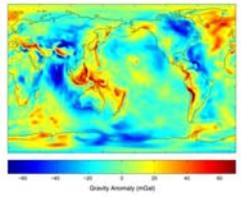


## PRE-SERVICE ELEMENTARY TEACHERS

During the 8+ years that we have been working with pre-service teachers it has been evident to us that student background and attitudes have a huge impact on student learning, enthusiasm for science, and classroom atmosphere.

### AVENUES TO ADDRESS ATTITUDES

- "Ice breaker" activities that illustrate science process ("Do You Know Me")
- High success rate activities: Earth Observation Day, Investigation of Hominid Skull Physiology, Case Studies
- Highly personal instructors!



### DATA - Directed Reflective Writing

#### Initial Essays:

- Describe your learning expectations for this class.
- Describe what you know about how you learn.
- What knowledge of <subject area> do you bring to this class?

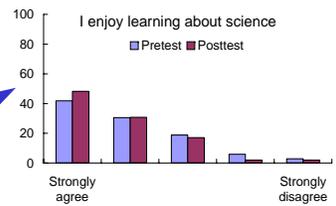
*"This is the first time I have experimented since middle school..."*

#### Portfolio Essays:

- Questions address previous ideas, how students learned content, remaining questions and confidence levels.

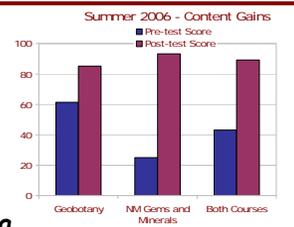
### DATA - Survey

- Early attempts at surveying changes in attitudes
- *Need a better instrument and more study*



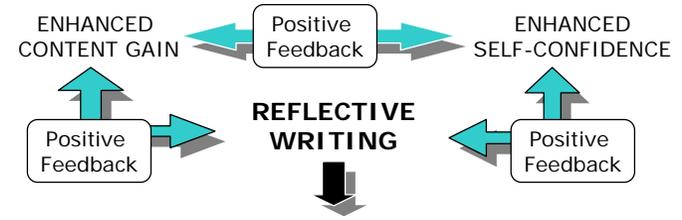
## SCIENCE WORKSHOPS FOR IN-SERVICE TEACHERS

For the last 2 summers the Science Education Institute of the Southwest (SEIS) has offered 1-week workshops for in-service science teachers. Our research questions are focused on evaluating changes in content knowledge, science process skills and attitudes towards science.



### Looking at the Affective Domain Using Reflective Writing

In the summer of 2006 we investigated changes in attitudes and comfort levels with doing science in the field using reflective writing.



#### Example Questions:

- When did you feel well-prepared and/or competent? Why?
- When did you feel uncomfortable and/or unprepared? Why?

#### Example Responses:

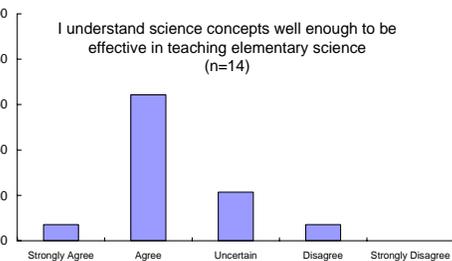
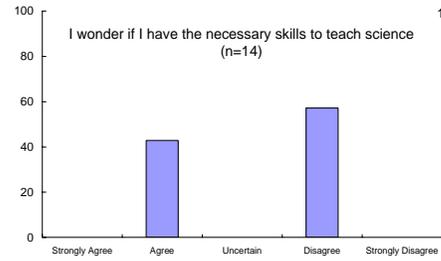
"Everything was a major learning curve... I'd never done anything like it before."  
It was "...embarrassing not having "official" hiking gear."  
"I wasn't into science until I took these courses, I CAN DO IT!"

## SCIENCE WORKSHOPS FOR IN-SERVICE ELEMENTARY TEACHERS

The Science Education Institute of the Southwest is currently sponsoring a series of science content workshops for in-service elementary teachers. Part of the associated research is looking at changes in science teaching self-efficacy as a function of workshop attendance frequency.

### DATA - STEBI

We are using the Science Teaching Efficacy Belief Instrument (Enoch and Riggs, 1990) to measure self-efficacy, and therefore one aspect of the affective domain. We have just started collecting and analyzing data. The graphs show some *very* preliminary results from a small sample size.



### VERY BRIEF DISCUSSION

In-service teachers from this very small sample have high self-efficacy with regard to these two questions. These teachers already have high content knowledge and confidence in teaching science.