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# *BELIEFS OF HIGH SCHOOL STUDENTS AND THEIR WILLINGNESS TO ACT IN ARAB AND JEWISH COMMUNITIES IN ISRAEL: THE CASE OF GLOBAL WARMING*

## CRENÇAS DOS ESTUDANTES DO ENSINO SECUNDÁRIO E SUA DISPOSIÇÃO PARA ATUAR NAS COMUNIDADES ÁRABE E JUDAICA EM ISRAEL: O CASO DO AQUECIMENTO GLOBAL

## CREENCIAS DE LOS ESTUDIANTES DE SECUNDARIA Y SU DISPOSICIÓN A ACTUAR EN LAS COMUNIDADES ÁRABES Y JUDÍAS DE ISRAEL: EL CASO DEL CALENTAMIENTO GLOBAL

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**ABSTRACT** | The present study investigates student beliefs about the effectiveness of pro-environmental actions in reducing global warming, and their willingness to actually carry out these actions. We examined the attitudes of 122 high school students from heterogeneous backgrounds in Arab and Jewish societies in Israel. A quantitative research paradigm was used, employing a closed-ended questionnaire. The results of the study indicate that students are moderately prepared to adopt practices, and that they believe in the efficacy of actions to reduce global warming to a more than moderate degree. A significant difference between Jewish students and Arab students was found, with Jewish students more prepared than Arab students to take steps for the benefit of the environment. The findings can form the basis for making recommendations regarding the promotion of environmental education issues and environmental literacy in the education system.

**KEYWORDS**: Environmental education, Global warming, Willingness to act, Belief in the efficacy of action.

**RESUMO** | O presente estudo investiga as crenças dos estudantes sobre a eficácia das ações pró-ambientais na redução do aquecimento global, e a sua vontade de realizar efetivamente essas ações. Examinámos as atitudes de 122 estudantes do ensino secundário de origens heterogéneas nas sociedades árabes e judaicas em Israel. Foi utilizado um paradigma de investigação quantitativa, recorrendo a um questionário fechado. Os resultados do estudo indicam que os estudantes estão moderadamente preparados para adotar práticas, e que acreditam na eficácia das ações para reduzir o aquecimento global a um grau mais do que moderado. Foi encontrada uma diferença significativa entre estudantes judeus e estudantes árabes, com estudantes judeus mais preparados do que os estudantes árabes para tomar medidas em benefício do ambiente. Os resultados podem formar a base para fazer recomendações relativamente à promoção de questões de educação ambiental e alfabetização ambiental no sistema educativo.

**PALAVRAS-CHAVE**: Educação ambiental, Aquecimento global, Disposição para agir, Crença na eficácia da ação.

**RESUMEN** | El presente estudio investiga las creencias de los estudiantes sobre la eficacia de las acciones proambientales para reducir el calentamiento global y su disposición a llevarlas a cabo. Examinamos las actitudes de 122 estudiantes de secundaria de orígenes heterogéneos en sociedades árabes y judías en Israel. Se utilizó un paradigma de investigación cuantitativa, empleando un cuestionario cerrado. Los resultados del estudio indican que los estudiantes están moderadamente preparados para adoptar prácticas y que creen en la eficacia de las acciones para reducir el calentamiento global en un grado más que moderado. Se encontró una diferencia significativa entre los estudiantes judíos y los árabes, con los estudiantes judíos más preparados que los árabes para actuar en beneficio del medio ambiente. Los resultados pueden servir de base para formular recomendaciones sobre la promoción de los temas de educación ambiental y la alfabetización ambiental en el sistema educativo.

**PALABRAS CLAVE**: Educación ambiental, Calentamiento global, Disposición a actuar, Creencia en la eficacia de la acción.

## 1. INTRODUCTION

One of the most worrying environmental challenges today is climate change, and, in particular, global warming (Suyatna & Rosidin, 2017). In recent years, awareness about environmental issues has increased among the general public around the world, and, consequently, also in the State of Israel. Issues such as the depletion of natural resources, air pollution, reduction of the ozone layer, the greenhouse effect to name but a few are topics for discussion. Examining student knowledge, beliefs, and willingness to act on issues related to the environment and sustainability has become an issue in educational frameworks (Klongyut, Singseewo & Suksringarm, 2015). The current international United Nations programmes such as Sustainable Development Goals, especially goal 4 "for Quality Education" (United Nations, 2015) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) Programme ESDfor2030 (UNESCO, 2020) point to crucial importance of a sustainable future. In the past decade, environmental education – both formal and informal – has been expanding in all educational institutions in Israel, from kindergarten to higher education (Tal, 2009). One of the goals of environmental education is to persuade people to behave in a pro-environmental manner (Kılınç, Boyes & Stanisstreet, 2011). In an age of climate crisis, global inequalities and austerity measures, it is crucial to empower people not only to change their thinking but also to change their actions. The development of action competence (Breiting & Mogensen, 1999) or shaping competence (de Haan, 2006; Rauch & Steiner, 2013) of the students is still a main goal of environmental education for sustainability (Sterling, 2002).

The connection of Israel's Arab community to the environment is influenced by its traditional lifestyle. Some aspects of this lifestyle are environmentally sound, such as economical and chemical-free farming, consuming products from home or local production although not many young people maintain this traditional lifestyle. Generally speaking, the Arab public is perceived as having low environmental awareness, both by the community itself and by others (Bendas-Jacob, Donitz & Reznikowski, 2012). On the one hand, ongoing development and use of the land's natural resources by the Jewish majority politicizes issues of the environment, while on the other hand, the environment is seen as a global, non-political issue that must be pursued for the common good (Alkaher & Tal, 2011). Additionally studies have found a tendency for minority groups to take a more anthropocentric approach (Adeola, 2004; Johnson, Bowker & Cordell, 2004).

In terms of gender, studies show no uniformity in their findings with regard to environmental issues. Findings in this area range from the lack of gender difference (Gulec, 2016; Davidson & Freudenburg, 1996) to more positive attitudes among females (Coertjens et al, 2010; Bennett, Graesel & Parchmann, 2005; Inzlicht & Ben-Zeev, 2000). Yet other studies have indicated a difference in favour of male students in environmental knowledge (Kollmuss & Agyeman, 2002).

To gain an insight into the environmental beliefs of students as well as taking into account their different cultural background, the Academic Arab College of Education conducted this quantitative study in 2019. The purpose of this study was to examine students' beliefs about the efficacy of specific actions to mitigate global warming, as well as to measure and describe their willingness to engage in pro-environmental activities to protect the environment. The study also aimed to determine whether there is a relationship between "belief in the utility of action" and the "degree of willingness to act" in students and to ascertain whether the relationship between

the two is affected by such variables as gender and sector. The results of the study may serve as a basis for planning pro-environmental educational intervention among students and educators.

## 2. LITERATURE REVIEW

### 2.1 Environmental Education

The goal of environmental education is to inspire students to protect and preserve the environment (Ilma & Wijarini, 2017; Zoller, 2013). Studies examining the effects of an environmental curriculum on students, parents, and the community at large (e.g., Cheak & Volk, 2003; Erhabor & Don, 2016) found that environmental education requires critical thinking and effective decision-making. Individuals must be able to consider the positions of different parties and make responsible and informed decisions. Students should consider themselves engaged, proactive community members, who take on roles of responsibility in core issues affecting the countries in which they live. One interesting study argues that it is essential to focus on the role of environmental ethics and the philosophy of nature in environmental education, and that ancient Greek philosophy, because of its richness and sensitivity, can contribute to the environmental education paradigm (Tsevreni, 2018). In a study by Lai (2018), the researcher concluded that students' awareness of environmental education can be encouraged by means of appropriate activities and field trips, as evidenced by a positive change in the attitudes of Taiwanese fifth graders towards the environment.

In Israel as well as other countries, environmental education is not viewed as a formal subject for classroom study. Rather, it is seen as a part of the broad educational framework – as a concept that guides the approach and conduct of a school – and so, is reflected in the teaching of a variety of subjects (Tal, 2004). For over a decade, schools, like other institutions and organizations in the world, have been called upon to implement policies of sustainability, that is, to conduct themselves in a manner that reduces environmental damage (Smyth, 1995). Schools are expected to engage the community in implementing social-environmental policies that emphasize caring, partnerships and concern for both the community and the environment, today and in the future.

Despite attempts to establish environmental education as part of the standard school curriculum, it is not yet recognized as an independent and unified subject to be taught in school; there is no consensus as to its place – whether it should be taught separately alongside other subjects, or within existing subjects. Thus, most students in Israel are not exposed to environmental education in an ongoing and systematic manner (Tal, Garb, Negev, Sagy & Salzberg, 2007).

The overarching goal of environmental education has been defined as "environmental literacy" (Fidan & Ay, 2016). The goal of environmental literacy education is to bring about a change in human behaviour towards the environment, so that it is not merely the acquisition of theoretical knowledge detached from practical action, but a fundamental change in the human approach that will manifest itself in relevant action. Existing studies (e.g., Shamuganathan & Karpudewan, 2017; Saltan & Divarci, 2017; Ricoy & Sanchez-Martinez, 2022) report on the importance of environmental literacy assimilation at an early stage of school, which will encourage students to adopt additional pro-environmental behaviours.

## 2.2 Global Warming

Global warming is a general concept that describes a variety of climatic phenomena and relates to climate change and the ecological balance of the Earth. These are changes that are caused in one way or another by the effects of human activity on the ecosystem. Studies indicate that global warming is now recognized worldwide as one of the biggest problems faced by humanity (Lin, 2017). Most of the warming is due to an increase in the concentration of greenhouse gases in the atmosphere (Çimer, Sabiha & Ursavas, 2011). It is now known that greenhouse gas emissions caused by human activity (primarily from burning fossil fuels, but also from other factors) cause an increase in the average global temperature and is the source of other modifications in the Earth's climate, such as precipitation changes and rising of sea levels (Rosidin & Suyatna, 2017).

## 2.3 Willingness to Act

Jensen argues that a given individual's environmental activities should be directed at solving a problem that he himself has decided to address, and that the activity should lead to a tangible change in his lifestyle (Jensen, 2002). On the other hand, studies (e.g., Hadjichambis et al., 2015; Ziesemer, Hüttel & Balderjahn, 2021) have shown that young children are considered a critical group in the effort to move towards sustainable consumption.

In the Western world, awareness of the effects of human consumption on the environment is growing, including the accelerated biodegradation of natural resources and climate change. It has now become clear that the addition of greenhouse gases as a result of human activity causes global warming (Rosidin & Suyatna, 2017), and that action must be taken to mitigate global warming and to address its consequences and potential dangers. Warming is a product of the modern way of life. Recognizing that global warming is already here and affecting us, action must be taken quickly to prevent further warming and exacerbation of the crisis.

Many studies have been conducted on the relationship between people's willingness to act on behalf of the environment and their actual behaviour, but research findings are inconsistent. Some studies indicate a high correlation between intent and action (Azjen & Madden, 1986), but other researchers point out that behavioural intentions usually exist on the level of personal assertion, and the likelihood that they will be translated into actual behaviour depends on other variables that establish a given individual's set of values (Fishbein & Aizen, 1975).

According to research by Kılınç, Boyes & Stanisstreet (2011), students expressed their willingness to adopt certain actions to reduce global warming, such as switching off unused electrical appliances, but not to adopt others, such as increasing their use of public transport. According to research by Devine-Wright, Devine-Wright & Fleming (2004) older students who are more knowledgeable and have a better understanding of global warming, are prepared to practise daily pro-environmental activities, e.g., riding a bicycle to reduce greenhouse gases and protect the environment. However, it should be noted that it is difficult to influence people's consumer preferences without influencing their values and perceptions, and because values change slowly, creating change in any behaviour – including consumer behaviour patterns – is a long-term process. Such change are slow not only because of values and perceptions, but also as a result of previously established habits that were not based on a foundation of sustainable consumerism aimed at mitigating negative effects on the environment.

### 2.4 Belief in the Utility of Action

Responsible environmental behaviour consciously strives to reduce the negative impact of personal behaviour on the natural environment. It is the practical expression of environmental literacy, representing a belief in adopting responsible personal behaviour towards the environment.

According to research by Devine-Wright, Devine-Wright and Fleming (2004) examining children's beliefs about global warming, it was found that shared learning environments can have positive effects on children's beliefs about large-scale environmental problems. In this study, researchers sought to identify whether situational factors influence children's beliefs about global warming. Beliefs explored in the study included general psychological processes about perceptions of self-responsibility, concern, and awareness, as well as perceptions of self-efficacy. The psychological processes explored in the study were those involved in pro-environmental behaviour, such as personal awareness, environmental concern, and perceptions of global warming.

According to Kılınç, Boyes and Stanisstreet (2011), students believe that pro-environmental actions are very effective in reducing global warming, and environmental education can be effective in reducing global warming. According to a study by Broom (2017), there are connections between childhood experiences in nature and their later views on the environment. Broom argues that the correlations between the views expressed on environmental concerns and eco-friendly actions were surprising, because actions were found to be inconsistent with beliefs. The study concludes with recommendations on how positive attitudes and actions towards the environment can be fostered in childhood.

## 3. THE RESEARCH QUESTIONS THAT GUIDED THIS STUDY

To get an insight in the environmental beliefs of students as well as taking into account their different cultural background, the Academic Arab College of Education conducted a quantitative study in cooperation with the University of Klagenfurt. The research questions that guided the present study included the following:

1. To what extent do students believe that various pro-environmental actions can mitigate global warming? (Belief in the utility of action)
2. To what extent are students willing to adopt these actions? (Willingness to act)
3. Is there a connection between student belief in the utility of action and the degree of their willingness to engage in environmental activity?
4. Are there differences between Jewish students and Arab students in their beliefs about the utility of action and their willingness to engage in pro-environmental activity?
5. Are there differences between boys and girls in their beliefs about the utility of action and their willingness to engage in pro-environmental activity?

The research hypotheses are as follows:

1. Students believe that various pro-environmental actions can reduce global warming.
2. Students are willing to take action on behalf of the environment.

3. There is a strong positive relationship between belief in the utility of students' action and their degree of willingness to engage in pro-environmental activity.
4. There will be a difference between Jewish students and Arab students in their beliefs in the utility of action and in their willingness to engage in pro-environmental activity, with Jewish students more inclined towards both.
5. There will be a difference between boys and girls in their beliefs in the utility of action and in their willingness to act for the environment, with girls more inclined towards both.

## 4. METHODOLOGY

The present study is a descriptive-correlational study that examined a statistical relationship, without an intervention plan. Data collection was done in 2019 using a closed-ended questionnaire. The questionnaire was based on a study from Kılınç, Boyes & Stanisstreet's (2011) and was slightly adapted to the context of this study.

The study population was made up of 11th grade students in the environmental science track in high school. The study sample included 122 students from schools in both the Arab and Jewish sectors in Israel. The sample was not a random sample, but a convenience sample, made up of students from four high schools: two Arab high schools (60, 49.2%), and two Jewish high schools (62, 50.8%). The classes from which the subjects were chosen were heterogeneous, and consisted of boys (46, 37.75%) and girls (76, 62.3%). As the study sample is a "convenience sample" and is not based on a random statistical sample, it should be noted that the current research concerns both Arab and Jewish sectors, but both are diverse, and therefore the extent to which findings can be generalized in both sectors is limited. Preparing the study included compiling a final version of the questionnaire in both Arabic and Hebrew. Internal consistency of the questionnaires was measured by using Cronbach's alpha and has proven to be high (0.89).

The collected data was quantified in Excel tables and processed and analysed using statistical tools in SPSS software. Mean and standard deviations, percentages and distributions, Pearson and Spearman coefficient tests were calculated. For the statistical tests, a t-test was used for independent samples, as well as "One-Way Analysis of Variance" (ANOVA).

## 5. RESULTS

***To what extent do students believe that various pro-environmental actions can mitigate global warming? (Belief in the utility of action)***

To answer this question, a frequency analysis was conducted of the responses of participating students on the first part of the questionnaire, which related to their beliefs in the utility of action to reduce global warming. In this analysis, the answer scale was divided into three levels in order to present a clear picture (disagree and strongly disagree were grouped together as "disagree"; "moderately agree" was left as is; and agree and strongly agree were grouped together as "agree"). Table 1 below presents the findings.

***Table 1-*** *The number and percentage of students responding to statements examining and describing their beliefs in the efficacy of action aimed at reducing global warming.*

| Questions | Disagree Strongly to Disagree | Moderately agree | Agree to strongly agree | Average (1-5) |
|---|---|---|---|---|
| 1. Were people to use their cars less, global warming would decrease. | 3 (2.5%) | 9 (7.4%) | 110 (90.2%) | 4.42 (0.80) |
| 2. Were people to purchase smaller vehicles that consume less petrol (or diesel) global warming would decrease. | 6 (4.9%) | 15 (12.3%) | 98 (80.3%) | 4.22 (0.88) |
| 3. Were we were to generate more energy from wind, wave and solar power, global warming would decrease. | 6 (4.9%) | 14 (11.5%) | 102 (83.6%) | 4.20 (0.86) |
| 4. Were we were to produce more energy from nuclear power plants, global warming would decrease. | 30 (24.6%) | 29 (23.8%) | 62 (50.8%) | 3.38 (1.19) |
| 5. Were people to consume less electricity in their homes, global warming would decrease. | 18 (14.8%) | 25 (20.5%) | 79 (64.8%) | 3.75 (1.12) |
| 6. Were people to have better insulation in their homes, global warming would decrease. | 21 (17.2%) | 34 (27.9%) | 66 (54.1%) | 3.63 (1.18) |
| 7. Were people to buy home appliances (like a refrigerator or washing machine) that consume less energy, global warming would decrease. | 28 (23%) | 22 (18%) | 72 (59%) | 3.58 (1.27) |
| 8. Were people willing to buy fewer new things and manage with their old things, global warming would decrease. | 20 (16.4%) | 27 (22.1%) | 75 (61.5%) | 3.78 (1.25) |
| 9. Were we to plant more trees in the world, global warming would decrease. | 12 (9.8%) | 19 (15.6%) | 91 (74.6%) | 4.13 (1.13) |
| 10. Were people to eat less meat, global warming would decrease. | 49 (40.2%) | 18 (14.8%) | 55 (45.1%) | 3.11 (1.50) |
| 11. Were people to recycle more, global warming would decrease. | 14 (11.5%) | 25 (20.5%) | 82 (67.2%) | 3.91 (1.13) |
| 12. If farmers stopped using artificial fertilizers with nitrogen, global warming would decrease. | 10 (8.2%) | 19 (15.6%) | 93 (76.2%) | 4.08 (0.94) |
| 13. If politicians passed proper new laws, global warming would decrease. | 29 (23.8%) | 29 (23.8%) | 62 (50.8%) | 3.40 (1.28) |
| 14. If politicians were able to persuade people to pay more taxes and spend the money on the right things, global warming would decrease. | 23 (18.9%) | 40 (32.8%) | 59 (48.4%) | 3.44 (1.23) |
| 15. Were people to learn more about global warming, global warming would decrease. | 18 (14.8%) | 25 (20.5%) | 79 (64.8%) | 3.83 (1.18) |
| 16. Were nations to sign international agreements prohibiting the emission of certain gases into the atmosphere, global warming would decrease. | 10 (8.2%) | 29 (23.8%) | 83 (68%) | 4.00 1.08 |
| Average of all statements | | | | 3.80 (0.67) |

An examination of Table 1 shows that 90% of students stated that they agree or strongly agree to the second statement, and that 84% agree or strongly agree to the third. Similarly, 80% of the students agree or strongly agree to the second statement, 75% of students agree or strongly agree with the ninth statement, and 76% agree or strongly agree with the twelfth statement.

In summary, in answer to the first research question, we can conclude that students believe in the efficacy of action to reduce global warming somewhat more than a moderate degree.

***To what extent are students willing to adopt these actions? (Willingness to act)***

To answer this question, a frequency analysis was conducted of the responses of the participating students on the second part of the questionnaire, which related to the students' willingness to engage in pro-environmental activity. In this analysis, the answer scale was divided into three levels in order to present a clear picture (disagree and strongly disagree were grouped together as "disagree"; "moderately agree" was left as is; and agree and strongly agree were grouped together as "agree"). Table 2 below presents the findings.

***Table 2-*** *The number and percentage of students responding to statements that examine and describe their willingness to engage in activity to reduce global warming.*

| Questions | Disagree Strongly to Disagree | Moderately agree | Agree to strongly agree | Average (1-5) |
|---|---|---|---|---|
| 1. I am willing to take buses and trains instead of a car even if it takes longer and is less comfortable. | 27 (22.1%) | 60 (49.2%) | 35 (28.7%) | 3.08 (1.00) |
| 2. I am willing to try to buy a car that consumes less petrol (or diesel) even if it is neither fast nor fancy. | 21 (17.2%) | 31 (25.4%) | 68 (55.7%) | 3.52 (1.14) |
| 3. I am willing to pay more for electricity, provided our energy is generated by wind, wave and solar power. | 37 (30.3%) | 33 (27%) | 52 (42.6%) | 3.16 (1.25) |
| 4. I am willing to pay more for electricity, provided our energy is generated by nuclear power. | 39 (32%) | 31 (25.4%) | 51 (41.8%) | 3.12 (1.31) |
| 5. I am willing to turn off home appliances when I don't need them. | 21 (17.2%) | 13 (10.7%) | 87 (71.3%) | 3.87 (1.31) |
| 6. I am willing to purchase additional insulation even if it costs money. | 35 (28.7%) | 25 (20.5%) | 61 (50%) | 3.31 (1.28) |
| 7. I am willing to buy home appliances (like a refrigerator or washing machine) that consume less energy, even if they are more expensive. | 28 (23%) | 29 (23.8%) | 65 (53.3%) | 3.43 (1.32) |
| 8. I am willing to buy fewer new things, even if it means that my clothing will not be the latest fashion. | 28 (23%) | 45 (36.9%) | 49 (40.2%) | 3.16 (1.10) |
| 9. I think more trees should be planted in the world, even if I will have to pay more taxes. | 27 (22.1%) | 29 (23.8%) | 66 (54.1%) | 3.42 (1.24) |
| 10. I am willing to recycle things instead of throwing them out, even if it is bothersome to me. | 15 (12.3%) | 36 (29.5%) | 71 (58.2%) | 3.65 (1.14) |
| 11. I am willing to eat fewer meat meals even if I really like meat. | 37 (30.3%) | 30 (24.6%) | 55 (45.1%) | 3.10 (1.28) |
| 12. I am willing to buy food that is produced without using artificial fertilizers even if it is more expensive. | 29 (23.8%) | 38 (31.1%) | 55 (45.1%) | 3.19 (1.22) |

| Questions | Disagree Strongly to Disagree | Moderately agree | Agree to strongly agree | Average (1-5) |
|---|---|---|---|---|
| 13. I am willing to vote for a politician who says he will bring forward bills to reduce global warming, even if it keeps me from doing things I enjoy. | 49 (40.2%) | 39 (32%) | 33 (27%) | 2.87 (1.15) |
| 14. I am willing to vote for a politician who says he would raise taxes to pay for a reduction in global warming, even if it meant I would have less money to spend. | 54 (44.3%) | 45 (36.9%) | 23 (18.9%) | 2.70 (1.11) |
| 15. I want to learn more about global warming even if it means more work for me. | 30 (24.6%) | 25 (20.5%) | 67 (54.9%) | 3.58 (1.34) |
| 16. I am willing to vote for a politician who said he would sign agreements with other countries on global warming even if it cause me discomfort (for example, force me to switch professions). | 39 (32%) | 30 (24.6%) | 53 (43.4%) | 3.35 (1.47) |
| Average of all statements | | | | 3.28 (0.79) |

An examination of the table shows that 71% of participants agree or strongly agree with the fifth statement, 58% of participants agree or strongly agree with the tenth statement, and about 56% agree or strongly agree to the second statement. Fewer than 50% of the participants express a high degree of agreement with the other questionnaire statements.

In summary, in answer to the second research question, we can conclude that students are willing to adopt pro-environmental actions to a moderate degree.

***Is there a connection between student belief in the utility of action and the degree of their willingness to engage in environmental activity?***

This research question was tested using a correlation test by Pearson's correlation coefficient. Table 3 below presents the findings.

***Table 3-*** *Averages and Standard Deviations for students' belief in the utility of action and their willingness to engage in environmental activity, Pearson's Correlation Coefficient for the relationship between them.*

| Category | Average | Standard deviation | t |
|---|---|---|---|
| Belief in utility of action | 3.80 | .67 | 0.570*** |
| Willingness to engage in pro-environmental activity | 3.28 | .79 | |

***p<0.001

The findings presented in the table above indicate a significant and strong positive relationship between students' belief in the utility of action and their degree of willingness to engage in pro-environmental activity ($r = 0.570$, $p < 0.001$). This means that as students' belief in the utility of action increases, their willingness to engage in pro-environmental activity increases.

***Are there differences between Jewish students and Arab students in their beliefs about the utility of action and their willingness to engage in pro-environmental activity?***

This research question was tested by means of a t-test for two independent samples. Table 4 below presents the findings.

***Table 4-*** *Averages and standard deviations for belief in the utility of action and willingness to engage in pro-environmental activity among Jewish and Arab Students, t-test values for differences between them.*

| Category | Sector | N | Average | Standard Deviation | t |
|---|---|---|---|---|---|
| Belief in the utility of action | Arab | 60 | 3.45 | 0.48 | -6.648*** |
| | Jewish | 62 | 4.14 | 0.66 | |
| Willingness to act | Arab | 60 | 2.93 | 0.78 | -5.298*** |
| | Jewish | 62 | 3.61 | 0.64 | |

***p<0.001

The findings presented in the table above indicate significant differences between Jewish students and Arab students with regards to the students' beliefs in the utility of environmental actions ($t = -6.648$, $p < 0.001$). Results show that the average level of belief among Jewish students in the utility of action is higher: 4.14, compared to an average of 3.45 among Arab students.

There was also a significant difference between Jewish and Arab students in their willingness to engage in pro-environmental activity ($t = -5.298$, $p < 0.001$). Results show that the average level of willingness of Jewish students to act on behalf of the environment is 3.61, as compared to an average of 2.93 for Arab students. Jewish students are more willing than Arab students to engage in pro-environmental activity.

***Are there differences between boys and girls in their beliefs about the utility of action and their willingness to engage in pro-environmental activity?***

This research question was tested using a t-test for two independent samples. Table 5 below presents the findings.

***Table 5-*** *Averages and standard deviations for belief in the utility of action and willingness to engage in pro-environmental activity among boys and girls, t-test values for differences between them.*

| Category | Gender | N | Average | Standard Deviation | t |
|---|---|---|---|---|---|
| Belief in the utility of action | Boys | 60 | 3.86 | 0.70 | 0.715 |
| | Girls | 62 | 3.77 | 0.66 | |
| | Boys | 46 | 3.22 | 0.77 | |

| | | | | | |
|---|---|---|---|---|---|
| Willingness to act | ---------- | ---------- | ---------- | ---------- | -0.588 |
| | Girls | 76 | 3.31 | 0.81 | |

The findings presented in the table above indicate an insignificant difference between boys and girls with regards to students' beliefs in the utility of action ($t = 0.715$, $p > 0.05$, N.S.). Results show that the average level of beliefs among boys is 3.86 compared with an average of 3.77 among girls. Boys and girls share similar degrees of belief in the utility of action.

There was also no significant difference between boys and girls with regards to their willingness to engage in pro-environmental activity ($t = -0.588$, $p > 0.05$, N.S.). Boys and girls are similarly willing to act.

## 6. DISCUSSION

The present study focused on an issue of great importance, which is the question of students' belief that pro-environmental actions can mitigate global warming, and their willingness to act on behalf of the environment and implement those actions. As other sectors of the population, students are becoming aware of the greenhouse effect to varying degrees, realizing that global warming is now recognized as one of the biggest problems faced by humanity, and that most of the warming is due to an increase in atmospheric greenhouse gases (Çimer, Sabiha & Ursavas, 2011). Recognizing the relevance of environmental education, it was important for the present study to clarify the beliefs and attitudes expressed by students regarding their willingness to act in the interest of/to protect the environment. The results of the study may serve as a basis for planning pro-environmental educational intervention among students and educators.

Environmental education can play a crucial role in nurturing the beliefs and attitudes of students. It is essential that students are taught to understand the complexity of human interaction with the environment, with the aim of improving the quality of human life in an increasingly technological world (Zoller, 2013). Foundations of environmental education, first formulated in the 1970s in UN-sponsored international forums, are based on the principles of: acquiring environmental knowledge (concepts, principles, phenomena and processes), developing awareness of environmental damage, acquiring learning and action skills (exploration, problem solving, decision making and public action), developing positive attitudes towards the environment, willingness to work towards improving the state of the environment, engaging in pro-environmental behaviour and acting to improve the state of the environment (Tal, 2004). The important conclusion from this, and what heightens the importance of the present research's contribution, is the understanding that environmental education shapes students' attitudes towards the environment (Ilma & Wijarini, 2017). For the reasons expounded above, clarifying and describing student beliefs and attitudes towards the environment is vital.

The findings that emerged in the current study regarding Israeli students' belief in the efficacy of various pro-environmental actions and whether these actions could reduce global warming (Table 1) indicated that most students agree or strongly agree that increased use of cars, and the type of car driven, impact on global warming, and if people were to reduce their use of cars or drive more eco-friendly cars, global warming would decrease. Students also believe that energy sources should be diverse, noting that more energy must be generated from wind, wave and solar panels, as these measures would reduce global warming. The students believe that

increased electricity consumption increases global warming; they believe that improved home insulation is very helpful; and they believe that pro-environmental actions help reduce global warming. Thus, in response to the first research question, it was found that students believe in the efficacy of action to reduce global warming, at a moderate to high degree. Therefore, it can be argued that the first hypothesis was confirmed.

These findings reinforce the findings of other studies, such as the study by Devine-Wright et al. (2004) that examined children's beliefs about global warming. They found that students reported positive beliefs and that shared learning environments can have positive effects on children's beliefs about large-scale environmental problems. The researchers also sought to identify whether situational factors affect children's beliefs about global warming. The beliefs examined in the study included general psychological processes on perceptions of self-responsibility, concern, and awareness, as well as perceptions of self-efficacy. The psychological processes explored in the study were those involved in pro-environmental behavior, such as personal awareness, environmental concern, and the perception of responsibility for global warming. As noted, reported beliefs and attitudes were highly positive.

Significant support for the findings of this study can be seen in the study by Kılınç et al. (2011), who found that students believe that pro-environmental actions are very effective in reducing global warming and that environmental education can be very useful in its mitigation. There is also increased awareness of the dangers caused by human consumption and the fact that human activity contributes to global warming (Rosidin & Suyatna, 2017), requiring that various actions be taken to reduce global warming and to address its consequences and dangers. Global warming is a product of a modern lifestyle; it is essential to clarify that it is affecting us now and that action must be taken quickly to prevent the continued warming and exacerbation of the crisis.

Regarding the findings on the willingness of students to act on behalf of the environment as presented in Table 2, it was found that students expressed a high level of willingness to adopt pro-environmental actions, such as bus travel instead of travel in a private vehicle, paying more for electricity produced from natural sources, planting trees, recycling, purchasing energy-efficient appliances and more. It can therefore be argued that the hypothesis was upheld.

The findings of the current study reinforce the findings of some other studies. However, since research findings on "willingness to act" are inconsistent there are also studies with which they do not align. Some studies indicate a high correlation between intent and action (Azjen & Madden, 1986), but other researchers point out that behavioral intentions usually exist on the level of personal assertion, and the likelihood that they will be translated into actual behavior depends on other variables that establish a given individual's set of values (Fishbein & Aizen, 1975).

The findings of the current study presented in Table 3 highlighted the strong relationship between student beliefs and their willingness to act, that is, as students' beliefs in the utility of action in reducing global warming increase, their willingness to engage in pro-environmental activity increases. It can therefore be argued that the hypothesis was upheld.

It is important to note that this finding was expected, and that studies exploring the issue of environmental education have shown that positive beliefs and attitudes lead to high levels of willingness to act in the interest of the environment. A study by Lai (2018) found that raising

awareness of environmental education among students will increase their willingness to engage in pro-environmental activity. He found that environmental education activities and field trips, for example, were effective in encouraging environmental learning and fostered positive change in the attitudes of fifth graders in Taiwan towards the environment. Similarly, Cheak and Volk (2003), who examined the effects of an environmental curriculum on students, parents, and the community, found that environmental education requires critical thinking and skill in effective decision-making. Individuals must be able to consider the positions of different parties and make responsible and informed decisions. Students consider themselves engaged, proactive community members, who take on roles of responsibility in core issues affecting the countries in which they live. One interesting study argues that it is essential to focus on the role of environmental ethics and the philosophy of nature in environmental education, and that ancient Greek philosophy, because of its richness and sensitivity, can contribute to the environmental education paradigm (Tsevreni, 2018).

The findings of the present study indicated a significant difference between Jewish students and Arab students with regards to their willingness to act in the interest of the environment: Jewish students are more willing than Arab students to act on behalf of the environment. It can therefore be argued that the hypothesis was upheld (see table 4). This finding aligns with the research by Alkaher and Tal (2011), which also found differences between these sectors. They found, for example, that – in contrast to Jewish students – Arab students highlighted the conflict between authorities and citizens. The Arab sector feels excluded from the public sphere in Israel, and this also has implications for environmental matters. Furthermore, the findings of the present study support the results of research comparing environmental perceptions of different ethnic-cultural groups in several countries around the world. These studies have found a tendency for minority groups to take a more anthropocentric approach (viewing the person at the center rather than the ecosystem) (Adeola, 2004; Johnson, Bowker & Cordell, 2004). One could argue that the Israeli-Arab sector, as a minority, is prone to the anthropocentric approach that views only people as having intrinsic value, whilst environmental components have only utilitarian value. This approach, then, is essentially not a pro-environmental approach.

Female and male students reported an almost equal degree of willingness to act, and there was no significant difference between them (see table 5). It can therefore be argued that the hypothesis was upheld.

With regard to gender, studies have not shown uniformity in their findings. This study's finding is in line with Gulec's research (2016) that there is no statistically significant difference regarding the environment based on gender. This differs from the conclusions of other studies. Coertjens et al (2010), for example, found that in comparison to male students, female students showed greater awareness of environmental issues and concepts and expressed more pro-environmental attitudes, expressing greater concern for the environment and greater recognition of the importance of education. Yet other studies have indicated a difference in favour of male students in environmental knowledge (Kollmuss & Agyeman, 2002), and differing findings regarding the attitudes of both sexes. Findings in this area ranged from the lack of gender difference (Davidson & Freudenburg, 1996) to more positive attitudes among females. In addition, there are studies that have shown that women express stronger feelings about the dire consequences of the deteriorating environment on themselves, on others and on the biosphere. Moreover, compared to men, women have a weaker sense of personal control and are more

confident in the ability of science and technology to solve environmental problems (Kollmuss & Agyeman, 2002). In a study conducted with teachers, it was found that female teachers hold more positive attitudes towards environmental education than male teachers, and that females are much more interested in issues of environmental crisis than their male colleagues (Bennett et al., 2005). Another study (Inzlicht & Ben-Zeev, 2000) showed that women are more interested than men in a safe, healthy, and risk-free environment.

## 7. CONCLUSIONS

The main conclusion of this research is that students have a strong desire to embrace pro-environmental behaviours to minimize negative impacts on the earth and to arrest the deterioration of its condition. In addition, the research findings indicate the need to intervene to promote a pro-environmental agenda and adopt positive environmental values. Environmental education components of the curriculum should be tailored to the needs of all students in Israel and respond to student differences stemming from cultural, ethnic and socio-economic factors. This study has several limitations: The study sample is a "convenience sample" and is not based on a random statistical sample. Furthermore, it should be noted that the current research concerns both Arab and Jewish sectors, but both are diverse, and therefore the extent to which findings can be generalized in both sectors is limited. Therefore, further research initiatives might investigate differences and similarities within the Arab and Jewish students' groups using qualitative methods.

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