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THE ROLE OF SOCIAL MEDIA IN SHAPING CLIMATE CHANGE (CC) AWARENESS AMONG ARAB UNIVERSITY STUDENTS

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Abstract

This paper delves into the largely unexplored area of changes in climate awareness among Arab university students, focusing on the influence of social media in shaping this awareness. The paper examines the intersectionality of demographic, academic, and socio-economic factors that shape students' awareness of changes in climate. The paper provides new insights into the function of social media proficiency and education level in shaping Arab students' understanding of Changes in climate. These insights carry significant implications for the development of strategies aimed at fostering Changes in climate awareness and promoting sustainable behaviors among Arab university students. The research demonstrates that university students have a strong understanding of Changes in climate as a sustainability goal. Their perception is significantly influenced by social media platforms, highlighting their function in shaping climate awareness. A robust positive correlation between students' Changes in climate awareness and their social media usage was found - increased usage is associated with heightened Changes in climate awareness.

Keywords: social media, Changes in climate, higher education, students' awareness.

1. INTRODUCTION

With respect to the research on Changes in climate awareness and function of social media, many areas are yet to be explored hence can be considered as gap in literature. These are exciting areas for future research, gaps which provide plenty of opportunity. A sizable lacuna in the literature concerns awareness of Changes in climate, as reflected by various studies among Arab university students (Ghanem, 2022). Though myriad studies have been conducted about students' Changes in climate awareness and demographic, academic, and socio-economic characteristics in a general sense (Ghanem, 2022), limited attention has been paid to Arab university students. Exploring the Arab region highlights available and likely uncoverable insights due to unique cultural, social, and environmental characteristics that may not be generalizable contexts of research (Takshe et al., 2022). It is therefore essential to carry out focused research to explore Arab university students' levels of awareness about Changes in climate, the main sources of information that they have for obtaining this knowledge, and the factors that affect their understanding and attitudes regarding this serious issue. A significant consideration here is the extent to which social media shapes Changes in climate consciousness among Arab university students (Briandana & Saleh, 2022). While a previous investigation saw research genitals on average, more broadly, in terms of the influence of social media on Changes in climate awareness, its effects on this particular demographic have been less well studied. Further, the future studies should explore how Arab university students utilized social media to access climate information & potential impacts of this exposure on student's awareness and attitudes, as well as evaluate effective mechanisms for utilizing social media in increasing the efficacy of Changes in climate (CC) education in this context (Briandana & Saleh, 2022). Furthermore, scant academic studies have examined the imbricating mechanisms behind Arab university students' Changes in climate awareness. As (Al-Maliki et al., 2022) suggested, it is thus necessary to understand how such factors coincide in this specific setting. This complexity warrants additional examination to better understand the relationships between heat stress, sources of information, and weather hedging within the Arab university student demographic that can contribute to more tailored educational interventions (La Torre et al., 2023). Although Vogel et al. (2022) have previous studies on which to base their understanding of Changes in climate awareness, and the function of Social Media, they can still greatly soar given that presently research is built on highly profitable area which exists so

far as Arab students in Universities. Addressing these research directions are expected to reinforce our knowledge of Changes in climate awareness in the Arab region and inform the establishment of successful Changes in climate education and communication strategies (Briandana & Saleh, 2022).

1.1 Objectives of the investigation

This research explores changes in climate awareness among Arab university students. This seeks to understand their climate knowledge, attitudes and behaviors as well as what influences their climate engagement. This investigation aims at achieving two goals. First, A field Investigation on Arab University Students Awareness towards Changes in climate to assess the awareness level concerning changes in climate that exists among Arab university students, second: this field investigation explores their knowledge, attitudes, and behaviors associated with changes in climate within the context of identifying different factors. To examine the function of social media in the development of changes in climate awareness, where respondents rely on for information and how it impacts their attitudes and behaviors (i.e. maybe they know), as well as the potential to utilize social media strategies for successful Changes in climate education here. Aiming to achieve the two mentioned objectives, the investigation will reflect a full image about Changes in climate awareness among university students in Arab countries and how impactful social media can on their perceptions, behaviors. Such a nimble approach will make possible a scrutiny that is centered on finding strategies to improve Changes in climate education and communication in these particular organizations.

1.1.1 Investigation questions

There are four questions that the current investigation seeks to answer:

1. What is the awareness level of Changes in climate as one of the sustainable development goals among university students?
2. How does social media affect awareness of Changes in climate as one of the sustainable development goals among university students?
3. Is there a relationship between university students' awareness of Changes in climate and their utilize of social media?
4. Does awareness of Changes in climate among university students differ based on gender (male, Female), academic qualifications (Natural, Human Science), education level (Student, undergraduate, graduate), social media proficiency (Intermediate and Advanced), or country of origin?

1.1.2 Significance of the investigation

The importance of this investigation lies in its ability to demonstrate the awareness students' level in some Arab universities regarding Changes in climate as one of the goals of sustainable development and its relationship with social media. Therefore:

- The research findings may contribute new information to the literature related to the awareness of university students about Changes in climate as one of the goals of sustainable development.
- The research findings may add new information to the literature concerning the relationship between the awareness of university students about Changes in climate and social media.
- It may pave the way for other researchers and individuals interested in Changes in climate and social media to conduct related studies.
- The findings of this research will be of great magnitude to universities and other educational institutions outside the United Arab Emirates.

2. LITERATURE REVIEW

2.1 Changes in climate and Sustainable Development

Changes in climate is among the critical global issues in the 21st century and forms one of the factors of the United Nations' Sustainable Development Goals (SDGs) (Lee et al., 2016). It is essential to the beginning of positive environmental behaviors and actions on an individual-level, particularly among youth who will have to live with this world. The creation of awareness related to Changes in climate is greatly facilitated by higher education institutions especially universities. Colleges provide for the transmission of knowledge on environmental issues as well as encouragement in the creation of skills and magnitudes required for sustainable development. However there has been evidence that the changes in climate level awareness among university students around the world is not constant (Ghazy & Fathy, 2023). In the Arab world, Changes in climate presents serious challenges. As highlighted by the Arab Forum for Environment and Development many Arab countries are particularly vulnerable to the impacts of Changes in climate due to their geographical location (Semaan & Tolba, 1995). Despite this, research into the awareness and understanding of Changes in climate among students in Arab universities is still limited (Zummo, 2024). Indisputably, the emergence of social media platforms has instigated a paradigm shift in the realm of Changes in climate communication and education (Essa & Harvey, 2022). Twitter, Facebook, and Instagram wield formidable power as conduits for rapid, wide-ranging dissemination of information, thereby engendering potential awareness and catalyzing dialogues about Changes in climate. The gravitas of this digital arsenal in our hyper-connected era cannot be overstated (Koch et al., 2023). However, Moshou and Drinia (2023) challenged as we look out over the expanse of this space; one cannot help but ask ourselves, have we begun to understand how much these platforms contribute in understanding Changes in climate? Much has shocked untouched in the purview of Arab universities. Rahman et al. (2021) stresses the urgent need to conduct studies on the impact of various factors on Changes in climate awareness. So, reducing the consequences of Changes in climate requires in-depth investigation by academics to investigate the relationships between the various factors affecting it, which will contribute to knowing and finding appropriate measures for this reduction (Rawson et al., 2023). Thus, paying attention to the importance of studying the relationship between social media and Changes in climate awareness in universities may increase the impact of these universities in reducing the consequences of Changes in climate (Abozaied, 2018). Conversely, Changes in climate awareness are related to both the individual and the general level at the community level, as aware members of society collectively constitute a climate-aware community (Brannon et al., 2024). Green and Healy (2022) emphasize the importance of education in terms of its impact on sustainable development in general, and on raising awareness of Changes in climate in particular. The United Nations' Sustainable Development Goal 4 explicitly calls for ESD to ensure that "learners acquire the knowledge and skills needed to promote sustainable development (Lee et al., 2016). Universities, as knowledge institutions, have a unique function to have in promoting changes in climate awareness. They can integrate sustainability into their curriculum, promote research on sustainable solutions, and lead by example through sustainable campus management (Ghazy & Fathy, 2023). However, despite the clear need and mandate for changes in climate awareness, many people, including university students, remain insufficiently informed about changes in climate. Therefore, efforts to increase changes in climate awareness, particularly within educational institutions, are critical to advancing sustainable development (La Torre et al., 2023).

2.2 Social Media and Changes in climate

In the era of social media, our lives possibly more than ever have become entwined with digital life as it shapes daily interaction and informs how we see and understand global concerns involving changes in climate (Mooseder et al., 2023). Among the new channels for changes in climate communication and awareness, social media platforms especially Facebook, Twitter, Instagram and YouTube are very powerful (Olteanu et al., 2015). A collection of studies have demonstrated the impact of social media on raising awareness about changes in climate. A investigation by Ghazy & Fathy (2023) detects that exposure to posts related with changes in climate on social media leads users to feel higher levels of concern about problems. Furthermore, the investigation of Chen et al. (2023) that social media can be part of the solution, demonstrated in proving that social media has a function in successfully communicating the scientific consensus on changes in climate, which significantly factors into public attitudes on the matter. In addition, some of the special features of social media, involving rapid information sharing or the ability to engage users through like commenting and sharing may help disseminate knowledge on changes in climate and encourage discussion around this topic (Karimiziarani et al., 2023; Nepraš et al., 2022). The decentralization of information propagation via social media has been recognized by Fernandez et al. (2016) and Hubner and Dixon (2023). Based on this, Mckie et al. (2022) see social media as the appropriate place for exchanging opinions and building real awareness among climate scientists, environmentalists, and environmental associations to communicate with different types of people, as it is characterized by its ability to spread environmental awareness around the world. Social media also has a significant impact on individuals because it contains images, sounds, and videos that increase their feelings of concern for changes in climate and even begin to actually contribute to this effort (Hasaan, 2022; Koch et al., 2023). It can be utilized by teachers in classrooms to spark important discussions about changes in climate (Zahra, 2023). However, integrating social media into education brings many challenges involving the spread of misinformation or false information that leads to confusion and chaos (Rabha, 2022). This supports the importance of paying attention to digital literacy and critical thinking (Treen et al., 2020). We must continue to utilize social media despite all the obstacles we face (Brannon et al., 2024). This continuation leads to increasing awareness of changes in climate by making different people take responsibility for the consequences of this change and thus mitigating its frightening effects (Treen et al., 2020).

2.3 Changes in climate Awareness in the Arab Region

Despite the environmental diversity in the Arab region, it faces various challenges related to changes in climate (Semaan & Tolba, 1995). These challenges include rising temperatures, desertification, and the impact of this change on coastal areas. These challenges increase the need to pay attention and focus on worrying climate developments (Al Sheikh & Al Serhan, 2022). However, many researchers believe that there is a decrease in awareness of changes in climate in the Arab region, related to a weak understanding of the nature of changes in climate, its causes, and its consequences, and that media coverage of these challenges is insufficient (Al-Maliki et al., 2022; Hassan, 2020; Hassan et al., 2022; Zahra, 2023). It is appropriate for universities to have a more effective function in raising awareness of changes in climate by integrating it into curricula on the one hand, and through seminars and conferences on the other hand to motivate students to engage in issues related to changes in climate. This could advance interdisciplinary research on changes in climate and promote a total understanding with novel solutions (Mokhtar et al., 2023). Some barriers facing Arab universities, involving limited resources, an absence of dedicated faculty and an established legacy of disciplinary siloed education can hinder the mainstreaming of changes in climate in institutional curricula (Al Sheikh & Al Serhan, 2022). A

stronger sync among universities, policy makers and other stakeholders could enhance the effectiveness of university-driven initiatives as well (Ghanem, 2022). Arab universities on the other hand are faced with huge chances. The very high presence of the youth demographic means that this is a ready field where young leaders can be sown and nurtured. The utilization of digital technology, particularly via social media, is one approach that universities can take to promote the awareness of changes in climate in creative and exciting ways. In addition to creating this general awareness of a sustainability mindset, they can also support sustainability-driven student-led or social justice initiatives and the agendas (Balasha et al., 2023). Furthermore, Arab universities may form partnerships with overseas universities to get more resources and experiences. They may also develop strong local partnerships with all levels of community, policy makers and NGOs to help them create a cohesive change in climate strategy which works well next to other intersecting local climate challenges (Essa & Harvey, 2022; Zummo, 2024). Dunne et al. (2022) despite the barriers in raising changes in climate awareness at the Arab region, there are great opportunities especially within higher education. A clear recognition of their irreplaceable presence can help Arab universities become effective vehicles for educating and building changes in climate concern toward a more sustainable future in the region.

2.4 Factors Affecting Arab University Students' Awareness towards Changes in climate

Changes in climate awareness in Arab universities is influenced by many factors (Treen et al., 2020). Involving modifying curricula and changes in climate-related support for university faculty members and integrating social media as an effective tool to improve understanding of changes in climate (Neff & Jemielniak, 2024). The nature of the interaction between the elements influencing changes in climate awareness also affects its consequences (Basch et al., 2022). Most Arab university students are young people, which is important in investing in supporting efforts to develop awareness of changes in climate and environmental sustainability, so that they become active in their small communities, families, and social groups to which they belong (Abozaied, 2018). Moreover, Mavrodiieva et al. (2019) the gender disparities observed in general changes in climate awareness studies may also surface within Arab university populations, underscoring the need for gender-responsive changes in climate education. Same thing about academic discipline is equally valid in the Arab university students. One would expect much higher levels of climate literacy in students majoring in the environmental or earth sciences, but it is necessary to adopt an approach to embedding changes in climate education to some extent even across all other disciplines, as their impact on everyone's daily life is undeniable (Hasaan, 2022). Crossing disciplines facilitates cross-departmental collaboration borne of shared learning experiences aimed at tackling changes in climate innovatively and comprehensively (Al-Maliki et al., 2022). Lastly, Vu et al. (2021) underscored the significance of this, socio-economic (SEF) factors. Arab university students are as diverse in their socio-economic underpinnings as they are on changes in climate. For example, students from a wealthy family or courses related to environmental studies have more exposure of changes in climate discussing with 2secretary expertise compared with other countries (Takshe et al., 2022). In light of these considerations, it is crucial to develop tailored interventions to increase the commitment and awareness of the Arab university student community towards changes in climate. Therefore, Ylä-Anttila et al. (2022) emphasize the need for a comprehensive approach taking into account demographic, academic as well as socio-economic indicators to bridge the changes in climate awareness gap effectively. This might include integrative changes and interdisciplinary campus community resident education through course correction and student engagement. students at universities in the Arab countries may prove to be a crucial source of awareness and understanding about crop improvement for sustainable development and changes in climate mitigation, as they become future leaders (Tyagi & Carley, 2021).

3. METHODOLOGY

3.1 Investigation approach

Utilizing a descriptive-analytical methodology, this present investigation conducts a thorough investigation, elucidation, comparison, and quantification of events as they inherently exist, as described by McNabb (2020). The objective herein is to explore the comprehension of changes in climate, a key pillar of sustainable development, among students from selected Arab universities (Egypt, UAE, Oman). This exploration also seeks to uncover the correlation between this understanding and the usage of social media.

3.2 Investigation participants

the participant body comprises of 518 male and female scholars drawn from Arab academic institutions. Their selection was made via a straightforward random sampling technique during the latter half of the 2022/2023 academic year. A detailed delineation of their demographic specifics can be found in Table (1).

Table 1: characteristics of the participants.

Group		Frequency	Percentage (%)
Gender	Male	134	25.9
	Female	384	74.1
	Total	518	100.0
Qualification	Human sciences	394	76.1
	Natural Science	124	23.9
	Total	518	100.0
Social Media level usage	Intermediate	180	34.7
	Advanced	338	65.3
	Total	518	100.0
Education	Student	270	52.1
	undergraduate	76	14.7
	graduate	172	33.2
Country	Total	518	100.0
	Egypt	302	58.3
	UAE	140	27.0
	Oman	76	14.7
	Total	518	100.0

3.3 Instrument of investigation

3.3.1 Climate Change Measurement Instrument

The initial construction of the changes in climate measurement instrument (CCMI) comprised 20 items, utilizing Likert scale. The instrument's validity was upheld by implementing face validity to evaluate the items' appropriateness. The instrument's preliminary rendition was submitted to a panel of specialists in education and science teaching methodologies, retaining items that accomplished an agreement rate exceeding 80%. Items in need of modification were altered, and those failing to attain the necessary agreement rate were expunged. To ensure the instrument's internal consistency, Pearson's correlation coefficient was applied to determine the correlation between each item and the overall instrument score. This resulted in a final instrument consisting of 15 items, with scores ranging from 15 (lowest) to 75 (highest). Scale Reliability: The changes in climate measurement instrument's reliability was examined utilizing Cronbach's alpha coefficient. Applied to a representative sample of 50 students, both male and female, it resulted in a coefficient of 86%, signifying an acceptable degree of reliability for instrument utilization.

3.3.2 Social Media Usage Measurement Instrument

The social media usage measurement instrument (SMUI) was initially assembled with 15 items, deploying a five-point Likert scale: strong agreement, agreement, uncertainty, disagreement, and strong disagreement. The instrument's validity was upheld by implementing face validity to appraise the items' appropriateness. The initial rendition of the instrument was submitted to a group of education and media experts, with items securing an agreement rate over 80% being retained. Necessary modifications were made to certain items, while those not achieving the required agreement rate were discarded. Pearson's correlation index was utilized to determine the correlation between each item and the overall score of the instrument, assuring its internal homogeneity. The final instrument consisted of 12 items, with respondents obtaining scores from 12 (lowest) to 60 (highest). Scale Reliability: The reliability of the social media utilize measurement tool was determined utilizing Cronbach's alpha index. It was applied to a representative sample of 50 male and female students, and the index was 82%, indicating an acceptable degree of reliability to proceed with the investigation procedures.

4. RESULTS

To answer the first question of the investigation, which states "What is the awareness level among university students regarding changes in climate as one of the sustainable development goals?" the mean was determined by dividing the range ($75-15=60$) by 3 levels (resulting in 20); thus, the low level $15+20=35$, the average level $35+20=55$, and the high level $55+20=75$. Accordingly, the averages are as demonstrated in Table (2) below:

Table 2: averages.

No.	Mean	Level
1	15.00 – 35.00	Low
2	35.01 – 55.00	Intermediate
3	55.01– 75.00	High

The average score of all students' responses on the changes in climate awareness scale was computed and found to be 61.83, accompanied by a standard deviation (SD) of 7.15. Referring to Table (2), it is evident that students possess a high awareness level regarding changes in climate.

Regarding the second research question, which investigates the impact of social media on university students' perception of changes in climate as a sustainable development goal, the mean was identified by dividing the range ($60-12=48$) into three levels, resulting in 16. Thus, the low level is determined as $12+16=28$, the average level as $28+16=44$, and the high level as $44+16=60$. Consequently, the means are displayed in Table (3) below:

Table 3: averages.

No.	Mean	Level
1	12.00 – 28.00	Low
2	28.01 – 44.00	Intermediate
3	44.01– 60.00	High

The mean score for all students' responses on the social media impact scale was determined, and it was found to be (47.75) with a SD of (6.55). Based on table (3), we can see that the impact of social media

platforms was high.

As for the third investigation question, which deals with university students' awareness of changes in climate and its relationship to the utilization of social media, Pearson's correlation index was utilized, which reached 0.601, which is statistically significant at the $p \leq 0.01$ level, indicating the existence of a strong positive relationship between the two variables.

As for the fourth question: related to the variance in university students' awareness of changes in climate based on gender (male, female), academic qualifications (natural sciences, humanities), education level (student, undergraduate, graduate), social media proficiency (intermediate and advanced), or country of origin?

I: Are there statistically significant variances in the awareness of changes in climate due to the variable of their gender (male, Female)?

The means and SDs of the students' scores were determined on the students' awareness of changes in climate scale based on their gender (male, Female), as demonstrated in Table.5.

Table 5: The means and SDs of students' scores on the awareness of changes in climate scale based on their gender

Gender	N	Mean	SD
Male	134	61.72	7.89
Female	384	61.87	6.89

Table 5 reveals notable disparities in the means of students' scores on the changes in climate awareness scale based on their gender (male, female). In order to identify the statistical significance of these variances, an independent samples t-test was conducted, and the outcomes are presented in Table 6 below:

Table 6: Independent Sample T-test to identify the source of variances in students' scores on the awareness of changes in climate scale based on their gender.

Gender	N	Mean	SD	t	df	sig
Male	134	61.72	7.89	-.214	516	.831
Female	384	61.87	6.89			

Table 6 detects that there are no statistically significant variances, at a significance level of $p \leq 0.05$, between the means of students' scores on the changes in climate awareness scale based on their gender. The mean for males was found to be 61.72, while for females it was 61.87. The determined statistical magnitude (t) was -0.214, which is considered non-statistically significant at the 0.05 level. These findings suggest that males and females possess an equal awareness level regarding changes in climate.

II: Are there statistically significant variances in the awareness of changes in climate due to the variable of their academic qualifications (Natural, Human Science)?

The means and SDs of the students' scores were determined on the students' awareness of changes in climate scale based on their academic qualifications (Natural, Human Science) as demonstrated in Table.7.

Table 7: The means and SDs of students’ scores on the awareness of changes in climate scale based on their academic qualifications

academic qualifications	N	Mean	SD
Natural Science	124	61.26	8.62
Human Science	394	62.01	6.63

Table 7 reveals significant disparities in the means of students’ scores on the changes in climate awareness scale based on their academic qualifications (Natural Sciences, Human Sciences). To identify the statistical significance of these variances, an independent samples t-test was conducted, and the findings are presented in Table 8 below:

Table 8: Independent Sample T-test to identify the source of variances in students’ scores on the awareness of changes in climate scale based on their academic qualifications

academic qualifications	N	Mean	SD	t	df	sig
Natural Science	124	61.26	8.62	--.892	171.117	.374
Human Science	394	62.01	6.63			

From Table 8, it is evident that there are no statistically significant variances, at a significance level of $p \leq 0.05$, between the means of students’ scores on the changes in climate awareness scale based on their academic qualifications. The mean for Natural Science students was found to be 61.26, while for Human Science students it was 61.01. The determined statistical magnitude (t) was -0.892, which is considered non-statistically significant at the 0.05 level. These findings detect that Natural Science and Human Science students possess an equal awareness level regarding changes in climate.

III: Are there statistically significant variances in the awareness of changes in climate due to the variable of their education level (Student, undergraduate, graduate)?

To address this question, the means and SDs of the students’ scores were computed on the awareness of changes in climate scale based on their education level (student, undergraduate, graduate). The findings of these calculations are presented in Table 9.

Table 9: Means and SDs of students’ scores on the awareness of changes in climate scale based on their education level

Education level	N	Mean	SD
Student	270	61.13	6.93
undergraduate	76	61.47	9.05
graduate	172	63.09	6.39

Table 9 highlights variances in the means of students’ scores on the changes in climate awareness scale based on their education level (student, undergraduate, graduate). The mean for Egyptian students was 61.40, for UAE students it was 62.76, and for Omani students it was 61.82. To identify the statistical significance of these variances, the One-way ANOVA test was employed, and the findings are presented in Table 10 below:

Table 10: One-way ANOVA test findings for the averages of awareness of changes in climate scale based on their education level.

	Source	Sum of Squares	df	Mean Square	F	Sig.
Education level	Between Groups	417.873	2	208.936	4.134	.017
	Within Groups	26031.178	515	50.546		
	Total	26449.050	517			

Based on Table 10, the determined statistical magnitude (F) was 4.134, which is considered statistically significant at the significance level of $p \leq 0.05$. To further analyze these variances, the Scheffe Test for post-comparisons was conducted as demonstrated in Table 11.

Table 11: Findings of the Scheffe Test for post-comparisons for the awareness of changes in climate scale based on their education level

(I) education level	(J) education level	Mean Variance (I-J)	Sig.
Student	undergraduate	-.34776	.932
	graduate	-1.96710*	.018
undergraduate	Student	.34776	.932
	graduate	-1.61934	.256
graduate	Student	1.96710*	.018
	undergraduate	1.61934	.256

* Statistically significant at level (0.05)

Based on Table (11), a statistically significant variance is observed between students who have not completed their undergraduate studies and graduate students, favoring the latter. The mean score for graduate students was 63.09, while the mean for students who have not completed their undergraduate studies was 61.13. Additionally, it is notable that there is no statistically significant variance between students who have completed their undergraduate studies and either those who have not completed their undergraduate studies or graduate students.

IV: Are there statistically significant variances in the awareness of changes in climate due to the variable of their social media proficiency (Intermediate and Advanced)?

To answer this question, the means and SDs of the students' scores were determined on the students' awareness of changes in climate scale based on their social media proficiency (Intermediate and Advanced) as demonstrated in Table.12.

Table 12: The means and SDs of students' scores on the awareness of changes in climate scale based on their social media proficiency.

academic qualifications	N	Mean	SD
Intermediate	61.72	59.97	6.11
Advanced	61.87	62.82	7.47

Table 12 reveals variances in the means of students' scores on the changes in climate awareness scale based on their social media proficiency (Intermediate and Advanced). To identify the statistical significance of these variances, an independent samples t-test was conducted, and the findings are presented in Table 13 below:

Table 13: Independent Sample T-test to identify the source of variances in students’ scores on the awareness of changes in climate scale based on their social media proficiency

academic qualifications	N	Mean	SD	t	df	sig
Intermediate	180	59.97	6.11	-4.679	431.92	.000**
Advanced	338	62.82	7.47			

**statistically significant

It is clear from Table 13. that there are non-statistically significant variances at the significance level ($p \leq 0.000$) between the mean of the students’ scores on the awareness of changes in climate scale based on their social media proficiency as the mean of Intermediate was (59.97), and the mean Advanced was (62.82), and the statistical magnitude (t) was (-4.679), which is statistically significant magnitude at the level (.000). This detects that advanced proficiency students have an awareness level of changes in climate better than Intermediate proficiency students.

V: Are there statistically significant variances in the awareness of changes in climate due to the variable of their country of origin (Egypt, UAE, Oman)?

To answer this question, the means and SDs of the students’ scores were determined on the awareness of changes in climate scale based on their country of origin (Egypt, UAE, Oman), as demonstrated in Table.14.

Table 14: Means and SDs of students’ scores on the awareness of changes in climate scale based on their country of origin

country of origin	F	Mean	SD
Egypt	302	61.40	7.83
UAE	140	62.76	6.02
Oman	76	61.82	6.12

Table 14 detects variances in the means of students’ scores on the changes in climate awareness scale based on their country of origin (Egypt, UAE, Oman). The mean for Egyptian students was 61.40, for UAE students it was 62.76, and for Omani students it was 61.82. To assess the statistical significance of these variances, the One-way ANOVA test was employed, and the findings are presented in Table 15 below:

Table 15: One-way ANOVA test findings for the averages of awareness of changes in climate scale based on their country of origin

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	175.171	2	87.586	1.717	.181
country of origin Within Groups	26273.879	515	51.017		
Total	26449.050	517			

From Table 15, it is evident that the determined statistical magnitude (F) was 1.717, which is considered non-statistically significant at the significance level of $p \leq 0.05$. This detects that there are no significant variances in the students’ awareness of changes in climate scale across different countries of origin. Thus, students’ awareness of changes in climate remains equal regardless of their country of origin.

5. DISCUSSION

Although the awareness level of changes in climate varies among individuals in general and among university students across the world in particular, universities have an important function in increasing this awareness. The findings of the investigation, which demonstrated a low understanding level of the changes in climate causes, its consequences, and ways to mitigate its effects, make it necessary for universities to move towards amending their curricula and courses offered to students to include changes in climate education. This in turn will ensure that universities have a fundamental function in integrating the foundations of sustainable development into education, on the one hand, and creating awareness of changes in climate on the other hand (Ghazy & Fathy, 2023). The findings of recent investigation regarding the impact of different factors: academic, social and economic on changes in climate awareness are consistent with the investigation of (Basch et al., 2022). Which emphasized the importance of these factors in shaping the basic understanding of changes in climate among university students. Based on Mavrodieva et al. (2019), this requires the urgent need for special measures to understand changes in climate for each category of society, including university students. For example, paying attention to gender during climate education may address some of the disparities in understanding its causes and mechanisms of change. The findings of the current investigation concluded that Arab universities have not exploited the features of social media as a powerful tool in education. Despite the increasing emphasis on the impact of social media on attention to the consequences of changes in climate (Essa & Harvey, 2022), universities' failure to exploit social media prompts them to reconsider the strategies utilized to expand understanding of changes in climate among students. This is an opportunity for them to benefit from these platforms more effectively in raising awareness of changes in climate among students, as (Mooseder et al., 2023) emphasized the great features of social media in promoting discussion, quickly disseminating climate news, and facilitating access to reliable sources of information, while taking into account addressing some of the negatives associated with the utilize of social media platforms, involving the spread of misinformation, through several methods involving supporting digital literacy and focusing on critical thinking skills among students (Rabha, 2022). The issue of changes in climate awareness overlaps significantly with many issues related to social, economic and environmental variances that represent compelling challenges for the Arab region (Semaan & Tolba, 1995). Hence, the importance of the function of Arab universities in reducing the negative function of these issues emerges, reflecting the global interest in education for sustainable development as a key factor in changes in climate awareness (Green & Healy, 2022). This confirms the essential function of universities and increases the burden on them as they have a leading function in efforts to formulate future policies for the consequences of changes in climate (Brannon et al., 2024). To conclude, it is important to emphasize the link between the important function of universities, and the pursuit of developing appropriate educational strategies to understand changes in climate while taking into account the influencing environmental factors, and exploiting the utilize of social media to ensure the promotion of changes in climate awareness among Arab university students. This leads to the importance of raising awareness in the broader context of sustainable development, in light of the hoped-for function of Arab universities.

6. CONCLUSION

The recent investigation was conducted to identify the extent to which Arab university students understand changes in climate and the extent to which social media raises awareness of this important global issue. The outcomes demonstrated that lots of students know about the existence of changes in climate, however notable

gaps in knowledge are apparent for specific causes, impacts and mitigation strategies. The investigation also revealed a investigation that academic discipline, demographic factors and socio-economic background of the students had a significant effect on their awareness level concerning changes in climate. In another part of the findings, it was demonstrated that a lot of information for students were received from social media which proved to be an adequate medium in bringing the awareness of changes in climate worldwide and also as a good reference point for discussions order than informing the students. But so far, universities have under-utilized social media as a force to raise student awareness of changes in climate. Hence, it is important to employ effective techniques that benefit from social media, and systematically delineate the knowledge deficiencies identified while considering the pertinent agents influencing their climatic behavior to improve general understanding of weather phenomena by students and adapt strategies for sustainable behaviors in Arab area conditions and cope with changes in climate. Moreover, the inferences that can be made from each of our investigation findings are interconnected and, when taken together, they provide a more comprehensive insight into the relationship between university students regarding changes in climate awareness and social media use. The investigations reveal that students in universities are fairly aware of changes in climate as one of the sustainable development goals. This awareness detects that students are familiar with the issue. How Social Media Platforms Are Changing The Way University Students Perceive Changes in climate This demonstrates how students today are greatly influenced by social media in their perceptions and knowledge of the subject. The investigation demonstrated a strong positive relationship between the awareness level of changes in climate and social media usage among university students. More utilize of social media is linked to greater awareness of changes in climate. The paper looked at several factors that contributed to the variance of changes in climate awareness categorized within university students. It also demonstrated that gender has no influence on their awareness, as female and male students manifest the same awareness level. In a similar vein, there were no variances in awareness by academic educational level –natural science or human science But it did discover an educational angle that yielded a significant gap in awareness. Graduate students were generally more aware than undergraduate students. Based on this, it appears as though changes in climate becomes an easier topic to grasp with higher education levels. Equally important, it notes many gained their awareness from social media. Students with advanced social media proficiency were more aware than students who had an intermediate proficiency. This demonstrates the function of social media platforms have in constructing student learning about changes in climate. The investigation found that education level and social media competence have strong influence changes in climate awareness among university students, while gender, higher learning qualification and country of origin does not significantly identify their level on awareness. Findings detect that graduate students and higher social media proficiency group demonstrated better awareness level considers it is important to further educate and utilize digital platforms in spreading changes in climate awareness aids. The investigation concluded by stating that the country of origin did not have a substantial effect on how much the student knew about changes in climate. Students were equally culturally unaware of their choice of destination across all countries. In sum, the investigation encourages the need to raise changes in climate awareness among university students and acknowledges that social media has a substantial part in influencing their perceptions. The findings underscore the importance of utilizing social media to educate the public and imply that initiatives aimed at promoting changes in climate knowledge should be geared toward students across educational disciplines, as well as with different levels of social media skills..

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ALQAWASMI ET AL.
THE ROLE OF SOCIAL MEDIA IN SHAPING CLIMATE CHANGE (CC) AWARENESS AMONG ARAB
UNIVERSITY STUDENTS

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