

# An Educational Intervention Among Spanish-Speaking Youth to Help Build Community Advocacy Around Climate Change, Sustainability, and Environmental Justice

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**Abstract** Climate change due to anthropogenic actions threatens public health. Simultaneously, communities migrate across borders, without prior education in climate change or environmental justice, including those communities settling in New Jersey. New Jersey became the first state, starting in the 2022–2024 school years, with student learning standards across K–12 subjects on climate change, sustainability, and environmental justice. Expanding an established peer-reviewed, evaluated online introduction training course in English and translating it into Spanish would benefit susceptible, vulnerable subpopulations. Our project used the 5-module *Introduction to High School Students to Climate Change, Sustainability, and Environmental Justice* online training course created by the New Jersey Safe Schools Program, with specific questions for each module's knowledge check and then a 20-question excerpt from the 2021 Student Conservation Association Survey. The new Spanish format was piloted with two schools in New Jersey and one in Houston, Texas. In total, 37 participants registered among both states (33 students and 4 teachers) and 10 finished, including 6 students and 4 teachers.

**Keywords:** climate change, environmental justice, schools, students, Spanish

## Introduction

Climate change and global warming have been increasing, creating more floods and rising temperatures (Turrentine, 2022). The warmer climates can accommodate new species in geographic regions where they could not exist before. Moreover, some of these species are vectors for diseases or pathogenic organisms. Thus, there can be an increased incidence of diseases and epidemics in locations where the host animals would not have been able to survive if the climate had not

cooperated with them. These climate fluctuations and the colonization of new regions by foreign species represent a threat to public health (Pan American Health Organization, n.d.).

At the same time—as either indirectly or directly related to climate change—the world has seen migrations of communities across borders. Within the U.S., in New Jersey, there has been a major increase in Spanish-speaking communities that have socioeconomic disparities, as well as limited financial and

technological resources and education (Montalvo & Batalova, 2024). These communities, for the most part, were not educated in climate change or environmental justice in their countries of origin, and these individuals have settled and made New Jersey their home (Tabasco Gobierno del Pueblo, 2024). Now, first- or second-generation migrants live in New Jersey who have limited awareness of the threat climate change has on the environment and public health. Simultaneously, New Jersey has become the first state to monitor student learning standards across K–12 subjects on climate change, sustainability, and environmental justice in the 2022–2023 school year (New Jersey Department of Education, 2025).

Education is the starting point for creating behavioral change. It is important to take into consideration the cultural and social characteristics of the communities we work with, or within which we want to have positive impacts (United Nations, 2020). Successfully educating these communities can open new perspectives to the younger generation, providing them with essential tools to develop critical thinking skills and approach life with a foundation of climate awareness for their communities (United Nations, 2020). These younger generations will be guided to understand how climate change goes beyond

TABLE 1

**Overall Knowledge Check Scores for Study Participants in Spanish Course Pilot**

| Knowledge Check | Highest Grade | Lowest Grade | Average Score ( <i>M</i> ) |
|-----------------|---------------|--------------|----------------------------|
| Module 1        | 10.0          | 4.7          | 8.8                        |
| Module 2        | 10.0          | 6.0          | 7.4                        |
| Module 3        | 10.0          | 4.7          | 8.3                        |
| Module 4        | 10.0          | 6.5          | 8.7                        |
| Module 5        | 10.0          | 8.5          | 8.4                        |
| Videos          | 10.0          | 0            | 8.2                        |

weather and is not a single isolated event but part of daily life (United Nations, 2020).

For students to address inequities and socioeconomic disparities while taking care of the environment, they must have the tools and knowledge of how to protect public health and the environment. The New Jersey Safe Schools (NJSS) Program has expanded its already established peer-review evaluated online introduction training course that is available in English by translating the course into Spanish so that Spanish-speaking youth (ESL/ELL) can increase their knowledge regarding climate change, sustainability, and environmental justice (Shendell et al., 2023).

## Methods

This project used the already established *Introduction to High School Students to Climate Change, Sustainability, and Environmental Justice* online training course created by NJSS. The course currently comprises a 5-module program with specific questions in each module's knowledge check and a 20-question excerpt from the 2021 Student Conservation Association (SCA) Survey (Shendell et al., 2023). Each module's knowledge check has 5 questions that are worth 2 points each for a maximum of 10 points, and completion of the excerpt counted as 1 point for a total of 61 points to achieve a 100% score.

Module 1 is an introduction to the basic concepts of the environment and highlights the importance of ecosystem services and their influence on the health of the environment. Several factors can influence the environment, and any imbalance can alter all life cycles. This module also explains the importance of environmental services such as

renewable and nonrenewable energy sources and their contributions to society's development (Alcaldía de Medellín, 2023).

Module 2 describes climate change, anthropogenic influences, and global warming, along with how heat islands are manifested (Organization of American States, n.d.). Based on an Executive Order by President Joseph Biden, which noted the use of relatively newer technology by the National Aeronautics and Space Administration (NASA, 2018) to monitor climate change (The White House, 2021), the most currently available concepts and definitions of terms were included in this module.

Module 3 explains natural disasters and extreme climate events, specifically naturally occurring events such as weather and weather patterns, along with how anthropogenic influences create a potentiation of these naturally occurring events. This module shows how research has shown evidence that climate change is real. The module also includes the social impact of climate change and its influence on public health, including how extreme heat (i.e., higher humidity) and cold conditions (i.e., dry air) affect work environments and communities with socioeconomic disparities (NASA, 2024).

Module 4 covers sustainability and aims to teach participants how our behavior can shift the way that the climate behaves. There are links to websites where students can calculate their carbon footprint and understand the importance of those concepts. This module also gives a brief description of the international conventions of development for sustainability during recent decades (United Nations, n.d.).

Module 5 focuses on environmental justice, the 17 principles of environmental justice established in 1991, and how these factors affect communities in New Jersey. This module offers tools, tips, and links to environmental justice resources and organizations for students to learn how they can support their communities by being active in these programs (People of Color Environmental Leadership Summit, 1991).

Each module includes videos that have an activity assessment at the end (via Rutgers Canvas); these knowledge checks aim to ensure learning reinforcement and information retention. These evaluation tools were translated into Spanish from English. For each of these assessments, the maximum number of points achievable is 10 per knowledge check, as every module assessment is composed of 5 questions worth 2 points each.

The new Spanish format of the course was offered to ESL/ELL programs in three school districts: two school districts were in central and northern New Jersey, and one school district was in Houston, Texas. The end of spring 2024 and summer 2024 were used for the analysis of assessments and descriptive data analysis of data per module. The Spanish format constituted a 5-module program with specific questions for each module and a 20-question excerpt of the 2021 SCA survey. In total, 37 participants registered from New Jersey and Texas; the participants were 33 students and 4 teachers. Of these, 10 participants (6 students and all 4 of the teachers) registered and successfully finished the pilot (27% completion rate).

## Results

The assessments or knowledge checks for modules 1–5 of the Spanish course pilot are presented in Table 1. The highest percentage for the overall pilot per student was 100% and the lowest was 63% among participants who finished the pilot and got the certificate of completion (which required an overall passing score of  $\geq 70\%$ ). One participant took the pilot but did not finish all of the modules and therefore did not get a certificate.

All participants were grouped together due to the small sample size. Participants performed worse in knowledge check 2 and performed best in the video knowledge checks and next best in knowledge check 5 (Table

TABLE 2

**Module Knowledge Check Score Ranges for Participating Students in the Spanish Course Pilot**

| Student | Knowledge Check 1 <sup>a</sup> | Knowledge Check 2 <sup>a</sup> | Knowledge Check 3 <sup>a</sup> | Knowledge Check 4 <sup>a</sup> | Knowledge Check 5 <sup>a</sup> | Knowledge Check for Videos <sup>a</sup> | Course Evaluation <sup>b</sup> | # of Total Points <sup>c</sup> | % of Total Points <sup>d</sup> |
|---------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1       | 10.0                           | 10.0                           | 8.0                            | 10.0                           | 8.5                            | 10.0                                    | 1.0                            | 57.5                           | 94                             |
| 2       | 8.0                            | 6.0                            | 6.7                            | 7.5                            | 9.5                            | 10.0                                    | 1.0                            | 48.7                           | 80                             |
| 3       | 9.3                            | 6.0                            | 9.3                            | 8.0                            | 6.0                            | 10.0                                    | 1.0                            | 49.7                           | 81                             |
| 4       | 4.7                            | 8.0                            | 8.0                            | 8.0                            | 10.0                           | 6.0                                     | 1.0                            | 45.7                           | 75                             |
| 5       | 10.0                           | 6.0                            | 9.3                            | 9.5                            | 8.0                            | 10.0                                    | 1.0                            | 53.8                           | 88                             |
| 6       | 9.3                            | 6.0                            | 10.0                           | 8.0                            | 8.0                            | 10.0                                    | 1.0                            | 52.3                           | 86                             |

<sup>a</sup> Out of a possible 10 points.

<sup>b</sup> A total of 1 point was awarded if the course evaluation questions were completed.

<sup>c</sup> Out of a possible 61 points.

<sup>d</sup> Out of a possible 100%.

TABLE 3

**Module Knowledge Check Score Ranges for Participating Teachers in the Spanish Course Pilot**

| Teacher | Knowledge Check 1 <sup>a</sup> | Knowledge Check 2 <sup>a</sup> | Knowledge Check 3 <sup>a</sup> | Knowledge Check 4 <sup>a</sup> | Knowledge Check 5 <sup>a</sup> | Knowledge Check for Videos <sup>a</sup> | Course Evaluation <sup>b</sup> | # of Total Points <sup>c</sup> | % of Total Points <sup>d</sup> |
|---------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1       | 10.0                           | 6.0                            | 4.7                            | 9.5                            | 7.0                            | 0                                       | 1.0                            | 38.2                           | 63                             |
| 2       | 6.7                            | 6.0                            | 7.3                            | 6.5                            | 7.0                            | 6.0                                     | 1.0                            | 40.5                           | 66                             |
| 3       | 10.0                           | 10.0                           | 10.0                           | 10.0                           | 10.0                           | 10.0                                    | 1.0                            | 61.0                           | 100                            |
| 4       | 10.0                           | 10.0                           | 10.0                           | 10.0                           | 10.0                           | 10.0                                    | 1.0                            | 61.0                           | 100                            |

<sup>a</sup> Out of a possible 10 points.

<sup>b</sup> A total of 1 point was awarded if the course evaluation questions were completed.

<sup>c</sup> Out of a possible 61 points.

<sup>d</sup> Out of a possible 100%.

2). Furthermore, there was a high teacher response in willingness to participate in the pilot; however, their students did not register. The overall student percentage of total points was 84.0% (Table 2), and the overall teacher percentage of total points was 82.3% (Table 3).

The modified SCA (2021) survey was part of the *Introduction to Climate Change, Sustainability, and Environment Justice* course. This survey asked students 20 questions about their opinion on climate change. The survey was available to participants in both the Spanish and English versions of the course; however, some participants did not complete it because the survey was presented after the

last module of the course, which some participants did not reach. There were 84 participants who completed the survey in the English version ( $n = 76$ ) and Spanish version ( $n = 8$ ) of the course. Our analysis summary focused on the total number of participants and highlighted responses that suggested a clear trend in one direction or another.

Most participants reported believing that climate change can be characterized as a crisis, problem, or concern. Most of the participants (94%) believe that the world's climate is changing; however, their responses to the reasoning behind their beliefs differed. Participants were asked if they based their

beliefs on personal experiences and observations (57%) and/or what they have read (77%), with approximately one third basing their beliefs on both options. Nearly every participant (96%) believed that human activity is the leading cause of climate change (Table 4).

When participants were asked how confident they were that the world will successfully address the causes and consequences of climate change, most responses were between "somewhat optimistic" and "somewhat pessimistic." For example, the majority of participants (79%) shared that they have reduced their reliance on single-use plastics to help

TABLE 4

**Responses to the Climate Change Awareness Survey**

| Survey Question                                                                                                                                                          | English Course<br>( <i>n</i> = 76)<br># (%) | Spanish Course<br>( <i>n</i> = 8)<br># (%) | Total From Both Courses<br>( <i>N</i> = 84)<br># (%) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------|------------------------------------------------------|
| Which actions do you take on a regular basis to lessen your impact on our climate? Select all that apply. <sup>a</sup>                                                   |                                             |                                            |                                                      |
| Curtail electrical use                                                                                                                                                   | 30 (39.5)                                   | 8 (100)                                    | 38 (45.2)                                            |
| Use alternate transportation                                                                                                                                             | 30 (39.5)                                   | 4 (50.0)                                   | 34 (40.5)                                            |
| Reduce reliance on single-use plastics                                                                                                                                   | 59 (77.6)                                   | 7 (87.5)                                   | 66 (78.6)                                            |
| Plant trees                                                                                                                                                              | 21 (27.6)                                   | 2 (25.0)                                   | 23 (27.4)                                            |
| When it comes to your own personal actions as they relate to climate change, which of the following comes closest to describing you? Select all that apply. <sup>b</sup> |                                             |                                            |                                                      |
| I can and I am making a positive difference.                                                                                                                             | 24 (31.6)                                   | 3 (37.5)                                   | 27 (32.1)                                            |
| I can make a positive difference, but I am not sure how.                                                                                                                 | 32 (42.1)                                   | 3 (37.5)                                   | 35 (41.7)                                            |
| There is little I can do, but I wish I could do something.                                                                                                               | 24 (31.6)                                   | 2 (25.0)                                   | 26 (31.0)                                            |
| Undecided                                                                                                                                                                | 14 (18.4)                                   | 0 (0)                                      | 14 (16.7)                                            |
| How confident are you that the world will successfully address the causes and consequences of climate change? <sup>c,d</sup>                                             |                                             |                                            |                                                      |
| Very optimistic                                                                                                                                                          | 14 (18.4)                                   | 2 (25.0)                                   | 16 (19.0)                                            |
| Somewhat optimistic                                                                                                                                                      | 22 (29.0)                                   | 2 (25.0)                                   | 24 (28.6)                                            |
| Up in the air                                                                                                                                                            | 32 (42.1)                                   | 3 (37.5)                                   | 35 (41.7)                                            |
| Very pessimistic                                                                                                                                                         | 10 (13.2)                                   | 0 (0)                                      | 10 (11.9)                                            |
| Which do you believe will impact your life more going forward? <sup>e,f</sup>                                                                                            |                                             |                                            |                                                      |
| The next 5 years of climate change                                                                                                                                       | 38 (50.0)                                   | 3 (42.9)                                   | 41 (49.4)                                            |
| COVID-19 in the past year (2020–2021) and climate change over the next 5 years                                                                                           | 8 (10.5)                                    | 3 (42.9)                                   | 11 (13.3)                                            |
| How would you characterize environmental justice in the United States? <sup>c,g</sup>                                                                                    |                                             |                                            |                                                      |
| Very strong                                                                                                                                                              | 12 (15.8)                                   | 2 (25.0)                                   | 14 (16.7)                                            |
| Generally good                                                                                                                                                           | 30 (39.5)                                   | 3 (37.5)                                   | 33 (39.3)                                            |
| Could use improvement                                                                                                                                                    | 42 (55.3)                                   | 2 (25.0)                                   | 44 (52.4)                                            |

*Note.* The Climate Change Awareness Survey was created by the Student Conservation Association (2021) and was adapted by the New Jersey Safe Schools Program for use in 2022–2023 (Shendell et al., 2023).

<sup>a</sup> Overall, 29% of participants who took the English course believed they could help by eating vegetarian, and 12.5% of participants in the Spanish course said the same (data not shown).

<sup>b</sup> A total of 14.5% of the English course participants chose, “There is little I can do and I am fine with that,” and 12.5% of participants in the Spanish course also chose this option (data not shown).

<sup>c</sup> This question was “select all that apply” for participants in the English course but not for participants in the Spanish course.

<sup>d</sup> In the English course, 35.5% of participants were somewhat pessimistic. In the Spanish course, 12.5% of participants chose this option (data not shown).

<sup>e</sup> One participant in the Spanish course did not answer this question (*N* = 83).

<sup>f</sup> There was a difference between groups: 37.4% of participants from the English course agreed that only the COVID-19 years were more impactful than the next 5 years of climate change, whereas 14.3% of participants who took the Spanish course agreed with this statement (data not shown).

<sup>g</sup> A total of 10.5% of participants in the English course thought environmental justice in the U.S. is extremely inequitable. Similarly, 12.5% of Spanish participants agreed with this statement (data not shown).

lessen their impact on the environment (Table 4). Most participants believed that excess greenhouse gases, water pollution, deforestation, and toxic materials are major problems. When all participants were combined, a smaller percentage of participants reported that they believed noise pollution is a major problem (Table 5).

More participants (49%) believed that the next 5 years of climate change will impact their life more than the past year of COVID-19 (37%) or than the combination of both (13%) (Table 4). Most of the participants (73%; 66 of 80 because 4 answers were missing) were at least a little familiar with environmental justice, and more than one half believed that

environmental justice in the U.S. could use improvement or is extremely inequitable. In addition, a majority (69%) of participants believed that environmental justice is part of conserving our environment and is not a separate issue (Table 4). Lastly, more than one half of the participants (59%) believed that there is still time to prevent the worst effects of climate

change, and about one half of the participants believed it will require major sacrifices (50%) or minor sacrifices (46%).

## Discussion

The goal of this pilot was to translate the NJSS online course, *Introduction to High School Students to Climate Change, Sustainability, and Environmental Justice*, into Spanish to make it more accessible. The course mainly focused on Spanish-speaking student knowledge of climate change, sustainability, and environmental justice. During the translation of this course, many new resources in Spanish were found to inform the understanding of aspects of climate change and of environmental justice.

Out of 37 registrants from both New Jersey and Texas, this course had 10 participants (students and teachers) finish (27% completion rate). Teachers who took the course provided feedback after completing the course. Feedback from different regions in the U.S. helped improve this course. Comments allowed for more diverse viewpoints and assisted in the NJSS goal of helping local high school teachers address and teach about inequities and socioeconomic disparities.

In the knowledge checks, individuals in the Spanish course scored slightly lower than individuals in the English course (Shendell et al., 2023), at approximately 85% versus 90%, respectively. This difference can be attributed in part to the smaller sample size. The overall average scores for each knowledge check were similar, which suggests that the courses are comparable in conveying the necessary information. In both the English (Shendell et al., 2023) and Spanish versions of the course, knowledge check 2 had the lowest average score.

Both students in the English and Spanish course took the NJSS adapted *Climate Change Awareness Survey* by SCA (2021). Students answered similarly when given the same answer choices. Overall, participants believe the world's climate is changing, and it is an issue that will impact their lives in the next 5 years, compared with the last couple of years with COVID-19.

In our study, a majority of participants believed that environmental justice in the U.S. can be improved and believed excess amounts of water pollution, greenhouse gases, deforestation, and toxic materials are major problems. Many participants believed there is still time to prevent further damage and have

TABLE 5

### Conception of Major Problems From the Climate Change Awareness Survey

| Answer                                                                                                                                                                                                           | English Course<br>( <i>n</i> = 76)<br># (%) | Spanish Course<br>( <i>n</i> = 8)<br># (%) | Total From Both<br>Courses ( <i>N</i> = 84)<br># (%) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------|------------------------------------------------------|
| Do you believe that excess ___ is a major problem?                                                                                                                                                               |                                             |                                            |                                                      |
| Greenhouse gases                                                                                                                                                                                                 | 62 (81.6)                                   | 8 (100)                                    | 70 (83.3)                                            |
| Water pollution                                                                                                                                                                                                  | 62 (81.6)                                   | 8 (100)                                    | 70 (83.3)                                            |
| Deforestation                                                                                                                                                                                                    | 67 (88.2)                                   | 8 (100)                                    | 75 (89.3)                                            |
| Toxic materials                                                                                                                                                                                                  | 66 (88.2)                                   | 8 (100)                                    | 74 (88.1)                                            |
| Noise pollution                                                                                                                                                                                                  | 33 (43.4)                                   | 7 (87.5)                                   | 40 (47.6)                                            |
| <i>Note.</i> The Climate Change Awareness Survey was created by the Student Conservation Association (2021) and was adapted by the New Jersey Safe Schools Program for use in 2022–2023 (Shendell et al., 2023). |                                             |                                            |                                                      |

taken personal actions to lessen their impact on the climate. Most participants believed they can make a positive change, but some were (and may remain) unsure how to make such changes in their communities. More information with clear and actionable items that individuals can do to help make a positive change regarding climate change should be provided to students to help them to make positive changes in their communities.

## Limitations

The sample size in our study was small. Therefore, we cannot assume that participants in our study are representative of the Spanish-speaking youth population. Furthermore, many students who initially were enrolled in the course did not accept their invitation, which caused us in the data analysis to focus on the students who at a minimum started the course and the students who completed the course.

Additionally, the low response rate possibly is related to the fact the participating students did not receive credit or a certificate for completing the SCA survey. There was a low response to the SCA survey in Rutgers Canvas partially because it was optional and redirected participants to PsychData via an outside link. We recommend a needed adjustment of having the links for PsychData open directly within Rutgers Canvas in the future. Moreover, the SCA survey was not required to receive the certificate; therefore, some students did not take the survey.

## Conclusion

For our pilot study, a small sample size was used to prove the viability of this course in Spanish based on the English version. For future programs, however, the sample size should be increased to stratify evaluation data by demographics, including region. Participants reported satisfaction with the translated Spanish training course and that they would recommend it to others. A future pretest could consist of 20 climate change-related questions randomly selected from the existing knowledge checks in the translated course. Then this pretest could be coded in Rutgers Canvas as “required” to allow access to module 1. At the end of the course, the pretest could be beneficial in contrasting baseline knowledge of the participants versus the impact of this course on the knowledge levels among individuals who finish the course, based on module knowledge check scores and the SCA survey. The NJSS program hopes to make such continued improvements to the courses to allow for broader availability. 🌸

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## Did You Know?

Earth Day is April 22. Celebrated first in 1970, Earth Day mobilizes approximately 1 billion individuals for action every year across over 190 countries. The theme for Earth Day 2025 is “Our Power, Our Planet.” Learn more at [www.earthday.org](http://www.earthday.org).

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