

Assessing Interdisciplinary Learning Styles

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The interdependent world we live in is increasingly reflected in the interdisciplinary nature of our professions. As professors, we are frequently required to teach students from various disciplines in our courses and to engage in interdisciplinary research and teaching efforts. This is perhaps even more the case when teaching at a polytechnic university. While it is indisputable that such endeavors enrich our understanding of complex issues and benefit the learning experience of students and faculty alike, they also bring with them new challenges that need to be met. One such challenge is the diversity of learning styles that students bring to the classroom.

Many of us are well aware of the vast literature on students' learning styles (e.g. Myers, 1962; Schroder et. al., 1967; Paivio, 1971; Kolb, 1976; Messick, 1976; Dunn & Dunn, 1978; Keefe, 1979; Riding & Sadler-Smith, 1992; Larsen, 1992; Jonassen & Grabowski, 1993; Biggs, 1993; Vermunt, 1996). Far less research has been done on the distribution of learning styles across the disciplines and how they affect the learning behavior of students in different majors and their response to various teaching and assessment strategies. In order to derive the maximum benefit from interdisciplinary teaching, it is essential that we understand such differences. In a collaborative project that involves scholars from five different disciplines, we are asking the following research questions:

- 1) How are learning styles distributed across different majors?
- 2) Is there a tendency for students to self-select into different majors based on their learning styles, or are certain learning styles influenced by departmental and cultural pressures?
- 3) How do students in different majors perform in different learning environments?
- 4) Is there a correlation between students' learning styles and how they respond to various assessment techniques?

At the conference, we present preliminary findings from the survey that offers insight into the research questions listed above. In order to answer these questions, we will conduct a survey that measures learning styles and various aspects of learning and assessment both across learning styles and across disciplines. The survey will be administered to majors from architecture, engineering, political science, the social sciences, and urban planning. In order to fully answer our questions, we plan to conduct a four-year panel study that will allow us to observe students in a diversity of majors throughout their career at Cal Poly.

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Purpose of the Study

- “Taking stock” of our students
 - Differences across disciplines?
 - Correlation between majors, different learning styles, and learning behavior/attitudes?
- Useful knowledge for:
 - Discipline-specific teaching
 - Teaching GE courses
 - Creating and teaching interdisciplinary courses
 - Interdisciplinary assessment

Research Questions

- To what degree do students' learning styles differ across majors?
- What are major differences in attitudes toward learning and learning behavior across disciplines?

Methodology

- 92-item questionnaire
- Administered to 301 Cal Poly students from Architecture (N = 106), City and Regional Planning (N = 34), Engineering (N = 77), and Political Science (N = 88)
 - Part I: Descriptive statistics
 - Part II: Solomon/Felder learning styles inventory
 - Part III: Student learning attitudes/behavior

Learning Styles

- **Active:** Active learners tend to retain and understand information best by discussing or applying it or by explaining it to others. They tend to enjoy working in groups.
- **Reflective:** Reflective learners prefer to think about information quietly. They tend to like working alone.

Learning Styles

- **Sensing:** Sensing learners tend to like learning facts, like solving problems by well-established methods, tend to be patient with details, and don't like abstract concepts.
- **Intuitive:** Intuitive learners often prefer discovering possibilities and relationships to facts, like innovation and dislike repetition, and tend to work faster and be more innovative than sensors.

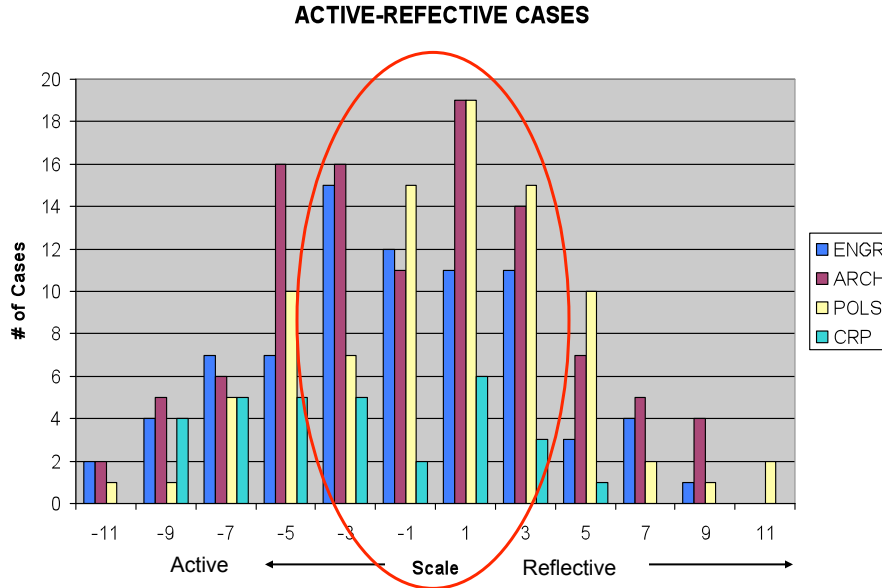
Learning Styles

- **Visual:** Visual learners remember best what they see--pictures, diagrams, flow charts, time lines, films, and demonstrations.
- **Verbal:** Verbal learners get more out of words--written and spoken explanations.

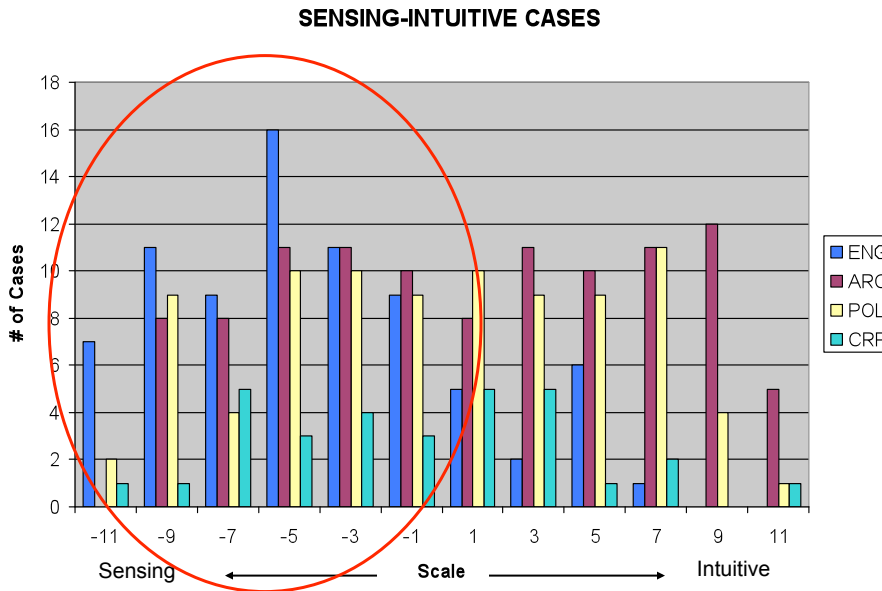
Learning Styles

- **Sequential:** Sequential learners tend to gain understanding in linear steps and tend to follow logical stepwise paths in finding solutions.
- **Global:** Global learners tend to learn in large jumps, absorbing material almost randomly without seeing connections, and then suddenly "getting it." They often arrive at solutions without being able to explain how they got there.

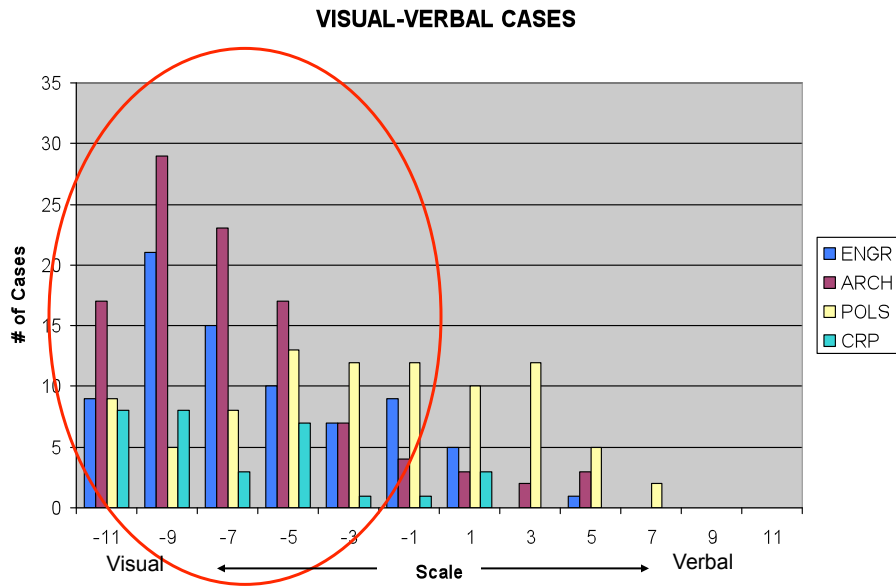
Findings: Learning Styles



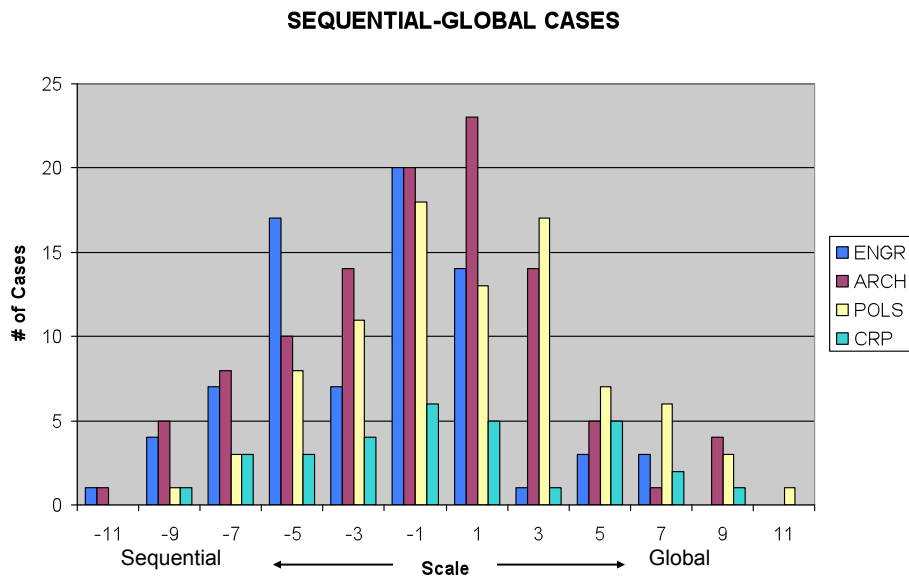
Findings: Learning Styles



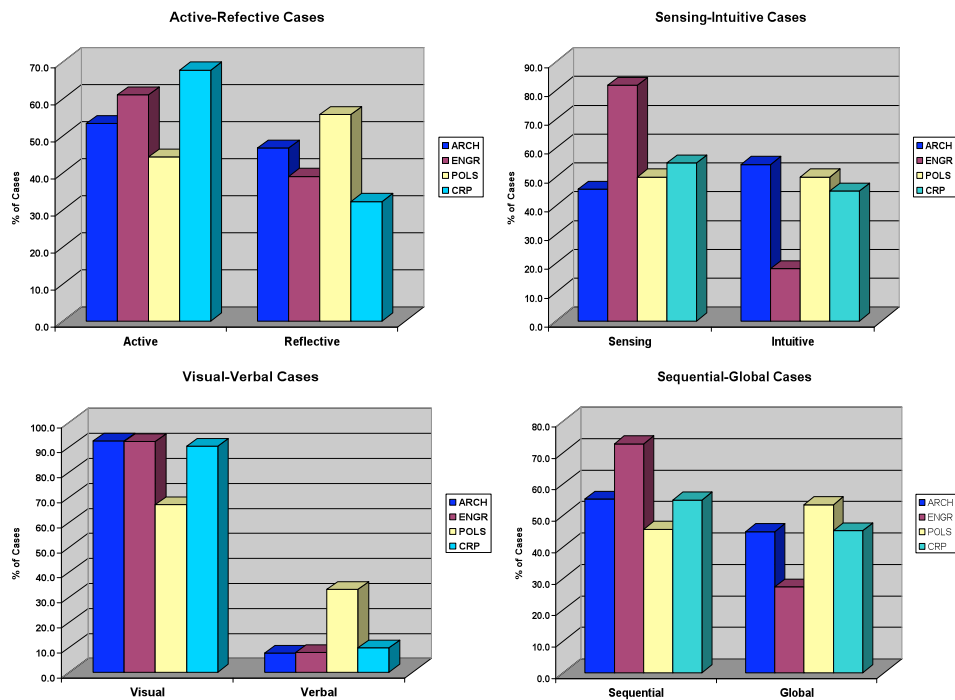
Findings: Learning Styles



Findings: Learning Styles



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Findings: Learning Behavior

- POLS students are most likely to complete assigned readings.
- POLS students are most likely, ENGR students least likely to contribute to class discussions.
- CRP are most likely to work with others on projects, POLS students are the least likely to do so.
- All majors are equally likely to apply learned material (learn by doing?).

Findings: Learning Behavior

- All majors are equally likely to prefer studying alone.
- CRP and ENGR students are most likely to consider career prospects when choosing their majors, whereas ARCH and POLS major claim to be more interested in personal satisfaction from their majors.
- All majors tend to study only what is expected, though POLS majors are least likely to do so.
- All majors are equally likely to “put off” by poor grades and to desire to be “the best.”

Findings: Learning Behavior

- CRP and ENGR majors tend to like seeing test results made public, whereas ARCH and POLS majors do not.
- All majors are equally unlikely to look over returned assignments/tests to see what mistakes they made.
- All majors are equally unlikely to take a course because they know they can get a good grade in it.

Future Research

- Four-year panel study: “nature or nurture?”
- Correlations between LS and learning behavior?
- Correlations between LS and assessment strategies?