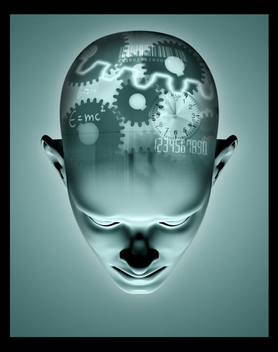
AN INITIAL ANALYSIS OF LEARNING STYLES EXHIBITED BY HIGH SCHOOL SCIENCE STUDENTS



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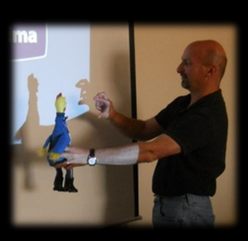
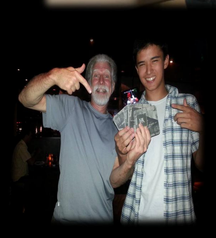
Purpose

Collect data to discover a general learning style "snapshot" of average high school science students and highly involved/motivated ones

Methods

1) Survey control students and experimental group with Felder Learning Style Assessment
2) Experimental group participates in NITARP research project
3) Experimental group reassessed and compared to controls





Abstract

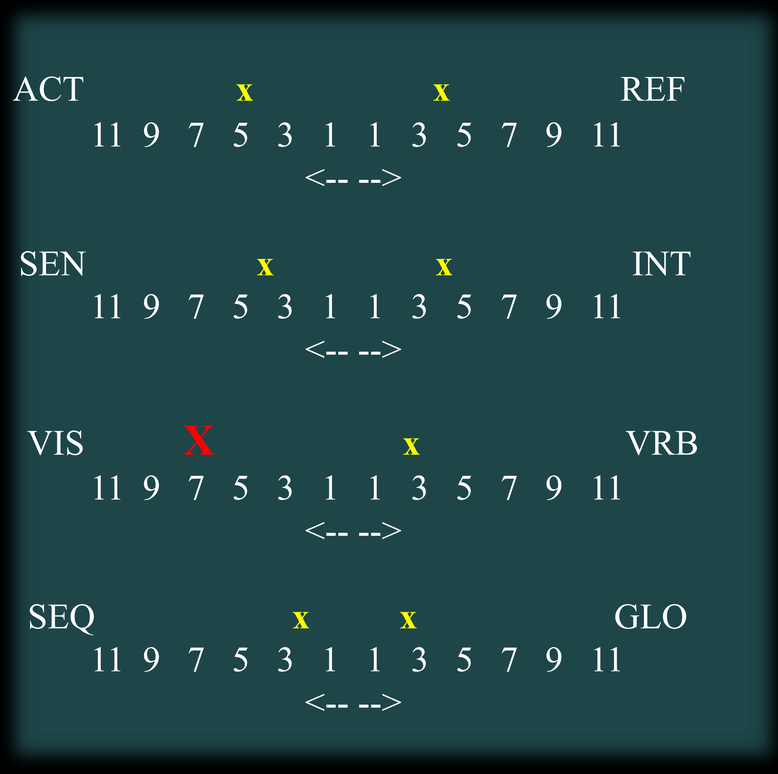
Educational research magazines are filled with information on learning styles and how they affect the learning process, but few studies have been conducted to specifically look at learning styles exhibited by high school science students. This project attempted to obtain a general "snapshot" of learning styles found in the high school science classroom, and then compare that to one derived from a subgroup of highly motivated science students involved in a NITARP student team.

Control students (N=54) from elective science courses at four high schools (urban, suburban, and rural) were administered the Felder Learning Style (FLS) assessment and rated on Likert scales in four learning constructs: Active/Reflective, Sensing/Intuitive, Visual/Verbal, and Sequential/Global. NITARP student team members (N=7) were given the FLS before project work began, and then re-tested approximately three months later, after project work concluded. Chi Square Analysis showed no clear significant difference between the general group and the NITARP group (p = .52). Both groups tended to be very visual and sequential, and slightly less reflective than active.

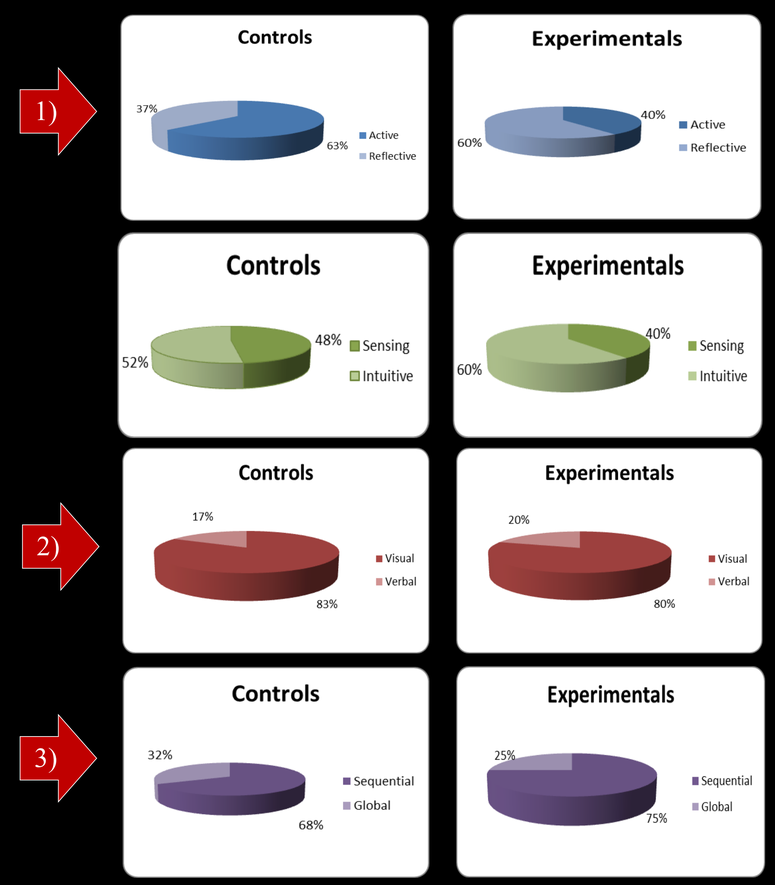
The results suggest several concerns that science teachers may need to address: (1) Research shows best practice science classes often are hands on, yet a significant minority of students are more reflective than active; (2) Big ideas tend to be better understood by global students, but a majority are more sequential; (3) Since a majority of students are visual, information given verbally may not be very effective. Further research is indicated for these areas of discontinuity. This research was conducted as part of the NASA/IPAC Teacher Archive Research Program (NITARP) and was funded by NASA Astrophysics Data Program and Archive Outreach funds.

Results

Average construct "scores" on Felder Learning Style initial assessment



Percentages of students on opposing Felder Assessment Likert values



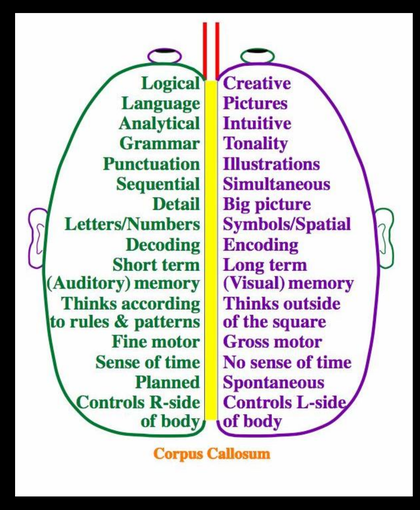
The "Snapshot" of a typical science class:

1) A significant number of students are *more reflective* than active
2) A large majority of students *process thoughts visually* rather than verbally
3) A majority of students are *more sequential* than global

Homer Simpson says:
Use A Whole Brain Approach to Learning

Recommendations for Teachers

1) Provide *regular time for reflection* by students, especially before or after lab work or hands-on activities, so reflective students can process learned information more completely.
2) Provide *scaffolding activities* for students that constantly take them back to *main ideas* and *over-arching concepts*.
3) Have students use *pictures, diagrams, concept maps* and *other visual methods* to communicate their learning.
4) *Assess* student cognitive learning styles and *encourage them* to use their strengths and develop their areas of weakness.



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