

Assessing the Effectiveness of an Initial Teacher Preparation Program

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College of Science Teacher Preparation Program

- Program housed in College of Science
- 30 credits of science pedagogy courses, leading to eligibility for certification
- Courses taught by science educators with appointments in content departments
- Courses include supervised field experiences in area middle & high school classrooms

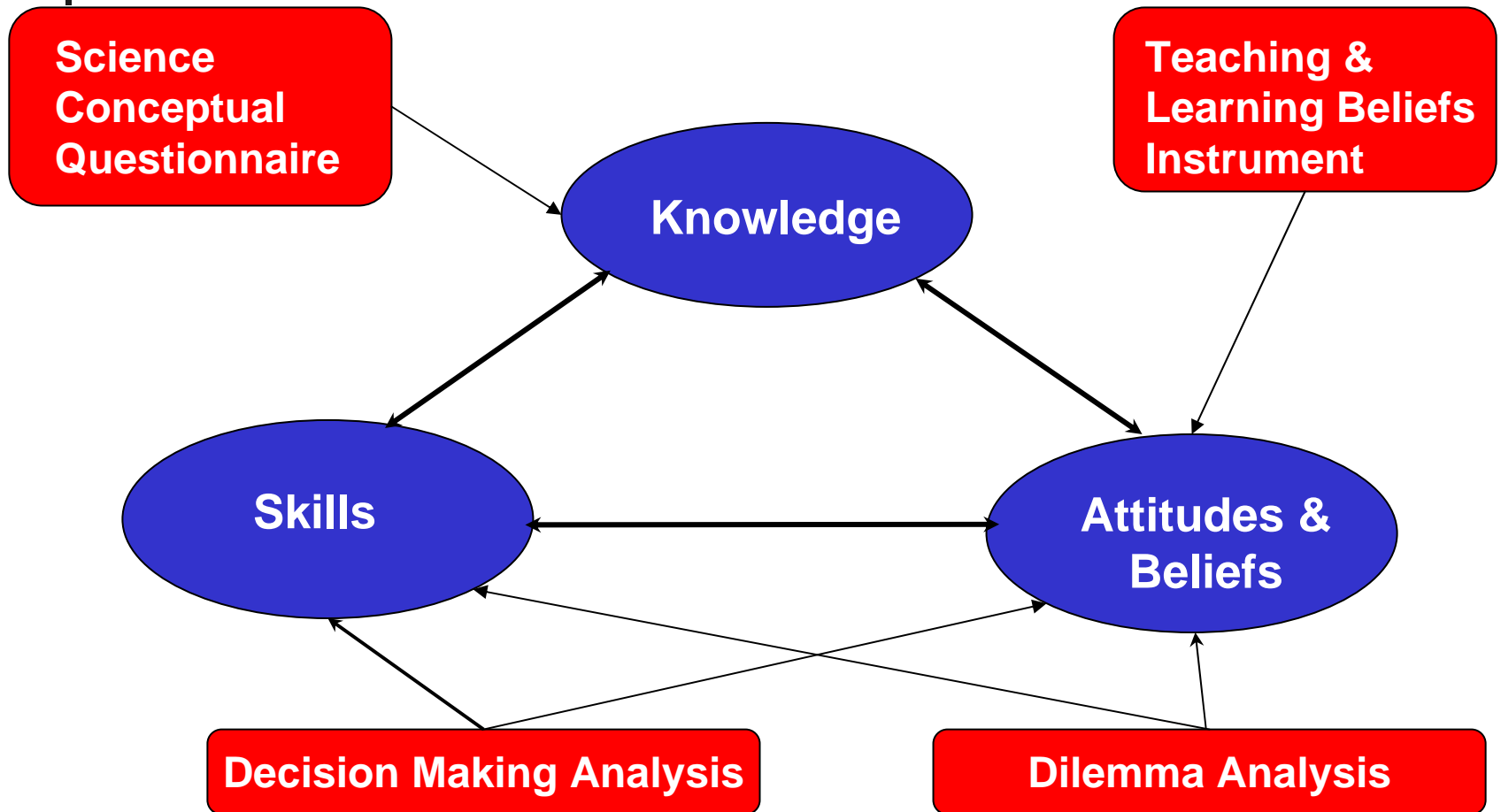


College of Science Teacher Preparation Program

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06 (proj.)
CoS TPP Course Enrollment	26	35	67	100	114	120
CoS TPP Completers*	5	1	5	14	8	20
Physics teachers	0	0	2	1	1	4

***Prior to TPP, ~ 6 science teachers graduated each year from College of Ed.; 2 physics teachers in 4 years**

Assessment Instruments





Assessment Instruments

- **Science Conceptual Questionnaire**
 - 40 multiple-choice items
 - 10 each from biology, chemistry, earth & space science, physics
 - Focus on common alternative conceptions
 - Two administrations--near beginning & at end of program



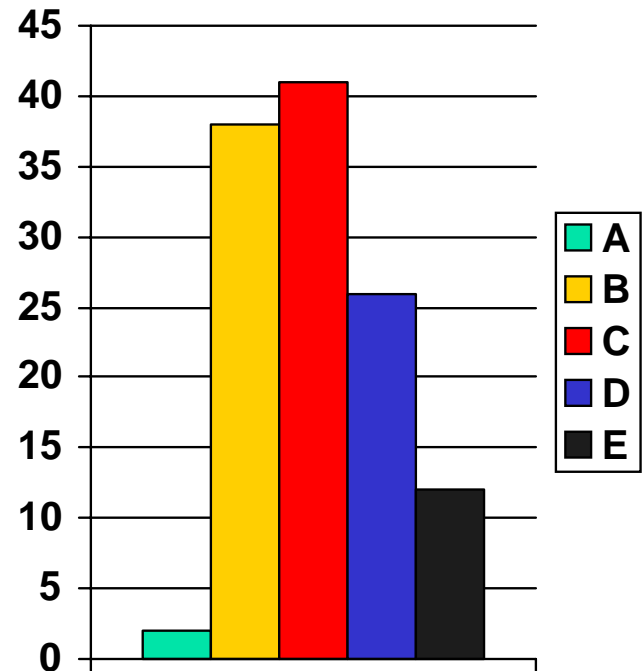
Assessment Instruments

- **Science Conceptual Questionnaire**
 - **First Administration**
 - N = 119
 - Mean score--43% (SD=15%)
 - **Second Administration**
 - N = 15
 - Mean score--58% (SD=15%)
- (3 matched administrations)**

Assessment Instruments

The air conditioning in your dorm room breaks down, so you open the door of a refrigerator that you have in your room. Over the rest of the afternoon what effect will opening the door on the refrigerator have on the temperature of your room?

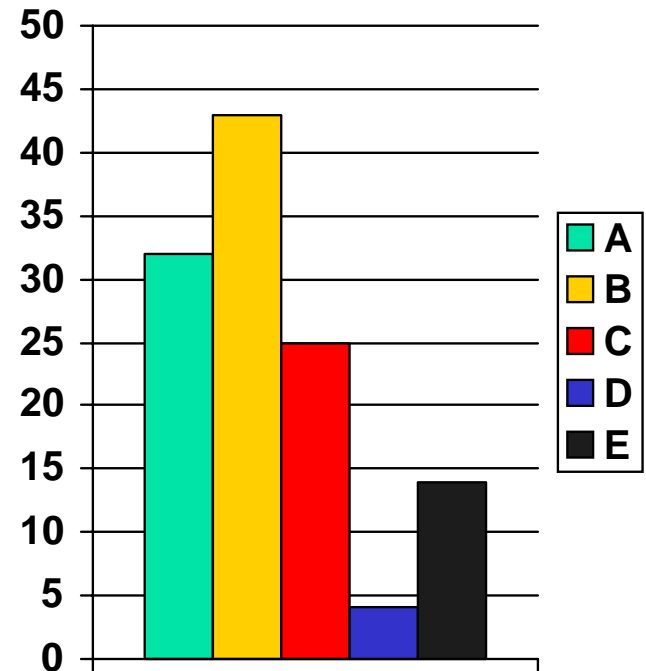
- A. This will decrease it significantly.
- B. This will decrease it only slightly.
- C. This will have no effect.
- D. This will increase it.**
- E. It depends on the refrigerator's setting.



Assessment Instruments

Where does the majority of the mass comprising a large tree come from?

- A. Minerals and nutrients in the soil
- B. Water in the soil
- C. Gases in the air
- D. Nutrients in the original seed
- E. Energy from the sun





Assessment Instruments

- **Science Conceptual Questionnaire**
 - **Next Steps**
 - **Item analysis to refine questionnaire**
 - **Acquisition of data from matched administrations**
 - **Use of data to influence content methods courses**
 - **Use of data to influence teaching in content courses**



Assessment Instruments

- **Teaching & Learning Beliefs**
 - **Section I**
 - **Ranking Tasks**
 - **Goals for science teaching**
 - **Characteristics of good science teachers**
 - **Classroom activities**
 - **Likert-Scale Items--Beliefs about Teaching & Learning**



Assessment Instruments

- **Teaching & Learning Beliefs**
 - **Section II**
 - **Likert-Scale Items--Analysis of Teachers' Decisions**
 - **Two administrations--in first course & last course of program**



Assessment Instruments

- **Teaching & Learning Beliefs**
 - **Goal of Current Data Analysis**
 - Develop reliable coding scheme for data
 - Identify shifts in beliefs as students move through program



Assessment Instruments

- **Decision-Making Analysis**
 - Students analyze teacher's planning and instructional decisions
 - Packet includes classroom video, lesson plans, teacher's notes, student work
 - Packets created for biology, chemistry, physics
 - Single administration during student teaching (N = 22)



Assessment Instruments

- **Decision-Making Analysis**

- **Results**

- Very difficult for preservice teachers to be critical of teachers
- Preservice teachers don't look carefully at students' work to determine if learning occurred

- **Implications**

- Increased focus on analysis of student work in all courses, especially student-teaching seminar



Assessment Instruments

- **Dilemma Analysis**
 - Analysis of problem or situation that is not easily resolved
 - Single administration during student teaching (N = 22)



Assessment Instruments

- **Dilemma Analysis--Areas of Concern**
 - **Student Performance & Success**
 - **Curriculum & Instructional Decisions**



Assessment Instruments

- **Dilemma Analysis--Findings**
 - **Dilemmas grounded in personal beliefs about students & teaching**
 - **Narrow definitions of student success**
 - **Changing beliefs about student learning**



Assessment Instruments

- **Dilemma Analysis--Findings**
 - **Dilemmas resulted from confronting or learning to negotiate perceived constraints**
 - **Examples--school policies, parental irresponsibility, intrinsically unmotivated students**
 - **Recognition of constraints created frustration, a sense of helplessness, and disillusionment**



Assessment Instruments

- **Dilemma Analysis--Findings**
 - **More concern about student motivation & emotional and social wellbeing than student learning and understanding**
 - **Only 5 questioned teaching based on concerns about student understanding**



Assessment Instruments

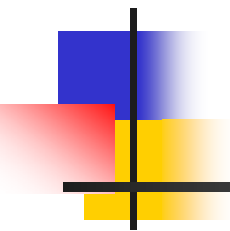
- **Dilemma Analysis--Implications**
 - Increased focus on assessment of student understanding in all courses
 - Review of field experiences to address teaching beliefs and concerns



Assessment Instruments

- **Future Plans**

- **Refine instruments**
- **Develop decision-making analyses for earth science**
- **Add observations of student teachers' and beginning teachers' practice (RTOP)**



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Any questions or comments?