



ITEST Management Information System 2010: Final Report Describing Active ITEST Projects

EXECUTIVE SUMMARY

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Executive Summary

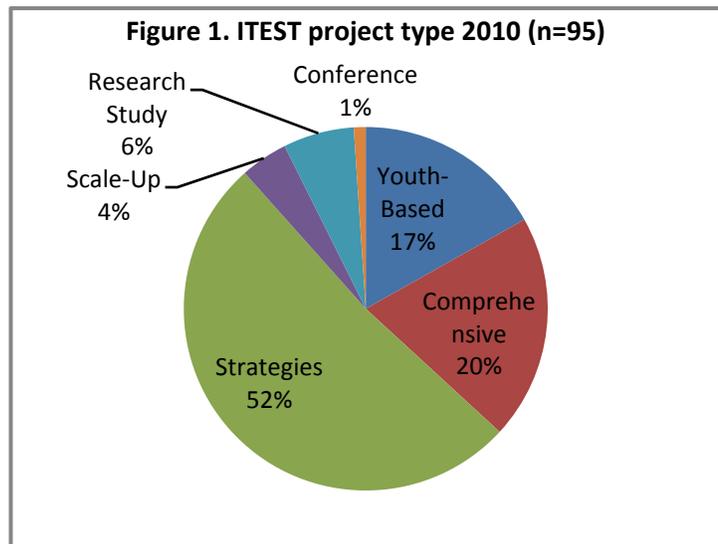
In 2003, the ITEST Learning Resource Center (LRC) at Education Development Center, Inc. (EDC), was funded to provide technical assistance and support to ITEST projects. As the program matured, questions about ITEST projects increased in both frequency and number, and it became apparent that the rapid response of the ITEST community to each set of questions was insufficient to meet the informational needs of a mature National Science Foundation (NSF) program. It was clear that ITEST would benefit from a comprehensive information system that contained accurate data describing ITEST projects. In coordination with NSF program officers, the LRC defined the following goal for the ITEST Management Information System (MIS): *To inform NSF, the LRC, the ITEST projects, the field, and other stakeholders as to the state of ITEST: who participates, how often, when, and in what kind of activities.*

In the fall of 2009, the MIS survey was administered to newly awarded and active projects, covering four years of funding. In 2010, these same projects completed their second MIS, and newly funded projects were asked to complete it as well. This report presents a selection of the results collected in four principal areas: (1) a description of ITEST projects and what they do, (2) a description of who participates in ITEST projects, (3) a summary of dissemination practices, and (4) a summary of research and evaluation practices.

Description of ITEST projects

Of the 119 projects from the most recent cohorts (4–8) that were asked to complete the 2010 MIS, 95 projects completed it by the deadline (80%). Cohort 4 (whose projects ended in 2009 unless they got a no-cost-extension) was asked to complete the final version of the MIS describing outcomes over the life of the project. Cohorts 5–7 completed the annual version describing activities in the previous year, and Cohort 8 completed the baseline version describing planned activities.

For the first five years of ITEST, projects were defined either as youth-based or comprehensive (focused on teacher professional development). Beginning in 2008, the program was revised, and projects were placed into one of four categories: strategies, scale-up projects, research studies, or conferences. (See Figure 1.) The strategies and scale-up categories encompass both youth-based and comprehensive projects, keeping ITEST's dual focus on both informal and formal education. Of the five cohorts included in this year's MIS, two were funded under the old definitions, and three under the new. More than half of the projects that completed the MIS (52%) are identified as strategies.



ITEST projects can also be classified by their content focus. The three largest areas of primary focus are computer science (38%), engineering (25%), and environmental science (22%),

followed by bioscience (10%) and mathematics (3%). The division of content focus is basically unchanged from 2009.

ITEST projects use technologies in innovative ways. The kinds of technologies they use are ever changing as the technologies themselves change. The five most commonly used technology tools are visualization and computer modeling tools, programming tools, data analysis and computation tools, multimedia tools, and communication tools.

In addition to specific technology tools, ITEST projects promote different technology skills. A comparison between the technology skills reported in 2009 and 2010 reveals that skills most frequently cited in both years remain similar; these skills include computing and data analysis, visualization and modeling, and computational thinking.

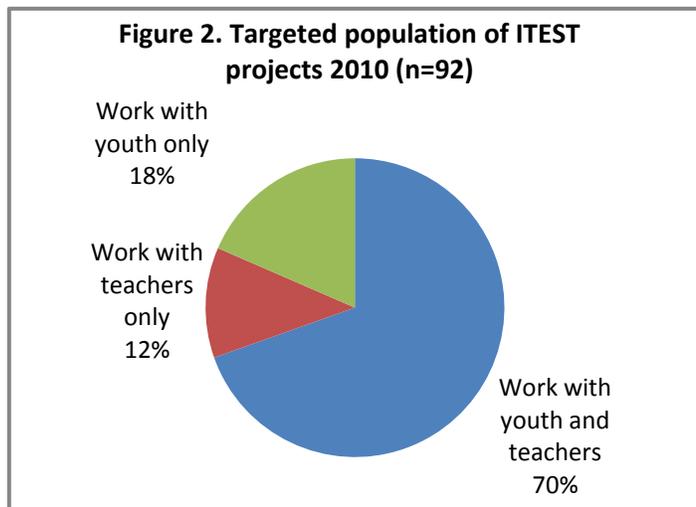
Principal investigators (PIs) were also asked to identify the primary components of their projects. For 65 projects (71%), technology-based learning was one of the primary emphases of the project. Other frequently mentioned components included career skills development (47%) and classroom work (45%). Projects were less likely to report engagement of caregivers or parents as an essential element; only 14% reported this as a primary component.

2010 ITEST Project Participants

Of the projects that completed the MIS in 2010, 70% work with both youth and teachers in some component of the project; 18% work only with youth, and 12% work only with teachers.¹ (See Figure 2.)

More than 80% of projects work in urban areas, and of those, 19 projects (30%) are exclusively focused on urban areas. Of the 60 projects that work in rural areas, 9 projects (15%) are exclusively focused on rural areas. Sixty-three projects work in more than one geographic area.

More than 70% of projects work at the high school level, and 64% work in middle schools. Eleven projects work in grades 3–5, while only two projects work in grades K–2. Although the ITEST program began with a focus on middle and high school, and only in the last two years has it broadened the target groups to include elementary school, 4 of the 11 projects targeting youth at the elementary level are in cohorts that were funded before this change in focus occurred.



ITEST projects, as part of their mission, target youth who have generally been underrepresented in the science, technology, engineering, and mathematics (STEM) fields. More than 80% of

¹ In 2009 only 2% of projects reported working only with teachers, but the change may be a result of changes in reporting formats. Some projects count the students who are taught by their teachers as part of the project, while others do not.

projects target either African American or Hispanic students, or both. A smaller portion of projects target American Indians (49%) and Pacific Islanders (23%). No project exclusively targets Native Hawaiians, Alaska Natives, or Pacific Islanders. Three projects exclusively target American Indians.

More than 80% of the projects target students who qualify for free/reduced price lunch, in sync with the ITEST mission to reach underrepresented groups. Ten projects (12%) are specifically designed to work with girls only. The 22 projects working with students with disabilities (27%) and the 26 projects working with students participating in gifted/talented programs (32%) work with these groups as part of their overall population, rather than designing the projects to meet their specific needs.

When asked to identify the various settings in which they work with students, projects most frequently cited 1- to 2-week summer sessions (64%), afterschool programs (53%), and in-school programs (51%). While nearly half of the projects reported the use of short summer sessions with youth, only 21% indicated they hold summer sessions lasting more than two weeks.

When asked to identify the various settings in which they work with teachers, projects most frequently cited the following: summer programs (81%), professional development days during the academic year (55%), afterschool programs (53%), and summer youth institutes (53%). Between 2009 and 2010, the projects using social networking increased from 32% to 41% while using distance learning increased from 22% to 33%.

Not surprisingly, the mean number of youth served varies greatly between those focused on in-school settings and those focused on out-of-school settings. For projects in in-school settings the mean ranges from 640 to 758 per year, while in out-of-school settings the mean number served is just over 100 youth per year. The larger mean served in in-school settings probably reflects working in multiple classrooms, and includes youth reached through teacher professional development. As with the youth, the mean number of teachers served per year has remained fairly constant over time, with a mean of 26–27 teachers served per project per year.

Dissemination

The most common target audience for dissemination in both 2009 and 2010 was educators (82% and 94%). However, the percentage of projects identifying a broad range of target audiences increased from 2009 to 2010: In 2010, more than 50% of the projects identified target audiences of researchers, youth, the public, and parents in addition to educators.

The 2010 MIS included a number of new items, one of which was to gather information about conference presentations. ITEST PIs present at many different conferences. Besides the conferences listed in Table 1, 44 PIs presented at conferences not listed in the table. In addition, 40% of PIs presented at least once with another ITEST project, indicating a high level of collaboration across projects.

Table 1. Number and percentage of projects presenting at conferences 2010

	Frequency	Percent
National Science Teachers Association (NSTA)	33	35
American Educational Research Association (AERA)	26	27
Society for Information Technology and Teacher Education (SITE)	25	26
International Society for Technology in Education (ISTE)	21	22
American Evaluation Association (AEA)	8	8
Association for Science Teacher Education (ASTE)	7	7
International Technology and Engineering Educators Association (ITEEA)	6	6
American Society for Engineering Education (ASEE)	5	5
Association of Science-Technology Centers (ASTC)	5	5
National Afterschool Association (NAA)	5	5
League for Innovation Science, Technology, Engineering and Math (STEMtech)	5	5
Serious Games	3	3
National Education Association (NEA)	1	1

*Forty-four projects (46%) presented at conferences not in this table.

Project research and evaluation

Of the 95 projects that completed the MIS, 85 affirmed that they will measure, or are measuring, changes in youth interest in STEM and/or STEM careers. More than 50% of projects use some form of mixed methods, while 6 projects are using experimental design, and 30 projects are using quasi-experimental design. Of the 85 projects, 28 projects reported outcomes on the MIS; the rest are currently in the data collection phase, have not yet begun to collect data, or do not collect data in the format requested for the MIS. Across the 28 projects, 49% of youth demonstrated an increase in STEM interest over the previous year; 44% showed no change; and only 7% showed a decrease in STEM interest.

While only 28 projects were able to report on the specific outcome of youth changes in STEM interest, many more projects are increasing the amount of research and evaluation in their project. As noted earlier, 85 projects measure or will measure changes in youth interest in STEM and/or STEM careers. Of those, 72 projects plan to measure the statistical significance of their findings. Forty-one projects are using a scale developed through statistical procedures to measure youth changes in STEM and/or STEM career interest. Twelve projects (8 research, 1 strategies, and 3 scale-up) provided their research questions in the MIS. The questions fall into three categories: (1) measuring the impact of the intervention on teacher participants, (2) measuring the impact of the intervention on youth participants, and (3) describing intervention characteristics. Not surprisingly, the majority of the questions focus on the impact on youth participants; however, the intermediary outcomes of impacts on teachers and the descriptive questions about intervention characteristics are also important areas of focus for the projects.

The response rate for the MIS continues to be strong, with 80% of PIs completing the MIS survey in each of the two years that it has been administered. Of eligible projects, 68% have completed both years; the longitudinal data collected are an important source of information about ITEST projects.

Full Report: http://itestlrc.edc.org/sites/itestlrc.edc.org/files/2010_ITEST_MIS_Final_Report.pdf