Positionality Matters: Understanding Culture and Context from the Perspective of Key Stakeholders

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Agenda

- Welcome and Overview
- Defining "stakeholders"
- ITEST Project presentations
- Small group discussions
- Large group report out

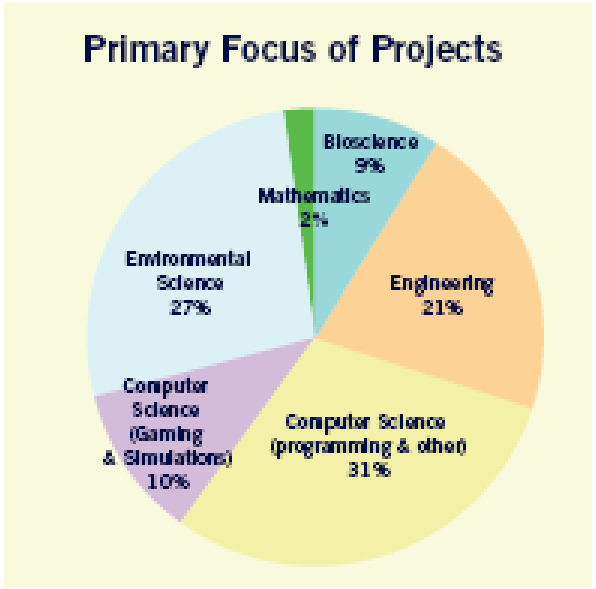
What is ITEST?

- The ITEST experience—including more than 161 projects across 39 states—helps young people and teachers build the skills and knowledge needed to succeed in a technologically rich society.
- Starting in 2003, through a $140 million federal investment from NSF, ITEST impacts more than:
  - 189,800 students, grades K–12
  - 6,800 teachers
  - 2,000 parents and caregivers

ITEST Portfolio

Mathematics includes the use of algebra, geometry, calculus, and other mathematical principles to solve real world problems

Environmental Science includes GIS/GPS, remote sensing technology, climate modeling, and ecological research and analysis



Bioscience includes bioinformatics, biotechnology, DNA analysis/sequencing, and biomedicine

Computer Science includes: programming; web development; multimedia – audio, video and animation; computer hardware; general skills and mathematics

Computer Science – Gaming & Simulations includes use and creation of gaming and simulations in formal & informal education

Engineering includes aerospace, design, robotics and nanotechnology

NSF

ITEST Learning Resource Center

EDC

Defining Stakeholders

- For the purpose of this discussion we will discuss 3 stakeholder groups (Cronbach et al., 1980)
  - Decision makers
  - Implementers
  - Recipients

POSITIONALITY MATTERS: UNDERSTANDING CULTURE AND CONTEXT FROM THE PERSPECTIVE OF KEY STAKEHOLDERS

Presented by:
Araceli M. Ortiz

AMERICAN EVALUATION ASSOCIATION

November 13, 2010

Chicago Pre-College Science and Engineering Program

- The Chicago Pre-College Science and Engineering Program (ChiS&E) was developed in January 2008. ChiS&E received an NSF ITEST grant in 2009.

- ChiS&E takes its inspiration from the programs developed and implemented by the Detroit Area Pre-College Engineering Program (DAPCEP).

- DAPCEP was established in 1976 and now provides out-of-school and in-school activities to more than 5000 students in grades K - 12 in more than 64 schools in the Detroit Public Schools.

- ChiS&E has developed a partnership with Chicago Public Schools and reached out to local foundations, corporations, universities, museums, and other nonprofit organizations

The Science, Engineering, and Technology for Students, Educators, and Parents (SETSEP)

- From kindergarten to third grade, young scientists participate in two 4-week Saturday sessions.
- The initial program began with 60 Kindergarten c hildren and their parents.
- Each year additional parents and students will be added.

	Yr-1	Yr-2	Yr-3
Students	60	120	380
Parents	60	120	380
Teachers	8	16	44

- In addition, teachers will receive 90 hours of prof essional development.

Program Goals

Pre-Engineering Design Experiences

- Provide hands-on, activity-based instruction in science and engineering to parents and students in Grades K-3
- Expose parents and students to science and engineering facilities in their communities via field trips and instructional classes in these facilities
- Provide parents and students opportunities to meet African American, Latino, and other scientists and engineers

Family Support

- Provide parents opportunities to meet parents who have supported their children in obtaining science and engineering degrees
- Provide a family support system for parents that will include information on health, educational opportunities, child psychology, and assistance with working with governmental agencies.

Curriculum & Professional Development

- Provide teacher training on the K-3 pre-engineering curriculum

Stakeholders/ Roles

- Decision makers (multiple-funders)
  - Summative concerns
  - Immediate impact in community vs. sustainability
  - Recognition
- Implementers (program staff)
  - Program improvement
  - Program element priorities
- Receivers (students/ parents/ teachers)
  - Knowledge transfer
  - Change agents

Challenges & Opportunities

- Negotiating Researcher Roles
- Multiple Stakeholders / Multiple Goals
- Complexities in Collaboration
- Supporting and Fostering long term Relationships

Discussion Questions

- 1) How do evaluators begin to understand the stakeholders' perspectives involved in the program evaluation?;

- 2) What role do or should stakeholders play in the design of the evaluation?

Research / Resources

- The Multi-Goal, Theory-Driven Approach to Evaluation: A Model Linking Basic and Applied Social Science

  [Chen and Rossi, 1980)

  - **The misleading range of Administrators' program goals- the program goals prescribed by policy makers and administrators are not necessarily the effects which are most likely to be achieved by the treatments delivered by a program.**

  - **Administrators' program goals appear to be selected under two kinds of criteria: the first is desirability ,the second is possibility. It often happens that the administrator spick goals more on the basis of desirability or hope than possibility or understanding.**

  - **Accordingly, official-goal-fixed approach evaluators who use administrators' statements of program goals as the limits within which to search for measurable effect variables may be on the wrong track in the first place**

Research / Resources

- Border Crossings: Collaboration Struggles in Education [Magolda, 2001)
  - **Strategies and opportunities for collaboration must be planned**
  - **Discourse must extend beyond techniques for evaluation**
  - **Cultural differences must be addressed**

- International Perspectives of School, Family, and Community Partnerships (Sanders & Epstein, 1998)
  - **Importance of partnerships in educational reform and excellence**
  - **Support for the teacher–parent relationship to foster positive and productive home–school connections.**

THANK YOU

FOR MORE INFORMATION:

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ART2STEM

Introducing girls to STEM career paths
by tapping into their natural attraction to art

pencil foundation

ALIGNMENT NASHVILLE

ADVENTURE SCIENCE CENTER NASHVILLE

Tennessee Tech UNIVERSITY

METROPOLITAN Nashville PUBLIC SCHOOLS

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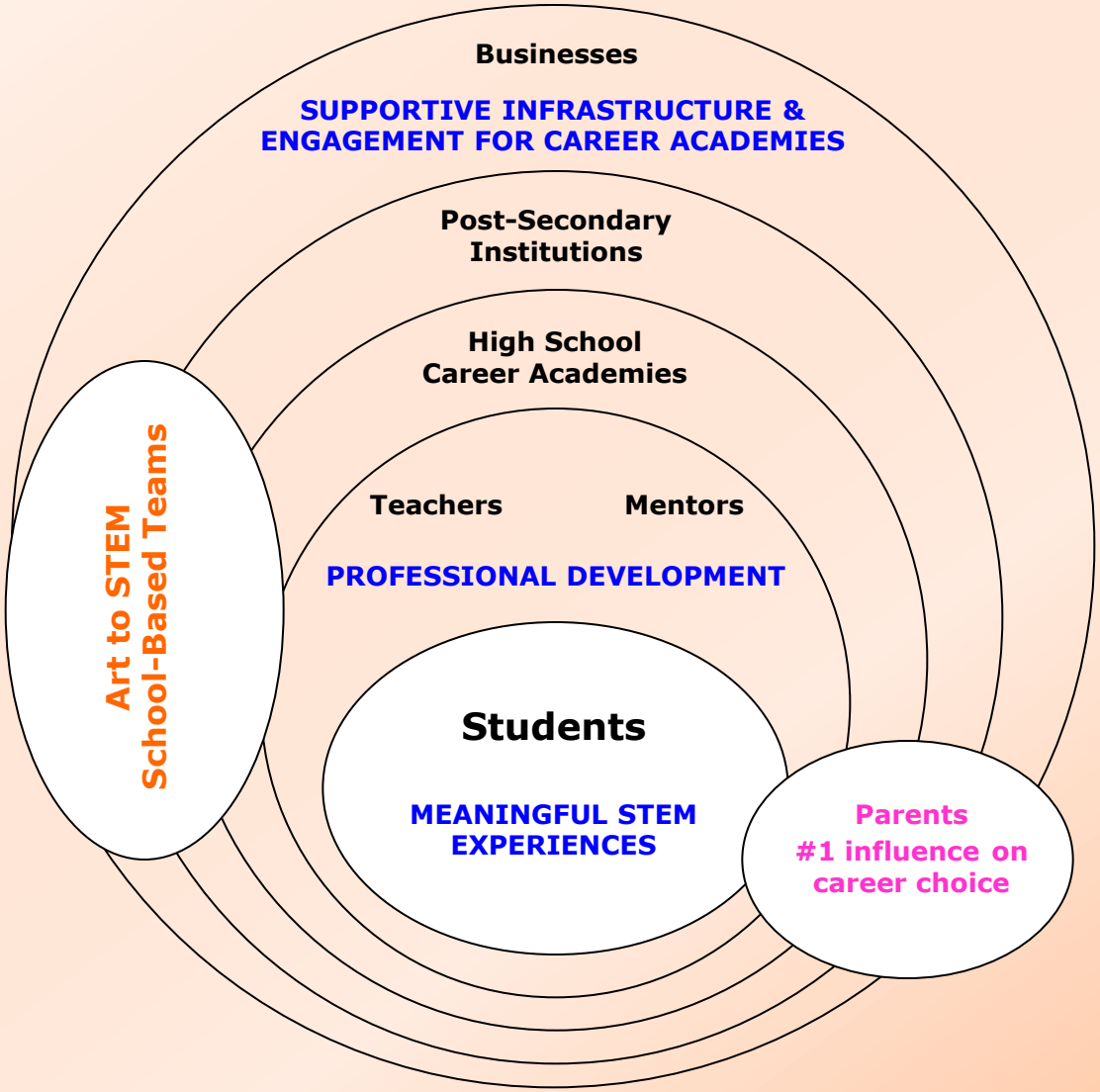
Art2STEM Project Overview

Comprehensive after-school program that integrates multiple approaches:

- Leverage girls' interest in creative arts to show how talents can be applied in STEM careers
- Hands-on, problem-based learning in an informal environment
- Engage community agencies to partner with schools to establish the infrastructure
- Include middle and high school teachers as well as mentors from the community as "Coaches"
- Partner with local STEM businesses to provide authentic, relevant career context



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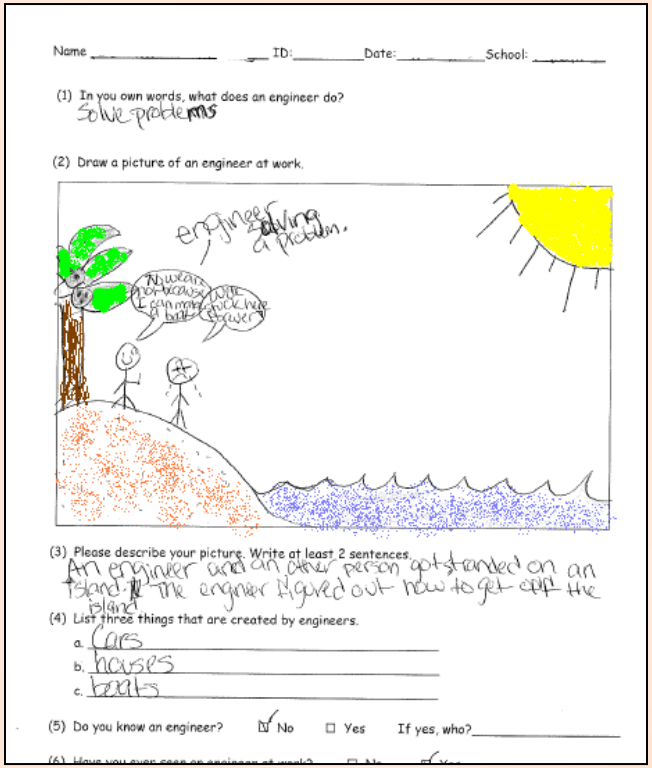
Stakeholders

- Alignment Nashville – mission is to bring community agencies together in support of Nashville schools
- Additional community agencies to provide infrastructure and connect with businesses
- Schools – **implications for high school academies
- Businesses – Chamber of Commerce is major player on high school academy effort
- Post-secondary institutions
- Teachers
- Students
- Families

Data Collection

- Student survey
- Draw an Engineer Test
- Timeline exercise
- School administrative data
- Focus groups
- After-school activity observations
- Business interviews
- Informal feedback from coaches


Name _____ ID:_____ Date:_____ School: _____

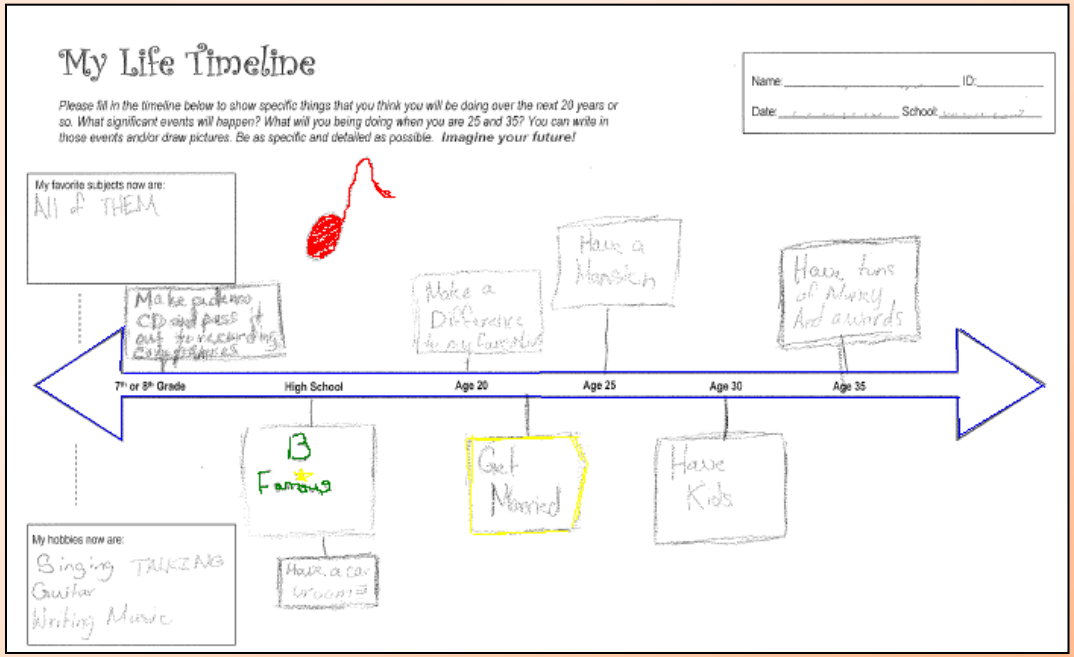
(1) In you own words, what does an engineer do?
solve problems

(2) Draw a picture of an engineer at work.

(3) Please describe your picture. Write at least 2 sentences.
An engineer and an other person got stranded on an island. The engineer figured out how to get off the island.

(4) List three things that are created by engineers.
a. cars
b. houses
c. boats

(5) Do you know an engineer? ☑ No ☐ Yes If yes, who?_____



Purposes of Evaluation

Formative

- Focus activities
- Monitor progress – Implemented as intended?
- Promote positive program changes

Outcome

- Tell a story
- Answer the question:

  So what?
- Highlight what works for whom and under what circumstances

Issues and Challenges

- Making time for follow-up student evaluations during sessions AND completing those up for students who did not attend
- Student feedback that assessments are too long and repeated
- Interim first cohort findings:
  - Some impact on student understanding of what engineers do and willingness to consider STEM careers
  - Most survey items show few changes over time
  - Timeline does not appear to appropriate measure of change over time for Art2STEM
  - Quite a bit of formative data to suggest appropriate quality improvements, especially related to PD, coaching, and technical assistance for coaches
- Evaluation story not always rosy
- Adding more and more to the evaluation scope while not taking anything off the plate

Photonics Leaders II

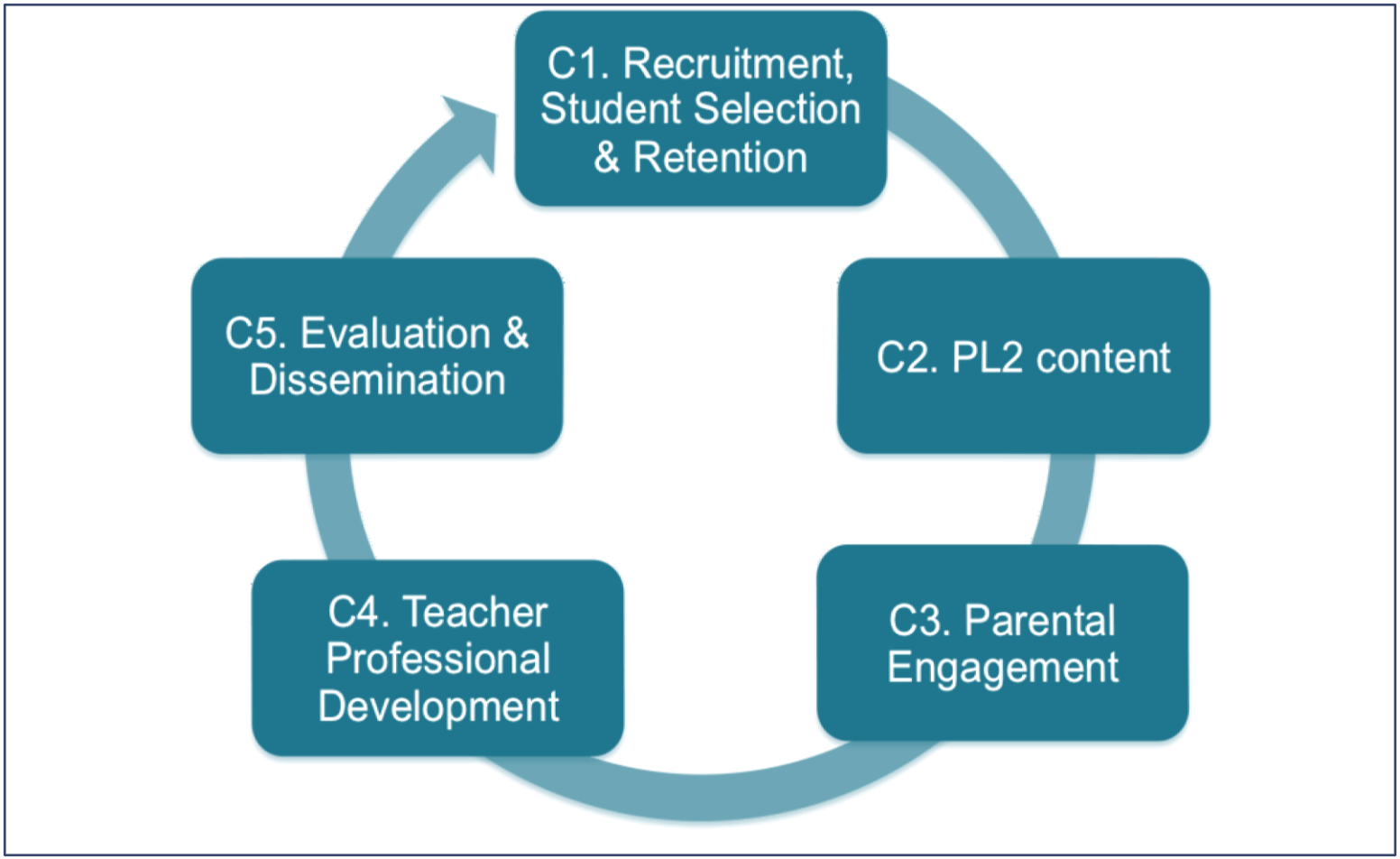
The Science House

NC State University

Photonics Leaders II

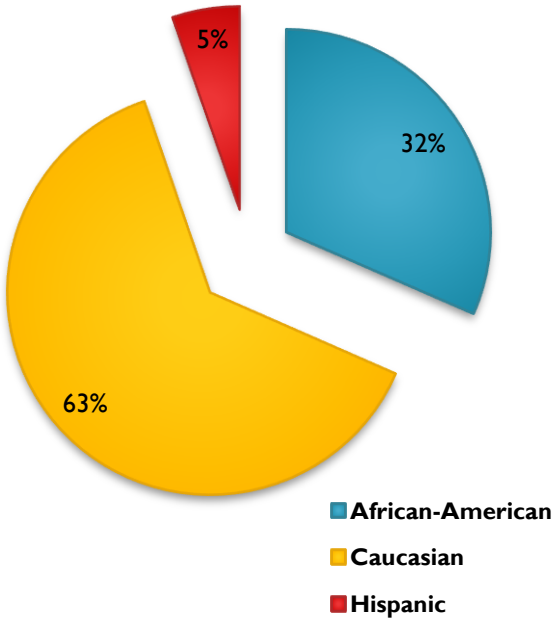
- Hybrid science and technology program
- Students – 164 hours annually
- Teachers – 45 hours annually

PL2 Program Model

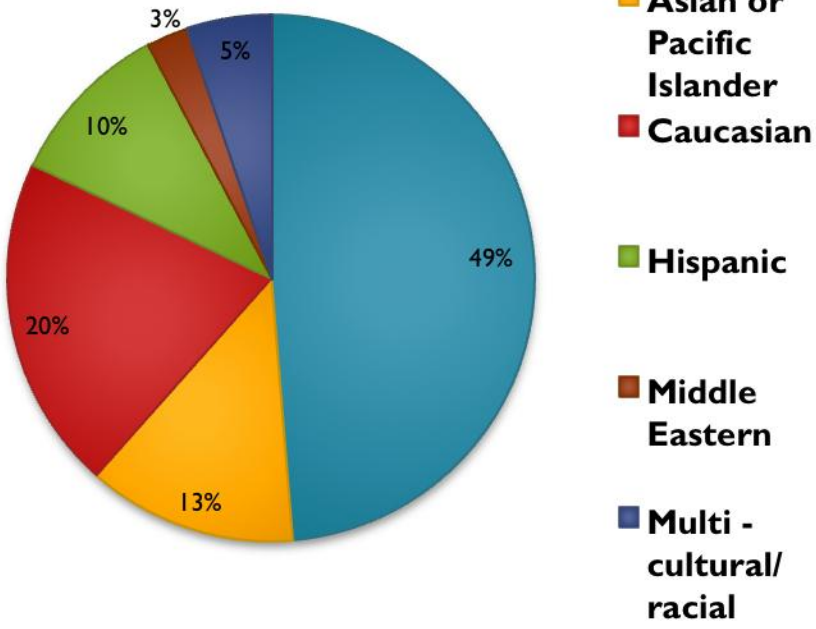


PL2 Participants

Middle and High School Teacher Data (N=19)



High School Students (N=39)



PL2 Student Program Objectives

- Recruit under-represented groups
- Retain 90% of students (for 2 year cycle) with 95% of those applying to college in STEM disciplines
- Increase students' knowledge of photonics and technology
- Develop and refine students' scientific investigation skills
- Develop students' understanding of the practical applications of science and talents, skills, and dispositions needed to succeed in the global workplace.

Evaluation Objectives

- Look beyond "testing" to fully illustrate the impact of PL2
- Align with instruction
- Provide quality (reliable and valid) evidence of program impact

PL2 Student Assessment Model (Evaluation Plan)

Variables to Measure	Ongoing Assessment	Point in Time Assessments
Understanding of Concepts (Objective 1C)	Daily review quizzes (summer program); teacher reflections of "what worked well"	Observations; Pre/Post Knowledge Tests
Designing and Conducting Investigations (Objective 1E)	Written design of experiments with real-time feedback from instructors	Ratings of Culminating Projects
Communicating Scientific Information (Objective 1D)	On-going writing prompts	Incorporation of writing prompts into larger PL2 Student Performance Scale
Functioning in a Hybrid Learning Environment (Objective 1C)	Group and individual presentations virtual environment	Pre/Post Knowledge Tests; "Observations"
Better preparation for STEM careers (Objectives 1C-E)	Internship reflections	Student Feedback Survey

PL2 Student Program Assessment Model (Evaluation Plan)

Variables to Measure	Embedded Assessment (Example of Evidence)	Point in Time Assessments (Evidence)
Understanding of Concepts (Objective 1C)	Daily quizzes reveal gaps in mathematics knowledge—instructor works one-on-one with students who need help	9.25 point increase (0-42 points total) from pre to post test group mean
Designing and Conducting Investigations (Objective 1E)	Students are required to post information about their science fair projects on "Moodle"—instructors review and give immediate feedback	78.9% of students score "proficient" or "expert" on their summer culminating project.
Communicating Scientific Information (Objective 1D)	Writing prompt data reveals that some students need to work on technical writing skills	(post data for Cohort 1 will be collected in March)

PL2 Student Program Assessment Model (contd.)

Variables to Measure	Embedded Assessment (Example of Evidence)	Point in Time Assessments (Evidence)
Functioning in a Hybrid Learning Environment (Objective 1C)	Elluminate (virtual classroom) observations show students' increased ability to work within a technology environment	Pre-survey revealed that 77% of students were NOT familiar with the virtual classroom environment. 100% of PL2 students use Elluminate (virtual classroom) and Moodle (wiki) to communicate with teachers and peers
Better Preparation for STEM careers (Objectives 1C-1E)	Internship reflections demonstrate that students have a general understanding of STEM career skills but need more guidance in developing a career pathway.	65% of students indicated on a follow-up survey that they are "more interested in a career in science" as a result of participating in PL2.

Stakeholders' Roles in Evaluation

- Decision makers (funder)
  - Summative concerns
- Implementers (program staff)
  - Program improvement
- Receivers (teachers/students)
  - Knowledge transfer

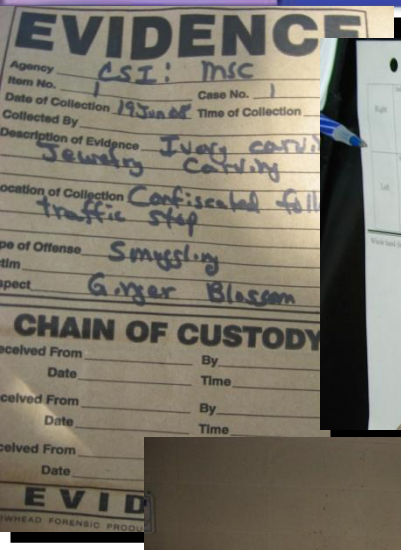
Evaluation-Opportunities

- Creates a complete "picture" of program impact for funder (decision-maker)
- Formative feedback tool for program administrators and instructors (implementer)
- Assists in refining program components (implementer)
- Identifies measurement issues so they can be resolved quickly (implementer)
- Formative feedback for teachers and students on progress (receiver)

Challenges (and questions)

- How do we ensure that on-going evaluation activities support (rather than create obstacles) to implementation?
- Data, data everywhere…how do we package it to meet the needs of the different stakeholders?
- How do we involve stakeholders (PIs, instructors/teachers, students, parents, evaluators)?
- How do we focus on formative uses of evaluation data (to meet needs of implementers) while attempting to address summative questions (to meet needs of decision-makers)?

Project Overview:
CSI: Creating Student Investigators



- High interest in the field.
- Integration of multiple science domains.
- Forensic science inherently problem-based.

Project personnel

- K. Yanowitz, Developmental psychologist, evaluation/research experience.
- A. Ross, Science teacher educator and former HS teacher.
- S. Vanderpool, Botanist.
- T. McKay, Entomologist.

The Institute:

- Week 1

  Teacher training by grant personnel

- Week 2

  Teachers training students

- Day programs
  - ✓ Forensic investigations of "crimes" – multiple STEM areas
- Evening
  - ✓ Presentations
  - ✓ Games and evening programs
  - ✓ Career night

Program Beneficiaries

- *Summer Institute*
  - Teachers
  - Students (may or may not be affiliated with specific teachers)
  - Parents of students

- *Academic Year*
  - Teachers (from Summer Institute)
  - Students of those teachers

Evaluation

- Multiple measures
  - Attitude scales
  - Current practices
  - Intended changes
  - “Snap-shot” reports during academic year
  - Classroom observations
  - Mixture of qualitative and quantitative measures

Stakeholder(s) & their Role(s)

- ***Teachers: dual role--*recipients of training AND implementers of programming**

- **Others: Grant personnel, granting agency, other recipients (students)**

Issues/Challenges/Lessons Learned

- Teachers used to authority role; clearly felt challenged by evaluation process.
  - Hard to get them to complete *INDIVIDUALLY.*
  - Argued with items/content.
- However, efforts to give program authority sometimes back-fired.
  - Perceived the program was disorganized.
  - Wanted to be told exactly what to do.

Issues/Challenges/Lessons Learned

- Classroom visits; ultimately not helpful for evaluation process; important to teachers.
- Time spent on reason/process of evaluation invaluable.
  - More “buy-in” to process.
  - Evaluation not capturing their stories; group decided on longer, qualitative narratives.

This project is funded by a grant given to Arkansas State University by the National Science Foundation (NSF 05-621 Information Technology Experiences for Students and Teachers – ITEST).

Small Group Discussion

1) How do evaluators begin to understand the stakeholders' perspectives involved in the program evaluation?
2) What roles do or should stakeholders play in the design of the evaluation?