Evaluating NSF-Funded Projects: Some Thoughts

Dr. Mark St. John

Inverness Research Associates

September, 2003
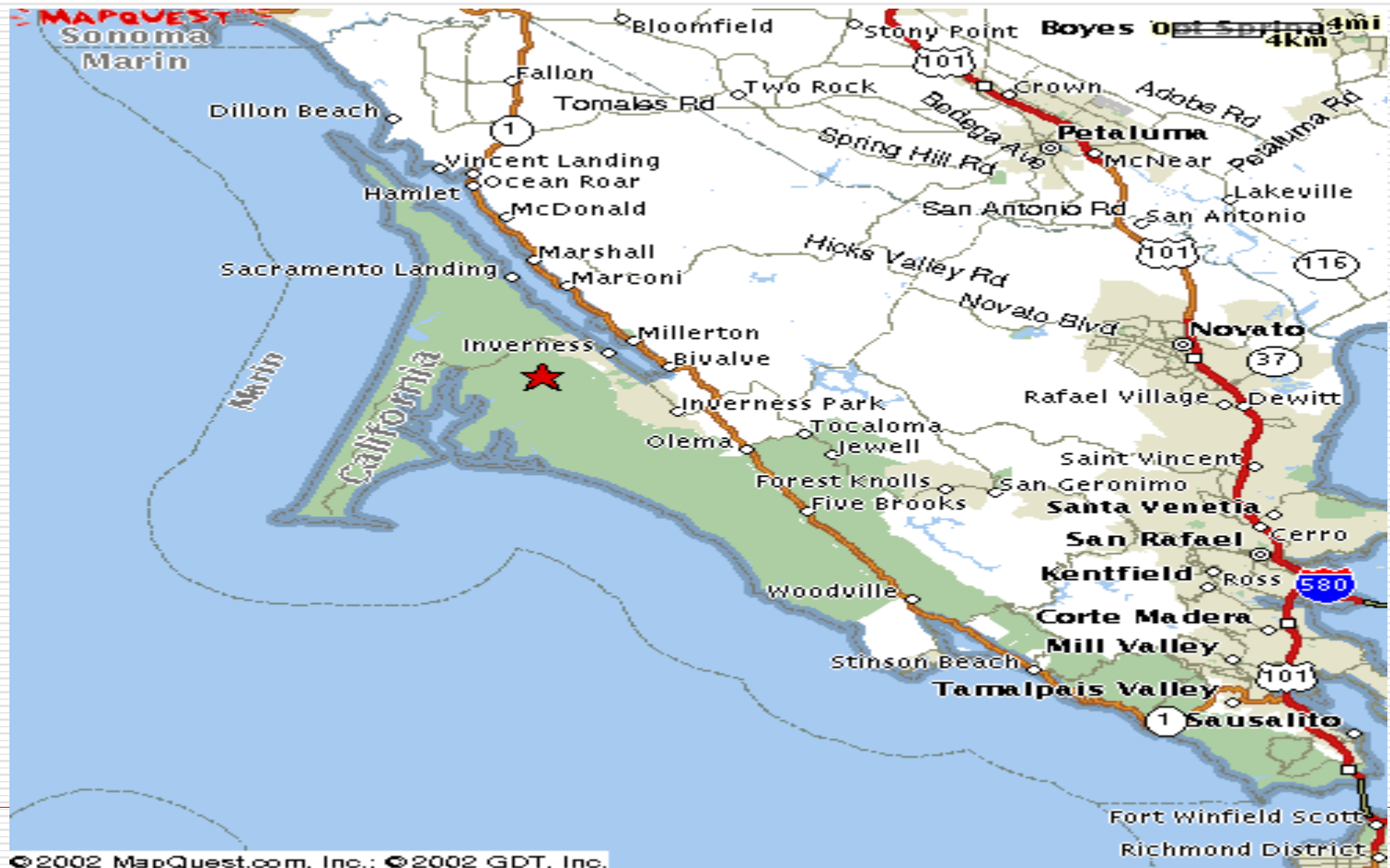
Overview

- ☐ Inverness Research

- ☐ The Functions Of Project Evaluation

- ☐ The Nature Of NSF Funding

- ☐ Two Perspectives For Evaluating NSF Investments: Initiatives And Projects

- ☐ Summary

Inverness Research

Inverness California

Inverness Research

- ☐ 15 researchers
- ☐ 43 Projects
- ☐ Both contracts and grants
- ☐ www.inverness-research.org

A Sample of Inverness Projects

- ☐ NSF Projects
  - ■ Two Centers For Learning And Teaching (CLTs)
  - ■ Five LSCs; One RSI
  - ■ Three MSPs
  - ■ 3 Materials Development Projects
  - ■ Three Curriculum Implementation Centers
  - ■ 6 ISE Exhibit Development Projects
  - ■ One ERC - BSAC
- ☐ The National Writing Project
- ☐ Work With Foundations
  - ■ HP, Annenberg/CPB, Pew

The Functions Of Project Evaluation

Four Functions of Evaluation

- ☐ Documentation And Portrayal
- ☐ Formative Feedback
- ☐ Summative Evaluation
- ☐ Research

Four Functions of Evaluation

FUNCTION	AUDIENCE	PURPOSE
Document and Portrayal	Internal and External Audiences	To help both insiders and outsiders better understand the nature and purpose of the project
Formative Feedback	Project Leaders and Staff	To help the project learn about its design and impact and thereby revise its design and strategies
Summative Evaluation	Funders	To help funders assess the ways in which and the extent to which the project is creating value, and to assess the return on their investment
Research	The "Field"	To generate knowledge and insights about the improvement of education

1) Documentation and Portrayal

- ☐ Foundational function
- ☐ Focuses on both theory of action and actual work done
- ☐ Assists the project in basic documentation
- ☐ Lays out the project in complete and analytical fashion so that all can see what it intends to be and what it is actually doing
- ☐ Helps others understand the nature of the work of the project
  - ■ Helping outsiders understand the work of a mathematics equity project (EMELI) and a community science workshop project (CSW)

2) Formative Feedback

- ☐ "Critical friend" role; "Groundtruthing"
- ☐ Working in relationship
- ☐ Focus on issues, interactions, and information that will assist project in shaping design and implementation
- ☐ Co-evolution of project and evaluation design
- ☐ Example: Studying prototype exhibits (TEAMS); studying project design and assumptions in year one (AMSP)
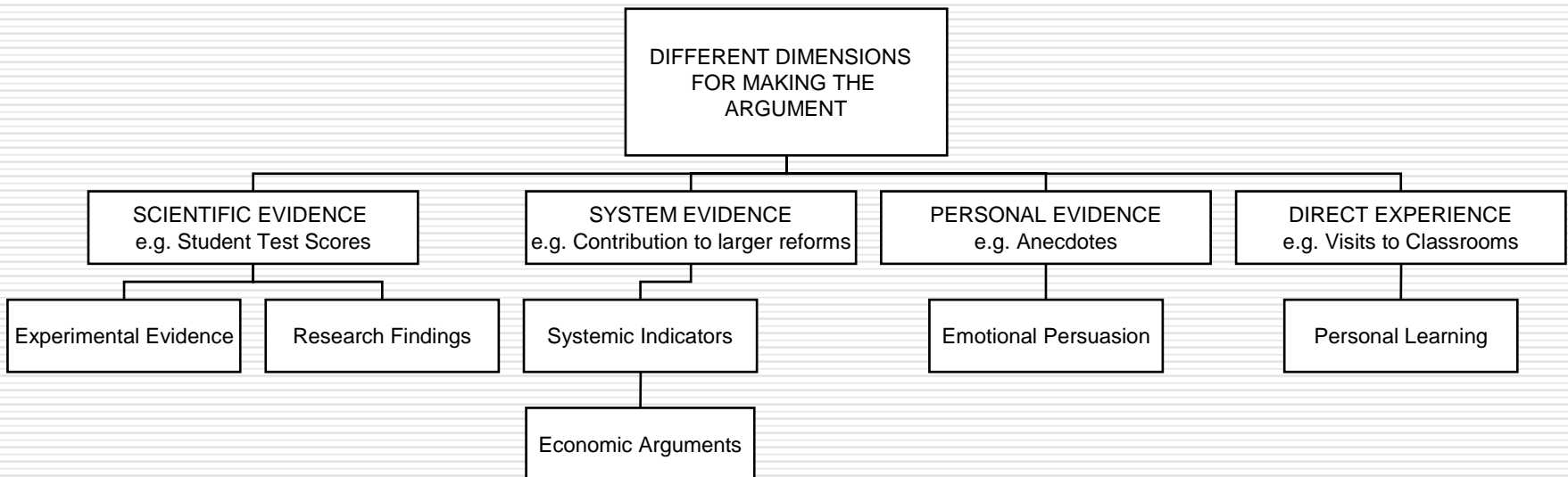
3) Summative Evaluation

- ☐ Helps others understand the theory, work and contributions of the project
- ☐ Allow funders (and others) to assess return on investment and overall value of the effort
- ☐ Places the project in broader contexts
- ☐ Seeks creative methods to measure appropriate outcomes in rigorous ways
  - ◼ Examples: Institute for Inquiry; Seattle LSC
- ☐ Can support the case for future funding

CLAIMS THAT
ARE TRUE

CLAIMS THAT
HAVE POLITICAL
CURRENCY

CLAIMS THAT
ARE DOCUMENTABLE
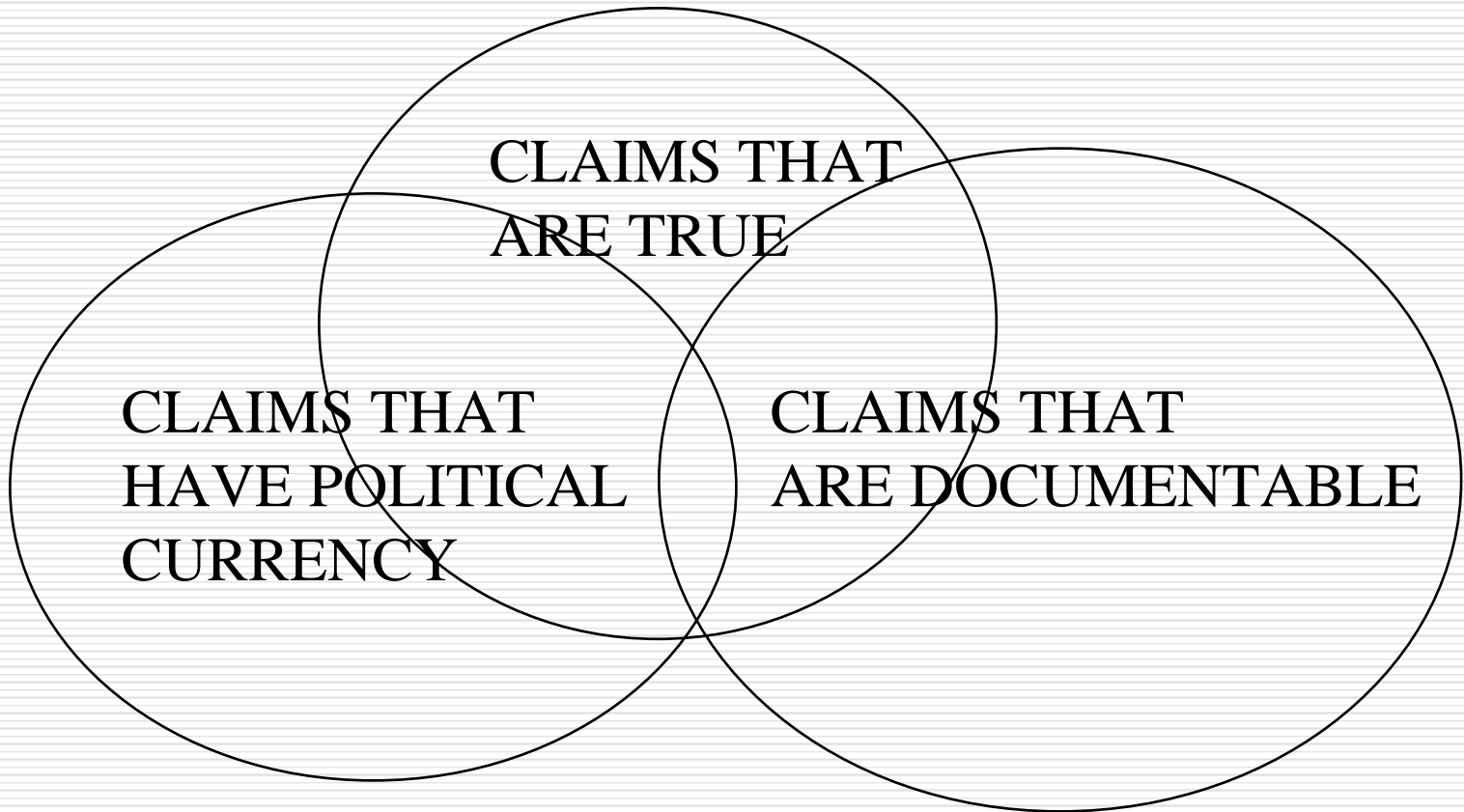
SUMMATIVE: MAKING A CASE

DIFFERENT DIMENSIONS OF THE ARGUMENT AND DIFFERENT TYPES OF EVIDENCE

```
                    ┌─────────────────────┐
                    │ DIFFERENT DIMENSIONS│
                    │   FOR MAKING THE    │
                    │     ARGUMENT        │
                    └─────────────────────┘
```

SCIENTIFIC EVIDENCE	SYSTEM EVIDENCE	PERSONAL EVIDENCE	DIRECT EXPERIENCE
e.g. Student Test Scores	e.g. Contribution to larger reforms	e.g. Anecdotes	e.g. Visits to Classrooms

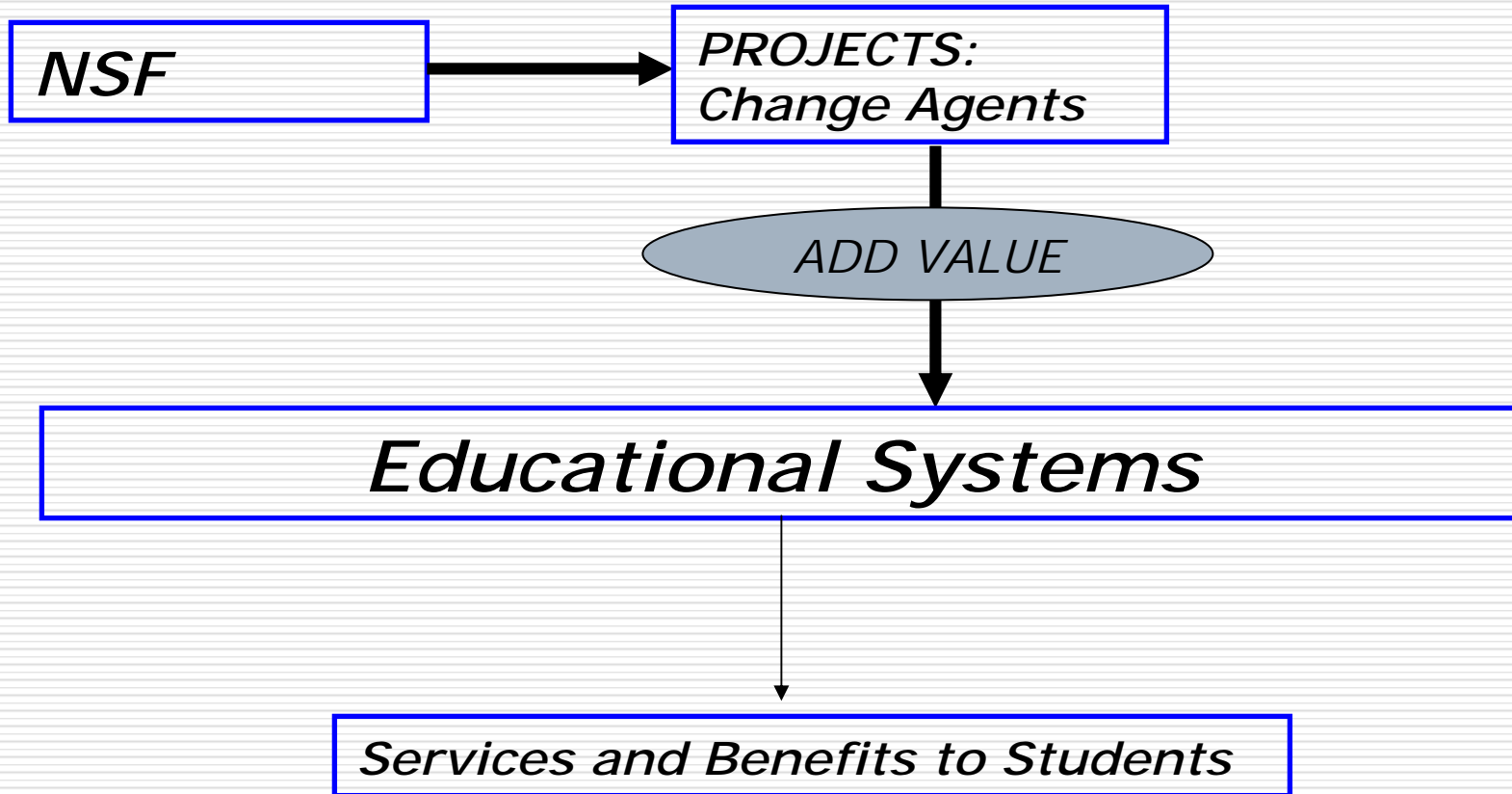| Experimental Evidence	Research Findings	Systemic Indicators	Emotional Persuasion	Personal Learning

Economic Arguments

4) Research

- ☐ Treats the project as a "case"
- ☐ Studies the landscape the project works within
- ☐ Studies the more general lessons learned vis-à-vis this type of investment
- ☐ Helps the project generate knowledge as one of its contributions
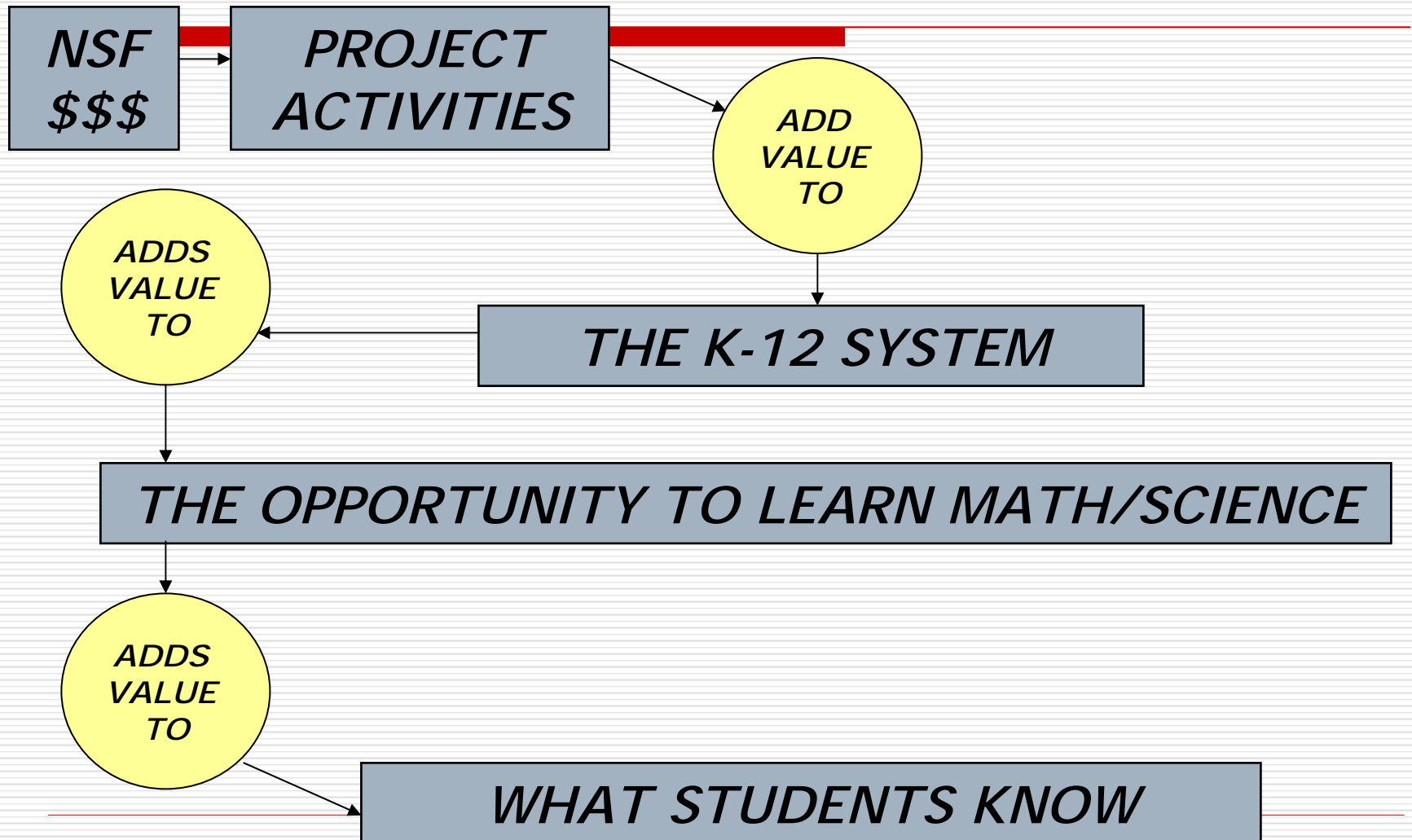 - ■ Examples: NYSSI; CICs – Landscape

The Nature Of NSF Funding

Making Strategic Investments in Educational Improvement
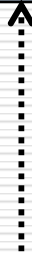
Investments in Educational Improvement

```
┌──────────────┐                    ┌──────────────────┐
│     NSF      │ ───────────────▶   │  PROJECTS:       │
│              │                    │  Change Agents   │
└──────────────┘                    └──────────────────┘
                                            │
                                            ▼
                                    ⬭ ADD VALUE ⬭
                                            │
                                            ▼
┌──────────────────────────────────────────────────────────┐
│              Educational Systems                          │
└──────────────────────────────────────────────────────────┘
                           │
                           ▼
          ┌────────────────────────────────────────┐
          │  Services and Benefits to Students     │
          └────────────────────────────────────────┘
```

NSF Investments in K-12 Education

NSF $$$ → PROJECT ACTIVITIES → ADD VALUE TO → THE K-12 SYSTEM → ADDS VALUE TO → THE OPPORTUNITY TO LEARN MATH/SCIENCE → ADDS VALUE TO → WHAT STUDENTS KNOW

NSF's Relationship to the Educational System

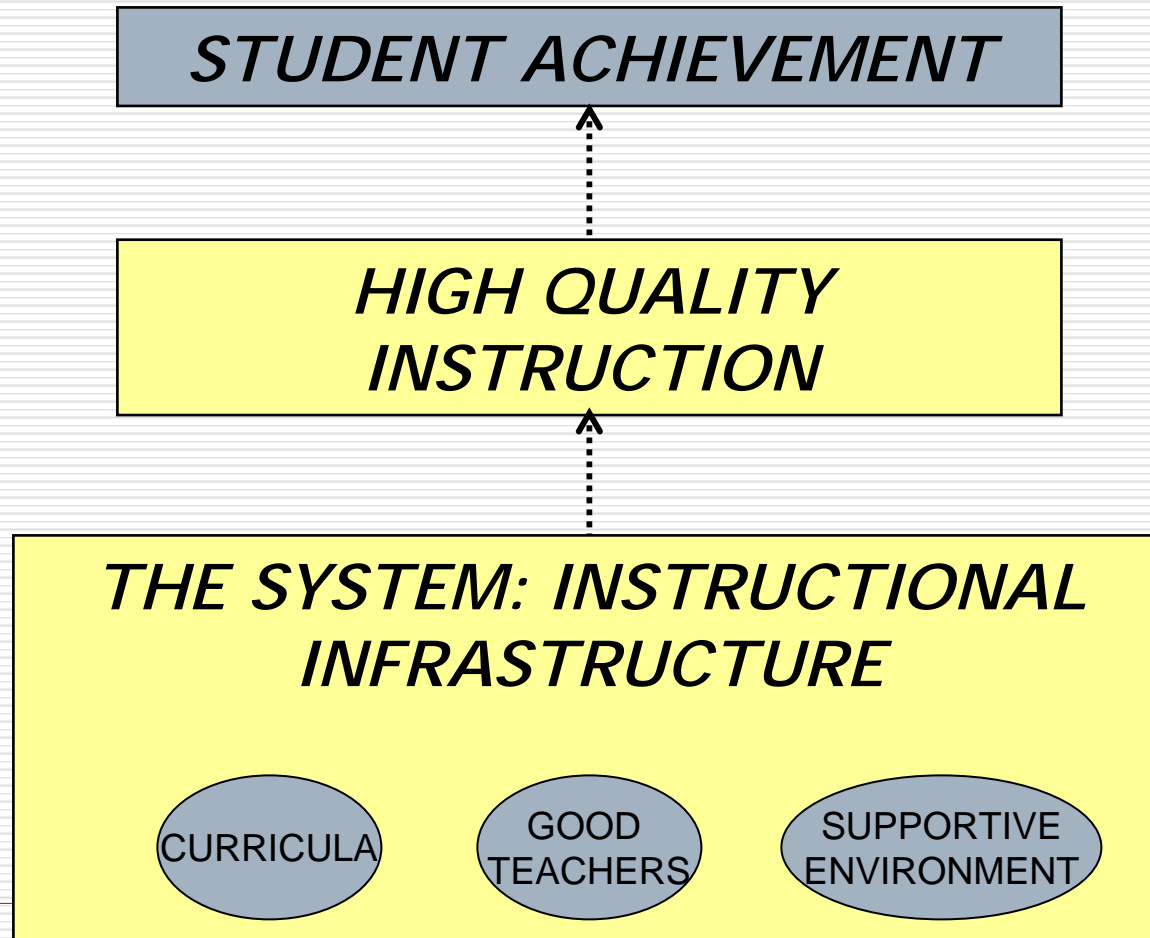## (NSF To Students –
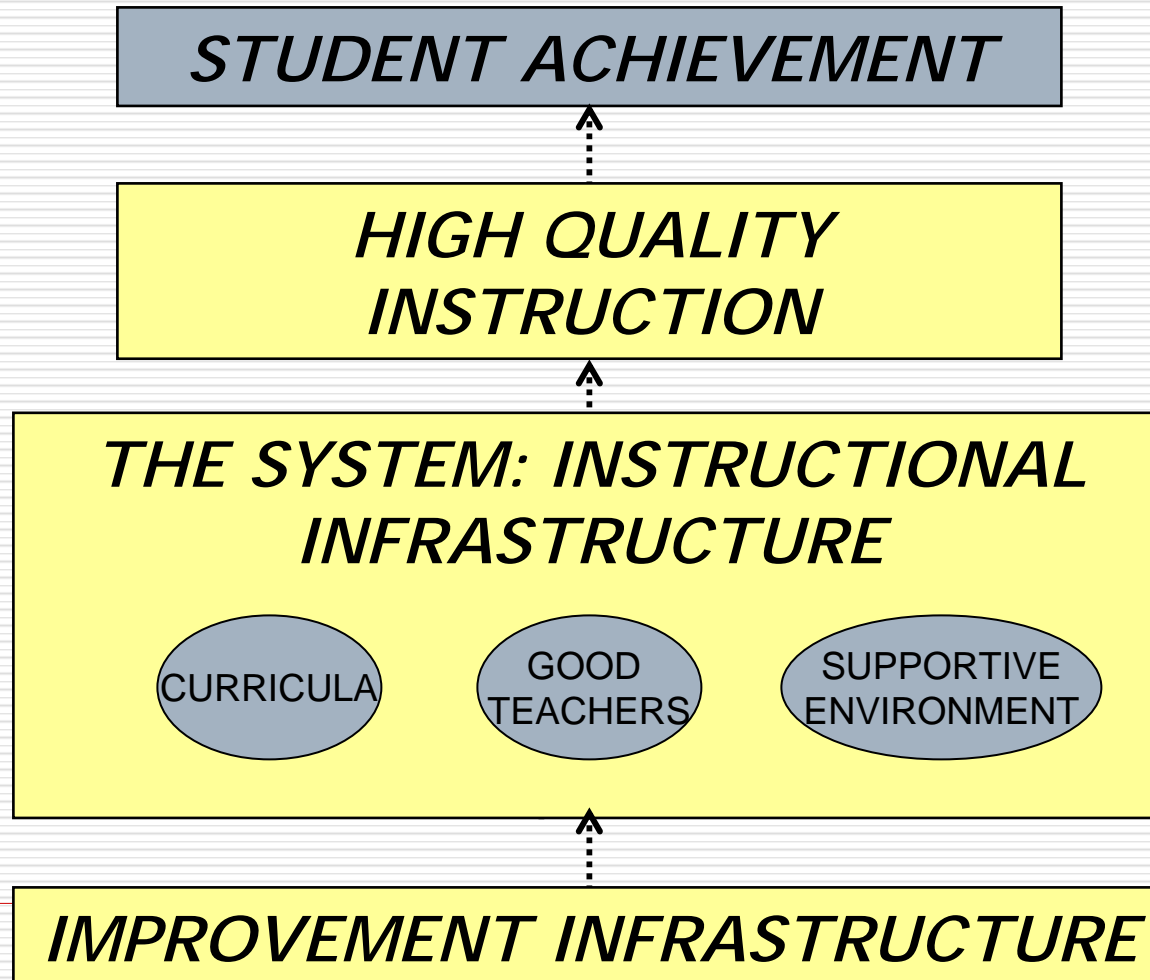## 3 Degrees Of Separation)

The First Degree

STUDENT ACHIEVEMENT

HIGH QUALITY INSTRUCTION

AND

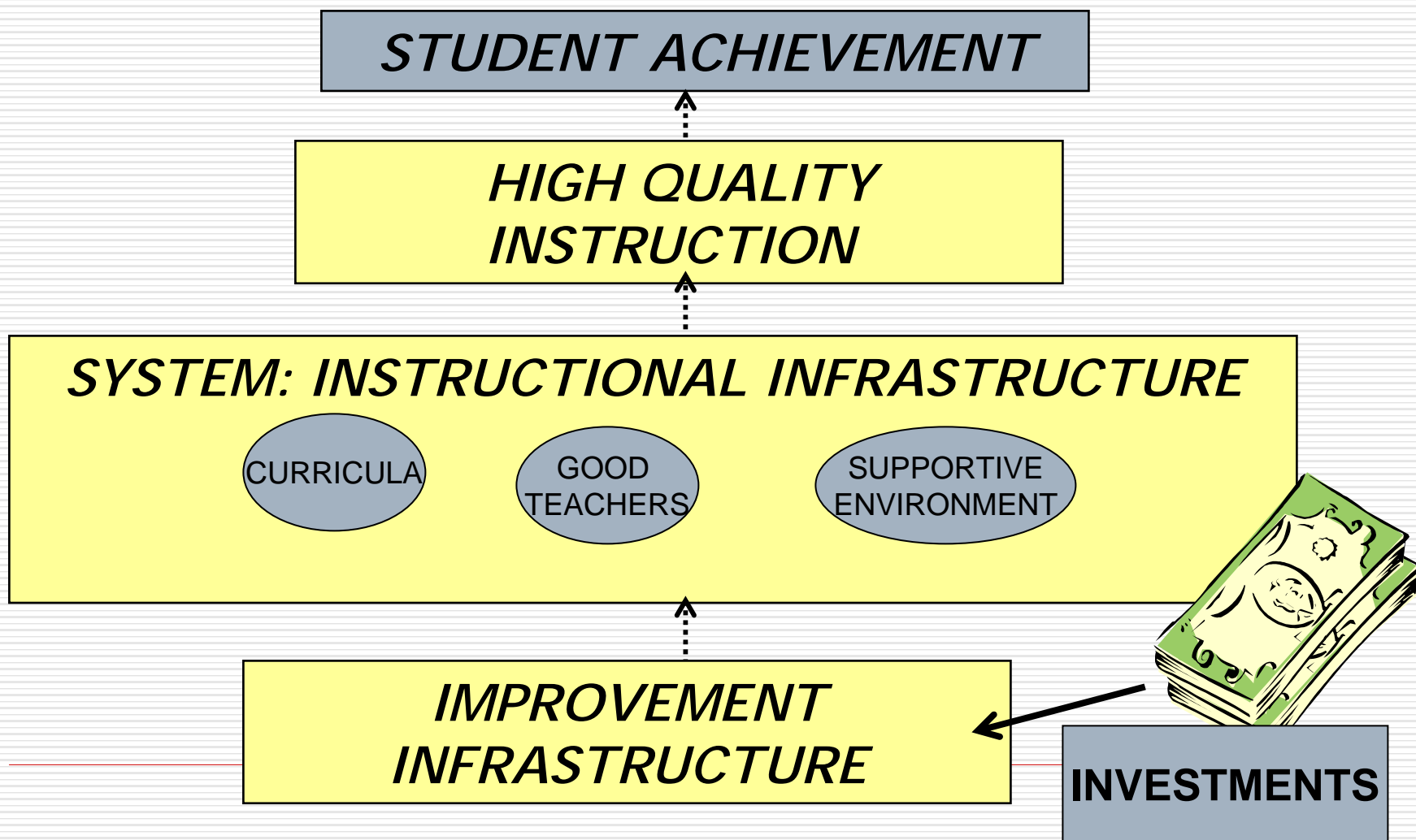RICH OPPORTUNITIES TO LEARN

(Formal and Informal)
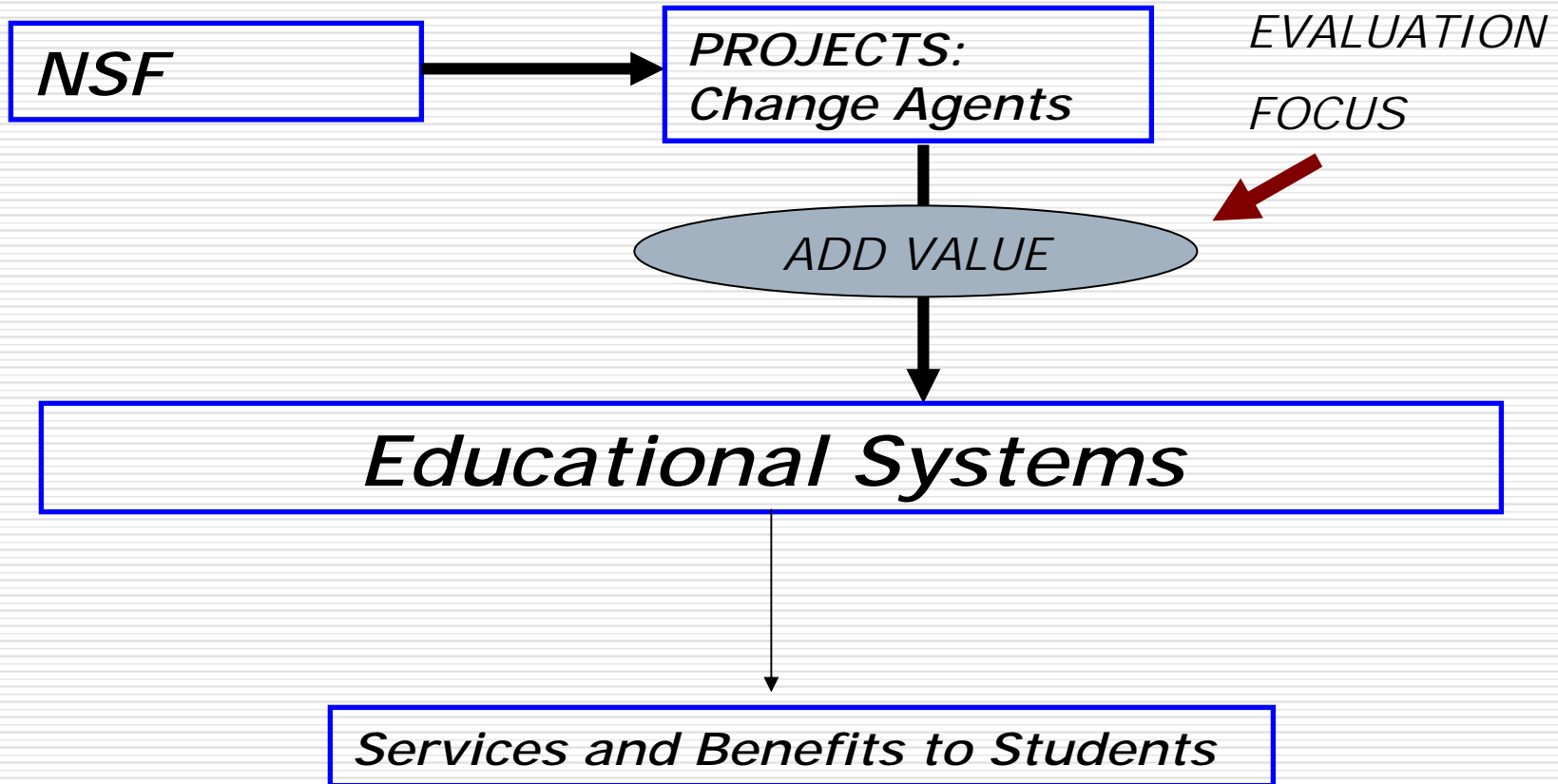
The Second Degree: Instructional Infrastructure

STUDENT ACHIEVEMENT

HIGH QUALITY INSTRUCTION

THE SYSTEM: INSTRUCTIONAL INFRASTRUCTURE

CURRICULA

GOOD TEACHERS

SUPPORTIVE ENVIRONMENT

The Third Degree:
The Improvement Infrastructure

STUDENT ACHIEVEMENT

HIGH QUALITY INSTRUCTION

THE SYSTEM: INSTRUCTIONAL INFRASTRUCTURE

- CURRICULA
- GOOD TEACHERS
- SUPPORTIVE ENVIRONMENT

IMPROVEMENT INFRASTRUCTURE

The Nature of Investments Made in Educational Improvement

STUDENT ACHIEVEMENT

HIGH QUALITY INSTRUCTION

SYSTEM: INSTRUCTIONAL INFRASTRUCTURE

CURRICULA

GOOD TEACHERS

SUPPORTIVE ENVIRONMENT

IMPROVEMENT INFRASTRUCTURE

INVESTMENTS

Evaluating Investments in Educational Improvement

NSF → **PROJECTS: Change Agents**

EVALUATION FOCUS

ADD VALUE

Educational Systems

Services and Benefits to Students
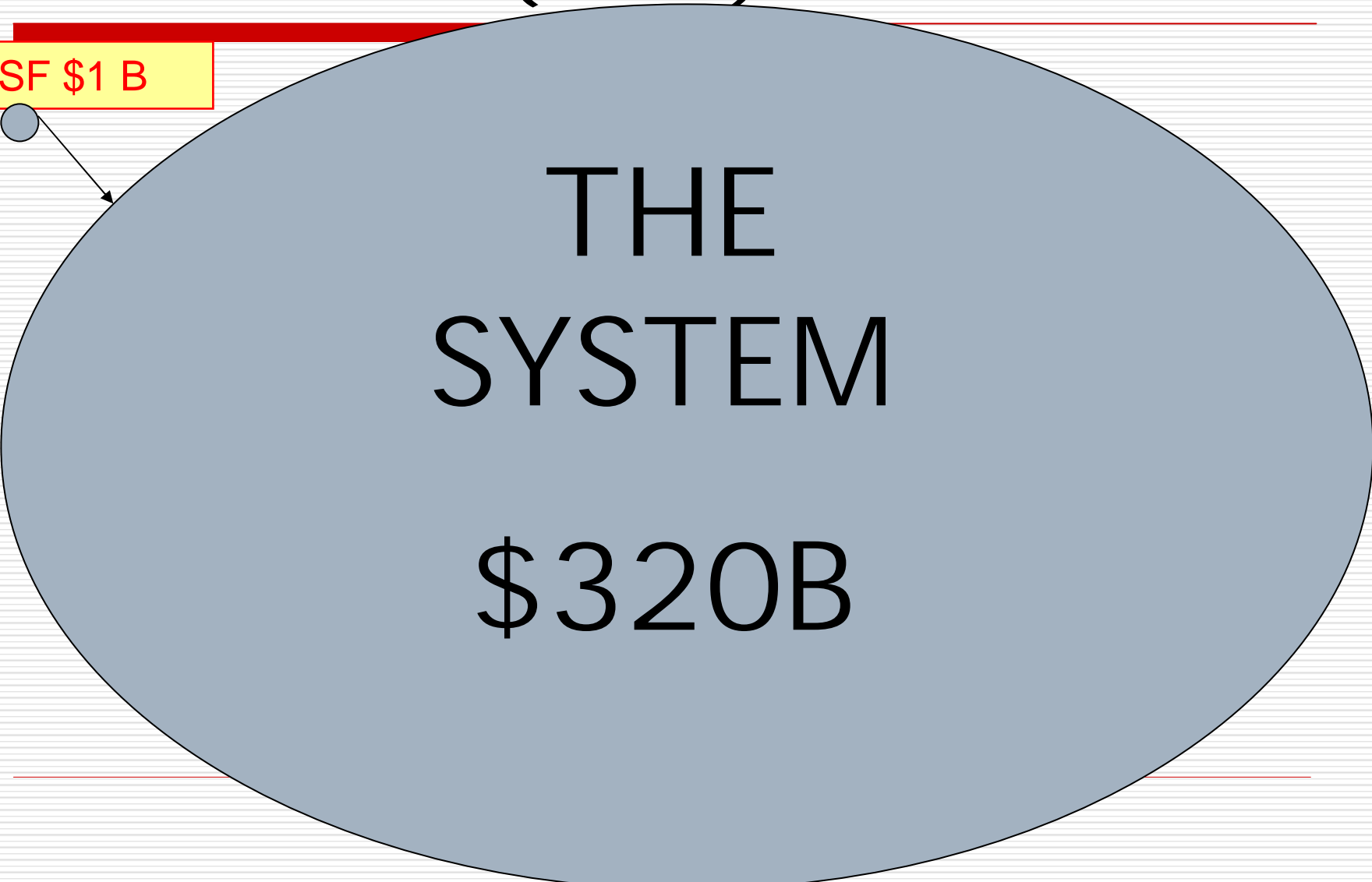
The fundamental paradox

- The ultimate purpose of investments in educational improvement is to improve student learning.

- But measuring changes in student learning is NOT a valid measure of the value of the investments made in improving the capacity of the system.

THE SCALE OF THE NSF INVESTMENT (.30%)

NSF $1 B

THE SYSTEM

$320B

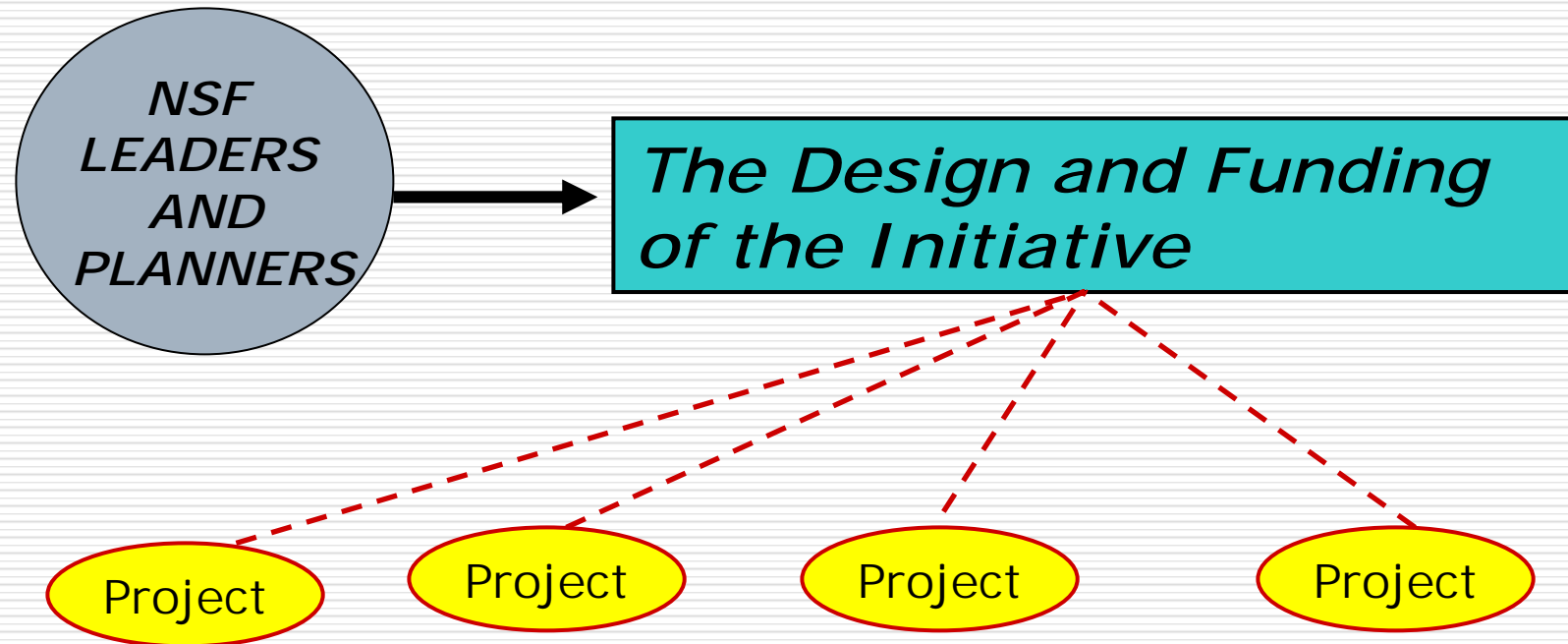# The Scale of the NSF Investment

THE

SYSTEM
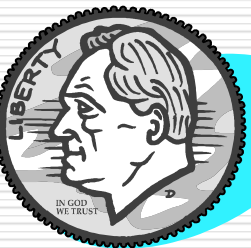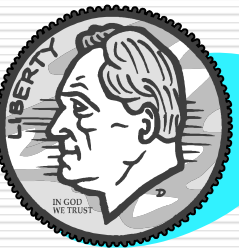
NSF

Two Perspectives for Evaluating NSF Investments: Initiatives and Projects

The Design of NSF Initiatives
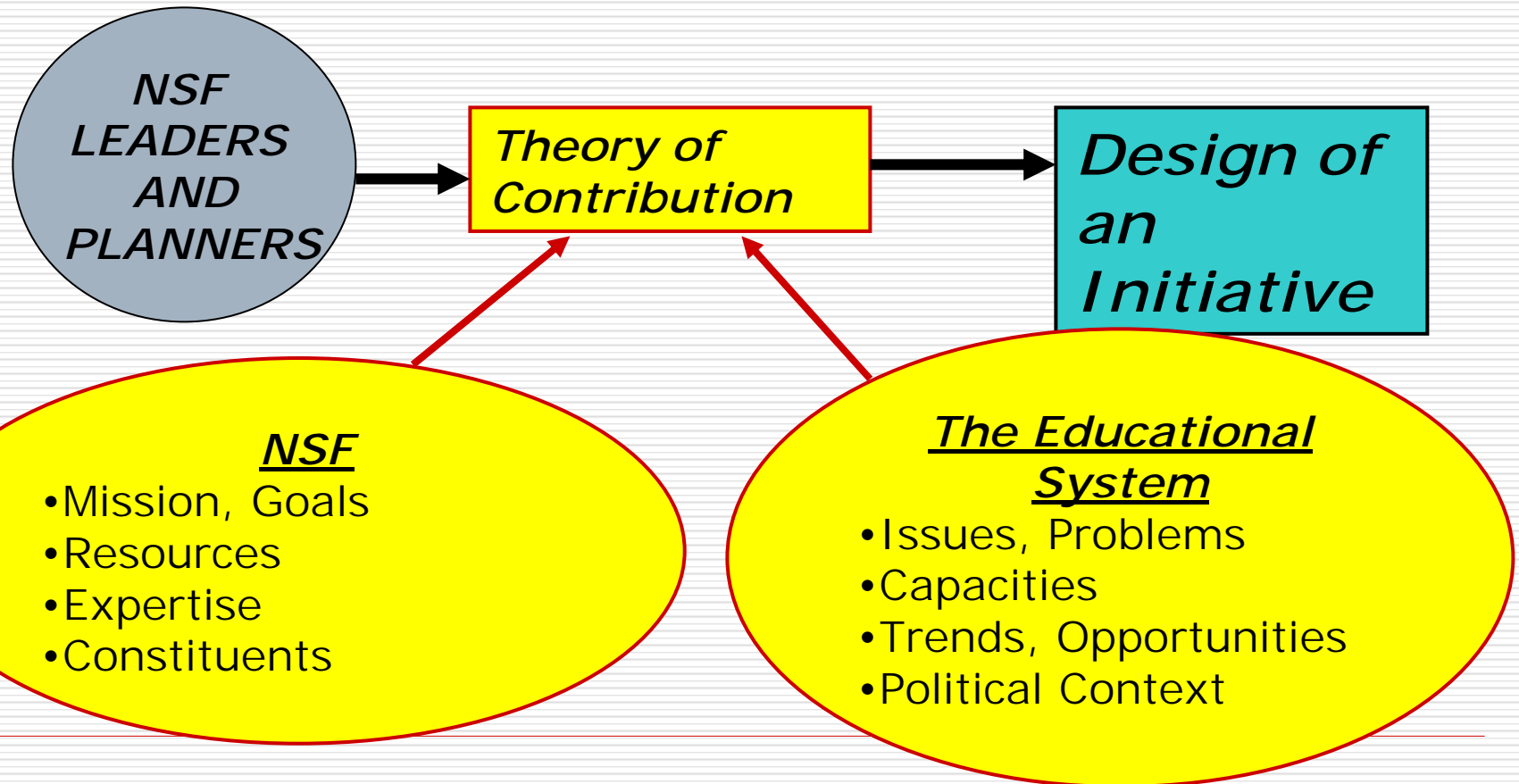
NSF Projects – The Offspring of the Initiative

NSF LEADERS AND PLANNERS → **The Design and Funding of the Initiative**

Project Project Project Project

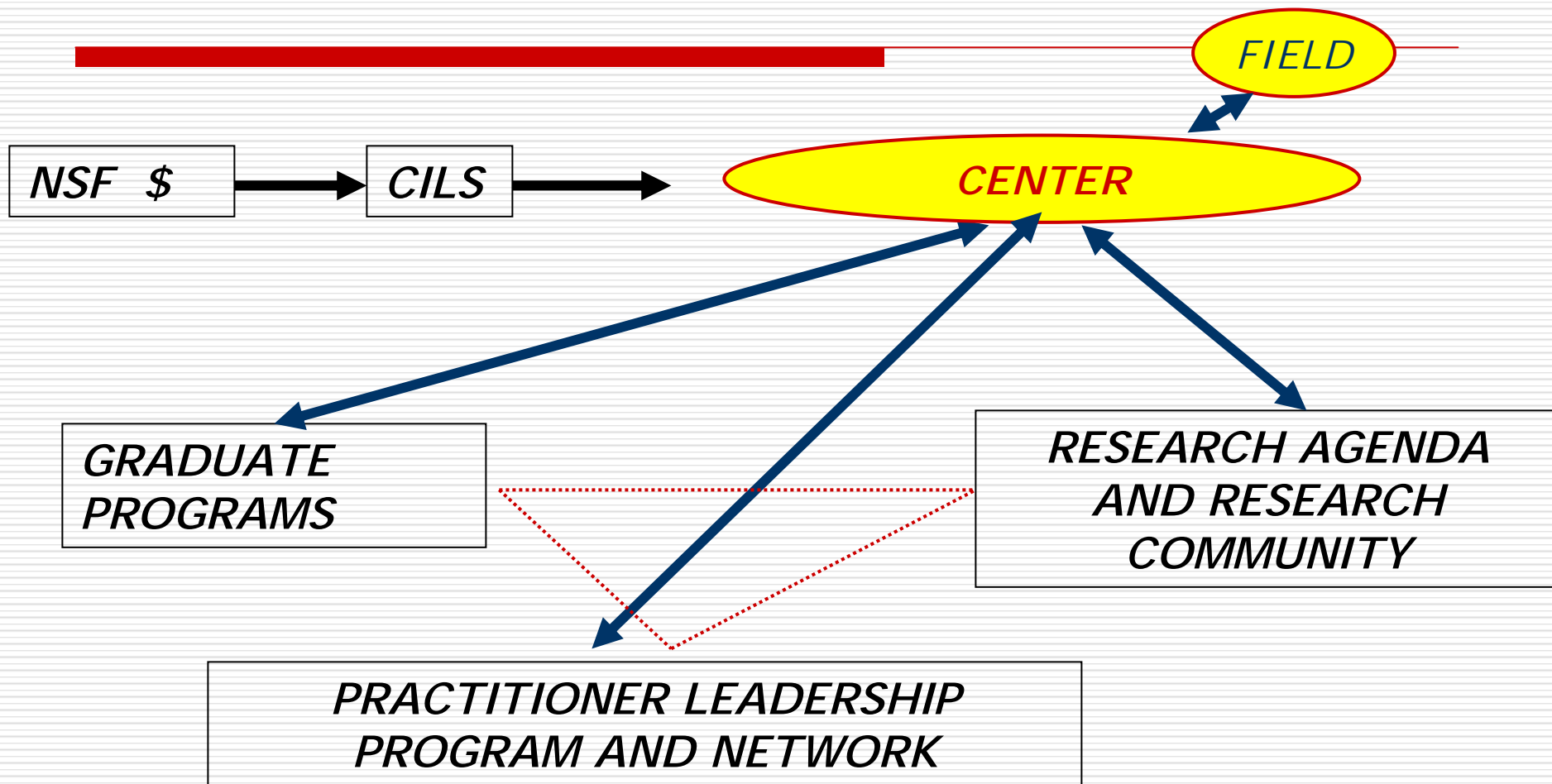# Two Perspectives for Evaluating NSF Projects

- The Internal Logic of the Project
- The Project's Contribution to the Goals, "Drivers", and Defining Features of the Initiative
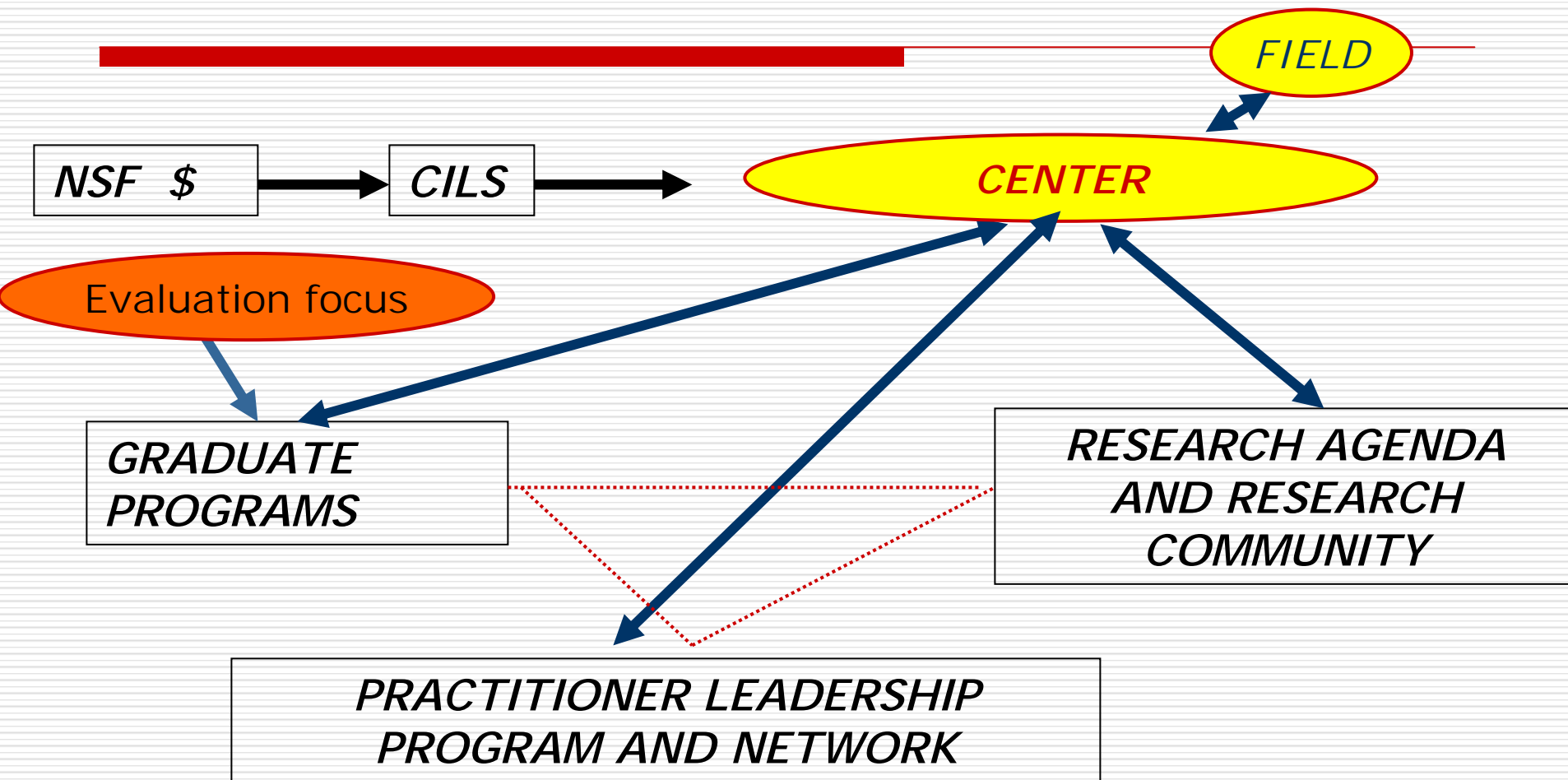
Perspective One: Studying The Project's Internal Logic

- Studying projects by assessing their own internal logic and integrity
- ...a.k.a...
    - The rationale for the investment
    - "Logic Model"
    - "Theory of Action"
    - Making a case

An Example: Logic Model for the CILS Center for Learning and Teaching

An Example: Logic Model for the CILS Center for Learning and Teaching

FIELD

NSF $ → CILS → CENTER

Evaluation focus

GRADUATE PROGRAMS

RESEARCH AGENDA AND RESEARCH COMMUNITY

PRACTITIONER LEADERSHIP PROGRAM AND NETWORK

Questions For The Graduate Program Strand (negotiated)

- ☐ To what extent does CILS attract, recruit and retain high-quality graduate students?
- ☐ To what extent does the experience of the graduate students reflect the CILS intentions?
- ☐ To what extent does the graduate component interact with the research component and the practitioner component?
- ☐ To what extent does the graduate program contribute to and benefit from the presence of the Center?
- ☐ What are the strengths and weaknesses of the graduate program?
- ☐ What are the career aspirations and actual placements of graduates?

Groundtruthing involves the comparison of theory (mental models) and field realities

Evaluation as Groundtruthing: Comparing Project Logic and Field Realities
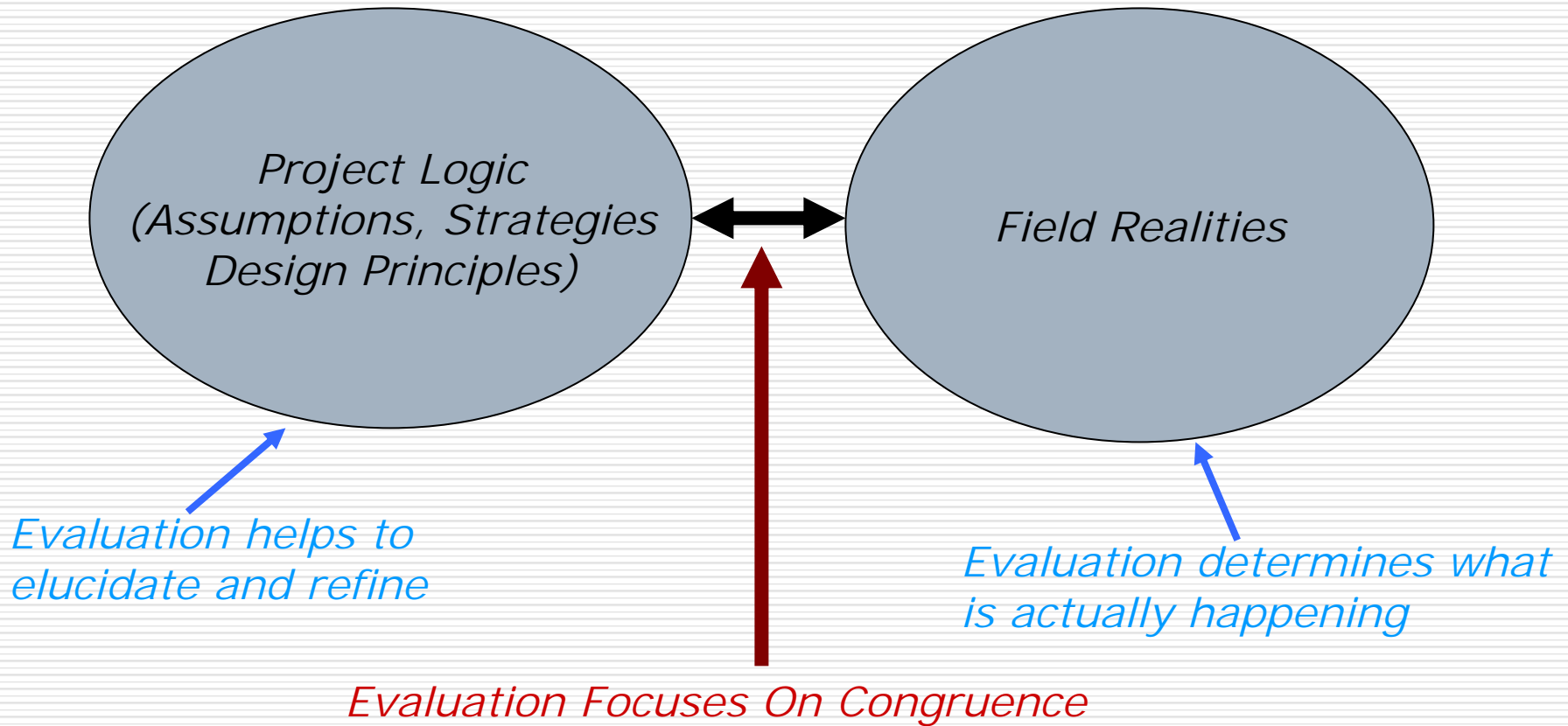
Perspective Two: The Project's Contribution to the Goals, Drivers and Design Features of the Initiative

Studying projects as mean to achieving initiative goals

The Difference between Program and Project Evaluation

- ❑ Initiatives are primarily evaluated through program (multi-project) evaluations

- ❑ Nonetheless, projects need to be able to assess the degree to which they are contributing to initiative goals

Example: CILS

- The CLT initiative is designed to create capacity in important areas of mathematics and science education.

- The mission of CILS is to build the capacity of the field to understand the essential features of informal learning, and to use that capacity to support formal school-based learning.

FIVE PROPOSED CLT DRIVERS

**LEADERSHIP SUPPORT
AND DEVELOPMENT**

**CREATION AND
DISSEMINATION
OF KNOWLEDGE**

"CENTERNESS"
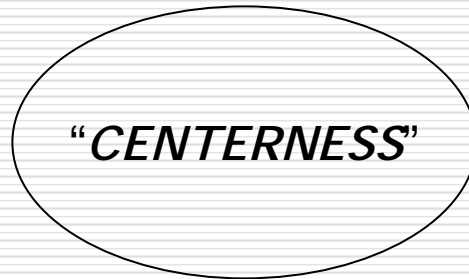
**CONNECTIONS AND
RELATIONSHIPS**

**POLICIES AND
STRUCTURES**

Assessing CILS Outcomes: The Committee Review Panel

- ☐ An external panel to study CILS
- ☐ Year one: Studying the internal logic of the project and groundtruthing
- ☐ Year two: Study contribution to initiative goals:
  - ■ The development of leadership
  - ■ The generation and dissemination of knowledge
  - ■ The development of connections and relationships
  - ■ The development of new policies and structures
  - ■ The development of a <u>Center</u> that unites the work and supports the field

Summary

Steps in Project Evaluation

- ☐ Prioritize (4) functions
- ☐ Begin work with evaluator around the theory of action
- ☐ Use groundtruthing in a formative fashion
- ☐ Decide on summative audience and their needs:
  - ■ Make the case using: 1) project logic and 2) initiative goals or drivers
- ☐ Decide if and how to use the evaluation to contribute to research effort

General Principles of Inverness Evaluation Work

- ❑ We see evaluation as a process of inquiry – where the phenomenon is the improvement effort.
- ❑ We begin with and focus heavily on the documentation of what is intended – and what is actually happening.
- ❑ We prefer to work in a context of relationship.
- ❑ We see evaluation as a powerful context for technical assistance.
- ❑ We are careful to define and bound our work so that we all are clear about what it is – and what it is not.

General Principles of Inverness Evaluation Work

- ☐ Researchers are our best instruments. We often employ a systematic and rigorous use of human judgment.
- ☐ Yet we try to be very clear about what is data, and what is interpretation.
- ☐ We often look for insights rather than "proof." It is often more important to help people think correctly about their work and the situations they face – than to gather data to try to prove things that may not be significant or even make sense.
- ☐ We believe there is great value in having an independent expert group try to document and portray what is actually happening.

end