

**Digital Transformation to enhance youth awareness of  
climate issues**

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**Abstract:**

It aimed to identify the extent to which the application of the digital transformation strategy - in the present and future- contributes to enhancing the awareness of youth on climate issues. What are the needs of young people from the digital transformation strategy in the field of climate issues by monitoring the models of currently available digital services, a comparative descriptive approach was followed using Likert scale using SPSS v. 21 to reveal the correlations. The sample size was 162 young (68.94% female, 31.6% male) of whom 80.2% live in urban and 11.7% in rural. 25.9% (18-22) years ,21% over 35 years, ,14.2% oare involved in voluntary work related to the climate and the environment. No differences between young people of both sexes in understanding the importance of applying digital transformation in the field of environmental awareness. A significant correlation between education and the feeling of climate pollution. 74.1% of the sample their knowledge comes from social media, 58% from reading, then 59% from free reading, and 43% from lectures and courses. 72.3% believed that the most important effects of global warming are the melting of mountain glaciers. 47% of the sample indicated that the dropout of girls from education leads to poor awareness of climate change.

As for knowledge needs, 87% answered "I need to receive awareness-raising digital services related to climate change and its effects" , and 90.7% answered " it will be useful in raising the awareness of university youth about climate problems at the local level.

**Key Words:**

Digital Transformation- Climate issues- youth

**Introduction:**

Low-and middle-income countries are suffering from the consequences of climate change, and the need to adopt innovative tools to address the adverse health effects of climate change has increased, so the "digital transformation" strategy is one of the tools owned by the Egyptian state, as Egypt ranks 15th in the world, according to the Egyptian Council of ministers Media Center in May 2021 in terms of its readiness to implement that strategy, and the first in the Middle East and Africa by 5.62 points, surpassing a number of countries in the region. The 2010 FAO report entitled "The role of information and communication technologies in society-based adaptation to climate change" also indicated that information and communication technologies will play a major role in fighting hunger in the future, in a clear reference to the role of digital transformation and the importance of accelerating its adoption to confront the gravity of climate change and since young people are the most responsible group for climate change-currently and in the future-because they make up more than 50% of the total population of Egyptian society, that is, they are the demographic gift and at the same time it is they who will bear the brunt of the effects of climate change, which will be borne by children and the elderly who are least responsible for climate change. Therefore, the current research was interested in discussing the axes of environmental awareness among the youth who will bear the consequences of climate changes,

which will play the role of the main actor in the next stage of the life of Egyptian society. The current study also added a new variable, "digital transformation", which has become influential in an era when the use of digital technology has prevailed among young people in particular. Digital transformation is defined as the inclusion of digital technologies in various aspects of work in order to radically transform the way of working, and it is understood that after the world passed the corona pandemic at the end of 2019, educational, environmental and other bodies realized that digital infrastructure is essential to deal with any upcoming crisis and its repercussions, despite the existence of obstacles preventing the adoption of digital transformation in bodies and institutions. However, we are not all afraid of the climate change crisis and how some Gulf countries have succeeded and digital infrastructures have helped to achieve a positive intervention by delivering digital skills to the less fortunate groups, such as the digital carbon footprint. A joint report from the World Economic Forum (Fadi, 2017) and PWC also showed that artificial intelligence has great capabilities to help achieve sustainability in several topics, including: climate change, biodiversity and environmental conservation, clean air, water security, immunity to climate and disasters, and focusing on renewable energies. The projected consequences of climate change for human health are profound, especially in low-and middle-income countries and among the most disadvantaged populations. Innovative policy tools to address the adverse health impacts of climate change continue to be needed (Pega et al., 2015).

If we are looking to improve and raise the quality of life for future generations, this also entails raising environmental awareness among different population groups, especially young people (planning, 2015) to reduce the impact of environmental change in the present and future.

**First: The Research Problem**

These changes coincided with a package of factors that led to a continuous change in the distribution of cycans due to ecological imbalance after the transformation of many productive lands into deserts due to climate change, after the discovery of oil, increased investment opportunities, the expansion of employment opportunities and the subsequent economic growth and attracting more working hands towards it, and therefore more migration from rural to Urban, the North African has also witnessed the misuse of groundwater and deforestation and desertification, which exposes it to droughts and, consequently, a decrease in production This will all lead to further inequality in the distribution of the population and the variation in population density between each country, region and another within the same country. The results of the study indicated the irregular distribution of the population of North Africa, where they gather in specific places, and may be few resources, so they represent a significant burden on the country, while a population vacuum extends over a wide area, or there is a specific number of people in areas with large resources that lack manpower to invest those resources.for example, for this distribution, more than half of the population of North Africa is concentrated in Egypt and Sudan and gathers around the Nile Valley and Delta.

The delta of Egypt and the Nile River have been exposed to environmental threats because they are considered a lowland at high risk, for example, the study of Abu Taleb was targeted .(Abutaleb et al., 2018) helping decision-makers by identifying what climate change will lead to from an increase in temperature and a decrease in rainfall the study pointed out that the major effects of climate change on Egypt are fluctuations in water flows in the Nile River and flooding of coastal areas due to sea level rise.the flow of the Nile will be affected by rain sensitivity and precipitation will decrease by 68% with an increase in temperature by 4 degrees Celsius.

As for the study (al-Saadi, 2010), it was reported at that time that temperatures would increase by one degree Celsius and precipitation would decrease by 20%, which means that the rates of climate change would accelerate during the few years between each study and the other. The Russian "Koppen" in 1900 classified the climate in Egypt, which was developed by Rudolf Geiger in 1961 (Abulbaki, n.d. It was included within the range of the dry desert climate, where all the climatic continental qualities are gathered, represented by the breadth of the Daily, seasonal and annual temperature range, the rarity, suddenness and fluctuation of rains, and the very low relative humidity in its center and South (Badawi, 2020) . Studies confirm that the effects of climate change will be severe on environmental and social systems that depend on stability (McKee, 2021), and the results of the 2016 World socio-economic survey confirmed that the main challenges to the implementation of the 2030 Agenda for Sustainable Development Come based on the recognition that climate risks have a different impact on people and societies. It has been discussed that in the absence of far-reaching transformative policies, the goal of building resilience to climate change will remain elusive and therefore poverty and inequality are likely to increase (United Nations, 2016).

Scientific evidence points to the deadly harmful effects of floods, desertification, forest fires, air pollution and similar negative effects of climate change on health and life and the lack of natural resources necessary for the continuation of life and the achievement of Sustainable Development Goals statistics for the period between 1995-2015 indicate the registration of 6457 disasters caused by bad weather that claimed the lives of 600 thousand people and affected the lives of 4 billion people in one way or another, which low-income countries suffered more than developed countries,

as the value of those losses is estimated at 154 billion dollars for the period from 2005-2014 after it was estimated at 54 billion dollars during the period from 1984-1995, that is, the losses tripled. In just 20 years, taking into account also the constant rise in sea level and growing desertification.

Therefore, the phenomenon of climate change is one of the most important environmental problems resulting from increasing human activities and increasing consumption of non-renewable energy sources (Mustafa, 2019), which threatens global security. The problem of climate change has been called the creeping catastrophe, and to the same extent that research interest in green energy and the environmental effects of energy began in the nineties and the United Nations climate change convention was applied in 1992 due to the high rates of greenhouse gases (Al-Nish, 2001) and individuals have an important and serious role in addressing the effects of climate change (Whitmarsh, L., Seyfang, G., & O'Neill, 2011) and also for sustainable development, as some may argue that humans have successfully adapted to the risks of climate change for centuries, almost all the great ancient civilizations (for example, Chinese, Egyptian, Mesopotamian) intervened directly to mitigate the effects of natural disasters and governments played a key role in the development of elaborate flood control systems (Linkov & Bridges, 2011) and, according to McDaniels and Small "risk management has been a fundamental driver for the development of social structures and governance over the years the last ten thousand". Since the eighties, the concept of danger has been central to the interpretation of changes and challenges in modern societies, in particular in the relationship between society and its natural environment.

The trends in the Middle East have become very worrying, as meteorologists predict that the Mediterranean Sea will rise from 30 cm to one meter this century. Such a rise would affect 42,000 square kilometers (four times the area of Lebanon) of land and Egypt, Bahrain and Qatar are considered particularly vulnerable, as a result, grasslands, livestock and water resources in the Middle East are likely to be exposed to climate change.

As for the ability of the state to digital transformation and thus benefit from its applications in reducing the effects of climate change, the media center of the Egyptian Council of ministers pointed out in May 2021 ([https://Mcit.Gov.Eg/Ar/Digital\\_Citizenship](https://Mcit.Gov.Eg/Ar/Digital_Citizenship), n.d) the Kearney index of global service locations, which includes 60 countries selected globally, based on the volume of inputs, remote service activities, and government initiatives to develop the telecommunications and information sector, and addresses the country's digital transformation, revealed that Egypt ranked 15th globally, and the first in the Middle East and Africa with 5.62 points, surpassing a number of countries in the region, followed by the UAE with 5.47 points, Turkey with 5.46 points, Mauritius with 5.45 points, Kenya with 5.31 points, Morocco with 5.28 points, then Ghana with 5.19 points, and South Africa with 4.6 points.

With the high annual growth rate of the Egyptian population, which reached 2.56% according to the 2017 census, up from 2.04% in the 2006 census, and with the percentage of young people in the age group of 15-34 years to 34.5% according to the results of the 2017 census, and with the awareness of the importance and role of youth towards climate issues, and with the continued presence of illiteracy, dropout from education and reluctance to continue attending education at any stage, this tells us the negative effects of and the importance of its role towards climate change, which may lead to hunger, desertification and drought, which inevitably lead to death and/or serious diseases.

On the other hand, the FAO report issued in 2010 entitled "The role of ICT in society-based adaptation to climate change" stated that ICT will play a major role in the fight against hunger in the future, in a clear reference to the role of digital transformation and the importance of accelerating its adoption to confront the gravity of climate change. Hence, the main question of the current research was about the awareness of young people about climate issues, the extent to which they benefit from the currently available digital uses, and whether they have needs. Other knowledge on climate issues and ways to address them through the digital transformation strategy in order to enhance youth awareness of climate issues.

### **Second: Main concepts**

#### **2-1- Awareness**

Environmental awareness is a mental process that a person practices in his daily life (Jalal Najib, 2013) and interacts in this process with the personal and social aspects of a person, and its goal is to deal with the environment positively and strengthen the sense of responsibility towards the environment to improve the environment and resist everything that would threaten his safety.

It has become imperative for us to focus on developing environmental awareness among members of society, especially the youth category (Asia, 2021) towards this global issue to build the perceptions, skills, attitudes and values necessary to understand and appreciate the complex relationships that link man and his civilization with his natural biosphere (Kamel, 2012). considering the university education sector, we find that some colleges have begun to develop their programs to be "interstitial" by introducing some topics related to climate issues in fine and applied arts, literature, humanities and Medical Sciences.

The development of environmental awareness is also one of the methodologies for managing the risks of climate change through adaptation that overlap with the strategy to reduce the vulnerability of the marginalized and the poor (Patrick Holsmann, 2023), the methodology of digital transformation strategies has been adopted (United Nations, 2016), as many young people still suffer from specific possibilities that restrict their communication with the digital world (Vickery, 2017), and thus they are deprived of many opportunities and benefits in addition to many schools and universities blocking young people's access to some websites, which deprives them of awareness of what is going on around them, educational institutions focus more on the threats of these sites, and they classify some of them, such as social networking sites, as a tool to distract attention and waste time, while it can be used as a tool to educate students, gain knowledge, while training them to train them on how to manage their risks themselves .

### **2-2- Digital transformation**

We are now living in the Fourth Industrial Revolution and are even participating in its creation by switching from paper to digitization in education, buying and selling, and mobility. Most government services have also turned to digital electronic services by clicking on an electronic link, but in the field of Environment and climate, you can also open an online project such as "junk stores" or "Golden waste"...Etc. The corona pandemic has contributed to accelerating the digitization of services and information to reduce direct interaction between people and reduce the incidence of injuries, such as digital financial transactions have become "normal", and digital transformation has become a reason and hope for success for projects, educational opportunities and companies as profits have been achieved from working at home electronically and even became the NEW NORMAL (Pega et al., 2015).

This shows that digital innovations have become one of the solutions to alleviate suffering (Majchrzak, A., & Shepherd, 2021), and "integrating the simple and equipping them with digital innovations" as an approach to raising awareness of the importance of digital transformation is currently of interest to researchers (Ib a nez, M. J., Guerrero, M., Y´añez-Vald´es, C., & Barros-Celume, 2021) in order to achieve the 2030 Agenda for sustainable development, namely, "transforming our world", to strengthen policy-making systems in such a way that they can effectively take the lead in the transformation process required for sustainable development, including building resilience to climate change.(United Nations, 2016).

Digital networks are "universal in nature", especially with the expansion of large-scale interactive networks that allow individuals to immerse themselves in cosmic interactive environments(Al-Badrani, N.d.In order to achieve a good understanding of cosmic interaction as a basis for achieving a positive international societal change in the direction of dealing with environmental issues, some have proposed a model of "deep media culture", which includes the level of skills of using information technologies, disclosing digital networks, critical thinking skills, and the level of appreciation of cosmic interactivity. Digital education is not a coincidence, but came in line with the necessities of dealing with climate issues in order to provide a positive and effective path that is useful for a wide segment of the middle age segment that deals digitally on a daily basis with the global internet. Most of the results of international reports and studies have confirmed the example (Abutaleb et al., 2018), including the report on non-traditional threats and security dimensions of climate change (future Center, 2020) the need for the countries of the Middle East to cooperate with regional and international organizations to combat the phenomenon of climate change as the most important environmental issue while adopting the concepts of "sustainable development" in order to meet the needs of current

generations while preserving the interests of new generations. We do not overlook the role of the Egyptian government represented by the Ministry of Environment and other ministries, such as the Ministry of youth and sports and the Ministry of communications , and the activities, initiatives and protocols of cooperation with religious and civil institutions, Egypt's participation in regional, African and international forums, and the establishment of training programs for climate ambassadors in some colleges concerned with Egyptian universities(<https://www.asu.edu.eg/>, 2022).

### **2-3-Youth**

According to UN statistics, the number of young people in the world reached 1.2 billion in 1995, and in Egypt the number of young women (15- Under 35 years old) 19176680 and males 20048277 according to the results of the 2017 census(central agency for public mobilization and Statistics, 2017), that is, the category of young people under 35 years old in total constitutes about 40% of the total population in 2017, taking into account the continued increase on the continent of Africa as a whole and Egypt in particular, which emphasizes the importance of the role of present and future youth towards various serious and important accompanied by a strong sense of social responsibility, the whole world has emerged from any ordeal related to existence and living under dangerous climatic conditions, and the lower the awareness of young people, the lower the amount of social responsibility, the more Climate issues are more serious and threaten the life and existence of man. Interpretations of the concept of youth among researchers have varied according to time and biological, psychological and social nature (Asia, 2021). This is because it is a transitional period that falls between the stage of dependence and the stage of independence, and the United Nations refers to this stage as the stage that falls between the stage of compulsory compulsory education and the stage of job search (Youth, 2014).

According to this definition, they fall into the age group between 14 - to under 25 years. And we mean young people are procedurally the most responsible group for climate change because they represent as big percentage of the total population of the Egyptian society, they bear the brunt of its effects, as do children and the elderly, who are least responsible for climate change.

#### **2.4. Climate:**

The United Nations defines climate change as long-term shifts in temperatures and weather patterns, and these shifts may occur naturally through changes in the solar cycle, but since the 19th century, human activities have become the main cause of climate change, due to the expansion of industrial activities and the emissions resulting from them, and the impact of climate change does not stop on temperature rise, but it is the beginning of the story, there are a lot of consequences resulting from climate change, including: Severe drought, water scarcity, severe fires, rising sea levels, floods, melting polar ice, catastrophic storms and others. The concept of temperature change is closely related to climate change (Mustafa, 2019) (United, 2022). The IPCC defines climate change as: "a change in the state of the climate, which can be defined as changes in the rate or variables in its characteristics that last a long time, usually for decades or more, and refers to any change in the climate over time, whether as a result of natural or successful changes from human activity. The United Nations Framework Convention on climate change UNFCCC defines climate change as " a change in climate directly or indirectly attributable to human activity, which leads to a change in the composition of the Earth's atmosphere (United Nations, 2022). changing precipitation patterns, rising temperatures and increased extreme weather events have contributed to the aggravation of food insecurity, poverty and displacement in Africa over the past year.

The state of the climate in Africa 2020 report provides a snapshot of climate change trends and impacts, including sea level rise and the melting of the continent's most famous glaciers. The report highlights Africa's increased vulnerability to climate change and shows that the potential benefits of investing in climate adaptation measures, weather and climate services and early warning systems far outweigh the costs.

The concept of the climate system refers to the entire processes of the atmosphere, hydrosphere, biosphere and terrestrial ocean and their interactions (Al-Araby, 2015)

### **Third: the importance and goals of the research**

The practical importance is to discuss the themes of environmental awareness among the largest population group in Egyptian society, i.e. youth, and 21 million young people, 21% of the population for the age group (18-29 years). The study aimed to identify the level of youth awareness of various climate issues, the extent to which they benefit from the currently available digital uses and whether they have other knowledge needs on climate issues. Then we tried to achieve the following sub-goals:

A-to identify the awareness of young people of both sexes on climate issues.

B-identify the current digital uses in light of the digital transformation era with regard to awareness of climate issues.

C-identify the knowledge needs of young people related to climate issues.

D-identify the challenges of using the digital transformation strategy in raising awareness of climate issues.

E-formulation of proposals aimed at enhancing youth awareness of climate issues.

**Fourth: questions and hypothesis:**

**4.1 .Field study questions:**

4.1.1. What are the demographic characteristics of a sample?

4.1.2. What are the sources of Youth information on climate issues?

4.1.3. How much do young people need to receive e-awareness services related to climate issues\* ?

4.1.4. What is the relationship between the emotional component and the participation of young people in environmental activities?

4.1.5 Are there any differences among the youth in the sample with awareness of the importance of digital transformation towards climate issues due to the change in education?

4.1.6. What challenges will the Egyptian state face if the digital transformation strategy is used to raise awareness of climate issues?

**4.2. Hypothesis**

4.2.1. There are significant gender and Youth Awareness differences on climate issues.

4.2.2. There is a correlation between age and awareness of climate issues.

4.2.3. There are differences according to the educational level and youth awareness of climate issues and the role of digital transformation in promoting it.

4.2.4. There are differences between rural and urban and the extent to which young people are aware of climate issues

**Fifth: Literature review**

Many studies have been researched the relationship between education and spreading awareness of environmental issues: in one of the studies to measure the awareness of university students in the Department of geography in Saudi Arabia of climate change and its impact(Sabiha, 2014), which also aimed to identify the effects of climate change on human economic, social, food, health and recreational life, and to find out the awareness of female students of the effects of technological development on the climate. She assumed that the students ' awareness was at least 50% as a hypothetical level, and then distributed a questionnaire to 300 students in the second, third and fourth teams. The results showed that the higher the educational level of the student and parents, the greater the awareness of the effects of technological developments on the climate, and there is no role for the family in this, as 75% of the study sample answered, and television came primarily as a source of awareness, and the sample's poor awareness of environmental laws and legislation.

In a study (Selm et al., 2019) during data collection, participants were asked how strongly they agreed with the phrase "I feel familiar with climate change" with a sample of young people, most of whom have a university qualification, at 49.2% of the total sample in Raleigh, North Carolina. a positive correlation was observed between education and gender, where women's self-perceived knowledge was higher than men among people with low levels of educational achievement, while highly educated men had a higher self-perception of climate change knowledge than less educated men women were almost one point higher than men on the self-reported climate change knowledge scale at the lowest level of achievement And about 0.6 points less than men at the highest level of educational attainment.

In the same context, (Alwan, 2021) conducted his study on building environmental education standards in education in Jordan, and the researcher saw that universities can contribute to facing environmental problems through scientific research, and he conducted his study by examining science books among basic eighth grade students, and a list of environmental education standards was built, which turned out to be present at a rate ranging from 3% to 43% in scientific books. Fatiha al-Taweel also conducted a study on environmental education and its role in sustainable development (Tawil, 2013), as she sought to understand and analyze the format of environmental education based on the functions performed by its interconnected parts to achieve sustainable development, among the institutions of Intermediate Education in the area of "Sukra" in Algeria, based on what the new functional theory proposes, using articles with a sample of teachers to identify various classroom and extra-curricular interactive processes, using the measurement of the cognitive test of the areas of sustainable development for a regular sample of fourth-year students of intermediate education (i.e. preparatory), and the results have shown that the format of Environmental Education does not support interdependencies These different parts should be interlinked in an integrated and balanced manner for Sustainable Development . This is the result of the dysfunction of the value directions of the information that organizes the interaction of the members and its lack of influence on their behavior, and the lack of good integration of the concepts of environmental education and sustainable development within the cognitive, skill and emotional needs that make up the building of the student's personality.

In a study (Selm et al., 2019) on the impact of gender on people's perceptions of their knowledge of climate change, it became clear the need for educational and psychological interventions for vulnerable groups for environmental literacy.

The Pew Research Center conducted a survey in November 2015 on 2,752 young people over the age of 18," where the center presented the concept of the " digital readiness gap" in its three dimensions: "the extent of trust in information published on the internet","digital skills in browsing and sharing with others or needing help", and"the extent of using digital tools"(Al-Fattah, 2017). The sample was classified into 5 categories: unprepared, i.e. the least adoptive of technology, traditional learners, i.e. the least likely to use technology in learning, reluctant, i.e. the least aware of new technology concepts, cautious users, i.e. the least aware of technological applications, digitally ready, i.e. those who achieve the highest skills in skill, confidence and use. The results revealed that 52% of the sample do not have digital readiness, which means that the societal shift towards more complex technologies will cause large sectors of society to be deprived of the benefits of these technologies in improving their lives, not because of their unavailability but because of the unpreparedness of individuals.

It should be noted that there is a long history of studies conducted by researchers on youth awareness of climate and environmental issues(Salem, 1992) (Ahmed, 1996) (said, 2006) on a sample of students of different practical and theoretical faculties at Cairo University, which included 494 male and 396 female students using the environmental trends scale, the results of the study showed that there are no statistically significant differences between the average grades of males and females in the fourth year at the faculties of engineering, arts, agriculture and law in all dimensions of the scale, and there are also statistical differences between the average grades of practical colleges and students of theoretical colleges in relation to environmental trends in favor of students of practical colleges,

and there are also statistically significant differences between the average grades of students of different colleges according to the type of study in each faculty is relative to positive environmental trends, and that the most trend-acquiring students Environmental students are students of the faculties of Science, followed by students of the faculties of engineering, followed by students of agriculture, then Commerce, then arts, then law.

He also conducted (Vicente-Molina, M. A., Fernández-Sáinz, A., & Izagirre-Olaizola, 2013) to identify the impact of environmental knowledge on environmental conservation behavior among university students of a number of countries belonging to different economic levels, these countries are (USA, Spain, Mexico, Brazil it turned out that external factors (culture, social buildings, environmental services in each country) play an important role in the behavior of university students towards the environment. It also turned out that the most important variables in explaining the behaviors of individuals preserving the environment are objective and subjective knowledge and that trends and educational level do not constitute variables affecting the production of this positive behavior. He also conducted (Caretta et al., 2022) a five-year study with the application of 446 questionnaire forms, 28 semi-structured interviews, 4 focus groups, focusing on 60 undergraduate students from six public universities in the Appalachian region of the USA. With the aim of formulating a perspective on climate change for undergraduates.

The results revealed that there is an impact of the rural and socio - economic situation of the surrounding environment on students ' views on climate change and that their information – whether scientific, media or family-reveals uncertainty and inaction about them as they believe that climate change is happening elsewhere and will not necessarily affect them. Researchers have revealed the impact of conscience and geographical location on students ' identities, which helps in framing climate change and pushes students to better express their views on climate change.

-Youth and the environmental development approach: (Zaki & Rabi, 2019) conducted a study to reveal the relationship between social and environmental changes related to youth empowerment in development projects by applying a rural and urban model to Cairo and Sharqiya governorate by applying a questionnaire tool to a sample of young people benefiting from development services in local community development associations. researchers found a statistical relationship between those factors and youth empowerment economically and environmentally. The researchers addressed the concept of environmental variables in the sense of income factors, the availability of development associations in the local community environment and the characteristics of that environment. A study (Whitmarsh, L., Seyfang, G., & O'neill, 2011) the relationship between socio-demographic composition and the commitment of individuals to certain behaviors to mitigate climate change.

It has carried out many researches that have demonstrated a close relationship between digitalization and sustainability in their leadership of contemporary society issues, including climate(Dwivedi, Y. K., Hughes, L., Kar, A. K., Baabdullah, A. M., Grover, P., Abbas, R. & Wade, 2022) where sustainability is preoccupied with social and environmental challenges and growing inequality, which is why United Nations initiatives were launched,

including the Sustainable Development goals and the launch of climate summits in Paris and GLASCOP26 in the UK COP27 in the Arab Republic of Egypt. in this framework, research has put forward the concept of sustainable environmental entrepreneurship as a vital source for achieving development goals by creating a positive environmental impact (Dean, T. J., & McMullen, 2007). Our current study sought to add a new variable that has become relevant in an era when the use of digital technology has prevailed among young people in particular.

### **Sixth: theoretical background**

The theory of Nicolas Le Mans, who is one of the proponents of the new functionalism (Le Mans, 2010) put forward the terms of communication, self-formation and discrimination, as he talks about self-formation Auto-poises, meaning that the system can produce its own processes only through its own network of processes, and the network of self-processes in turn is the production of these processes. In other words, reflecting on what a person does and making decisions according to this reflection works on the formation of the active self of young people through the formation of pure awareness of how to exploit the transformation of Environmental Services and applications to digital available at the fingertips and contribute positively and consciously to the challenges of climate change and their awareness of the importance of their role and they are the strike force that will lead the future in solving current and future problems regarding successive climate changes that need to use the scientific, technological, mental and behavioral energies of young people to reduce those changes negatively affecting the entire universe. So how can young people separate from the surrounding environment and be closed despite the need for everything that is happening in their environment in order to be able to continue living.

The sociology portal website (sociology portal, 2021) refers to what "Loman" mentioned, in a late work of his, to the negative aspects ( functional obstacles), and believes that society is facing the challenges of the full results of its constructive choices such as environmental problems resulting from its rationality, and also refers to the growing awareness of the cosmic dangers emanating from contemporary environmental problems and discomfort from them, and the struggle to maintain the level of social well-being .The neo-Malthusians also see that with the increasing environmental risks, the traditional economic concepts that put rapid growth to satisfy accelerated consumer needs have become outdated and dangerous for the environment and for the human race(Naama, 2016) it is imperative to save the planet and the pattern of our civilization by formulating new economic concepts such as the concept of "green economy" that can correct environmental imbalances and climate changes . They emphasize that the green economy links the environment and the economy and address the interrelationship between the human economy and the natural ecosystem. As Schwartz's shorts pointed out in the standard activation model Norm activation model (Ortega-Egea et al., 2014) to the value orientations driving the practice of a certain environmental behavior, as Stem and others divided the values into the values of social altruism and the values of vital orientation, and also (Gagnon Thompson S, 1994) who distinguished between the values of environmental centrality, which if adopted by a person becomes tired of his environment and provides his effort, himself and his giving to the environment, and this belongs to the field of biospheric values of biosphere values, as for the values of it is about the values of social altruism and selfishness.

As some theories have explained the relationship between gender and socialization in terms of integration into environmental activities (Zelezny LC, Chua P, 2000), the traditional socialization of females is pre-linked to environmental behavior and orients women towards the values of environmental altruism and its role as "environment caregiver" (Hunter LM, Hatch A, 2004) as she cares about the natural environment and things that she believes have value, so females are more sensitive than males to the consequences and consequences of each behavior (Mobley C, vagias WM, 2010), they also treat the world as a risk world that includes a large amount of environmental risks that require huge handling (P, 1999) (Davidson DJ, 1996). The current study has benefited from these theoretical frameworks in formulating the conceptual and explanatory framework of the research problem.

There are no magic or immediate solutions to the issue of climate change, and the responsibility is not only for individuals, as evidenced throughout history, but also deepening public awareness and seeking new technological solutions that keep pace with successive changes is no longer a luxury (Naama, 2016), so the Egyptian Ministry of Environment signed a number of cooperation protocols with religious and development institutions to raise environmental awareness (Institution, 2022), promote joint work in the field of environmental issues and access to a general culture of society that translates into positive behaviors towards the environment and its natural resources in order to protect the environment and achieve sustainable development.

The Egyptian Union for climate change was also established in December 2021 as a response to the invitation of the "youth loves Egypt" Foundation as one of the civil society institutions working in the field of environmental awareness and implementing environmental campaigns to maintain a clean and green environment.

This alliance came as one of the outputs of the Glasgow November 2021 summit, in which 25 non-governmental organizations participated (Nassar, 2021). With the decline in the per capita share of clean water has reached below the water deficit line (Hassanein, 2022), the imbalance of climatic conditions and the increase in average temperatures, as Egypt contributes 0.61% of global emissions (Hassanein, 2022), a number of Egyptian experts agreed (hamshary, 2022) in order to achieve basic and other sub-achievable goals by developing plans to reduce greenhouse emissions and improve the governance and management of work in the field of climate change, as well as improving the infrastructure to finance climate activities while enhancing the promotion of scientific research, technology transfer and Knowledge Management in raising awareness to address climate change. With the rise in sea level, there was a loss of jobs in the agriculture sector, which negatively affected the indicators of achievement of goals No. 1, 2 and 8 of the Sustainable Development Goals (Hassanin, 2022), and food crops declined, which negatively affected the indicators of achievement of goals 2, 3 and 12), which necessitated the redistribution of the migrant population (goal 11), improving community awareness and sending warnings to achieve achievement towards goal 4, 13 and 15.

“ Andrew Kane” in his book entitled :How to fix the future preserve your humanity in the digital age (andreuken, 2018) says that we are stuck between the twentieth century system that is no longer able to work and the network system that replaced it in the Twenty-First Century, as he addresses the inability of some countries to catch up with the network age. Although the digital transformation will contribute to enhancing the process of self-learning and raising climate awareness, it will face challenges, including: challenges in the infrastructure of educational institutions concerned with raising awareness and increasing knowledge, and human challenges,

as there is a category and a population sector that cannot deal with digital technology in all its diversity, especially the elderly over 60 years. There are also technical challenges, for example, designing appropriate and attractive curricula in form and subject, supported by environmental participation activities, organizing seminars and technological competitions for the benefit of environmental issues. And the importance of the availability of university services aimed at making the required behavioral, skill and developmental changes (Hamdi, 2018) in the environment surrounding the University, Publishing ideas for university associates and providing proposals and solutions to environmental and societal issues. The previous proposals are directed towards achieving total quality in university education, which includes processes and activities that contribute to changing the culture for all influencers and those affected by the university education environment.

Among these challenges is also the challenge of activating the decision to convert all environmental institutions to digitization so that they are not vulnerable to any digital penetration (El-Shishy, 2020), as reports indicate that Egypt occupies the 25th place, as stated in the global cybersecurity indicators ranking report for 2018. We list the following, for example, but not limited to electronic contributions and initiatives in the field of the environment:

- Private sector: environmental contributions from telecommunications companies for example "Vodafone Egypt" the first first eco-Sim mobile chip manufactured 100% from recycled plastic materials (keep a greener environment with Vodafone N.d) as part of Vodafone's celebration of World Earth Day, customers are encouraged to recycle their old phones, use paperless electronic bills, reduce lighting, and reduce the automatic operation of mobile phones.

Schneider Electric, a private sector company, has also launched an environmental competition entitled "go green" to provide digital solutions for energy and autonomous operation to achieve sustainability (Forsa, 2020).

- Government initiatives: the digital path initiative for sustainable green recovery (telecommunications, 2022), the launch of the agricultural knowledge management program (telecommunications, 2022), and the launch of the digital transformation project for Sustainable Development between the Ministry of communications and the United Nations Fund in 2002 to take advantage of the potential of Information Technology in achieving a leap in awareness and the environment (telecommunications, 2022) ([https://Mcit.Gov.Eg/Ar/Digital\\_Citizenship](https://Mcit.Gov.Eg/Ar/Digital_Citizenship), n.d), and the green skills development program as mentioned in the cooperation protocol between the Ministry of communications and Ain Shams University ([https://Mcit.Gov.Eg/Ar/Digital\\_Citizenship](https://Mcit.Gov.Eg/Ar/Digital_Citizenship), n.d).

- Enlightening service applications to support the efforts of individuals or small groups to issue electronic applications to encourage families to separate from the source, for example, the application of bekia, Zabala store, and others to achieve a simple material benefit for the family in exchange for the sale of waste after separation and also to ensure safe disposal so as not to raise environmental pollution rates, the application "Environmental Challenge" helps the mobile phone user to identify environmental challenges and some news about them, identify air quality according to the place and time in the city, detect sound pollution and identify environmental events (Environmental Challenge application). And some limited electronic applications that require certain conditions to spread awareness, as whoever has a smartphone is the one who can search for these electronic applications provided that he wants and needs to take advantage of them, whether to achieve material or cognitive benefit, in this case only he will download them to the device.

-Educational applications such as "my environment" to learn about the ecosystem, natural resources, the plant and animal world and the causes of ecosystem imbalance.

The previous monitoring of electronic services related to awareness of climate issues shows their inadequacy, weak prevalence, low volume of beneficiaries, and they are not addressed to a large segment of "illiterate" non – literate as the limitation of "illiteracy of reading and writing" does not enable the mobile phone user to read and use applications related to the environment-even if he is interested in identifying them, then he will not be able to achieve cognitive benefit from them.

It was also noted that there are no electronic applications to urge different age, cultural and educational population groups, taking into account subcultures and different places of trust (urban – rural - urban rural outskirts) to urge everyone to adopt positive environmental behavioral values that will inevitably positively affect the climate.

### **Eighth: Methodology**

The study followed the descriptive and inductive method to extrapolate the current situation of the digital transformation strategy in Egypt to identify the reality of digital transformation applications that facilitate environmental awareness services to the public and that contribute to raising the awareness of young climate leaders in the future. Then a controlled scale was used and the tool's sincerity was measured through the tool's experience with a limited number of respondents, and then adjustments were made to the tool according to the observations of the researchers by clarifying, surveying and describing the digital initiatives of the private and government sector and some civil society institutions. therefore, some questions were modified and the tool was finally re-applied 10 days after the modifications were made to the tool. Fieldwork to collect data began on May 20, 2022 until July 20, 2022 on a random irregular sample of 162 males and females.

**Ninth: Results**

**9-A-answering research questions:**

**9.A.1..Demographic characteristics of the sample:**

The spss V. 21 program was used to perform the data analysis resulting from the application of the data collection tool with the youth sample, the following table shows the values of the averages and standard deviation of the demographic characteristics of the sample and the median values of some demographic characteristics of the sample.

**Table (1) The demographic characteristics of the sample**

media	Standard deviation	average	%	n	Chracteristics
<b>Sex</b>					
	1.463	3.31	31.677	51	Male
	1.540	2.71	68.94	111	Females
	1.537	2.90	<b>Age group</b>		
			25.9	42	22-18
			21.0	34	27-23
			14.2	23	32-28
			14.8	24	37-33
			24.1	39	37+
	1.658	2.51	<b>Education level</b>		
			41.4	67	University graduate
			29.6	48	Post-graduate
			5.6	9	University student year one
			7.4	12	University student year two
			5.6	9	University student year 3
			8.6	14	University student year 4
			1.9	3	Equivalent to high school certificate
	0.972	1.45	<b>Faculty</b>		
			74.1	120	humanities
			16.7	27	Medicine-pharmacy
			3.7	6	Business
			2.5	4	engineering
			1.9	3	Education
			1.2	2	Equivalent to high school
0.603		1.28	<b>residence</b>		

		<b>80.2</b>	<b>130</b>	<b>Urban</b>
		<b>11.7</b>	<b>19</b>	<b>Rural</b>
		<b>8.0</b>	<b>13</b>	<b>Urban-rural borders</b>
<b>3.507</b>	<b>3.63</b>			<b>governorate</b>
		<b>43.8</b>	<b>71</b>	<b>Cairo</b>
		<b>18.5</b>	<b>30</b>	<b>Giza</b>
		<b>11.1</b>	<b>18</b>	<b>Fayoum</b>
		<b>6.8</b>	<b>11</b>	<b>Alexandria</b>
		<b>12.3</b>	<b>20</b>	<b>Behera</b>
		<b>7.2</b>	<b>11</b>	<b>Beni Suef-Kafr ElSheikh- Banha- Qalubiya- Damietta-Sharqia-Sohag- Aswan-Assuit-New Valley</b>
<b>1.205</b>	<b>3.33</b>			<b>Family Monthly income</b>
		<b>0.6</b>	<b>1</b>	<b>Less than L.E.1000</b>
		<b>32.7</b>	<b>53</b>	<b>l.e.1000-less than 5000</b>
		<b>24.1</b>	<b>39</b>	<b>5000-less than 10000</b>
		<b>20.4</b>	<b>33</b>	<b>L.E.10000+</b>
		<b>21.0</b>	<b>34</b>	<b>I don't know</b>
		<b>1.2</b>	<b>2</b>	<b>irregular</b>
		<b>%100</b>	<b>162</b>	<b>Total Sample</b>

The results revealed that 68.94% of the sample are female, and 31.67% are male, and as for the age distribution, 25.9% are in the age group of 18-22 years, followed by 24.1% older than 37 years, and then 21% in the age group of 23-27 years. Most of the sample, 41.4% have a higher qualification, of which 29.6% have either a master's degree or a Ph.D at the postgraduate level. 74.1% studied in theoretical faculties, followed by 16.7% studied natural sciences such as Medicine and Pharmacy. 80.2% are urban residents, most of them 43.8% in Cairo, 18.5% in Giza, 12.3% in Beheira and 11.1% in Fayoum. 11.7% live in rural areas and 8% live in urban rural areas. In terms of monthly household income, the highest percentage of 32.7% receive a wage of 1000-less than 5000 EGP, then 24.1% receive between 5000 and less than 10000, then 20.4% receive more than 10000 EGP.

**Table (2) residence place/gender**

total %    n	urban		rural		Urban-rural borders		sex
	%	n	%	n	%	n	
<b>32.09</b> <b>52</b>	25.30	41	4.938	8	1.851	3	<b>male</b>
<b>67.90</b> <b>110</b>	54.93	89	6.79	11	6.172	10	<b>female</b>

In terms of gender distribution by residence, it turned out that 54.9% of females live in urban areas, 6.79% live in rural areas, and 6.1% live in urban rural areas. The following table shows the Pvalue for the phrases of the three axes : Cognitive; Skillful and Emotional

**Table (3) the P value of the three components of awareness**

skill	P value		component
	emotional	cognitive	
.279 Sig 0.001	.313 Sig 0.001	1	<b>Cognitive</b>
.543 Sig 0.001	1	.313 Sig 0.001	<b>emotiona</b>
1	.543 Sig 0.001	.279 Sig 0.001	<b>skill</b>

The results showed that the order of the axes is descending as follows according to the values of P: Skill 0.543 followed by Emotional 0.313, followed by Cognitive 0.279. The scale included 11 questions (Yes – No ), demographic characteristics questions(7) and multiple choice questions (8), the value of the Alpha coefficient of the scale was 0.780 for 47 phrases. -To measure moderation, the Kolmogorov-Smirnov scale was used and it turned out to be greater than 0.05 between the type and the cognitive, emotional, skill component, non-function and parametric.

**Table (4) Alpha Chronbakh value for the three components of the scale**

<b>Cognitive component</b>	<b>Emotional component</b>	<b>Skills component)</b>	<b>Value</b>
0.922	0.821	0.665	<b>Alpha Chronbakh</b>
2.7695	3.6088	2.5836	<b>mean</b>
2.6667	3.6250	2.5455	<b>media</b>
0.77745	0.50754	0.35877	<b>Standard deviation</b>
1.00	1.88	1.36	<b>Minimum</b>
5.00	4.50	3.55	<b>Maximum</b>

By comparing the values of the standard deviation, it is clear from the previous table that the skill component ranks first, followed by the Emotional component in the second rank associated with "intention" or "behavior" as indicated by environmental studies (Whitmarsh, L., Seyfang, G., & O'Neill, 2011) “reducing energy consumption at the individual level”, “reducing the dumping of plastic bags in the waters of the seas and oceans”, “increasing the rates of planting oxygen-producing fruit trees”, and “spreading environmental awareness Digital Culture” are all individual and collective behaviors that express positive individual trends to reduce the negative effects of climate change on the planet. The Cognitive component is in third place.

**Table (5) the sample's opinions on the importance of studying climate issues and the importance of digital transformation in raising awareness about them**

rank	direction	Standard deviation	mean	Completely disagree	diagree	neutral	agree	Completely agree	Phrases of cognitive component
1	<b>high</b>	.0.844	3.9815	2 1.2	7 .4	26 16.0	84 51.9	n43 26.5 %	<b>I believe in the importance of field studies and research on environmental issues</b>
2	<b>high</b>	1.11	3.4	10 6.2	6 3.7	48 29.6	50 30.9	n 48 29.6 %	<b>I see that digital transformation has a role in educating young people about climate issues</b>
3	<b>neutral</b>	1.22	3.224	20 12.3	18 11.1	57 35.2	39 24.1	n28 17.3 %	<b>I see that digital transformation has contributed to my knowledge of climate change</b>
		0.4769	2.8580	<b>mean Standard deviation and</b>					

The results showed that 51.9% of the total sample, with a standard deviation of 0.84, agreed with the phrase "I believe in the importance of studying environmental issues", and with them 26.5% fully agree with the phrase, and the general trend of the phrase "high" and that phrase ranked first among the phrases of the knowledge component, followed by a high trend also as mentioned by 30.9. The phrase "I see that digital transformation has a role in educating young people about climate issues" is followed by 29.6% who fully agree with the same phrase in a neutral direction.

As for the phrase "that is, the digital transformation contributed to my knowledge of climate changes", it occupied an average trend of 35% among the sample, followed by 24.5% agreeing with the phrase, and then 17.3% completely agree.

**Table (6) the value of the T test for gender differences and the phrases of the cognitive component**

rank	T value	sig	df	phrase
<b>males</b>				
4	21.908	0.001	3.654	Do you see that digital transformation has a role in educating young people about climate issues
1	28.862	0.001	1.077	Do you think it will be useful in raising the awareness of university youth about climate problems at the local level
2	20.584	0.001	1.135	Do you know anything about climate issues
3	18.646	0.001	3.21154	How much do you think digital transformation has contributed to your knowledge of climate change
<b>females</b>				
4	37.074	0.001	3.782	Do you see that digital transformation has a role in educating young people about climate issues
1	38.281	0.001	1.100	Do you think it will be useful in raising the awareness of university youth about climate problems at the local level
2	30.575	0.001	1.227	Do you know anything about climate issues
3	27.855	0.001	3.236	How much do you think digital transformation has contributed to your knowledge of climate change

The calculation table shows the values of the test (V) and the significance values by type, as it shows a significant correlation at a level below 0.05 in favor of females among the following questions in order of importance to the sample, the question is "Do you think it will be useful in raising the awareness of university youth about climate problems at the local level?" Ranked first in both groups, followed by the question "Do you know anything about climate issues?"

In second place, then the question "Do you know anything about climate issues" and then the question "Do you see that digital transformation has a role in educating young people about climate issues?" in fourth place.

**Table (7) description of the sample (Male, Female) for its  
knowledge of climate issues**

rank	direction	Standard deviation	mean	Very weak	weak	neutral	good	Very good	n %	The phrase (how to describe your (...knowledge of
1	neutral	.940	3.07	6 3.7	25 15.4	73 45.1	40 24.7	18 11.1	n %	The impact of dumping plastic bags in the seas and oceans on human health
2	neutral	.9435	2.418	30 18.5	53 32.7	63 38.9	13 8.0	3 1.9	n %	Contributions of schools and universities to environmental activities
4	neutral	1.01	2.598	25 15.4	53 32.7	56 43.6	18 11.1	10 6.2	n %	Climate summits that solve environmental problems
6	neutral	1.04	2.596	27 16.7	47 29.0	59 36.4	23 14.2	6 3.7	n %	The role of various ministries in reducing environmental problems
7	neutral	1.05	2.778	21 13.0	40 24.7	64 39.5	28 17.3	9 5.6	n %	The problem of atmospheric dust
8	neutral	1.07	2.891	20 12.3	32 19.8	65 40.1	35 21.6	10 6.2	n %	The problem of deforestation
8	neutral	1.07	2.875	20 12.3	34 21.0	64 39.5	34 21.0	10 6.2	n %	The problem of melting ice
5	neutral	1.016	3.098	8 4.9	45 21.6	69 42.6	33 20.4	17 10.5	n %	Global warming
10	neutral	1.136	2.456	43 26.6	38 23.5	52 32.1	23 14.2	6 3.7	n %	International conventions on climate
9	low	1.135	2.431	41 25.3	45 27.8	49 30.2	19 11.7	8 4.9	n %	Egypt Strategy 2030
3	neutral	1.00920	2.987	11 6.8	38 23.5	67 41.4	34 21.0	12 7.4	n %	By rationalizing the use of resources, traditional energy sources (such as coal, oil and gas),



and the percentage of those who do not know about international agreements reached 50.1% and those who have an average knowledge of 32.1%, this result does not agree with the result of a study (Sabiha, 2014), as 76% of the sample knew about international agreements on climate issues.

**Table (8) the extent of the sample's knowledge of climate change and digital transformation and its importance in raising awareness of climate issues**

rank	Standard deviation	mean	I don't know	no	yes		question
1	0.252	1.79	--	11 6.8	151 93.2	n %	Did you know that global climate changes are negatively affecting many countries
3	0.415	1.20	1 0.6	30 18.5	131 80.9	n %	Do you know anything about climate issues
2	0.343	1.14	--	22 13.6	140 86.4	n %	Do you know what digital transformation means
4	0.74	1.6	26 16.0	7 4.3	129 79.6	n %	Do you see the importance of applying digital transformation in Egypt in the field of environmental awareness in general

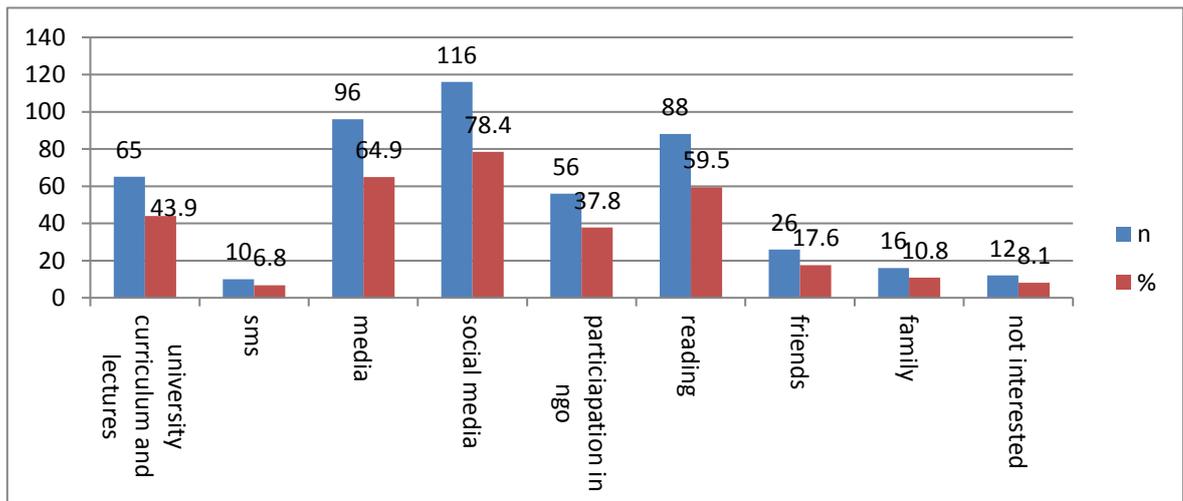
93.2% answered that they are "aware of the occurrence of global climate changes that negatively affect many countries", followed by 86.4% of the sample know "what is meant by digital transformation", which is a fairly high percentage, and 80.9% "have information about climate issues", and then 79.6% know about "the importance of applying digital transformation in Egypt in the field of environmental awareness in general."

**Table (9) what researchers know about digital transformation**

Standard 0.252=deviation	1.79=mean	%	n	What do you know about digital transformation
		42.6	69	The use of digital technology in the provision of government services
		1.2	2	Offering private sector companies their services and products using mobile phones
		1.2	2	Creating and disseminating innovative modern economic and cultural values among people
		49.4	80	All of the above
		5.6	9	None of the above
		<b>100</b>	<b>162</b>	Total sample

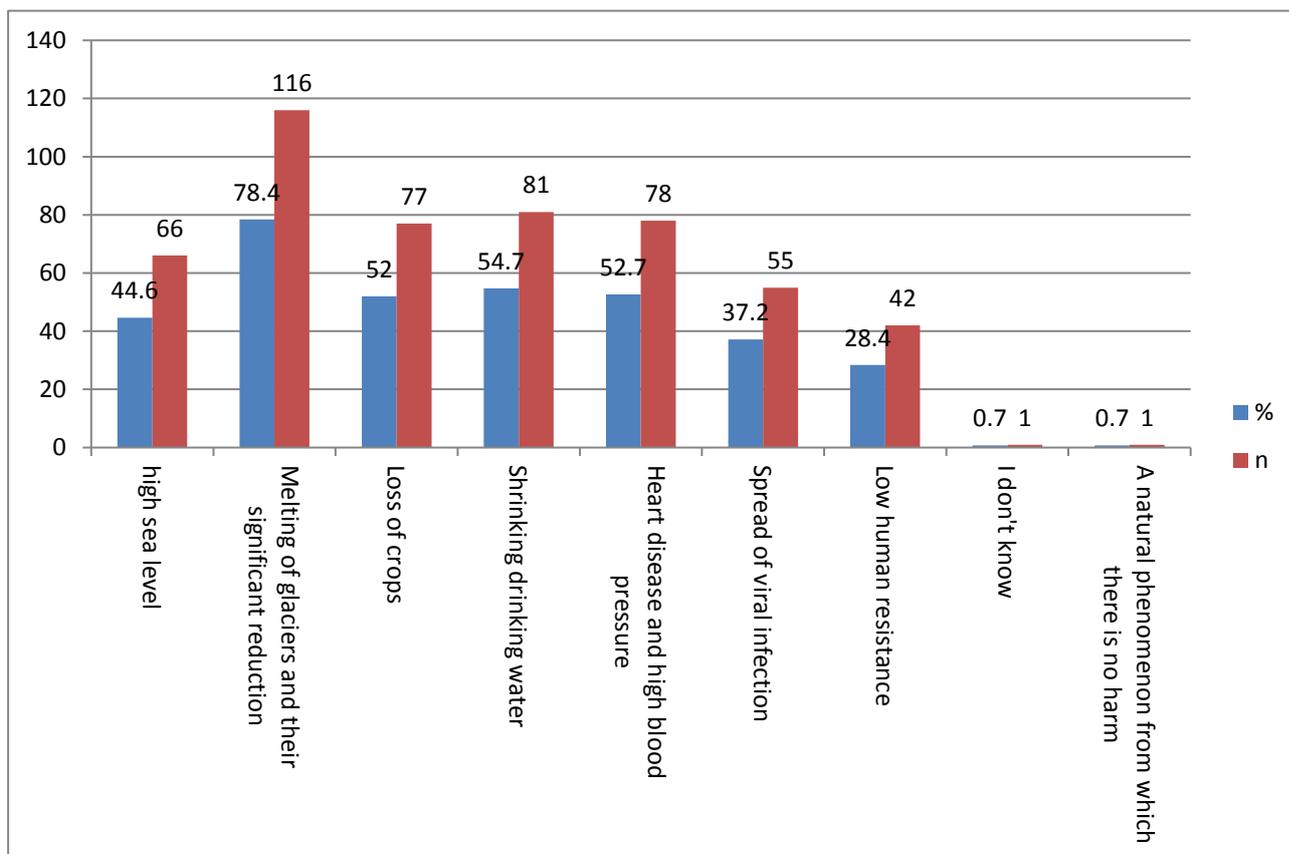
Most of the sample agreed by 49.4% that what they know about digital transformation includes several things together, namely "using digital technology in providing government services", "offering private sector companies their services and products using a mobile phone", and "creating innovative modern economic and cultural values and spreading them among people". This is followed by 42.6% who stated that what they know about digital transformation is only "the use of digital technology in the provision of government services".

**Figure (1) the sample's sources of information on climate issues**



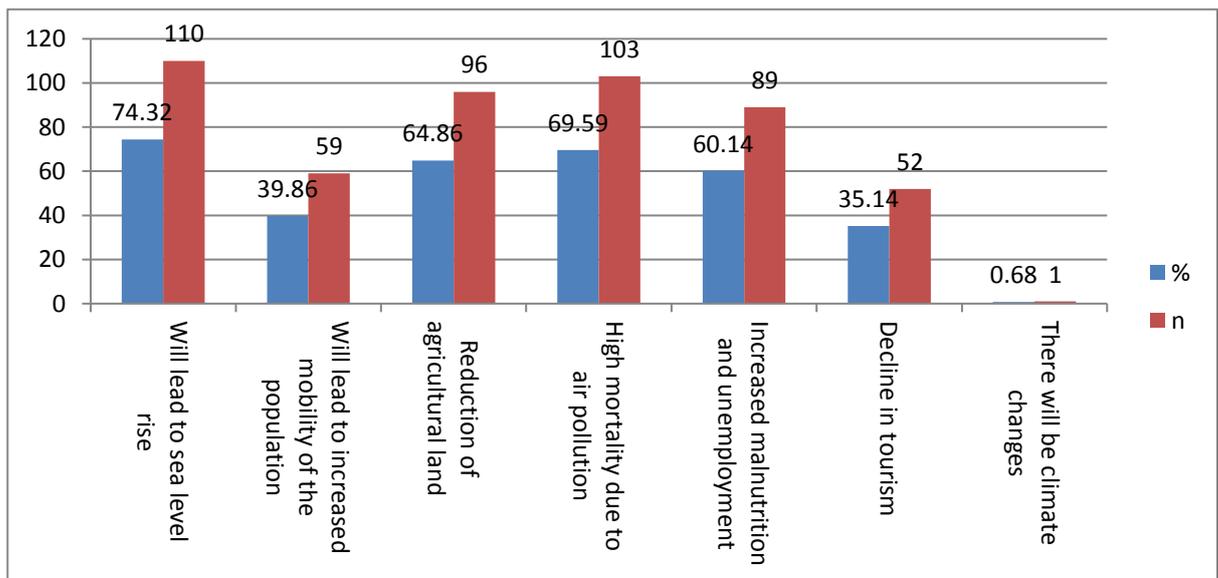
The results revealed a significant decrease in the percentage of those who learned about climate issues through university courses and lectures, as mentioned by 43.9% of the sample, and this source came in third place, compared to those who learned about climate issues through social media, and 78.4% of them ranked first, followed by the second place read, visual and audio media, as mentioned by 64.9% of the sample . This result is consistent with a study (Sabiha, 2014) that the school curriculum does not come first, but is preceded by the media. The percentage of those who obtained knowledge about climate issues through the family also decreased, as only 10.8% of the sample mentioned this, and this result is also consistent with a study (Sabiha, 2014), which found that the family has an ineffective role in educating students about climate issues.

**Figure (2) The Effects of global warming as seen by the sample**



The results showed that the highest percentage of the sample, which amounted to 78.4%, believed that the effects of global warming as a result of an increase in the amount of energy released by the Earth (Jafar, 2021) in the first place are "melting of mountain glaciers and a significant decrease in their number" followed by a large difference and by 54.7% "reduction of drinking water", then 52.7% believed that global warming effects will be "directly on human health, 2021), which revealed an annual increase in the number of days exceeding the daily average of 250 is 0.5 days/year or 17.7 during the standard climatic period (20 years) and the number of days exceeding the daily average of 300 is 0.687 days/year, i.e. about 44 days, and these results negatively affect the wheat crop in Egypt, which cannot tolerate a temperature higher than 250, so it will be negatively affected after the passage of three climatic cycles . Then 44.6% stated that it will cause "sea level rise", followed by 37.2% stated that it will lead to "the spread of virus infection" and finally 28.4% will lead to "a decrease in human resistance."

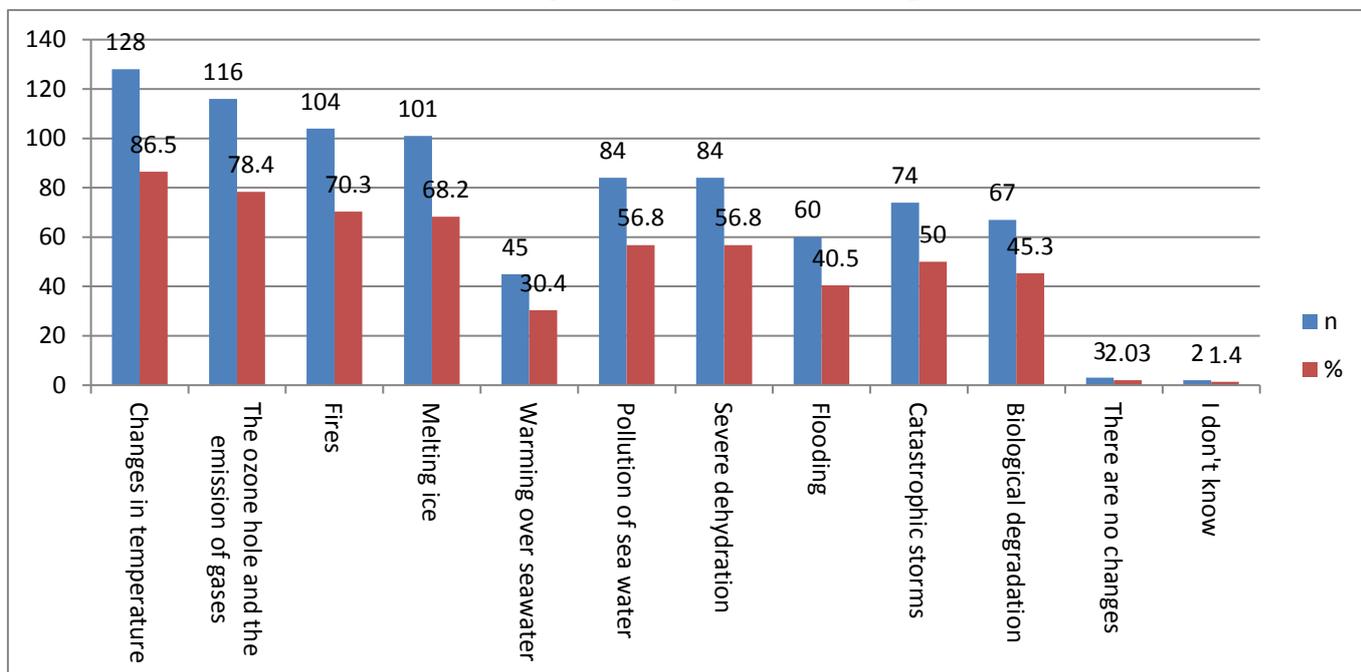
**Figure (3) What the sample knows about the effects of climate changes**



The results showed that 74.3% believed that the effects of climate change will lead first to rising sea levels, followed by 69.59% who said that it will lead to higher death rates as a result of increasing the concentration of pollution in the air, then 64.86% agricultural lands will be flooded with sea water, then 60.14% thought that malnutrition and unemployment will increase, then 39.86% saw that it will lead to increased population movement, and 35.14% will lead to any decline in tourism.

The following figure reveals the most important climate changes in the sample's opinion by asking a multiple-choice question, and the majority of the sample explained by 86.5% that changes in temperature come in first place, then in second place 78.4% mentioned the ozone hole and the emission of toxic gases, then in third place 70.3% mentioned fires, then in fourth place 68.2% mentioned melting ice, then in fifth place 56.8% mentioned sea water pollution and severe drought, then in sixth place 50% mentioned catastrophic storms, then in seventh place 45.3% mentioned biological degradation, then 40.5% floods ranked eighth. This ranking of the most important climatic changes in the opinion of the sample may stem from the nature of the changes taking place in the Arab Republic of Egypt and according to its geographical location, with the country not exposed to floods or hurricanes and the absence of icebergs, this result shows the impact of the sample on the nature of the geographical location and the impact of the emotional component in formulating the ranking of the most important climatic changes in this order.

**Figure (4) The Most important climate changes that the world is witnessing in the opinion of the sample**



**9-a-2-The extent to which young people need to receive electronic awareness services related to climate issues:**

A number of (4) questions were asked to identify the cognitive and skill needs of young people of both sexes regarding climate issues and we present below the results of the sample's answer to those questions for which the values of averages and standard deviation were also calculated.

**Table (10) the sample's needs for electronic awareness services and their usefulness in climate issues**

rank	Standard deviation	mean	total	I don't know % n	Yes % n	phrase	
2	0.336	1.1296	162	--	13.0 21	87 141	I need to receive electronic awareness services related to climate change and its effects
3	0.291	1.09	162	--	9.3 15	90.7 147	It will be useful in raising the awareness of university youth about climate problems at the local level
1	0.2442	1.0494	162	0.6 1	3.7 6	95.7 155	We need to impose more laws and financial restrictions than currently prescribed to maintain a clean environment
4	.81886	3.9198	162	---	4.9 8	95 154	I would like to know everything new about climate issues

The results of the previous table show that the need of the sample-as they mentioned - is to impose financial laws and restrictions with a financial value greater than currently stipulated to maintain a clean environment by 95.7%, in the first place with an average of 1.0494, and in the second place, 87% of the sample would like to receive electronic awareness services related to climate change and its effects with an average of 1.1296 with a standard deviation of 0.336.

In the third place comes the creation of digital services in the field of climate awareness, which will lead to raising the awareness of young people at the local level, as stated by 90.7% in the first place with an arithmetic average of 1.09 and a standard deviation of 0.291, and in the fourth place 95% want to know everything new about climate issues with an average of 3.9198 and a standard deviation of 0.81886. This shows that the cognitive need ranks behind the behavioral and emotional needs of the current study sample.

**Table (11) values of means and standard deviation for sample needs by sex**

rank	I would like to know everything new about climate issues	rank	I need to receive electronic awareness services related to climate change and its effects	rank	We need to impose more laws and financial restrictions than currently prescribed to maintain a clean environment	Standard 9 mean/ sex deviation
3	3.78	2	1.2115	1	1.0385	<b>Males n=52, mean</b>
	0.84799		0.41238		0.1941	<b>Standard deviation</b>
3	3.9818 0.80117	2	1.0909 0.28880	1	1.0545 0.26531	<b>females ,n=110, mean Standard deviation</b>
	3.9198 0.81886		1.1926 0.33694		1.0419 0.2445	<b>Mean of total sample=162 Standard deviation of total sample</b>

It is clear from the previous table the ranking of needs by gender, and the needs occupied the same gender order mentioned in the previous table, the need for organized laws occupied the first place, followed by the provision of digital services in the second place, and the knowledge need for awareness of climate issues ranked third.

9.a.3. Emotional component and youth participation in environmental activities:

The mean and standard deviation values of 7 emotional component phrases and one question were calculated.

**Table (12) respondents ' feeling of the impact of pollution on the climate**

rank	Standard deviation	mean	I don't know % n	No % n	Yes % n	السؤال
1	0.36211	1.0741	3.1 5	1.2 2	95.7 155	Do you feel the impact of pollution on the climate
					<b>%100 162</b>	<b>TOTAL</b>

The results showed that 95.7% of the sample answered "yes" "I feel the impact of pollution on the climate" with an average of 1.0741 and a standard deviation of 0.36211, against 1.2% "I do not feel the effects of pollution on the climate".

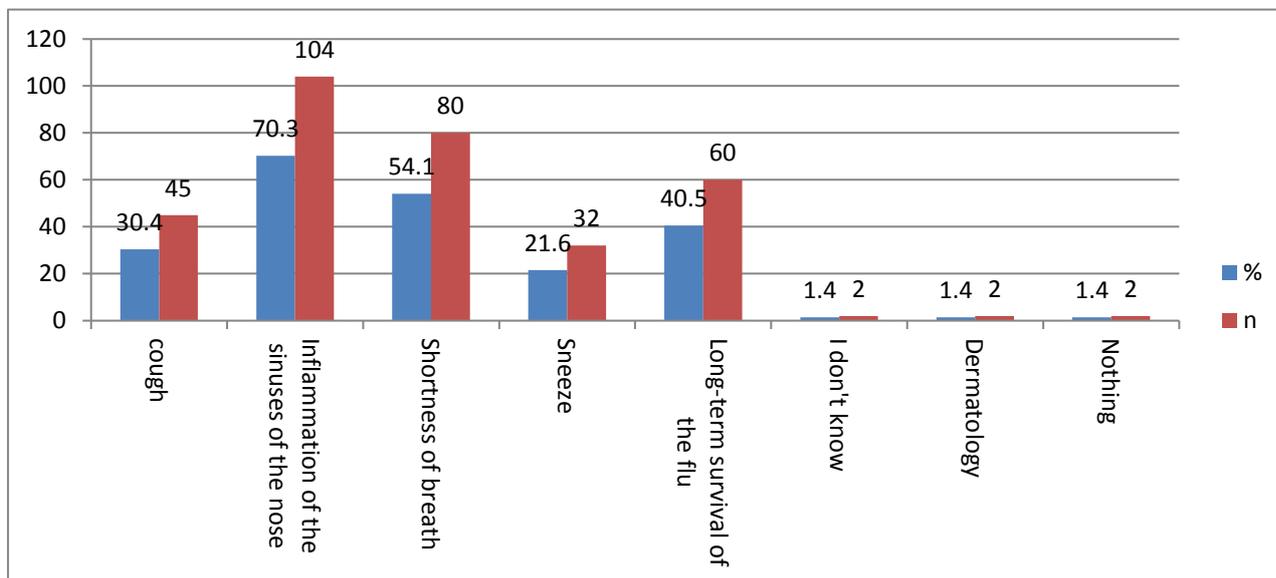
**Table (13) The Results of the expressions of the Emotional component**

rank	direction	Standard deviation	mean	totally disagree	disagree	neutral	agree	Totally agree	The phrase
2	high	.74656	4.1420	1 0.6	4 2.5	17 10.5	89 54.9	51 31.5	I feel the importance of addressing environmental problems
3	high	.77330	4.1296	53 32.7	7 4.3	18 11.1	84 51.9	-- --	I'm worried about pollution
4	high	.77625	4.1358	1 0.6	5 3.1	18 11.1	85 52.5	53 32.7	I feel the seriousness of environmental problems in the future
5	high	.90278	3.8951	3 1.9	8 4.9	33 20.4	77 47.5	41 25.3	I feel the importance of having a climate course
6	high	.95391	3.8333	6 3.7	6 3.7	35 21.6	77 47.5	38 23.5	I feel the importance of

									<b>seminars and conferences on climate</b>
7	high	.97519	3.7407	7 4.3	7 4.3	40 24.7	75 46.3	33 20.4	<b>I encourage my colleagues to participate in environmental conservation activities</b>
		.50754	3.6088	<b>mean, Standard deviation</b>					

The trends of phrases expressing the emotional component all came in a "high" direction, and the phrase "I feel the importance of treating environmental problems" ranked first with 54.9% approving the phrase and 31.5% completely approving, this result is associated with a high percentage of those who stated that they feel polluted (95.7%). Moreover, the phrase "I am worried about pollution" ranked second, with 51.9% agreeing with the phrase against 32.7% who disagree completely, and here the impact of the geographical location (urban-rural-urban rural outskirts with the volume of knowledge available to the respondents) is evident in his feeling of the presence of climate pollution in his environment in which he lives. In the third place, the phrase "I feel the seriousness of environmental problems in the future" was used, where 52.5% approved of it, then 47.5% stated "I feel the importance of having a course on climate" in the fourth place, then in the fifth place "I feel the importance of seminars and conferences on climate" followed by the last seventh place "I encourage my colleagues to participate in environmental conservation activities", it is clear here the weak impact of cognitive awareness in shaping positive behavior by encouraging others to carry out behaviors and activities that preserve the environment.

**Figure (5) the effects of climate change on health as seen by the sample**



9-a-4-Are there differences among the youth in the sample in awareness of the importance of digital transformation towards climate issues due to the change in education?

The values of the averages and the standard deviation of the phrases of the skill component have been calculated, we provide them as follows:

**Table (14) the extent of the sample's participation in activities related to climate issues**

Standard =deviation 1.3779	2.8025=mean	%	n	The extent of participation in activities related to climate issues
		35.2	57	I have not participated before
		26.5	43	I would like to participate if the opportunity arises
		23.5	38	Previously engaged in environmental activities
		9.3	15	I don't know anything about her
		5.5	9	I seek to participate to minimize the effects
		<b>100</b>	<b>162</b>	<b>Total sample</b>

The previous table shows a low percentage of participation in activities for forums or institutions, as the percentage of those who participated in environmental activities reached only 23.5% of the sample, and this result is consistent with a study (sabaha, 2014). Only 35.2% participated in the sample and 26.5% would like to participate if given the opportunity, and 9.3% do not know anything about participating in voluntary activities related to the climate, so the percentage of those seeking to participate to reduce its negative effects decreased by 5.5%. Here it becomes clear to us the weakness of the behaviour skill component versus the impact of the emotional and then cognitive component.

**Table (15) values of means and standard deviation for the phrases of the behavioral skill component**

rank	Direction	Standard deviation	mean	totally disagree	disagree	neutral	agree	Totally agree	The phrase
1	High	.65961	4.2716	-- --	3 1.9	10 6.2	89 54.9	60 38.0	I support the activation of environmental laws
2	منخفض	.76793	1.3519	125 77.2	25 15.4	5 3.1	6 3.7	1 0.6	Leave the tap open when not in use
3	Low	.81181	1.4506	114 70.4	31 19.1	9 5.6	8 4.9	-- --	I'll drop it off anywhere if I can't find the designated place
4	High	.85494	4.1975	6 3.7	1 0.6	7 4.3	89 54.9	59 36.4	Dump waste in designated places
5	Neutral	1.10407	3.0679	18 11.1	25 15.4	61 37.7	44 27.2	14 8.6	I practice agriculture and afforestation activities at the University with colleagues
6	neutral	1.10890	2.9877	20 12.3	28 17.3	60 37.0	42 25.9	12 7.4	Visit environmental

									<b>associations and learn about their activities</b>
7	neutral	1.11278	3.2901	14 8.6	18 11.1	60 27.0	47 29.0	23 14.2	<b>Participate in voluntary activities to preserve the environment</b>
9	neutral	1.28966	2.6296	43 26.5	33 20.4	40 25.7	33 20.4	13 8.0	<b>Use plastic bags a lot</b>
8	High	1.11732	2.9938	19 11.7	32 19.8	54 33.3	45 27.8	12 7.4	<b>Use paper bags a lot</b>

The sample was asked about the number of (9) phrases of the skill component, and it turned out that 54.9% of the sample of both sexes agreed with the phrase "I support the activation of environmental laws", which ranked first in a high direction, this result is consistent with what 95.7% of the sample said about their needs to "impose laws and financial restrictions greater than currently stipulated to maintain a clean environment". 77.2% of the sample disagreed with that phrase, and in third place the phrase "throw garbage if I don't find the designated place "in a low direction, then in fourth place the phrase" throw waste in the designated places "in a high direction, and then the phrase" I practice agriculture and afforestation activities at the University with colleagues "in fifth place in an average direction. Then in the sixth place the phrase "I visit environmental associations and learn about their activities" also in an average direction, then the phrase "I participate in voluntary activities to preserve the environment" then the phrase "use plastic bags a lot" in an average direction in the eighth place, then the phrase "I use paper bags a lot" in the ninth place in a high direction, and the presence of this phrase may be in the last rank because the use of paper bags as an alternative to plastic bags has not yet begun to circulate in the country and depends on the institution or the culture of individuals who may adopt this culture of substitution for their awareness of the harms of the intensive use of plastic and its harmful effects on public health.

**Table (16) matrix of the relationship between some phrases of the emotional and professional axis**

I believe in the importance of field studies and research on environmental issues	I participate in voluntary activities to preserve the environment	I throw waste in designated places	I practice agriculture and afforestation activities at the University with colleagues	I encourage my colleagues to participate in environmental conservation activities do you	I feel the impact of pollution on the climate	
.600**	.298**	.345**	.171*	.265**	-.215**	P Value I support the activation of environmental laws
.000	.000	.000	.030	.001	.006	Sig.
				.642**		P Value I Participate in voluntary activities to preserve the environment
				.000		sig

The results revealed an inverse relationship between the support for the activation of environmental laws and the feeling of the impact of pollution on the climate, as the Pearson coefficient value was -0.215 at an indication level below 0.01 with a value of 0.006. While a positive relationship was found between "supporting environmental laws" and phrases indicating a positive practice such as "encouraging the vocabulary of the sample for their colleagues to participate in environmental conservation activities", "practicing agriculture and afforestation activities at the University with colleagues", "dumping waste in the designated places", "participation of the vocabulary of the sample in voluntary activities to preserve the environment",

and "the belief of the vocabulary of the sample in the importance of field studies and research on environmental issues."

**9-B-answering research hypotheses:**

**First hypothesis**

- There are significant differences between gender (Male, Female) and youth awareness of climate issues in favor of females:

There is a relationship between the type (male ) with the cognitive and skill component and there is no relationship with the emotional, as for females there is a relationship between the type (female) with the cognitive and emotional component and there is no relationship with the skill component due to the high significance value of 0.009 and this result is consistent with a study (Semenza JC, Hall DE, Wilson DJ, Bontempo BD, Sailor DJ, 2008)(Whitmarsh L, 2010)(Diamantopoulos a, Schlegelmilch BB, sinkovics RR, 2003)(ajzen I, 2008)(Zelezny LC, Chua p, 2000), as females have a greater interest in the environment than males, and this is reflected in their behavior and increased participation in environmental activities, for example, garbage recycling, waste reduction, and reducing electricity and water consumption in everyday life (Whitmarsh L, 2010).

**Answer to the second hypothesis:** -There is a correlation between age and awareness of climate issues. The results revealed a significant relationship between the age group (18-under 22 years) and the behavioral component and the emotional component, as the value of P Value was 0.001 and 0.032, respectively, a significant function at the level of  $>0.05$ , and there is no relationship between that low age group with the cognitive component. As for the slightly older age group (23-less than 27 years), there is a correlation of the moral value of the pvalue 0.25 for the emotional component and 0.025 for the skill component function at the level of  $0>05$  and with the cognitive component the value of the pvalue coefficient was 0.047 function at the level of  $0>05$  and the same is the case with the age group older than 37 years, the value of the Pvalue coefficient was 0.001 for the emotional and knowledge component and 0.003 for the skill component function at Level  $0>05$ .

**Table (17) Pearson coefficient values for the three components of the scale by age**

Cognitive component	Emotional component	Behaviour component	Age group	component
1	.331*	.283	<b>22-18 N=42</b>	<b>P Value cognitive</b>
	<b>.032</b>	.069		<b>sig</b>
.331*	1	.692**		<b>P Value emotional</b>
<b>.032</b>		.000		<b>sig</b>
.283	.692**	1		<b>P Value skill</b>
.069	<b>.000</b>			<b>.sig</b>
1	.344*	-.098	<b>27-23 n-34</b>	<b>P Value cognitive</b>
	<b>.047</b>	.580		<b>.sig</b>
.344*	1	.384*		<b>P Value emotional</b>
<b>.047</b>		.025		<b>.sig</b>
-.098	.384*	1		<b>P Value skill</b>
.580	<b>.025</b>			<b>.Sig</b>
1	-.087	.202	<b>32-28 N=23</b>	<b>P Value cognitive</b>
	.693	.356		<b>Sig</b>
				<b>.</b>

-.087	1	.217		<b>P Value</b>	<b>emotional</b>
.693		.320		<b>.sig</b>	
.202	.217	1		<b>P Value</b>	<b>skill</b>
.356	.320			<b>.sig</b>	
1	.310	.377	<b>37-33 N=24</b>	<b>P Value</b>	<b>cognitive</b>
	.140	.069		<b>.sig</b>	
.310	1	.592**		<b>P Value</b>	<b>emotional</b>
.140		<b>.002</b>		<b>.sig</b>	
.377	.592**	1		<b>P Value</b>	<b>skill</b>
.069	<b>.002</b>			<b>.sig</b>	
1	.461**	.567**	<b>37 + N=39</b>	<b>P Value</b>	<b>cognitive</b>
	<b>.003</b>	<b>.000</b>		<b>.sig</b>	
.461**	1	.610**		<b>P Value</b>	<b>emotional</b>
<b>.003</b>		<b>.000</b>		<b>.sig</b>	
.567**	.610**	1		<b>P Value</b>	<b>skill</b>
<b>.000</b>	<b>.000</b>			<b>.sig</b>	
<b>*. Correlation is significant at the 0.05 level (2-tailed).</b>					
<b>** . Correlation is significant at the 0.01 level (2-tailed).</b>					

As for the age group (28-32 years), there was no relationship with the three cognitive, affective and skill components, as the Pvalue values of 0.356, 0.320 and 0.693 were non-functional at the level of  $0 > 0.05$ . And the age group (33-37 years) there is a relationship only with the affective component and the value of the Pearson Pvalue coefficient 0.002 is a function at the level of  $0 > 0.05$ . There were also differences between the sample averages by age, as shown in the following table.

**Table (18) Differences by age with T test**

mean	Standard deviation	T Value	.sig	Age/ component
.47967	1.53562	3.864	.000	cognitive Component/age
-.72876	1.55998	-5.778	.000	Emotional component/age
.29531	1.54821	2.359	.020	skill Component/ age

Answer to the third hypothesis: there are differences according to the educational level and the awareness of young people about climate issues and the role of digital transformation in promoting it.

The gender distribution of the sample was calculated according to the level of education, and it is clear from the following table that the majority of the sample, 26.54% of females in the sample have a higher qualification compared to 14.8% of males, and that 20.98% of females are at the postgraduate level compared to 8.6% of males. The percentage of those who have a higher qualification is 41.35% of the sample and 29.62% at the postgraduate level, followed by 8.64% university students in the fourth year.

**Table (18) Gender distribution of the sample according to the stage of Education**

Education level (n=162)							Gender
Post-graduate	University graduate	University student year one	University student year two	University student year 3	University student year 4	Equivalent to high school	
% ك	% ك	% ك	% ك	% ك	% ك	% ك	
8.64 14	14.81 24	1.85 3	1.85 3	1.23 2	2.46 4	1.2345 2	ذكور
20.98 34	26.54 43	3.70 6	5.55 9	4.30 7	6,17 10	0.617 1	اناث
29.62 48	41.35 67	5.55 9	7.40 12	5.55 9	8.64 14	1.851 3	المجموع

The following table shows the views of the sample of both sexes on the role of university education in spreading awareness of the impact of climate change, where the results revealed that university education in the opinion of the sample may be effective and influential to some extent in spreading awareness of the impact of climate change, as 45.7% of the sample chose the phrase "to some extent" and this result largely agrees with the study (Vicente-Molina, M. A., Fernández-Sáinz, A., & Izagirre-Olaizola, 2013) that objective and subjective knowledge were the influences on environmental conservation behavior and not formal or informal education as they are unrelated variables, then in second place 22.8% of both sexes did not see that education has an effective impact in spreading awareness of the impact of climate change, followed by those who agreed that university education has an effective impact on the evil of awareness of the impact of climate change,

as stated by 20.4%, followed by 11.1% do not know what whether university education has a role in spreading awareness of the impact of climate change or not.

**Table (19) the numbers and percentages of the researchers who answered on "the role of university education in spreading awareness of the impact of climate change"**

Average=2.4753 Standard deviation= 0.94047	I don't know	To some extent	No	Yes	the role of university education in spreading awareness of the impact of climate change
	% n	n %	% n	% n	
	18 11.1	74 45.7	37 22.8	33 20.4	
	<b>%100    162</b>				<b>Total</b>

The results of the following table indicate that there is a relationship between the researcher's knowledge of the concepts of digital transformation and the educational stage attended by the researcher, as the value of  $\chi^2$  220.888 is a function at the level of  $0 > 0.5$  and the value of the significance is 0.002, while the relationship was not a function between the research opinion on the role of digital transformation in educating young people about climate issues because the value of the significance is greater  $0.571 > 0.05$ .

**Table (20) the value of Pearson Chi<sup>2</sup> the relationship between the stage of education and the extent of research knowledge of what is meant by digital transformation And its role in educating young people about climate issues**

Education level	Value	The phrase
20.888 6 0.002	Chi <sup>2</sup> DF .sig	Do you know the meaning of Digital transformation
22.146 24 0.571	Chi <sup>2</sup> DF .sig	Do you see that digital transformation has a role in educating young people about climate issues

Answer to the fourth hypothesis: there are differences between the rural and urban sample and youth awareness of climate issues:

An analysis of the results of the 2017 census of population and establishments indicates that the dropout rates from education continue to reach 7.2%, and they are higher in rural than urban areas, and higher among males than females, and in addition 27% have not enrolled in education (Banha, 2017)

**Table (21) the importance of applying digital transformation in Egypt in the field of environmental awareness in general as mentioned by the researchers**

total	I don't know		no		Yes		Geographic distribution
	%	n	%	n	%	n	
130	17.69	23	4.61	6	77.69	101	urban
19	15.87	3	0.61	1	78.94	15	rural
13	--	--	--	--	100	13	Rural urban boarders
						162	total

Most of the urban and rural residents and all residents of urban rural areas of the sample by 77.69%- 78.94% -100% (respectively) felt that there is an importance to apply digital transformation in Egypt in the field of environmental awareness in general, as well as all residents of urban rural areas.

The results also revealed that there is an inverse correlation between the place of residence (urban-rural-urban rural borders) and the youth believed that the digital transformation will be useful in raising the awareness of young people about climate problems at the local level, where the coefficient value was 0.158 - at a moral level of less than 0.05 with a moral value of 0.023. There is also an inverse relationship between the place of residence and the phrase "to what extent did digitization contribute to your knowledge of climate changes" at a significance level below 0.01 with a significant significance value of 0.005 and the value of the Spearman coefficient of 0.201-. This finding is consistent with a study (Caretta et al., 2022) in the Appalachian region of the United States, that those who live in an isolated rural area do not feel the effects of negative climate changes because they are above sea level, therefore, dealing with the expected risks is related to previous experiences, not to social or economic factors, treatment methods and interventions used.

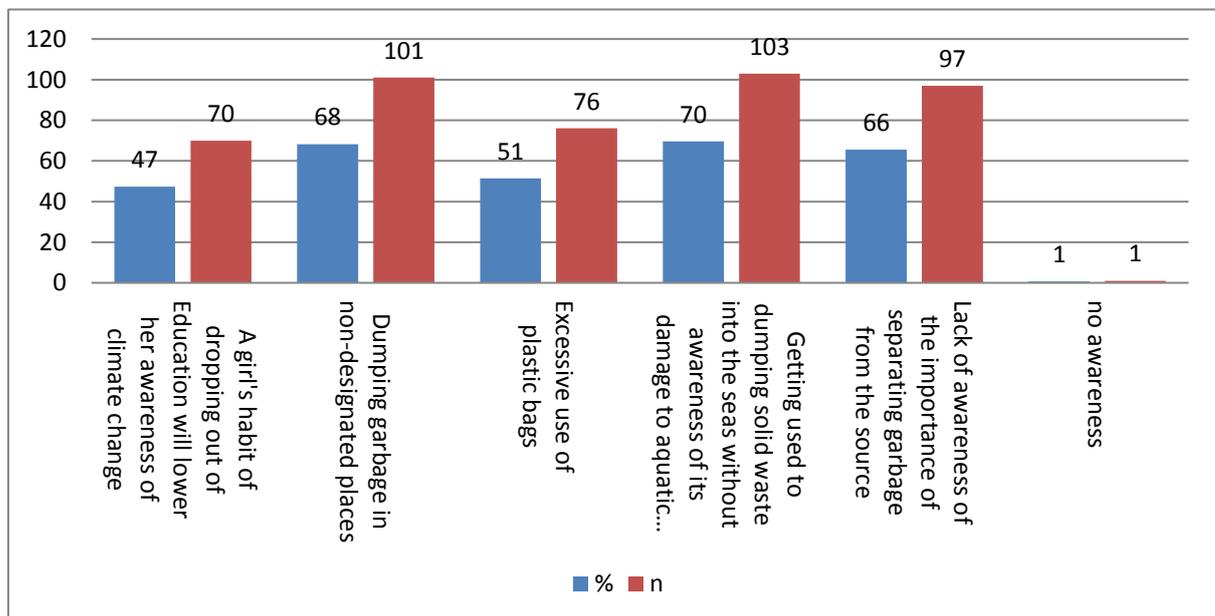
The results also revealed a significant relationship at a level below 0.01 for the relationship between the place of residence and the sample's opinion on the importance of applying digital transformation in Egypt in the field of environmental awareness in general, as the value of the Spearman coefficient was 0.191 and the significance was 0.017. I found a significant correlation at a moral level of less than 0.05 with a coefficient value of 0.167 and a significance of 0.017 between the place of residence and "do you know anything about climate issues?". The results also showed that there was no significant relationship at a moral level of less than 0.01 with a moral significance of 0.001 and a Spearman coefficient value of 0.252 between the place of residence and the phrase "I know that global climate changes are negatively affecting many countries."

**Table (22) respondents ' responses on customs and traditions that prevent raising awareness of climate change through digital transformation**

total	I don't know		no		Yes		Geographic distribution
	%	n	%	n	%	n	
130	17.69	23	4.61	6	77.69	101	urban
19	15.87	3	0.61	1	78.94	15	rural
13	--	--	--	--	100	13	Rural urban boarders
						162	total

Most of the sample (71%) stated that there are some customs and traditions that prevent raising awareness of climate change through digital transformation, followed by 21.6% do not know whether there are influential Customs and traditions or not, followed by 7.4% do not believe that there are customs or traditions that hinder awareness of climate change through digital transformation.

**Figure (6) Customs and traditions that hinder digital transformation from benefiting from awareness of climate issues**



The sample was asked (multiple choice) about the Customs and traditions that hinder the benefit of digital transformation in the field of awareness of climate issues in the opinion of the sample, 70% of the sample of both sexes felt that "the habit of dumping solid waste into the seas without awareness of its harm to aquatic and terrestrial life" falls in the first place,

and the habit of "dumping garbage in places other than those designated for it" ranked second as mentioned by 68% of the sample, and in third place came the habit of "lack of awareness of the importance of separating garbage from the source" as mentioned by 66% of the sample, followed by the fourth place "using plastic bags a lot," as stated by 51%, and then "dropping out of education reduces the girl's awareness of climate change." As 47% came in last place, we note that this result is related to previous field results that showed the weak role of gender education in relation to climate issues.

**Table (23) the relationship between the residence variable and the cognitive component phrases**

Do you think it will be useful in raising the awareness of university youth about climate problems at the local level s	Do you know anything about climate issue	Do you see the importance of implementing digital transformation in Egypt in the field of environmental awareness in general	To what extent do you think the digital transformation has contributed to your knowledge of climate change	Did you know that global climate changes are negatively affecting many countries	Geographic distribution
-.158*	.167*	.191**	-.201**	-.020	<b>Spearman value</b>
.023	.017	.007	.005	.398	sig.

It turned out that there is a significant correlation at a level of less than 0.05, worth 0.005 between the place of residence and the researcher's opinion on the contribution of digital transformation to his knowledge of climate changes, and also a significant 0.017 value between the researcher's knowledge of climate issues with the place of residence, and also a 0.023 value with the researcher's opinion that "it will be useful in raising the awareness of university youth about climate problems at the local level."

**Tenth: Discussion of the results**

1- There is a relationship between the gender with the three axes of consciousness, there is a relationship between males with the cognitive and skill component and there is no relationship with the emotional. And females are with the cognitive and affective component and there is no relationship with the skill component. There was also a significant relationship between the age group (18-under 22 years) and the behavioral component and the emotional component, and there is no relationship between that low age group with the cognitive component. This result reveals the need to address the root causes of inequality that enable adaptation and build resilience in the face of climate risks, which requires a continuous series of policies, including sound development policies that focus on reducing inequality to achieve poverty eradication and social inclusion. These specific measures will be more effective in reducing vulnerability to climate change when they are part of long-term transformative strategies that adopt coherent policies across the economic, social and environmental dimensions of Sustainable Development (United Nations, 2016) to build resilience to climate change by creating structural transformations that enhance the opportunities of people in general and young people in particular. For example, Vickery (Vickery, 2017) discussed the "idea of digital equality", that is, the possibility of public education institutions relying on the digital world to build students' awareness, especially since it is considered an unconventional way to acquire knowledge and eliminate the monotony and boredom that afflict students as a result of exposure to traditional teaching methods. Also, the provision of outdoor spaces to help reduce the stress that الطلاب on students during their school day and increase academic performance, in addition to the fact that students benefit academically and behaviorally from the school/university grounds (al-Omari, 2021.)

2-Most of the urban and rural residents and all residents of the urban rural outskirts of the sample saw the importance of applying digital transformation in Egypt in the field of environmental awareness in general, but an inverse correlation appeared between the place of residence urban-rural-urban rural borders) and the youth felt that digital transformation would be useful in raising the awareness of young people about climate problems at the local level. This reveals the impact of geographical location on the awareness of young people in particular and the public in general on their awareness of the important role that digital transformation strategy can play if followed correctly in the field of environmental awareness.

3-As for the sources of knowledge, the results of the study revealed a significant decrease in the percentage of those who learned about climate issues through university courses and lectures, as this source came in third place, compared to those who learned about climate issues through social media and their percentage ranked first, followed by the second place in the read, visual and audio media. The phrase "I feel the importance of addressing environmental problems" ranked first, followed by the phrase "I am concerned about pollution", then the phrase "I feel the seriousness of environmental problems in the future" and the phrase " I feel the importance of having a course on climate", which also ranked late. Moreover, in the opinion of 45% of the sample, university education may be to some extent" effective and influential in spreading awareness of the impact of climate change. In terms of Customs and traditions related to human interactions with the surrounding environment, most of the sample and both sexes placed the habit of "dumping solid waste into the seas without awareness of its harm to aquatic and terrestrial life" in the first place, then the habit of "dumping garbage in places other than those designated for it", then the habit of "not aware of the importance of separating garbage from the source",

then the fourth habit of "using plastic bags a lot" and finally "dropping out of education reduces the girl's awareness of climate changes". We note that these results are linked together, which shows the weak role of gender education in raising awareness about climate issues .

4- The existing concepts of climate issues and current digital transformation services: most of the sample by 93.2% disclosed their knowledge of" global climate changes that negatively affect many countries", then their knowledge of" what is meant by digital transformation" in a high direction, while those who have information about climate issues reached 80.9%, and a smaller percentage of 79.6% know about" the importance of applying digital transformation in Egypt in the field of environmental awareness in general". Most of what the sample knows about digital transformation is "using digital technology in providing government services","offering private sector companies their services and products using a mobile phone", and"creating innovative modern economic and cultural values and spreading them among people, followed by "using digital technology in providing government services" only.

5- As for voluntary participation, the percentage of participants in voluntary environmental activities decreased compared to a higher percentage who would like to participate if given the opportunity, although comparing the standard deviation values of the three axes of the data collection Scale (cognitive-emotional-skill), it turned out that the skill component ranked first, followed by the emotional component and then the knowledge in third place.

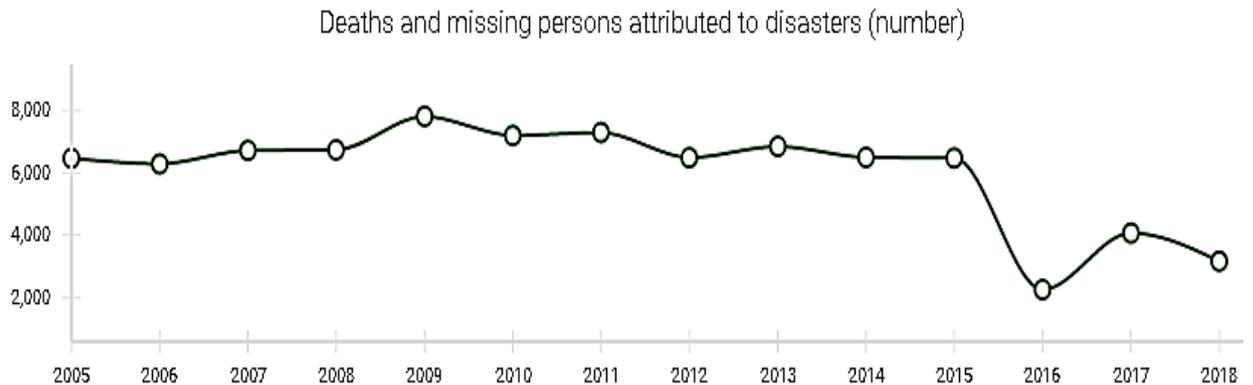
6- Level of knowledge: the sample's knowledge of all the phrases of the knowledge component came out as "average", the phrase "how to describe your knowledge of the impact of dumping plastic bags in the waters of the seas and oceans on human health" came in first place, then the phrase "how to describe your knowledge of the contributions of schools and universities to environmental activities" then the phrase "how to describe your knowledge of the rational use of resources and traditional energy sources" in terms of standard deviation values, and in the last place the phrase "how to describe your knowledge of climate peaks that solve environmental problems". Then, it was noted that the general trend of almost half of the sample towards the belief of "the importance of studying environmental issues" has increased, followed by the statement "I believe that digital transformation has contributed to my knowledge of climate change" in an average direction, and then the phrase "I believe that digital transformation has a role in educating young people about climate issues" in a neutral direction.

7- The most important climatic changes in the opinion of the sample, the temperature rise came in the first place, then the ozone hole and the emission of toxic gases, then the outbreak of fires, the melting of ice. Most of the sample considered that the effects of global warming occurred as a result of an increase in the amount of energy released by the Earth (Jafar, 2021), "melting of mountain glaciers and a significant decrease in their number", then "shrinking drinking water", and it will have direct effects on human health by developing blood pressure and heart diseases" and also "loss of crops".

More than half of the sample believed that the effects of climate change will lead first to a rise in sea levels in the first place, followed by a rise in death rates as a result of an increase in the concentration of pollution in the air, followed by agricultural land will be subjected to flooding by seawater, then malnutrition and unemployment will increase, then the movement of the population will increase, then tourism will decline. The world has begun to witness a change in the pattern of temperatures to which we have become accustomed for a long time, the climate has not become "hot dry summer, warm rainy winter" in the Arab Republic of Egypt, for example, and all countries are trying to reduce global warming and carbon emissions(United, 2022), which have accumulated until the problem of gases is escalating back to Earth affecting all aspects of life in food, water and weather, in addition to the destruction of livelihoods, increased migration and conflicts. The causes of air pollution are the same as what causes climate change, and about two million children are living in areas that exceed the air pollution levels set by the World Health Organization, forcing them to toxic air pollution, and more than half a million children have died from causes related to air pollution. Many more will suffer damage as a result of pollution. We now have 11 years to make the necessary transition to avoid the worst effects of climate change, and it is necessary to reduce the level of carbon dioxide in the atmosphere by 45% by 2030 to prevent global warming exceeding 1.5 degrees Celsius. The following figure shows the number of deaths and missing persons due to climate-related problems in Egypt according to the database of indicators of the Sustainable Development Goals.

**Figure 7: number of deaths and missing persons due to climate change problems in Egypt**

In 2018, there were a total of **3162.0** deaths and missing persons attributed to disasters.



**Source: SDG indicators database, updated July 2021(Oct, 2021)**

As for the needs of the future sample to raise the contribution of the digital transformation strategy to environmental issues did not differ according to type, as they disclosed: imposing laws and financial restrictions with a value greater than currently stipulated to maintain a clean environment, then receiving electronic awareness services related to climate changes and their effects, then finding digital services in the field of climate awareness, which will lead to raising the awareness of young people at the local level, and then introducing everything new about climate issues, and this shows that the cognitive need ranks behind the behavioral and emotional needs of the current study sample. A little more than half of the sample agreed with the phrase "I support the activation of environmental laws" and in a high trend, this result is consistent with what 95.7% of the sample stated about their need to "impose laws and financial restrictions greater than currently stipulated to maintain a clean environment".

If we talk about the requirements for applying the digital transformation strategy, the most important of them are: the integration of the organization's pyramid (people, i.e. people, institutional procedures, organizational structure, strategies, flexible digital leadership with technological skills) and the technology support pyramid (the technology on which the enterprise is based, infrastructure, the ability of the enterprise to implement technology projects using internal and external cadres( (Khalif, 2022) . The digital transformation process requires the transformation of the integrated pyramid with all its layers on the timeline from the first day of the digital transformation initiative, and in order for the change to bear fruit, the transformation speed of each layer of the pyramid must be proportional to the speed of the organization as a whole and its capabilities. The problem here lies in the fact that the speed of human transformation - for example, as the base of the pyramid - must be proportional to the nature of the technology used and keep up with it, and the technologies used must be appropriate in the speed of their adoption of the ability of processes in the enterprise to develop using that technology. For example, the latest technology may be an obstacle to achieving smooth application of procedures and processes in their digital form, as well as does the functional management structure of the organization represent the optimal structure for the nature of the new digitally reengineered processes, or does this require a change For example, the seriousness of dealing with the environmental dimension and climate change was emphasized in the framework of achieving the Sustainable Development Goals and digital transformation, and spreading community awareness about the challenges of climate change and the capabilities of modern technologies as the most important goals (the national initiative for smart green projects in all governorates).d.

Launched by the Egyptian Ministry of planning as part of the current efforts to chair and host The conference of the parties to the United Nations Framework Convention on climate change COP27, and efforts aimed at achieving sustainable development in the context of implementing Egypt's Vision 2030 by preserving the environment to improve the quality of life and taking into account the rights of future generations, and implementing the national strategy for climate change 2050, as the national initiative for smart green projects is being implemented in the governorates of the Arab Republic of Egypt as a leading initiative in the field of sustainable and smart development and dealing with the environmental dimension and the effects of climate changes, by setting a map at the governorate level for smart green projects, and attracting the necessary investments from all those in charge of small and large-scale projects in different Its categories. It is noteworthy that the most important criteria for evaluating the submitted projects is the technological standard (mobile applications, web applications, Internet of Things, artificial intelligence, remote sensing, big data processing, applications of the Fourth Industrial Revolution, Geographic Information Systems). It is worth mentioning what the Ministry of Environment has done in the field of deploying solar energy projects in Zafarana and Aswan, and factory initiatives to reduce emissions, in agriculture, the cultivation of plants resistant to salinity and the establishment of barriers to confront rising sea waves ..Etc.

The Ministry of Environment has completed the first phase of the WIMS National Waste Information System, which is implemented through the National Solid Waste Management Program and in cooperation with the GIZ International Security Cooperation Authority, in accordance with the needs of the Waste Management Regulatory Authority of the Ministry of environment, the second phase of the digital transformation will include the establishment of an electronic system of grievances for companies whose licenses have been refused, an electronic system for managing and tracking hazardous waste and another for managing and tracking non-hazardous solid waste. the third phase also includes the establishment of a website for the Waste Management Regulatory Authority, this system will lead to the use of data easily share and communicate Cooperation with citizens and external communities, awareness-raising, Management, Collection and access to information on site (communications, 2022)(Masrawy, 2022.(

**Proposed recommendations:**

One of the positive effects that occurs if the digital transformation strategy is adopted in the field of the environment (i.e., the transformation of environmental and climatic processes) is to reduce carbon emissions by 15% as a result of low rates of car use and exhaust emissions from transportation, crowding in queues and crowding in transportation . And the processing of data on meteorology and climate, the impact of the digital carbon footprint on carbon dioxide and thus the transition to green technology so that the use of electricity in the devices used in our hands will be reduced and the emissions from those devices will decrease and the energy from the mobile phone battery will decrease so that it consumes the least amount of energy as well as for home electricity and household appliances.

Thus, the monthly consumption expenses for household electrical appliances are reduced by calculating the consumption values and reducing them using the saved bulbs, which work longer hours, and so on for devices that leave the charger in electricity, and one of the aspects of waste utilization projects is "recycling electronic devices" such as a mobile phone, the accumulation of electronic devices and waste is currently being recycled and benefiting, for example, from metals ..Etc. As for the negative effects of technology, it is the need for electric power to supply information centers, digital data and services with continuous and uninterrupted electric power. Digital transformation is defined as the integration of digital technology in all areas of business, leading to fundamental changes in how companies operate and how they deliver value to customers. Digital transformation is a process of cultural change that requires organizations to constantly challenge the status quo, experiment more often, and rest with failure. Digital technologies can help us better understand the world we live in, and the data we collect using these technologies can improve the process of making scientifically based policies, including those related to climate change, and we can study both terrestrial and aquatic systems using various digital methods to assess the effects of climate change on the environment. Technologies and tools are effective in monitoring greenhouse gas emissions such as carbon dioxide, nitric oxide N<sub>2</sub>O and methane, understanding environmental changes in the oceans, mountains and their ecosystems, and developing ways to adapt to food and water shortages, which have been exacerbated by changing weather patterns. Currently, countries are realizing the value of using digital technologies in combating various challenges facing climate change.

Data related to the identification, monitoring and management of sources of greenhouse gas emissions are collected using digital technologies to understand how they are related to the changes occurring on land and at sea in order to avoid the severe risks that can occur on land and at sea and thus achieve the Sustainable Development Goals (13, 14, 15.)

It has become very important to find and develop self-awareness for Environmental Protection and understanding of climate issues, which has made environmental education a key tool for spreading knowledge about local, national and international environmental problems and becomes education for Sustainable Development(Tawil,2013), hence the study suggests:

1-Setting general rules that allow the different sectors of society to be "digital ready" (Al-Fattah, 2017), i.e. increasing the adoption rates of digital technology in order to reduce the need for assistance, and raising the skills of Use and awareness of technological applications related to previous climate issues referred to in the body of current research. The low rates of digital readiness cause people to be unable to take advantage of knowledge repositories, information banks, and other digital tools that work in return to qualify them and develop their skills, which means that refraining from them because they do not realize their importance, low confidence in their effectiveness, or lack of the necessary skills to use them will lead to a vicious circle of "reluctance" and "technological deprivation" and hence poor participation of ordinary citizens in practical policies that reduce the effects of climate change not only at the individual level but also community.

2-Educating and educating individuals, combining digital skills, establishing scientific knowledge about them together and integrating all stakeholders, influencers and influencers(Patrick Holsmann, 2023) to make the most of the unprecedented potential of digital sustainability.

3-Environmental work should be one of the compulsory activities at universities, establishing official awareness pages on social media.

4-Dissemination of " climate education " in the early stages of education, and reorientation of curricula and activities to raise awareness of climate changes.

5-Education and awareness of the "green infrastructure" and encouraging social initiatives and youth entrepreneurship in this field

6-Providing electronic applications suitable for those who do not read or write using animated images, for example, or illustrations. It will also suit children and uneducated women, thus increasing the rates of citizens ' integration in dealing with environmental problems positively, as well as stopping negative behavior that negatively affects the climate later.

7-If google play & app store stores offer weather applications to follow and forecast weather conditions, it is also better to stimulate competitions to produce technological awareness applications on the importance of reducing the consumption of excess energy-exporting devices, how to save energy, outlets selling energy savers and reducing water consumption..Etc

8- Encouraging the planting of trees in youth competitions, each in the vicinity of his local community

9-Supporting the implementation of research aimed at measuring the success of the international community in implementing its previous commitments, for example, the Paris Agreement pledges to limit global warming and keep it below "two degrees Celsius" in order to impose the need to reduce greenhouse gas emissions and take measures to reduce the consumption of non-renewable energy, which the Paris summit kept some issues aside, such as India's refusal to stop using highly polluting coal, and the Gulf oil exporting countries did not make any pledges,

but there were initiatives, pledges and commitments by multinational companies that began to prepare seriously for a decisive and inevitable technical transition towards new energy sources, then there is a need. It is urgent to follow up and evaluate the commitments that have been implemented and have not yet been implemented in both developing and developed countries alike.

10- Encouraging young people to find a new market for job opportunities through the establishment of "electronics recycling" factories with the aim of reducing the use of plastic and other carcinogenic substances in computers, and spreading the culture of electronics recycling among young people.

11-For crop shortages, it is possible to change planting dates, rationalize irrigation, move crops to suitable places from the south to the north, change the methods of plowing the land to increase the ability of the land to retain water and nutrients, genetic engineering(Talaba, 2019), as there is an urgent need for effective management of water resources used in agriculture to overcome the prevailing situation of water scarcity, and the application of "under-irrigation" practices is a good candidate for achieving sustainable use of water resources without sacrificing food production (Ouda et al., 2020).

12-To reduce harmful emissions cash transfers can be used to use active emission - free means of transportation-for example cash for cycling to work-it can prevent harmful health consequences in the future by contributing to climate change mitigation and, at the same time, improving the health of the current population. Another example is cash transfers provided to communities that decide to move to areas where their lives and health are not endangered by climatic disasters. More research is needed on such interventions to ensure that they are effective, ethical, equitable and cost-effective (Pega et al., 2015).

### **refernces**

1. Abulbaki, K. (n.d.). Steps of climate classification according to Quinn. <https://www.academia.edu/1743444/>
2. Abutaleb, K. A. A., Mohammed, A. H. E. S., & Ahmed, M. H. M. (2018). Climate Change Impacts, Vulnerabilities and Adaption Measures for Egypt's Nile Delta. *Earth Systems and Environment*, 2(2), 183–192. <https://doi.org/10.1007/s41748-018-0047-9>
3. Ajzen I, G. N. (2008). Attitudes and the prediction of behavior. In: Crano WD, Prislin R, editors. *Attitudes and attitude change*. New York, NY: Psychology Press., 289–311.
4. Caretta, M. A., Rothrock, B. A., & Zegre, N. P. (2022). Exploring Climate Change Perspectives. An Analysis of Undergraduate Students' Place-Based Attachment in Appalachia, USA. *Rural Sociology*, 0(0), 1–26. <https://doi.org/10.1111/ruso.12433>
5. CLIMATE HOME NEWS. (2013). <https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=0CAMQw7AJahcKEwiYrailyvT5AhUAAAAAHQAAAAAQAg&url=https%3A%2F%2Fwww.climatechangenews.com%2F2013%2F09%2F24%2Ftop-10-climate-change-apps%2F&psig=AOvVaw2fsg3Ihy22SlvpKIH7a3qt&us>
6. Davidson DJ, F. W. (1996). Gender and environmental risk concerns: A review and analysis of available research. *Environ Behav*, 28. <https://doi.org/10.1177/0013916596283003>
7. Dean, T. J., & McMullen, J. S. (2007). Toward a theory of sustainable entrepreneurship: Reducing environmental degradation through entrepreneurial action. *Journal of Business Venturing*, 22(1). <https://doi.org/https://doi.org/10.1016/j.jbusvent.2005.09.003>
8. Diamantopoulos A, Schlegelmilch BB, Sinkovics RR, B. G. (2003). Can socio-demographics still play a role in profiling green consumers? A review of the evidence and an empirical investigation. *J Bus Res*, 56, 465–480.

9. Dwivedi, Y. K., Hughes, L., Kar, A. K., Baabdullah, A. M., Grover, P., Abbas, R., & Wade, M. (2022). Climate change and COP26: Are digital technologies and information management part of the problem or the solution? An editorial reflection and call to action. *International Journal of Information Management*, 63. <https://doi.org/https://doi.org/10.1016/j.ijinfomgt.2021.102456>
10. El-Shishy, R. (2020). استراتيجية التحول الرقمي في الدولة المصرية وسبل تعزيز تطبيقات الذكاء الاصطناعي (Issue December, pp. 0–20). <https://doi.org/10.13140/RG.2.2.28270.43848>
11. Fadi, S. (2017). Digital Transformations and Societal Trends in the Age of the 4th Industrial Revolution. *MBR School of Government*, 3. <http://www.mbrsg.ae/getattachment/e30a43c5-ba93-4f4e-b7af-e0c4abd4e771/The-Arab-World-Online-2017>
12. Gagnon Thompson S, B. M. (1994). Ecocentric and anthropocentric attitudes toward the environment. *J Environ Psychol*, 14. [https://doi.org/doi:10.1016/S0272-4944\(05\)80168-9](https://doi.org/doi:10.1016/S0272-4944(05)80168-9)
13. H Kara, O. A. M. A. (2022). التحول الرقمي. *Paper Knowledge . Toward a Media History of Documents*, 7(2), 107–115. [https://mcit.gov.eg/ar/Digital\\_Citizenship](https://mcit.gov.eg/ar/Digital_Citizenship). (n.d.).
15. <https://www.asu.edu.eg/>. (2022). البرنامج التدريبي لتأهيل سفراء المناخ بالدورة الرابعة. <https://www.asu.edu.eg/>
16. Hunter LM, Hatch A, J. A. (2004). Cross-national gender variation in environmental behaviors. *Soc Sci Q*, 85. <https://doi.org/10.1111/j.0038-4941.2004.00239.x>
17. Ibãñez, M. J., Guerrero, M., Yãñez-Valdés, C., & Barros-Celume, S. (2021). Digital social entrepreneurship: the N-Helix response to stakeholders' COVID-19 needs. *The Journal of Technology Transfer*. <https://doi.org/https://doi.org/10.1007/s10961-021-09855-4>
18. Institution, B. (2022). Signing a Cooperation Agreement with the Environment. <https://blessegypt.org/>
19. Linkov, I., & Bridges, T. S. (2011). *Climate : global change and local adaptation*.

20. Majchrzak, A., & Shepherd, D. A. (2021). Can digital innovations help reduce suffering? A crowd-based digital innovation framework of compassion venturing. *Information and Organization*, 31(31(1), Article 100338.). <https://doi.org/https://doi.org/10.1016/j.infoandorg.2021.100338>
21. Mobley C, Vagias WM, D. S. (2010). Exploring additional determinants of environmentally responsible behavior: The influence of environmental literature and environmental attitudes. *Environ Behav*, 42. <https://doi.org/10.1177/0013916508325002>
22. Ortega-Egea, J. M., García-de-Frutos, N., & Antolín-López, R. (2014). Why do some people do “more” to mitigate climate change than others? Exploring heterogeneity in psycho-social associations. *PLoS ONE*, 9(9). <https://doi.org/10.1371/journal.pone.0106645>
23. Ouda, S., Zohry, A. E. H., & Noreldin, T. (2020). Deficit irrigation: A remedy for water scarcity. In *Deficit Irrigation: A Remedy for Water Scarcity*. <https://doi.org/10.1007/978-3-030-35586-9>
24. P, S. (1999). Trust, emotion, sex, politics, and science: Surveying the risk- assessment battlefield. *Risk Anal*, 19, 689–701. <https://doi.org/10.1111/j.1539-6924.1999.tb00439.x>
25. Patrick Holsmann, P. G. (2023). The promise of digital technologies for sustainable entrepreneurship: A systematic literature review and research agenda. *International Journal of Information Management*, 65–76.
26. Pega, F., Shaw, C., Rasanathan, K., Yablonski, J., Kawachi, I., & Hales, S. (2015). Climate change, cash transfers and health. *Bulletin of the World Health Organization*, 93(8), 559–565. <https://doi.org/10.2471/blt.14.150037>
27. Selm, K. R., Nils Peterson, M., Hess, G. R., Beck, S. M., & McHale, M. R. (2019). Educational attainment predicts negative perceptions women have of their own climate change knowledge. *PLoS ONE*, 14(1), 1–11. <https://doi.org/10.1371/journal.pone.0210149>
28. Semenza JC, Hall DE, Wilson DJ, Bontempo BD, Sailor DJ, G. LA. (2008). Public perception of climate change: Voluntary mitigation and barriers to behavior change. *Am J Prev Med*, 35, 479–487.

29. Set, S. indicators data. (2021). sustainable development goals.  
<https://unstats.un.org/sdgs/dataportal/countryprofiles/egy#goal-13>
30. United Nations. (2016). World economic and social survey 2016. Climate change resilience: an opportunity for reducing inequalities. In United Nations Department of Economic and Social Affairs. [https://wess.un.org/wp-content/uploads/2016/06/WESS\\_2016\\_Report.pdf](https://wess.un.org/wp-content/uploads/2016/06/WESS_2016_Report.pdf)
31. Vicente-Molina, M. A., Fernández-Sáinz, A., & Izagirre-Olaizola, J. (2013). Environmental knowledge and other variables affecting pro-environmental behaviour: comparison of university students from emerging and advanced countries. *Journal of Cleaner Production*, 61, 130-138.  
<https://doi.org/https://doi.org/10.1016/j.jclepro.2013.05.015>
32. Whitmarsh, L., Seyfang, G., & O'Neill, S. (2011). Public engagement with carbon and climate change: To what extent is the public 'carbon capable'?. *Global Environmental Change*, 21(1), 56-65.  
<https://doi.org/https://doi.org/10.1016/j.gloenvcha.2010.07.011>
33. Whitmarsh L, O. S. (2010). Green identity, green living? The role of pro- environmental self-identity in determining consistency across diverse pro- environmental behaviours. *J Environ Psychol*, 30, 305-314.
34. Youth, D. O. F. (2014). Definition of youth. 2009, 1-7.
35. Zelezny LC, Chua P, A. C. (2000). Elaborating on gender differences in environmentalism. *J Soc*, 56, 443-457.  
<https://doi.org/10.1111/0022-4537.00177>
36. آسيا, ع. ا. ز. ع. ا. (2021). دور المؤسسات الاجتماعية في تنمية الوعي البيئي لدى الشباب. *مجلة الرواق للدراسات الاجتماعية والانسانية*, 1(07).
37. أحمد, أ. (1996). دور الشباب الجامعي في حماية البيئة وتميئتها -دراسة في المشاركة والإحجام. *معهد الدراسات والبحوث البيئية جامعة عين شمس*.
38. أندروكين. (2018). *كيفية إصلاح المستقبل: الحفاظ على إنسانيتك في العصر الرقمي*.
39. "الاتصالات, و. (2022). مبادرة "المسار الرقمي للتعافي الأخضر المستدام". [https://mci.gov.eg/ar/Media\\_Center/Latest\\_News/News/66350](https://mci.gov.eg/ar/Media_Center/Latest_News/News/66350)
40. الاجتماع, ب. ع. (2021). النظرية الوظيفية الجديدة في علم الاجتماع. [https://www.b-sociology.com/2018/12/blog-post\\_46.html](https://www.b-sociology.com/2018/12/blog-post_46.html)

41. التربية الإعلامية والرقمية وتحقيق المجتمع (n.d.). البدراني, ف. م. 41. مجلة دراسات في المستقبل العربي, cognitive452
42. التخطيط, و. (2015). استراتيجية التنمية المستدامة رؤية مصر 2030. الأهداف ومؤشرات الأداء. مؤتمر دعم وتنمية الإقتصاد المصرى
43. السعدى, ع. ف. (2010). توزع الإنسان في الشمال الأفريقي العربي ودور (المناخ في تفاوت انتشاره المكانية. مجلة دراسات في المستقبل العربي, 1)2008
- 44.4. السعيد, س. (2006). نمو المفاهيم البيئية لدى طلاب كية التربية بأبها (ed.).
45. العربي, م. ا. (2015). الاتفاقية الاطارية العالمية فى شأن تغير المناخ. العلوان, ج. ر. م. (2021). بناء معايير التربية البيئية وقياس درجة توافرها فى (كتب العلوم فى الأردن. المجلة العلمية كلية التربية جامعة اسيوط, 37)5
47. العمرى, س. ع. ا. و. ا. ي. (2021). التصميم التفاعلى فى الفضاءات الية دراسة مقارنة لتوظيف التقنيات الرقمية والتقليدية. مجلة urban الخارجية الالرافدين للهندسة, 26)2, 18-31
48. الفتاح, ف. ا. ع. (2017). الفجوة الرقمية: إشكاليات التكيف مع التحولات. التكنولوجيا فى المنطقة العربية. مركز الدراسات والبحوث المتقدمة (n.d.). المبادرة الوطنية للمشروعات الخضراء الذكية بكافة المحافظات. 49. <https://www.sgg.eg/>
50. المتحدة, ا. (2022). إتفاقية الأمم المتحدة الإطارية لتغير المناخ. <https://news.un.org/ar/tags/tfqy-lmm-lmthd-ltry-ltgyr-lmnkh>
51. النيش, ن. (2001). الطاقة و البيئة و التنمية المستدامة: أفاق و مستجدات. 1-43.
52. الهمشرى, د. (2022). استراتيجية تغير المناخ المصرية. <https://attaqa.net/2022>
53. بدوى, ه. د. ص. (2020). التغير فى قارية المناخ فى مصر. مجلة البحث العلم, 21, 199-231
54. (n.d.). تطبيق تحدى البيئة. <https://play.google.com/store/apps/details?id=com.aminprojects.saveearth&hl=ar&gl=US>
55. جعفر, م. م. ع. ا. ع. ا. و. م. ف. ا. ع. و. ك. ا. ي. م. (2021). تقييم تغير المناخ فى مصر. مجلة كلية الآداب جامعة بنى سويف, 59
56. جلال محمد نجيب. (2013). دور وسائل التنشئة الاجتماعية فى تشكيل الوعى البيئى لدى الطفل. المؤتمر 15 المركز القومى للبحوث الاجتماعية والجنائية (n.d.). حافظ على بيئة أكثر خضارا مع فودافون. <https://web.vodafone.com.eg/ar/Earth-day>
58. حسانين, م. (2022). ورشة عمل مشروعات اللجنة الوطنية للمسائل البيئية. أكاديمية البحث العلمى والتكنولوجيا
59. حمدى, ش. م. (2018). دور إدارة الجودة الشاملة فى تنمية قدرات المعاهد العليا بالتطبيق على معاهد القاهرة بالمقطم. مجلة الدراسات والبحوث التجارية <http://search.mandumah.com/Record/1182649>

- خليف, م. (2022). مستقبل التحول الرقمي في قطاع الطاقة المصري. مجلة  
85)22 (الديموقراطية,  
<http://search.mandumah.com/Record/1230764>
- زكى, أ. و. م. إ. و. أ. ع. ا. ش. و. ر. و. ربيع, ش. (2019). المتغيرات البيئية  
والاجتماعية المرتبطة بتمكين الشباب في مشروعات البيئة. مجلة العلوم البيئية-  
(جامعة عين شمس, 47)3
- سالم, ص. ا. (1992). الاتجاهات البيئية لدى طلاب جامعة القاهرة. معهد  
الدراسات والبحوث البيئية جامعة عين شمس
- صباحة, ص. ص. م. (2014). مدى وعي الطلبة في جامعة حائل بالتغيرات  
المناخية والعوامل المؤثرة في ذلك. بحوث ودراسات, رسالة الخليج العربي,  
(300)133
- طلبة, م. ك. (2019). تغير المناخ العالمي وأثره على مصر. مجلة المجمع  
العلمي المصري, 94
- طويل, ف. (2013). التربية البيئية ودورها في التنمية المستدامة-دراسة ميدانية  
بمدينة بسكرة-الجمهورية الجزائرية الديمقراطية الشعبيةmeanبمؤسسات التعليم  
فرصة. (2020). قائمة بأفضل 10 مسابقات بيئية عالمية ت.  
<https://www.for9a.com/learn/10-مسابقات-بيئية-عالمية>
- فيكيرى, ج. ر. (2017). القلق من الأشياء الخاطئة: الشباب والمخاطرة,  
Massachusetts Institute of TECHNOLOGY. والفرصة في العالم الرقمي
- كامل, و. م. (2012). الوعي البيئي نحو مشكلات البيئة لدى عينة من طلاب  
الجامعات الليبية. 1999
- (Ed.); 1st ed.). لومان, ن. (2010). مدخل الى نظرية الأنساق (ن. لومان.  
<https://shaqhaf.com/read1363.html> مطبعة الجمل
- مصراوي. (2022). المرحلة الأولى للتحول الرقمي.  
[https://www.masrawy.com/news/news\\_egypt/details/2022/7/25/2264191/البيئة-الانتهاج-من-المرحلة-الأولى-للتحول-الرقمي-لإدارة-المخلفات/2264191](https://www.masrawy.com/news/news_egypt/details/2022/7/25/2264191/البيئة-الانتهاج-من-المرحلة-الأولى-للتحول-الرقمي-لإدارة-المخلفات/2264191)
- مصطفى, ا. أ. ع. ا. (2019). الإدارة الدولية لقضية التغيرات المناخية. مجلة  
(كلية السياسة والاقتصاد-جامعة الملك خالد- المملكة العربية السعودية, 1)3
- مكيه, ن. (2021). دروس كوفيد 19 معضلة الأمننة وتغير المناخ في النظام  
النيوليبرالي. المجلة العربية للعلوم السياسي, 4(21), 2-4
- نصار, أ. (2021). الاتحاد النوعي لتغير المناخ.  
<https://www.youm7.com/story/2021/12/16>
- ة, م. (2016). قمة التغيرات المناخية في باريس لم تغير شيئاً. المستقبل Yes  
العربي.

75. والاحصاء, ا. ا. ل. ا. ا. (2017). النتائج النهائية للتعداد العام للسكان والإسكان والمنشآت لعام ٢٠١٧. الجهاز المركزي للتعبئة العامة والاحصاء  
www.capmas.gov.eg
76. والدراسات, م. ا. ل. (2020). التهديدات غير التقليدية: الأبعاد الأمنية للتغيرات المناخية في الشرق الأوسط (pp. 78–80).
77. seif El Nasr Ali Mohammed, Heba. The impact of digital technologies on the plastic arts. International Journal of Artificial Intelligence and Emerging Technology, Vol. 3, No. 2, 2020, PP. 61-83.
78. Mohammed Mahmoud Mohammed Ahmed, Ola. New Approach for Digital Technologies Application in Heritage Architecture Conservation. International Journal of Artificial Intelligence and Emerging Technology, Vol. 3, No. 2, 2020, PP.24-56.