INTRODUCTION

Fostering and Assessing Critical Thinking in a Geology Classroom

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Fostering and Assessing a Major Transition (from Discussion Using the Example of Global Warming.

After Perry (1970)
undergraduate courses. In spirit, most agree that to think critically about an argument, or

This transition requires that students learn the fundamental criteria scientists use to
distinguish "better" arguments from "worse" arguments. In short, this transition requires that students learn to think critically in the ways that scientists think critically.

Step 1: Set up two alternatives to compare:
1) Global Warming is a result of anthropogenic forcing.
2) Global Warming is a result of natural climate variation or other factors

A) Examples: isotopic signatures show that the increase of CO2 in the atmosphere is due
1) to burning of fossil fuels and not from natural sources in the terrestrial biosphere.
B) Examine whether initially conflicting data can be shown to agree
Example: Average global temperatures, which have increased since the 1960s
decreased in the early 1990s. However, the 1991 eruption of Mt. Pinatubo sent volcanic
ash into the atmosphere, partially reflecting the sun's radiative heat and sending cooling
aerosols into the troposphere, with a 1-3 year recovery period.
C) Examine whether there are conflicting lines of scientific evidence
D) Examine whether there are conflicting lines of scientific evidence
E) Check to see if supporting evidence is particularly strong
Example: Data on air temperature can be variable; however, temperature of permafrost,
which is more robust and less variable, in Alaska has steadily risen since the 1980s.
F) Examine whether alternatives are conceptually defective (untestable or ad
hoc).

Areas of Student Concern: View of Student Role: View of Instructor Role

FAIRNESS IN EVALUATION

Perry’s positions 6-9 explore more sophisticated commitments in relativism and are not outlined here.

Fostering and Assessing a Major Transition (from Perry’s Position 4 to Position 5) in a Geology Classroom

Using the Example of Global Warming.

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