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The Innovative Technology Experiences for Students and Teachers (ITEST) program

was established by the National Science Foundation (NSF) to help ensure the breadth and depth of the Science, Technology, Engineering, and Mathematics (STEM) workforce, in direct response to concerns and projections about the growing demand for and current shortages of STEM professionals in the U.S. The STEM Learning and Research (STELAR) Center at Education Development Center, Inc., in partnership with the EdLab Group, assists ITEST principal investigators (PIs) and evaluators to design, refine, and evaluate their ITEST projects and to synthesize and disseminate project findings effectively. These periodic *DataBriefs* explore results reported by ITEST project leaders through the Management Information System (MIS), which collects information each year from all active ITEST projects about what the projects do, whom they serve, and their successes and challenges.

For more information, questions, or comments:

<http://stelar.edc.org>
stelar@edc.org



Project Strategies to Engage Underrepresented Populations

The ITEST program specifically targets its work toward engaging the participation of youth who have been traditionally underrepresented in post-secondary STEM education and the STEM workforce, including, but not limited to, "... women, underrepresented minorities (African Americans, Hispanics, Native Americans, Alaska Natives, Native Hawaiian and other Pacific Islanders) and persons with disabilities" ([2014 NSF ITEST solicitation](#)). How do projects do this?

A [2012 *DataBrief*](#) describing the work of ITEST projects found that many ITEST projects do indeed target their services to underrepresented populations. Approximately 70% of projects in the 2011-2012 school year targeted African American students, Hispanic students, and/or students eligible for free or reduced price lunch. Other underrepresented populations were also targeted, albeit by a smaller number of projects. This *DataBrief* extends the previous findings by presenting data on how projects engage these participant populations. Specifically, the 2012-2013 MIS asked ITEST project leaders to describe the strategies they used to engage participants from underrepresented groups. The ITEST program funded 75 projects during the 2012-2013 school year and 64 projects completed the MIS. This *DataBrief* reports on the strategies described by project leaders and the patterns that emerged across projects.

Of the 64 active projects that completed the MIS in 2012-2013, 58 projects provided information in response to the question, "What specific strategies were used over the last year to broaden participation in your activities to traditionally underrepresented populations?" Responses to the question fell into one or more of the following four categories: targeted recruitment, cultural competence, strategic partnerships, and active marketing.

Targeted Recruitment

Forty projects (69%) reported engaging in some type of targeted recruitment. Ten of them noted explicitly that their targeting started in the planning phase, with a decision about the kinds of youth they would seek to enroll. Some projects were interested in serving youth from any of the groups that are traditionally underrepresented in STEM. Others specifically targeted youth from certain racial or ethnic backgrounds, youth from low-income families, girls, or in one case, youth with disabilities. A few PIs strove for a broad mix of participants, including white and middle class youth along with those from underrepresented groups. A few projects set numeric goals, such as attracting an enrollment that was 50% female.

Many recruitment strategies involved deciding where to look for the type of youth sought. Twenty-eight projects said they partnered with or recruited in districts, schools, or out-of-school-time programs that served one or more populations of interest. Five other projects recruited in specific geographic areas.



Cultural Competence

Nineteen projects (33%) mentioned strategies that fell under the category of cultural competence; in some cases, cultural competence overlapped with other strategies for broadening participation. Understanding where and how the people in targeted communities live, as well as their interests and motivations, informed some projects' decisions about the kinds of marketing, partnerships, and content they developed to reach and serve underrepresented youth. Several projects made deliberate efforts to be aware of and responsive to the cultures of their target populations, including incorporating a sense of place, the arts, community values, language, and family routines. One PI described, "Most [of our participants] are from first or second generation immigrant groups. Our strategy is to involve young people in entrepreneurship activities that have value to the local community..." Other projects designed their programs around the needs of parents and families. For example, one project offered spots "in the free after-school program...to siblings [so] that childcare duties at home [did not] prevent low SES students from attending."

Some projects chose or developed content that they thought would be particularly relevant and engaging for underrepresented youth, based on either their cultural backgrounds or other demographic characteristics. For example, one curriculum was "intended to be equally appealing to boys and girls," and another was described as "particularly relevant to students with disabilities." Some of the content choices were research-based, as in the program that "infused social relevance... by having the students develop an instructional math-based game for first and second graders [because] social relevance is correlated with motivational factors."

Strategic Partnerships

A separate question on the MIS asked projects to check off the types of institutional partners with whom they worked (see box). Despite the large numbers of projects that involve a range of institutional partners within the ITEST program, only 11 projects (19%) specifically mentioned using partnerships in order to engage participants from underrepresented groups. Of these 11, some forged relationships with groups that had well-established connections to underrepresented youth, including community and not-for-profit organizations, such as the Girl Scouts. Some projects, particularly those that worked with Native Americans, Alaskan Natives, or Hawaiian Natives, made concerted efforts to involve community members. Said one PI, "We work with two local and neighboring American Indian communities. Through focused and collaborative efforts (community meetings, hiring of community liaisons, and numerous opportunities to join community events) we have been able to develop a holistic and culturally relevant STEM curriculum." Members of the local community or adults with demographics similar to those of youth participants were recruited by some projects to provide role models for underrepresented youth. For example, one project decided to "host engineering events with Hispanic community members in STEM fields," and another was "able to recruit several minority teachers and a large number of female teachers." Other projects took advantage of program graduates to reach out to potential new participants.

Active Marketing

The four projects that identified marketing strategies for increasing participation of underrepresented populations stressed the need to be energetic and strategic when spreading the word about openings in their programs. They relied on a variety of methods: as one PI said, "We recruit through email distributions, surface-mailed recruitment posters, online application forms, phone calls, follow-up visits, and classroom visits." Two projects made creative use of videos that showed their programs in action. One of the projects documented "student success stories and [featured] ... students of diverse ethnic and socioeconomic backgrounds."

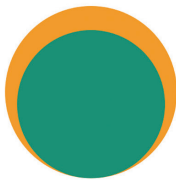


"Our strategy is to involve young people in entrepreneurship activities that have value to the local community..." ITEST PI

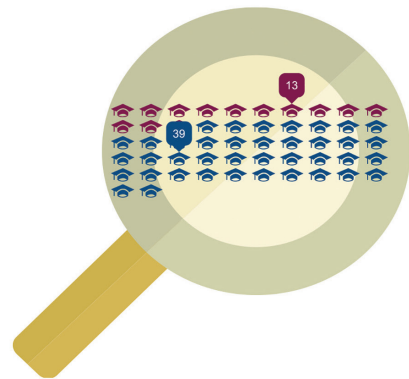


ITEST projects worked with diverse partners

All projects had at least one partner institution...



...and 86% had more than one



More projects worked with schools and universities than with other partners...



...and 13 out of 52 higher education partners (25%) were Historically Black Colleges or Universities, Hispanic serving institutions, or other minority serving institutions

Summary

While the results presented in this *DataBrief* may not encompass the entirety of strategies used by projects to broaden participation, they represent the most salient strategies as determined by the PIs describing them. Most of the projects who responded to the 2012–2013 MIS were taking active steps to broaden participation to underrepresented groups; the majority through targeting specific populations, but some also by incorporating culturally relevant design into the projects themselves. All projects partnered with at least one institution; the majority with schools or universities, but some also had other partners, including businesses, science museums, and community organizations. Twenty-five percent of the 52 projects that worked with colleges and universities partnered with minority-serving institutions.

With long term program goals of increasing the numbers of youth from underrepresented groups who enter the STEM pipeline and opt for STEM careers, ITEST projects aim to do more than just encourage participation in discrete project activities. Building their partnerships, marketing, and recruitment strategies, as well as their project activities, within a cultural framework aligned with the lived experiences of their participants may be one way to reach those goals.

Describing the strategies projects use to broaden participation is just one part of the story. Knowing who actually participates in the projects can help to measure the success of the strategies, and determining the number of youth participants who eventually join the STEM workforce would be an even more useful indicator of success. The issue of long term impact is a complicated one for several reasons. ITEST projects represent a diversity of project designs, with some projects working directly with youth out of school over long periods of time, others working with youth in school, still others targeting the teachers who then work with youth. In addition, years can often elapse between youth participation in ITEST and joining the STEM workforce. As the ITEST program matures, the community of practice is increasingly addressing challenges related to longitudinal research, methods and common instrumentation, improving the ability to quantify the program’s long term impact.

