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### ATTITUDES OF BIOLOGY TEACHERS TOWARDS DIMENSIONS OF THE SENDAI FRAMEWORK AND ITS RELATIONSHIP TO BIOETHICAL, DECISION-MAKING, AND ENVIRONMENTAL AWARENESS

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#### **ABSTRACT**

The study aimed at the orientations of biology teachers towards dimensions of the Sendai framework and their real tionship to bioethical decision-making and environmental awareness. The research tool was a list of Sendai dimensions and indicators consisting of (41) indicators, and the researchers presented it to a group of experts and specialists in science teaching methods and the quality of teaching to express their opinions and observations to verify confidence and objectivity, and use the relational descriptive approach to achieve the goal of the research. The sample consisted of the sample of the participants in this study (N = 200), Babylon, Iraq. The results indicate that the secondary school biology teachers have orientations towards the Sendai framework and bioethical decision-making and environmental awareness when compared to the hypothetical average. The researchers recommend the necessity of cooperation between the directorates of preparation and training with the deanships of the Faculties of Education and Basic Education to establish educational courses for science teachers in general on the Sendai framework orientations, ethical decision-making, and environmental awareness, and thus to raise the level of preparedness in the face of disasters and their dangers.

#### **INTRODUCTION**

Biology is astable, complementary, and important science among other scientific disciplines. Nowadays, as a result of the destruction of nature, many living creatures have become extinct. If the human threads to nature continue with this ratio, then the extinction of humans, who are also part of nature, and

the abolition of nature are inevitable. At this point, the importance of biology, geography and education arise,s (Özkan, 2011).

The Arab countries have realized the negative effects of continuous environmental degradation, accelerated and unplanned urban growth, demographic distribution trends, and migration on achieving sustainable development goals in this region, while the region threatens other challenges posed by the risks associated with population displacement, the spread of epidemic diseases, food insecurity and conflicts for direct responsibility. Against the turmoil, more than what the region experienced before. This realization accompanies effective disaster risk management and response at the national and regional levels, especially as disasters are occurring frequently as a result of increasing climate change across the Arab region. There are effects that result from and it seems clear that disasters have a direct impact on lives, infrastructure, and livelihoods. We are also aware of these disasters in the long and medium-term, which appear in the movement of people and animals to other areas with limited resources and in the establishment of informal (slums) and unsafe housing in centers. Urban areas, in addition to the limited transportation, health, education, and other public services, and limited access to them in vulnerable areas (UNISDR, 2017, p30).

The Sendai Framework for Disaster Risk Reduction for the period (2015-2030) was adopted during the Third United Nations World Conference held in Sendai, Japan. The Sendai Framework is based on elements that ensure the continuity of the work that countries and other stakeholders have been implementing in the context of the Hyogo Framework for Action in general, The Hyogo Framework for Action has been an important tool for educating public and institutional awareness, generating political commitment, focus, and motivation for actions by a wide range of stakeholders at all levels (UNISDR, 2017, p12).

### ***The first dimension: understanding disaster risks***

Disaster risk management policies and practices should be based on an understanding of disaster risk in all its dimensions, namely the vulnerability and capacities of persons and property, their exposure to risks, the characteristics of hazards, and the environment. This knowledge can be harnessed for the purposes of conducting prior assessments of the emergence of disaster risks, for prevention and mitigation purposes, and for developing and implementing appropriate and effective disaster preparedness and response procedures. (UNISDR, 2015, p11)

### ***The second dimension: strengthening ways to manage disaster risks in order to better respond to them***

The approach used in managing disaster risks at the national, regional, and global levels is of great importance to ensure effectiveness and efficiency in managing these risks. In this regard, a clear vision, plans, terms of reference, guidelines, and coordination within and between sectors, as well as the participation of the concerned authorities, are required. Therefore,

strengthening disaster risk management for the purpose of prevention, mitigation, preparedness, response, recovery, and rehabilitation is essential, which will enhance cooperation and partnership among the mechanisms and institutions responsible for implementing the instruments related to disaster risk reduction and sustainable development. (Muneneale, . 2018, p654)

***The third dimension: investment in disaster risk reduction to increase resilience***

To enhance the economic, social, health, and cultural resilience of people, societies, countries, and their properties, as well as the environment, public and private investments must be made in the field of disaster risk prevention and reduction using structural and non-structural measures. These investments can be powerful incentives for innovation, growth, and job creation. They are cost-effective measures that contribute greatly to saving lives, preventing and minimizing losses, and ensuring effective recovery and rehabilitation. (Erdeljalet, . 2017, p26)

***The fourth dimension: Enhancing disaster preparedness in order to effectively address them and "build back better" in the recovery, rehabilitation, and reconstruction phase***

The steady growth of disaster risk, and the increased exposure of people and property to disasters, in addition to the lessons learned from previous disasters, indicate the need to continue strengthening disaster preparedness and taking measures to prepare for confrontation, ensuring that the necessary capabilities are available for nature's symptoms, and making disaster risk reduction a part of the anticipation. To respond effectively to disasters and recover from their impacts at all levels. In this context, it is imperative to empower women and people to cope with disasters, recover from their effects, rehabilitation, and reconstruction. People with disabilities have leadership and publicly promote the implementation of gender equity and that everyone can benefit from it. Disasters have proven that the recovery, rehabilitation, and reconstruction phase, which needs to be prepared before disasters strikes, represents a critical opportunity to rebuild in a better way, including by integrating disaster risk reduction into development measures, making nations and societies resilient to disasters (Pekaralet, . 2020, p47).

In view of the importance and sensitivity of the subject of bioethics, it was necessary to create a generation familiar with the correct regulations, laws, and ethical standards in the field of biology, and this can only be done by addressing such topics in the curricula. In addition, it is necessary for students to become familiar with the positive and negative aspects of these practices, through studying the branches and fields of science in the general education stages, and to become familiar with the ethical obligations and controls associated with such achievements. Therefore, social, scientific, and religious institutions have become preoccupied with this topic and societies have realized the great role of education in providing students. With bio-ethics, preparing a generation of morals to play games for a better life on the one hand, and informing society about the data of science and its effects on society and the environment (Abd, 2012)

Bio-ethics appeared as a new trend and as a new term in science curricula in general and life sciences in particular at all stages of education, so it became necessary to direct the course of scientific research and not let it go its way without controls or directives or planning and studying all negative possibilities for it, then we find ourselves after It is a period of suffering and we face problems that we did not anticipate or take into account. We need an ethical constitution to implement the achievements of science, technology, and biology on the one hand, as well as the need for new scientific and moral education that is appropriate for the new world in which we live on the other hand. And we were adapted to the world that we made more than our adaptation to the world that we made, and in which the scientific and technological revolution is the main driving force for its formation. Therefore, new scientific education cannot overlook the scientific and technological innovations and achievements and their moral distancing from science curricula (Ahmed, 1995: 20, (related decisions) The cognitive and sentimental aspects related to the scientific applications of new developments and biological issues which are of a controversial and ethical nature. ”(1995: 20, Johnston)

Some of the goals of environmental education are to give practical environmental education to students starting from the preschool period and to teach them about disasters arising from environmental problems with messages to introduce environmental awareness and love of nature. This is one of the ultimate goals of our project (Demirkaya, 2006).

Environmental awareness is one of the components that include environmental literacy. It is defined as a combination of motivation, knowledge, and skills. Environmental literacy consists of five aspects which are knowledge, awareness, behavior, participation, and behavior. We also know that environmental awareness grew in the second half of the twentieth century. Environmental awareness is integral to the movement's success. By teaching our an environmental family that the physical environment is fragile and indispensable, we can begin to fix the problems that threaten it (Amran al et., 2019)

The research problem can be formulated by asking the following question:

What is the extent of biology techers 'orientations towards dimensions of the Sendai Framework and its relationship to bioethical decision-making and environmental awareness?

## **METHODOLOGY**

The two researchers followed the relational descriptive approach as it is the appropriate method for research that aims the biology teachers 'attitudes towards dimensions of the Sendai Framework and its relationship to bioethical decision-making and environmental awareness.

### ***Sample***

The sample of participants in this study (N = 200) consisted of 100 teachers and 100 neighborhood schools in middle and high schools in Babylon Governorate - Iraq for the academic year (2019-2020), where each participant completed a questionnaire after another.

***Search Tool***

To achieve the aim of the research, it is required to prepare the research tools. It is a list of Sendai dimensions and indicators in the light of which the biology teachers 'orientations are identified towards the dimensions of the Sendai framework ... The researchers formulated (4) dimensions and (41) indicators, and the two researchers also prepared a list of environmental awareness that includes (40) items, as for the awareness measure AI-bio-ethics has been adopted from the study (Abd, 2012), which included (30) paragraphs. The Sendai Framework and Environmental Awareness tools were also from Likert's Five-Year Scale (5 -1) from Strongly Agree (5) to Strongly Disagree (1), and they were presented to a group of experts and specialists in life sciences teaching methods and teaching quality to express their opinions and observations to verify Confidence and objectivity.

***Data Analysis***

As for the results of the research, where the statistically obtained data were processed after unpacking it into the IBM® SPSS 25.0 program prepared for this purpose, and statistical methods were used commensurate with the nature of the research, such as the arithmetic mean and standard deviation, the hypothesis, T-test at (0.05 confidence level)

**RESULTS AND DISCUSSION**

In this study, the arithmetic mean and standard deviation were used to find out the Sendai framework trends of neighborhood teachers in middle and high schools in Babylon Governorate in Iraq, and the T-test was used to find out if there were statistically significant differences in the level (0.05).

Based on data analysis, the highest score a teacher can achieve under the Sendai Framework is (205) and the lowest score (41). The results showed that the arithmetic mean of the research sample (200) teachers on the Sendai Framework was (154.75) and the standard deviation (24.602), and knowing the importance of the difference between the arithmetic mean and the default average. Which was (123), it was found that the difference had a statistical significance at the level of (0.05), where the calculated T value was (18.251), which is greater than the tabular T value (1.96) and the degree of freedom (199) and this indicates that the biology teachers for the stage Secondary have tendencies towards the Sendai Framework compared to the hypothetical average, and Table (1) illustrates this.

**Table 1:** The significance of the differences between the arithmetic mean, the hypothetical mea, and the T-values in the Sendai framework.

Mean	Std. Deviation	Hypothetical	Computed	Tabular
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		<b>Mean</b>	<b>T-value</b>	<b>T-value</b>
<b>154.75</b>	<b>24.602</b>	<b>123</b>	<b>18.251</b>	<b>1.96</b>

**Source:** Authored by the author's

The results also indicated that the arithmetic means of the research sample scores in the bioethical decision-making scale reached (73.26) with a standard deviation of (10.388) and the hypothesis reached (60), and it was found that the difference was in statistical significance at the level (0.05) as The calculated T value was (18.045), which is greater than the tabular T value (1.96) and with a degree of freedom (199), and this indicates that biology teachers at the secondary stage have the ability to make bioethical decisions compared to the hypothetical average. Table (2) shows that:

**Table 2:** The significance of the differences between the arithmetic mean, the hypothesis means and the T-values in the bioethical decision-making scale

<b>Mean</b>	<b>Std. Deviation</b>	<b>Hypothetical Mean</b>	<b>Computed T-value</b>	<b>Tabular T-value</b>
<b>73.26</b>	<b>10.388</b>	<b>60</b>	<b>18.045</b>	<b>1.96</b>

**Source:** Authored by the author's

As for the environmental awareness measure, the arithmetic mean of the research sample scores in the Environmental Awareness Scale was (144.66) with a standard deviation of (25.221) and the hypothetical mean reached (120), and it was found that the difference was in statistical significance at the level (0.05) as The calculated T value was (13,825), which is greater than the tabular T value (1.96) and with a degree of freedom (199), and this indicates that the biology teachers of the secondary stage have an environmental awareness compared to the hypothetical average and Table (3) shows that:

**Table 3:** The significance of the differences between the arithmetic mean, the hypothetical mean, and the T-values in the scale of environmental awareness

<b>Mean</b>	<b>Std. Deviation</b>	<b>Hypothetical Mean</b>	<b>Computed T-value</b>	<b>Tabular T-value</b>
<b>144.66</b>	<b>25.221</b>	<b>120</b>	<b>13.825</b>	<b>1.96</b>

**Source:** Authored by the author's

In order to identify the direction and strength of the correlation between the Sendai framework orientations of biology teachers and bioethical decision-making and environmental awareness, the two researchers used the Pearson correlation coefficient, and the results showed that the degree of correlation coefficient between the Sendai framework and bioethical decision-making for the sample as a whole reached (0.477 \*\*). At the level of significance (0.05), which is a positive simple correlation coefficient, while the degree of the correlation coefficient between the Sendai Framework and the environmental

awareness of the sample as a whole reached (0.653 \*\*), which is a positive average correlation coefficient, and Table (4) illustrates this:

**Table 4:** Pearson's correlation coefficient between biology teachers' Sendai Framework attitudes and bioethical decision-making and environmental awareness

<b>Sendai Framework</b>	<b>123</b>	<b>24.602</b>	<b>154.75</b>	<b>correlation0.477**</b>
<b>Bioethical decision-making</b>	<b>60</b>	<b>10.388</b>	<b>73.26</b>	
<b>Sendai Framework</b>	<b>123</b>	<b>24.602</b>	<b>154.75</b>	<b>0.653**</b>
<b>Environmental awareness</b>	<b>120</b>	<b>25.221</b>	<b>144.66</b>	

**Source:** Authored by the author's

### CONCLUSION AND RECOMMENDATIONS

The above results showed the existence of a positive correlation between the sendia framework orientations of biology teachers and between bioethical decision-making and environmental awareness, so the researchers concluded that the higher the level of orientations towards the Sendai framework, the greater their ability to make bioethical decisions and their environmental awareness.

Based on the results of the study, the researchers recommend taking these criteria into consideration, and the directorates of preparation and training, in cooperation with the deanships of the Faculties of Education and Basic Education, should undertake training courses for science teachers in general on the Sendai framework orientations and bioethical decision-making of environmental awareness, and how Activating it in classrooms. Moreover, the study was limited to neighborhood teachers - in Babylon, and therefore the researchers suggest conducting a similar study in other Iraqi provinces.

### KNOWLEDGE

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