

The NASA Innovations in Climate Education Project: “Instructional Strategies for Expanding Climate Change Concepts within Reading/Literacy Skills”

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Abstract

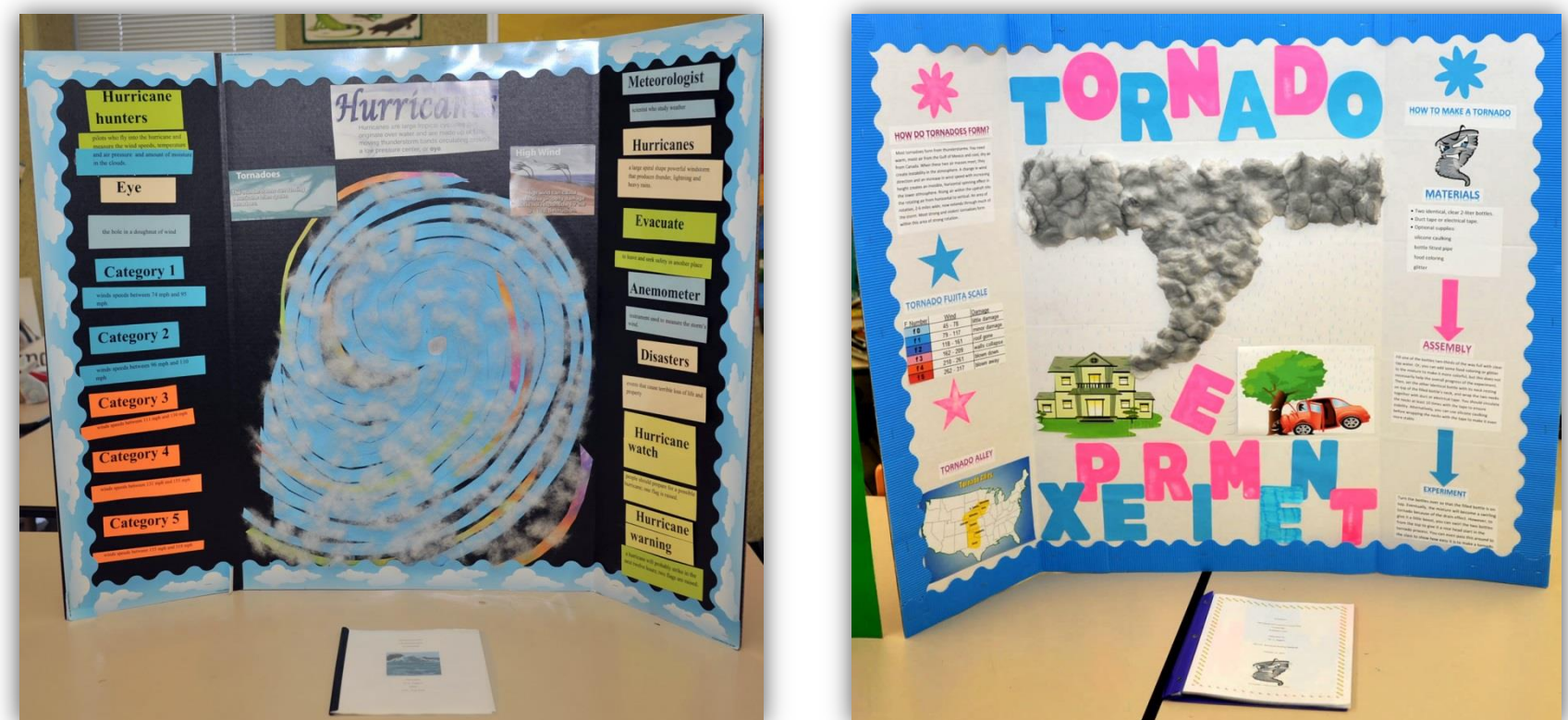
The Common Core State Standards (CCSS) provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. In 2010 the standards were designed to be robust and relevant to the real world, reflecting the knowledge and skills that young people need for success in college and careers. In 2013 the Next Generation Science Standards (NGSS) in connection with the CCSS developed revised science standards in performance, prior standards documents listed what students should know or understand, foundations were each performance expectation incorporates all three dimensions from a science or engineering practice, a core disciplinary idea, and a crosscutting concept, and coherence that connects each set of performance expectations lists connections to other ideas within the disciplines of science and engineering.

Elizabeth City State University (ECSU) in Elizabeth City, North Carolina has joined with the University of New Hampshire (UNH) in Durham, New Hampshire under the NASA Innovations in Climate Education (NICE) grant to empower faculty of education programs at Minority Serving Institutions (MSIs) to better engage their pre-service teachers in teaching and learning about global climate change through the use of NASA Earth observation sets. Specifically, professors from MSIs received training with Global Positioning Systems (GPS) and GES-DISC Interactive Online Visualization and Analysis Infrastructure (GIOVANNI) to engage pre-service teachers in facets of climate education.

Grambling State University faculty members served as participants of the NICE workshop for 2012 and were encouraged to develop lessons in climate education from information shared at the workshop. A corresponding project that incorporated the CCSS and NGSS at Grambling State University in Grambling, Louisiana was headed by Dr. Loretta Jaggers. This paper documents activities that pre-service students in the GSU Curriculum and Instruction Department (College of Education) ED 452-Advanced Seminar Methods course have implemented. Activities included: Critique of Climate Education (oceans) articles, Methodology instruction; and design of a grade specific daily science lesson plan based on Climate Education that focused on El Nino, La Nina, seasonal characteristics of the southern oceans and resources from a NASA NICE workshop packet. Lessons designed were implemented on-site of partner secondary schools. The implementation included a virtual component as Grambling and ECSU students interacted via a polycom environment during reports from ED 452-Advanced Seminar Methods students.

Methodology

Through participation in the NASA Innovations in Climate Education Summer Workshops (2011, 2012, 2013), Dr. Jaggers received a wealth diverse resources, information, and hands-on activities that served as a foundation for presenting the Climate Education concepts to candidates enrolled in her classes. Specifically, she made several Climate Education presentations to the candidates enrolled in ED 452. ED 452-Advanced Seminar Methods is a 6 hour undergraduate course that is designed to basically focus on the selection and use of appropriate content, activities, instructional strategies, and assessments necessary for meeting the diverse learner needs of early childhood and elementary students. One of the signature projects requires candidates to use the Common Core State Standards to design grade specific instructional lessons and design appropriate materials for implementing the grade specific lessons. Therefore, as a result of participating in the diverse Climate Education presentations (that included information and resources provided in the NASA Workshops), the candidates were able to effectively design and implement Daily lesson Plans and Thematic Units that related to specific Climate Education concepts.



The sequential preparation and implementation process included the following:

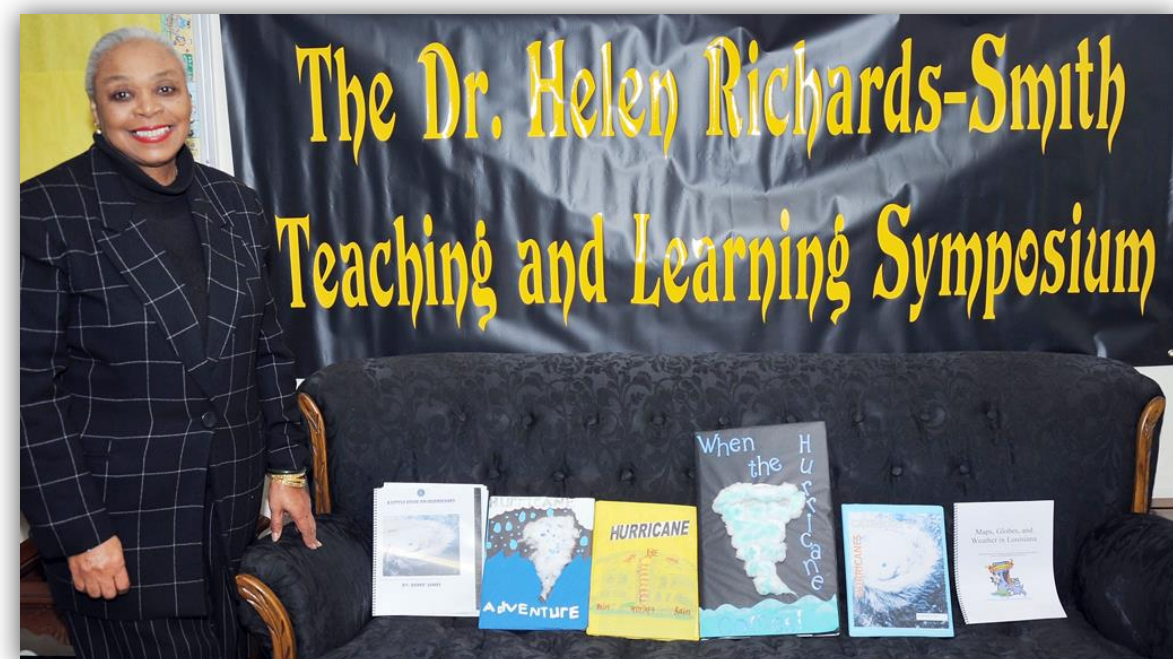
- First, Dr. Jaggers provided an introduction to Climate Education by using the 2011, 2012 2013 NASA/NICE Resource Packets, resources, and diverse strategies/activities that were provided.
- As a follow-up, the candidates reviewed, critiqued, and had in-class discussions of several articles on Climate Education Concepts.
- The candidates also made in-class oral presentations that focused on their specific Climate Education concept that they had selected for their lesson. This phase helped to insure that the candidates were very knowledgeable about their topic.
- Then the candidates reviewed the Common Core State Standards and selected the appropriate standard that served as a basis for their grade specific instructional lesson.
- Next, the candidates developed their instructional lessons and created the specific teacher-made devices to enhance the teaching-learning process.
- After presenting the instructional lessons through a micro-teaching activity in the university classroom, the candidates implemented their instructional lesson (using their teacher-made device) in the grade appropriate classroom at the on-site partnership school.
- The candidates presented their instructional lessons and teacher –made devices at the 2012 Dr. Helen Richards Smith American Education Seminar that was a polycom that was held jointly with Elizabeth City State University.
- Dr. Jaggers will present the Climate Change projects (designed and implemented by the candidates) at the 2013 Louisiana Reading Association Conference in Monroe, Louisiana. The focus of the presentation is to demonstrate how Climate Change concepts and specific Reading/Literacy skills can be enhanced through the diverse activities.



Analysis

The Climate Change Signature project was assessed by using several assessment measures. First, the Oral Presentation Rubric was used during an in-class activity to allow students to present and discuss their Climate Change concept to promote an increased knowledge and understanding of their selected Climate Change concept. Second, the Written Lesson Plan Rubric was used to assess the design of the appropriate instructional objectives, activities, materials, and assessment as related to the grade specific Common Core State Standard, the Climate Change concept, and the specific Reading/Literacy skill(s) emphasized. Third, the On-Site Lesson Delivery Rubric was used to assess the candidate’s ability to effectively implement the lesson. This component specifically emphasized how knowledgeable the candidate was about their specific Climate Change concept and how they effectively used the strategies and resources to implement the lesson in addition to their teacher-made device. The Impact on Student Learning data was reflected in the exemplary student work samples that the candidates shared as they provided feedback from the results of their implementation of the Climate Change Signature project at the on-site partnership school.

As a result of participating in the Climate Education Signature project, the assessment results revealed that the candidates gained a great deal of knowledge about the impact of Climate Change Concepts on our everyday lives. The candidates also stressed that they now have an increased awareness and understanding of “how to” infuse Climate Education throughout the instructional process. They further emphasized that they have a greater awareness of need to emphasize Climate Education concepts through-out the P-12 Curriculum. Finally, the candidates expressed that their students expressed that they learned a great deal about Climate Change Concepts. The candidates also stated that their students made some of the following comments: 1)“Climate Change activities were fun and exciting”; 2) “We learned a lot about Climate Change”; 3)” I have a better understanding of how Climate Change really makes a difference in our lives and what we do.”



Conclusion

The focus was to use the resources and activities presented during the NASA Innovations in Climate Education Summer Workshops (2011, 2012, and 2013). The purpose was to enable the candidates to plan and implement Climate Education instructional lessons in the partnership schools. The implementation process was very successful based on the formal and informal feedback from the candidates and the students that were involved.

Future Work

The Climate Change Signature Project will continue to be implemented in the Teacher Preparation program at GSU because of the very positive feedback received and the very positive impact of the program on the candidates and the students.

