107	0.011	-0.074
A9										0.026	-0.001	0.048	-0.047	-0.090	-0.113	-0.014	-0.001	0.109	-0.078	0.084	-0.019
A10											-0.011	-0.038	-0.136	-0.226	-0.180	-0.024	0.023	-0.012	-0.052	-0.042	-0.073
B1												-0.003	-0.028	-0.041	0.048	0.023	-0.017	-0.037	0.108	-0.101	0.062
B2													0.026	0.046	-0.029	-0.021	0.007	0.027	-0.091	0.009	0.067
B3														0.081	0.058	-0.015	-0.020	0.044	-0.124	-0.029	0.093
B4															0.044	-0.008	-0.042	-0.005	-0.055	0.010	0.010
B5																0.039	-0.010	-0.094	0.023	-0.087	0.085
B6																	0.005	-0.065	0.058	-0.044	-0.012
B7																		-0.021	0.043	0.066	-0.094
B8																			0.015	0.172	0.236
B9																				0.061	0.022
B10																					0.062
C1																					
C2																					
C3																					
C4																					
C5																					
C6																					
C7																					

Residuals for Observed Correlation Matrix

Path Diagram



[5]

Correlation Matrix

Correlation Matrix

	AVG Perception	AVG Attitude	AVG Knowledge
AVG Perception	—		
AVG Attitude	0.716***	—	
AVG Knowledge	0.388**	0.506***	—

Note. * p < .05, ** p < .01, *** p < .001

This correlation matrix illustrates the connections among three variables: average perception, average attitude, and average knowledge. It presents the correlation coefficients for these variables.

The average perception variable has a perfect correlation of 1.000 with itself, which is why there is a dash in the first row and column. This indicates that the variable being compared to itself will always have a perfect correlation of 1.000.

The correlation between AVG Perception and AVG Attitude is 0.716, which is shown by three asterisks (***) indicating high significance and a low probability of occurring by chance. This suggests a strong

positive connection between AVG Perception and AVG Attitude, meaning that when one variable increases, the other generally increases as well.

The correlation between the average perception and average knowledge is 0.388, while the correlation between the average attitude and average knowledge is 0.506. Both of these correlations are significant but have different levels of significance. The two asterisks indicate that the correlation between average perception and average knowledge is significant at the 0.01 level, while the three asterisks indicate that the correlation between average attitude and average knowledge is significant at the 0.001 level.

To put it simply, the correlation matrix reveals how the three variables are interconnected. There is a significant positive association between AVG Perception and AVG Attitude, and both of them are moderately correlated with AVG Knowledge.

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