The 2013 American Meteorological Society (AMS) Symposium on Education continued its tradition of bringing together educators, researchers, professionals, and students to share innovations in education and increase the understanding of the role of educational activities and practices to benefit all ages of learners. The 2-day symposium included 32 oral presentations and 56 posters (available at online at https://ams.confex.com/ams/93Annual/webprogram/22EDUCATION.html).

Instruction and learning have moved well beyond presentations and lecturing and the organizing committee of the symposium aimed to model best practice in the structure of several sessions. This symposium was groundbreaking in that it included two nontraditional session formats: a panel discussion of award-winning instructors and an interactive format for sharing innovations in university and professional development; both sessions were evaluated.

The symposium also built on the recent direction of highlighting interdisciplinary, multiple stakeholder work around societally relevant themes, one such example is shared here.

Attendees to the symposium and other Annual Meeting attendees interested in advancing education issues in the atmospheric and related sciences participated in an Education Symposium Discussion at the conclusion of the symposium. The goal of the open discussion was to begin a dialog to inform future directions of both the Symposium on Education and the development of a broader AMS education community.

**THE AMS TWENTY-SECOND SYMPOSIUM ON EDUCATION**

**WHAT:** AMS Annual Meeting attendees from all professional avenues met to share innovations in teaching, best practices, and program highlights that advance education initiatives and learning of the atmospheric and related sciences, including the demonstration of best practices within a nontraditional session format and the integration of multiple stakeholders and learners for program success.

**WHEN:** 5–10 January 2013

**WHERE:** Austin, Texas

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**THEME 1: DEMONSTRATION OF BEST PRACTICES WITH NONTRADITIONAL SESSION FORMAT.** Panel of teaching award winners. Delivery of content via lecture format or as a presentation is typically less effective and conducive to learning than more interactive formats.
The symposium took the first steps in challenging the typical meeting presentation method with a panel discussion of the previous Teaching Excellence Award (TEA; now the Edward N. Lorenz Teaching Excellence Award) winners. The Teaching Excellence Award is given annually to an individual in recognition of sustained outstanding teaching and mentoring at the undergraduate and/or graduate levels in the atmospheric, oceanic, and related sciences. The panel session Creative and Effective Teaching in Challenging Times highlighted the talents and teaching experiences of recent TEA winners. Panel members included Steven Ackerman, University of Wisconsin–Madison (2009); Henry Fuelberg, Florida State University (2011); Robert Fovell, University of California, Los Angeles (2012); and Bruce Albrecht, University of Miami (2013). Each panelist provided a 15- to 20-min presentation in the style they typically use to teach classes. Each panelist provided a description and demonstration of their own innovative and interactive teaching methods, followed by a discussion about their teaching philosophy and style.

The panel session was very well received, with over 100 people in attendance—everyone from students to AMS fellows. Results of an audience survey show that they agreed or strongly agreed that the format of this session was more beneficial than a traditional oral presentation to learn about effective teaching. Participants indicated they would like to see this format used again in future symposiums. Attendees of the panel discussion suggested longer, more interactive demonstrations of teaching styles that are presented on an elevated stage in the room, along with the possibility of a panelwide debate discussing unique styles of teaching.

Interactive sessions. Building on the alternative presentation format of the panel discussion, the University and Professional Education Initiatives sessions offered a more interactive session format with a goal of providing a smaller, more intimate setting where presenters could interact with attendees. Five speakers presented innovative approaches to education through active participation by the audience. Presentation talks ranged from the impact of department social structure on teaching practices and community-based fieldwork for undergraduate research to comparative assessment of student learning with varied instructional deliveries to inform best practice.

The second interactive session consisted of four roundtable presentations that required a physical transformation of the room setup. Tables were placed in each corner with 20 to 25 chairs available for attendees to meet with the presenter at each table. Presenters conveyed their work via 10-min demonstrations with a short question-and-answer period after. Audience members rotated through the different demonstrations. Presenters demonstrated techniques to enhance problem solving, showed ways to use data in the classroom to facilitate undergraduate research, highlighted online resources for the instruction of tropical synoptic meteorology, and demonstrated instrumentation used to teach observation and data collection fundamentals. All of these sessions included one-on-one interaction between the presenter and the audience, as well as lively discussions that would not have been possible in the usual presentation format. The session was well attended with 65 to 90 participants at any given time during the session.

Evaluation analysis found that the format was well received. Attendees found the more intimate setting and the interaction between audience and speaker preferable to the traditional meeting lecture format. Improvements for similar future sessions will include more guidance to presenters to ensure that the focus is on interaction with attendees. The most significant challenge for the four concurrent interactive sessions was the physical setup of the room. Traditional conference room setup is not conducive to one-on-one interaction with the speaker, and the size of the room that is ideal for a traditional presentation is too small to break into multiple interactive groups. Sufficient lead time and planning is critical to coordinate the changes to the physical layout of the room with both the AMS staff and conference hall facility. These logistical issues are well worth overcoming to allow the level of interaction and “group thinking” that took place in the University and Professional Education Initiatives sessions.

Theme 2: Educational Benefits from Multiple Stakeholders. Instructional programs focused on complex topics, such as climate change and air pollution, are becoming more common in that they provide learners with multiple aspects of information and typically bring together multiple people with varying expertise. The depth and breadth of such programs is proving to be an effective way to reach students at multiple levels. Elaine Hampton and Tom Gill of The University of Texas at El Paso (UTEP) shared their program (Buen Ambiente-Buena Salud) experience that links UTEP with the U.S. Environmental Protection Agency (EPA), El Paso Independent School District (EPISD), and the North American Association for Environmental Education’s (NAAEE) Guidelines for Excellence.
The program is supported by the EPA and is designed to train UTEP students in air pollution science and engineering and then to place and provide financial support to them in summer air quality–related internships with a variety of agencies and corporations. The objective of the UTEP–EPA air quality internship and training program is to increase the number of future air quality professionals in the U.S.–Mexico border region by recruiting students and providing them with training, education, civic engagement, and internship opportunities in air quality–related fields.

In parallel, through a strong partnership with EPISD, curriculum lead writers and master science teachers at UTEP are creating curriculum modules that address local and regional air quality. Each year, all students in third grade through high school will experience at least one module of inquiry learning experiences about air pollution. Each unit aligns with state standards and addresses NAAEE’s Guidelines for Excellence to ensure that the students are engaged in inquiry learning with activities that lead to community or civic action. This is a unique curriculum modification in that environmental education, often ignored or addressed only slightly in enrichment lessons, will be formalized and institutionalized into the district’s full curriculum. Because El Paso is a bilingual community, activities are designed to enhance learning for English language learners.

The program draws on the social, economic, scientific, and political context of the community so that the students see the relevance to their border environment and the social justice context. By the 2014/15 school year, the curriculum will reach approximately 50,000 students each year—predominantly Hispanic students from communities whose members have been underrepresented in science, technology, engineering, and mathematics (STEM) careers.

**Building the education community.** The symposium concluded with an inclusive conversation about the Education Symposium. The goal was to seek ideas to make the symposium even more dynamic, to better connect it to research and other research-focused symposia, and to interest more Annual Meeting attendees in participating. Over 50 attendees provided feedback on the innovative sessions of the symposium, volunteered to serve on the symposium planning committee and other activities, and provided guidance and input to shape the 2014 Symposium on Education. All Society members are encouraged to help build the AMS education community through the Symposium on Education or any of the many education-focused activities the AMS supports.
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