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Build the Future of Science Communication in Developing Countries through Systematic Training of Young Scientists

To the Editor,

Science communication is an essential but often ignored aspect of scientific training. To this end, leading scientific societies and academic institutions have taken steps to ensure that undergraduate and graduate students are adequately trained to enable them to effectively communicate scientific findings to the public. For example, the American Association for the Advancement of Science, an influential society, in its *Vision and Change for undergraduate biology education* suggested that students should be competent in "communication and collaboration" (1). Several universities have successfully developed and implemented programs aimed at providing students with essential skills and "hands-on" training in scientific outreach. One such report was provided by Goldina and Weeks (3) on the development of a science café course to train undergraduate biology students to become ambassadors of science through the design and delivery of outreach activities on topics important to science and society. Furthermore, Cameron and colleagues (2) showed in a survey of graduate students and postdoctoral fellows at a leading university in the United States that interest and productivity in science communication activities predict intention to remain in scientific careers, suggesting that early-career scientists who actively engage in outreach activities are more likely to continue pursuing research careers than those who do not. This adds to the growing body of evidence showing that early introduction of scientists to public engagement is necessary in developing sustainable efforts to bridge the gap between scientists and the public.

We have also read with great interest articles in the recent *Journal of Microbiology & Biology Education (JMBE)* themed issue on scientific citizenship. We applaud the journal, the Editor-in-Chief, and the American Society for Microbiology for the pioneering effort in providing a dedicated platform for discussion and note sharing on this important topic. In the themed issue, Shah and Martinez (8) advocated for stronger scientist-school partnerships as a means to strengthen education at the K-12 level. In addition, Webb shared experience of a student-led service-learning program that was mutually beneficial to outreach providers and participants (9), as Wilson and colleagues provided evidence that involving high school students in local community-relevant university research increases their interest in science (10).

While we share in the excitement of the increasing development of science communication training efforts in many academic establishments, we are simultaneously worried that most of such efforts are limited to institutions in North America and Europe. Author affiliations in the *JMBE* scientific citizenship issue provide an indication of this. Scientific outreach training efforts are particularly lacking in developing countries, where public engagement suffers from multiple, often-peculiar challenges. In some of these countries, scientific research is perceived as a curiosity of little benefit to local communities (7). Science development efforts should therefore not overlook the importance of public engagement, since scientific progress is closely linked with citizen engagement (6). Identifying meaningful and sustainable ways to engage the public must be a priority for the research community in the developing world (4, 5, 11). We acknowledge that while there remains an urgent need for institutional reforms to incorporate science communication training (5), the lack of model programs in the literature from specific developing-country contexts remains a major challenge. Although we cannot rule out the possibility that useful models exist, the fact that such models remain unreported rather precludes the opportunity for others to learn from and extend existing initiatives. We therefore call on the scientific community in these countries to get better involved in science communication activities and also devise appropriate methods of training budding scientists in this skill. We ask that those already involved in these activities also share their experiences with the wider scientific community, as this may provide exemplary approaches for the development of training initiatives aimed at building capacity for designing innovative solutions to public engagement.

Sincerely,

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