

Seven Lessons Learned Over Eight Years of Hosting the National ITEST Learning Resource Center



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ITEST program goals

- **To produce research findings** that build knowledge about approaches, models, and interventions with youth and educators that are most likely to increase the nation's capacity and innovation in the STEM workplace of the future.
- **To develop, implement, study and evaluate strategies** that encourage youth to develop interest in and to be prepared for careers in the STEM workforce of the future.
- **To equip teachers with the resources** to ensure that their students consider choosing and are prepared to enter the STEM workforce of the future.



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ITEST Portfolio (see snapshot)

- The ITEST experience—including **181 projects across 41 states**—helps young people and teachers build the skills and knowledge needed to succeed in a technologically rich society.
- Starting in 2003, the NSF ITEST program impacts more than:
 - 212,040 K–12 students
 - 7,261 educators
 - 2,020 parents and caregivers



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ITEST Learning Resource Center Revised Logic Model – June, 2010

<p>ITEST Program Goals (Solicitation 09-506):</p> <ul style="list-style-type: none"> • To produce research findings that build knowledge about approaches, models, and interventions with youth and educators that are most likely to increase the nation’s capacity and innovation in the STEM workforce of the future. • To develop, implement, study and evaluate strategies that encourage youth to develop interest in and to be prepared for careers in the STEM workforce of the future. • To equip teachers with the resources to ensure that their students consider choosing and are prepared to enter the STEM workforce of the future.
<p>ITEST LRC Mission: To support achievement of the ITEST program goals through:</p> <ul style="list-style-type: none"> • Increased knowledge and capacity among ITEST PIs and their teams to design, evaluate and refine their work to achieve individual project goals • Synthesis, analysis and documentation of the collective experience and results of ITEST projects • Dissemination of the knowledge created in the ITEST program to inform the field of STEM workforce development
<p>ITEST LRC Target Audiences: a) Primary: All ITEST Projects (PIs, Evaluators, Project staff) & National Science Foundation b) Secondary: Other stakeholders in building the STEM pipeline (Professional Associations, Non-ITEST Educators, legislators, other policy makers) c) Tertiary: Student & educator participants of ITEST projects.</p>

<p>RESOURCES <i>In order to accomplish our activities, we will draw upon the following:</i></p>	<p>ACTIVITIES <i>In order to accomplish our goals, we will undertake the following activities:</i></p>	<p>OUTPUTS <i>We expect that once accomplished these activities will produce the following evidence:</i></p>	<p>SHORT- AND LONG- TERM OUTCOMES <i>We expect that if carried out, these activities will lead to the following intermediate changes:</i></p>	<p>IMPACT <i>We expect that if carried out, these activities will have the following impact:</i></p>
<ul style="list-style-type: none"> ▪ ITEST PIs, evaluators, project staff and other audiences as identified above ▪ Sufficient staff with expertise to design and implement technical assistance, data gathering and dissemination activities ▪ Advisors and partners with science, engineering, and mathematics content knowledge, expertise and networks to inform and strengthen LRC activities ▪ Guidance, funding and support from NSF ▪ Knowledge sharing with other NSF resource centers through DRLnet, and others ▪ Innovative technologies, specifically collaborative and social media tools and infrastructure 	<p align="center">Technical Assistance and Collaboration</p> <ul style="list-style-type: none"> ▪ Provide community-wide and individual project technical assistance ▪ Provide an infrastructure for participation, collaboration, professional development ▪ Facilitate knowledge sharing; new knowledge generation and dissemination <hr/> <p align="center">Data Gathering and Synthesis</p> <ul style="list-style-type: none"> • Establish and maintain a system for collecting reports and other data from projects • Produce findings that describe the characteristics, knowledge generated and outcomes of ITEST projects <hr/> <p align="center">Dissemination</p> <ul style="list-style-type: none"> • Disseminate research, models, strategies and practices from the ITEST program 	<ul style="list-style-type: none"> ▪ Annual PI interest and expertise (TA) survey ▪ # TA events ▪ Annual Summit ▪ # liaison activities ▪ # small groups ▪ # publications* ▪ Website usage (<i>internal community</i>) ▪ # conference presentations* <hr/> <ul style="list-style-type: none"> ▪ MIS data collection and reporting ▪ Collection & synthesis of data from reports ▪ Database of information on ITEST projects & participants ▪ Yearly updated snapshot ▪ Yearly updated PAG ▪ Continually updated website ▪ Timely response to NSF information requests <hr/> <ul style="list-style-type: none"> ▪ # SIGs/Conference strands with professional associations* ▪ # publications* ▪ # conference presentations* ▪ Website usage (public) 	<ul style="list-style-type: none"> ▪ ITEST Community members report changes in practice due to participation in TA activities such as: <ul style="list-style-type: none"> ○ Complete TA survey ○ Attend TA events ○ Access online resources ○ Contact liaisons with updates and questions ▪ Small groups generate and disseminate new knowledge through webcasts, conference presentations, and publications ▪ NSF staff have the information needed to understand the ITEST portfolio, work effectively with PIs, and report to stakeholders within and outside of NSF ▪ ITEST projects are informed about the state of the ITEST program: who participates in ITEST projects, how often, when, and in what kind of activities ▪ Other stakeholders in building the STEM pipeline become aware of and use reports, research and resources from the ITEST program 	<ul style="list-style-type: none"> ▪ Increased student participation in the STEM workforce, especially by those currently underrepresented in STEM fields (maps to Goals 1 & 2) ▪ Increased knowledge, and adoption, of effective ITEST program models, interventions, strategies and research-based practices (maps to Goal 2 and 3) ▪ Learnings from the LRC evaluation can inform future resource center design for NSF and other funders’ programs
<p>* = Enabled by LRC</p>	<p>BENCHMARKS/INDICATORS:</p>		<p>PI/project satisfaction with TA events; Productive use of information from TA events and LRC liaison interaction by projects; Productive use of the LRC’s web portal by projects and others; LRC responsiveness to project needs; Extent of reach of information about ITEST, its projects, and their findings; Extent of follow-up conducted in response to TA provided</p>	

Lesson 1: Offer Collaborative TA through Community* Building and Multiple Methods

- **Approach:**
 - Work in collaboration with ITEST PIs, evaluators and project staff to identify expertise areas and interest in order to design capacity building activities and connections across the community
 - Members develop a sense of ownership and connection as they share their expertise and learn from each other
 - Offer primary contact at LRC for individual questions/assistance
- **Findings from external evaluator:**
 - PIs and evaluators feel that they are part of a community of practice
 - Appreciate multiple methods of connecting and getting information on specific topics at specific times of need (e.g. annual reporting overview)
 - 80% of PIs participated in one or more TA events and/or accessed materials
- **Response/adjustment:**
 - Continue to offer webinars, conference calls and written event summaries (InfoBriefs) that synthesize material. Continue to connect PIs & evaluators
 - Decreased number of online dialogs and increased synthesis and facilitation
 - Formed topical interest groups (TIGs)

* ITEST Community = 624+ PIs, evaluators and staff of 181 ITEST projects, NSF POs, LRC staff



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Lesson 2: Strengthen Collective Knowledge Through Long-term Community Involvement

- **Approach:**
 - Develop/maintain an infrastructure for participation that highlights/elevates individual projects and leverages learning into new knowledge
 - Emeritus vehicle for community participation beyond the funding period
 - Single point of contact
 - Project led/participatory activities/events (webinars/group presentations/papers/TIGs)
 - Create opportunities to leverage/share learning publicly/raise visibility of ITEST program through examples of individual projects/achievements
- **Results:**
 - The majority of PIs and evaluators choose to remain on e-discussion list
 - Many participate in other ways outlined above
- **Response/adjustment:**
 - Continue with program
 - Implement targeted outreach to PIs and evaluators for specific activities based on their expertise



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Lesson 3: Co-constructed Management Information System produces positive results in data collection

- **Approach:**
 - Voluntary data gathering around who participates in ITEST projects, how often, when and in what kind of activities
 - Understand value and maximize potential contribution of ITEST data; current and future data needs/research interests of PIs and NSF
 - Due diligence in MIS design coupled with broad-based input and collective decision making of ITEST COP on policies/procedures
 - Maintain sensitivity to PIs' time and resource constraints
- **Results:**
 - 89 projects (82% of active cohorts) completed the 1st round of MIS in Fall 2009
 - 95 projects (80% of active cohorts) completed 2nd round of surveys in Fall 2010
 - Reduced level of effort to respond to NSF inquiries related to ITEST
 - Consistent set of ITEST data increases accuracy and consistency of information describing the ITEST program
- **Response/adjustment:**
 - Ongoing attention to PIs' data needs/research interests
 - Develop policies/procedures for accessing data by external researchers
 - Test infrastructure/system for participant level data and longitudinal research



Lesson 4: Engage Organizations as Partners and Champions through synergistic activities

- **Approach:**
 - Identify national organizations with interests aligned with ITEST goals and audiences and engage them in activities that benefit their own constituents and provide opportunities to highlight and champion the ITEST program
- **Results:**
 - Society for Technology in Teacher Education - Co-chair Workforce Education SIG; dedicated JTATE, ITEST section in CITE
 - National Career Development Association – ITEST collaboration on Symposium on STEM-Centric Career Development
 - International Technology Education and Engineering Association (ITEEA) ½ day ITEST invitational meeting for ITEEA members and area educators
- **Response/adjustment:**
 - Implement a strategy that identifies target audiences, key messages and a process to engage partners in synergistic activities
 - Focus on high return activities that engage organizations and their membership



Lesson 5: Collaborative Dissemination Practices Leverage Learning/Increase Visibility of ITEST

- **Approach:**

- Establish a national presence for ITEST within constituent groups whose interests and goals are aligned with ITEST's by developing agreements with organizations to co-host ITEST group activities at national conferences/PI meetings
- Coordinate/organize ITEST submissions of group presentations/articles
- Coordinate annual legislative visits to help policy makers understand the ITEST program, its presence and impact on citizens in their districts

- **Results:**

- LRC organized 35 multiple-project conference presentations and presented the work of ITEST at 75 conferences, professional meetings, and advisory boards
- 200 LRC publications (website, InfoBriefs, e-news, snapshot, Ideabriefs, webinar archives)
- 3 journal articles, 2 special issues: co-edit ITEST dedicated JTATE; special section in CITE
- Collaborated with WGBH Educational Foundation on "Inside ITEST" video series

- **Response/adjustment**

- Target specific audiences/peer reviewed journals
- Develop/Disseminate models emerging from ITEST investments
- Cross agency collaborations



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Lesson 6 Collaboration Across Resource Centers Builds Capacity and Expands Opportunities for Programs, NSF and RCs

- **Approach:**

- Recognize common interests and goals
- Share expertise, challenges, strategies and tools
- Coordinate on cross-program conference presentations
- Create cross-program topical interest groups as applicable
- Open events (webinars) to and share resources with PIs in different programs

- **Results:**

- Each RC has strengths and areas of expertise based on focus of program – sharing builds capacity
- Cross-program conference presentations showcase findings from NSF-funded work on a broader scale than just one project/program

- **Response/adjustment:**

- Continue to collaborate with DRL, ATE and COSEE resource centers
- Remain open to collaboration with other programs' and divisions' resource centers
- Share lessons learned, tools and recommendations with NSF



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Lesson 7: Use Technology Strategically in Combination with a "Human Option"

- **Approach:**
 - Use technology tools to support both ITEST Community and public information needs
 - Review and upgrade information architecture as appropriate & as technology evolves
 - Also offer human option.
- **Findings from external evaluator:**
 - Community members want information accessible in multiple ways and easy ways to get when needed
 - Also, find it useful to be able to email or just pick up the phone and call an LRC staff member for assistance
- **Response/adjustment:**
 - Continue to balance human and technological support, ongoing changes to website/online community to increase ease of use
 - "Services brochure" provided to all new PIs and posted prominently on online community
 - Analysis of website usage statistics , and feedback from community and public to inform changes – e.g. driving more logins



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References

- "Preparing Tomorrow's STEM Workforce Through Exploration, Equity and Engagement" (EDC, Newton MA 2010)
<http://itestlrc.edc.org/publications/preparing-tomorrows-stem-workforce-through-exploration-equity-and-engagement>
Lessons learned from first 5 years as ITESTLRC, includes COP lit review
- ITEST website <http://itestlrc.edc.org/>
- Facebook: <http://www.facebook.com/pages/National-STEM-Learning-Resource-Center/101798609861119>
- Twitter: http://twitter.com/#!/ITEST_LRC
- RSS: <http://itestlrc.edc.org/rss.xml>
- Available upon request:
 - Annual reports
 - Resource Center Toolkit
 - ITEST LRC "services" brochure for community members



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