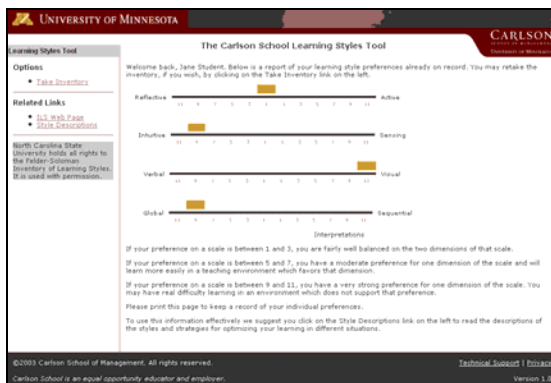


Learning Styles and Instruction

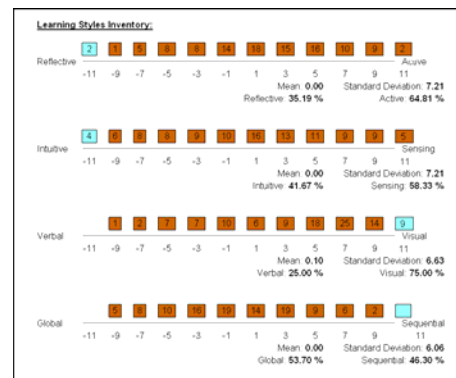
Introduction

When we walk into the classroom, we know that there are many characteristics of the student body that can affect how successful we might be with our instructional strategies and how successful they may be with the course's assignments and assessments. A graduate course in statistics is taught at a different pace, and uses different assignments and assessments than an undergraduate course. A financial analysis class taught to veteran executives will look quite a bit different from one a junior might take. By understanding our "audience," we can choose instructional techniques and select appropriate scope, sequence and assignments to optimize the students' and the course's chances of success.

In addition to audience characteristics like age, gender and familiarity with subject matter, we can look at the students' learning styles. Research into learning styles has identified different ways that people prefer to receive and process information. One of the researchers in this field is Dr. Richard Felder and the Carlson School has been given permission to use the inventory he and Barbara Soloman developed. We have web site (<https://apps.csom.umn.edu/ole/learningstyles>) that delivers the inventory, produces a report for the respondent and stores the preferences so that they can be reported to faculty as part of the student profiles in the Learning Management System (LMS).



Individual report seen by respondent after completing the inventory



Aggregate report available to faculty through the LMS

The inventory measures students' preferences along four dimensions:

- **How they prefer to perceive new information.** Sensors like learning facts and following established processes; Intuitive learners prefer finding relationships and thinking abstractly.

- **How they prefer to receive new information.** Visual learners learn best when they see lots of diagrams and pictures; Verbal learners prefer written or spoken explanations.
- **How they prefer to process new information.** Active learners might say "Let's try it out and see how it works"; The reflective learner would more likely say "Let's think it through first"
- **How they develop understanding.** Sequential learners prefer a logical step-wise progression in learning and solving problems; Global learners need to see the big picture and may absorb information without making connections until it "clicks."

Of course, there is no "right" way to learn. And just because one has a preference towards one style doesn't mean that he will fail in an environment that favors the opposite style. It is also not an indication of whether the student is suited to a discipline.

Using Knowledge of Students' Learning Styles

In order to use this knowledge about students' learning styles, we recommend that faculty take the inventory (<https://apps.csom.umn.edu/ole/learningstyles>) to learn their preferences and ask all students to complete it too (Note: Once a student takes the inventory for one class, the preferences are stored so that students do not need to retake it if a second instructor wants the data). Then take a look at the aggregate profile report (learning styles are at the end of the report) on your course's LMS site, in the Student Roster section.

Understand the Relationship Between Your Learning Preferences and Teaching

Take a look at your preferences, marked by blue shading on the report. Are they in the middle or ends of the continua? The nearer the middle they are, the less strong the preference is. Then think about the techniques that your teachers used that were most effective for you. If you're a global learner, did you have a favorite instructor who was always able to relate the pieces into a bigger whole? If you're a verbal learner, maybe you remember a teacher who gave great lectures.

It is natural for us to emulate the teachers that have inspired us. When we consider how our learning styles may be a factor in the preferences we exhibit in our teaching, it can be illuminative to compare them. Look at the *teaching preferences*¹ you exhibit.

- **What content do you emphasize?** Concrete (factual) or abstract (conceptual, theoretical).

¹ The list of teaching styles and their relationship to learning styles are from Felder, R.M. and Silverman, L.K., "Learning and Teaching Styles in Engineering Education," *Engr. Education*, 78(7), 674-681 (1988).

- **What mode of presentation is stressed?** Visual (pictures, diagrams, demonstrations) or verbal (lectures, readings, discussions).
- **What mode of student participation is facilitated by the presentation?** Active (students talk, move) or passive (students watch and listen).
- **What type of perspective is provided on the information presented?** Sequential (step-by-step progression, “the trees”) or global (context and relevance, “the forest”).

Teaching and learning styles can be related to each other, as depicted in this table:

Preferred Learning Style		Corresponding Teaching Style	
sensory	} perception	concrete	} content
intuitive		abstract	
visual	} input	visual	} presentation
verbal		verbal	
active	} processing	active	} student participation
reflective		passive	
sequential	} understanding	sequential	} perspective
global		global	

How closely linked are yours? If they are very closely linked, you may find that you have students that you cannot reach unless you make a conscious effort to incorporate teaching techniques that are outside your preference zone.

Look at Your Students

Now look at the class distribution. Are there particular features you notice?

- **Do students tend toward the middle or the extremes?** If it’s the middle, you’re in luck. That means that the preferences are not strong and that students can likely compensate for any features of your classroom environment that differ from their preferences. If they are at the extremes, you may find that they are not engaged if your teaching style does not support their preference.
- **Are there any clues in the response you’ve already noticed in your class?** For example, do you have a large number of students grouped at the visual extreme and do you remember how engaged they got when you revealed the diagram that depicted the model you had just lectured about for 15 minutes?

Implications for Your Teaching

So, what are the implications for your teaching? First, it would be unproductive to try to meet the exact learning preferences of each of your students (there are 16 possible combinations). They are, after all, *preferences* not *requirements*. Nevertheless, you can do the following:

- **Vary the strategies you use.** If you prefer to lecture, include a demonstration occasionally and include slides with graphics to illustrate concepts and relationships. If you often ask students to actively process information through problem-solving activities, include also exercises that encourage them to reflect and relate the new learning to their prior view of the world.
- **Encourage your students to grow.** Many students will already have learned how to adapt to environments outside their preferences and to compensate for styles that do not match their learning. For example, global learners who find themselves in a sequentially-structured course can use concept maps in their note-taking to bridge the gap. You may wish to take a look at Bob Hansen's Featured Faculty article (see Resources, below) for one idea on how this can be done.

It is important to know as much about your students as you can to maximize learning. Learning styles are another piece of information you can use to design or improve your class activities.

Resources

Here is a short list of resources for additional information on the Felder-Soloman inventory and the general topic of learning styles.

- <https://apps.csom.umn.edu/ole/learningstyles> is the Carlson School Learning Styles Tool.
- <https://apps.csom.umn.edu/ole/learningstyles/deftips.htm> describes the styles and gives tips to learners. This is also available via the "Style Descriptions" link on the Carlson School Learning Styles Tool.
- <http://www.ncsu.edu/felder-public/ILSpage.html> lists validation studies on the inventory, other research and implementation tools. This is also available via the "ILS Web Page" link on the Carlson School Learning Styles Tool.
- <http://www.csom.umn.edu/Page5192.aspx> is an article on how Bob Hansen used learning styles in MBA 6210.
- <https://www.carlsonschool.umn.edu/Page6532.aspx> contains information from Dr. Felder's workshop at CSOM, including video clips of his descriptions of the styles.
- Kolb, D. A. (1984). *Experiential Learning: Experience as the source of learning and development*. New Jersey: Prentice Hall. David Kolb developed a model of experiential learning from which is derived an alternate categorization of learning styles.