

Innovative Inclusive Science Teacher Education

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Much of what science teachers are expected to know and be able to do is quite extensive. Highly-qualified science teachers are expected to have knowledge of science, inquiry, scientific practices, science pedagogy, curriculum, instruction, assessment, student learning, and student cognition. Equally, much is expected from science teacher educators who prepare preservice and inservice science teachers to possess the knowledge, skills, experiences, attitudes, and habits of mind essential to be a successful science teacher.

Currently, inclusion is a topic that is receiving more and more attention in science education research and science teacher education. As such, science teachers are now expected to know much about inclusion. However, inclusion is often an elusive term for both preservice and inservice teachers. And although science teachers commonly limit inclusion to the perspective of special education, inclusion encompasses a much broader view, which includes second language learning, diversity, underrepresented student populations, culturally relevant pedagogy, and intercultural pedagogy.



"Diversity and inclusion, while commonly conflated, are not the same. Inclusion speaks to whether individuals have equal access to opportunities and empowerment" ([Bumpus, 2015](#)). Similarly, [Pratt \(1997\)](#) expresses that inclusion is a belief that all students, regardless of labels, should be members of the general education community, and that students with and without disabilities should have access to the full range of curriculum options. Additionally, the [Howard Hughes Medical Institute](#) states that inclusive excellence emphasizes improving

the students' environment and to help schools find ways to significantly increase their capacity for inclusion so that students from all backgrounds — especially those from groups underrepresented in science — can excel. The Yale Center for Teaching and Learning provides the following statement on the topic:

“An inclusive classroom climate refers to an environment where all students feel supported intellectually and academically, and are extended a sense of belonging in the classroom. Inclusive classroom environments are sustained when instructors and students work together for thoughtfulness, respect, and academic excellence. Inclusive teaching strategies further strive to serve the needs of all students, regardless of background or identity. It builds upon an instructor's basic instinct to ensure that all students can participate fully in the learning process, while expanding perspectives through stimulating discussion and new approaches to traditional and contemporary issues.”

Moreover, the ASTE Position Statement on the Inclusion of Underserved Populations in Science Education urges all educators to highlight integration and inclusion for all students, and further provides seven noteworthy goals for science educators:

1. to insure that instructional adaptations are made to allow for students with physical disabilities to participate fully in laboratory and outdoor learning opportunities.
2. to access new technology for students with physical disabilities enabling them to participate in all facets of the instructional program by becoming informed about emerging technologies and acquiring these tools for student use during instruction.
3. to serve as advocates for underserved students to insure they are not advised to take classes which minimize the need for adaptations, special modification, or instructional accommodations within the instructional setting.
4. to provide opportunities for all students to socialize informally in and out of the classroom.
5. to create a caring, supporting atmosphere that tolerates and welcomes a wide range of student diversity.
6. to foster cooperative learning activities rather than competitive or individual tasks.
7. to provide opportunities for peer interaction, multi-age grouping, and group cohesiveness.



Thus in view of inclusion, science teacher educators will need to know how to develop various ways to engage preservice and inservice teachers with various dimensions of diversity, as well as best inclusive teaching strategies and practices in science education classrooms. Science teacher educators will also need to provide preservice and inservice teachers with guidance for the development of inclusive science curricula.

Accordingly, the *Innovations* journal is continuously in need of fresh new perspectives on innovative inclusive science teacher education and inclusive professional development. The *Innovations* journal provides a place for science teacher educators to share detailed descriptions of how their inclusive science teacher education programs or inclusive professional development programming is conducted. Innovative inclusive science teacher activities are also essential for science teacher educators and classroom teachers, as both attempt to improve science teaching and learning. Thus, we encourage science teacher educators, scientists, science coordinators and supervisors, and informal science educators who prepare and provide professional development for teachers of science at all grade levels to share their innovative ideas with our international science education community through the *Innovations* journal.



Innovations is the official peer-reviewed online practitioner journal of the ASTE that serves as a forum for disseminating effective instructional practices that are innovative and inspirational. Be sure to check out our website to learn more about publishing in *Innovations in Science Teacher Education* by using the following link: <http://innovations.theaste.org>. Please be sure to review the instructions for authors section prior to submitting to ensure that

your manuscript adheres to format guidelines and addresses each criterion. We look forward to receiving your manuscripts and want to thank everyone who is, and will be, participating in the submission and review of manuscripts.

If you have any questions regarding the *Innovations* journal, please contact Rommel Miranda (Rmiranda@towson.edu) or Ron Hermann (Rherrmann@towson.edu).