

Felder-Silverman Learning Styles Test – Aggregated Results

	Autumn 2005
Act : Ref	7 : 13
Sen : Int	4 : 16
Vis : Vrb	12 : 8
Seq : Glo	6 : 14

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Felder-Silverman Test Results Aggregated (from Last Time)

ActSenVisSeq 1	ActIntVrbSeq
RefSenVisSeq	RefIntVrbSeq 2
ActSenVisGlo	ActIntVisSeq 1
RefSenVisGlo 1	RefIntVisSeq 2
ActSenVrbSeq	ActIntVrbGlo 1
RefSenVrbSeq	RefIntVrbGlo 3
ActSenVrbGlo	ActIntVisGlo 4
RefSenVrbGlo 2	RefIntVisGlo 3

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Session 04: Active Learning

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Outline

- n The concept of active learning
- n Active learning exercises and in-group discussions
- n Barriers to active learning
- n Meta-cognitive discussion

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Resources

- n *Teaching Tips*
 - n Ch.16 (pp.213-219), Ch.15 (pp.192-196) + p.72, Ch.17 (pp.221-227), Ch.19 (pp.254-258), Ch.20 (pp.266-272)
- n *How People Learn*
 - n pp.12-13 (<http://www.nap.edu/openbook/0309070368/html/>)
- n *Tools for Teaching*, by Barbara Gross Davis
 - n Ch.8 (pp.66-69, 72-73), Ch.9, Ch.16, Ch.18, Ch.19
- n *Promoting Active Learning Strategies for the Classroom*, by C. Myers and T. Jones
- n *The 7 Habits of Highly Effective People*, by Steven Covey

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What Constitutes Active Learning?

Active learning is a _____. (Circle all that apply.)

- n (A) form of group work aimed at facilitating student learning and knowledge retention;
- n (B) technique for effectively transmitting knowledge to students;
- n (C) dialog between students and instructor, intended to promote knowledge discovery;
- n (D) teaching strategy that is superior to traditional lecturing;
- n (E) teaching method based on intensive engagement of students in the classroom;
- n (F) set of teaching techniques unified by the idea of learning by doing;
- n (G) other (please fill in): _____.

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What Constitutes Active Learning?

- My short answer: ... being actively engaged in the creation and organization of new knowledge.
- Reading, sitting quietly, and listening could all be active learning exercises...
 - ... as long as the student doing them is engaged in the exercise.
- Discussions, simulations, and problem solving may not always be active learning exercises...
 - ... for those students who are not being involved.

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Two Competing Views of Learning – Old and New

“Learning is not so much an additive process, with new learning simply piling up on top of existing knowledge, as it is an active, dynamic process in which the connections are constantly changing and the structure reformatted.”

-- K. Patricia Cross

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Your Personal Experience with Active Learning

How often have you as a student experienced active learning in the courses you have taken? (*Circle one.*)

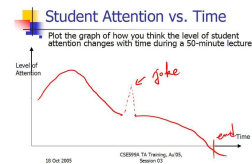
- (A) never
- (B) very rarely
- (C) sometimes
- (D) quite often
- (E) every time

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We Know from Last Week...

- Student attention typically drops when traditional lecturing is the teaching approach.
- Uninterrupted talking results in transmitting a fairly low percentage of the information.



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Let's Try Active Learning

Rules:

- (3 mins)** Form groups of size 4+ (preferably small) so that every chapter (15, 17, 19, 20) has been read by at least one student in each group.
- (8 mins)** Within each group, take turns to briefly describe what you have learned from the readings.
- (2 mins)** I provide a learning goal + some context to each group.
- (10 mins)** In the same groups you will come up with an active learning exercise that supports those learning goals.
- (10 mins)** Groups show the class the fruits of their labor.

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Active Learning Exercise: Learning Goals to Strive For

- Group #1: the importance of testing one's own code
- Group #2: the importance of commenting one's own code
- Group #3: the evils of tightly coupled software components / modules
- Group #4: the concept and mechanism of hash tables
- Group #5: the concept and mechanism of polymorphism

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Active Learning Exercise: How I Came Up with This Idea

- I started by identifying the learning goals for the class session.
- With those learning goals in mind, I asked what would help you (students) learn the “to know” and “to be able to do” parts.
 - I also wanted you to be actively engaged (as always).
- Then, I asked which of the active learning methods I know best apply to the situation at hand.
- Out emerged the jigsaw-style group work and discussion.

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Barriers to Active Learning

- Instructors have less control over the exact script of the lecture.
 - Less confident/experienced instructors often resort to conventional lecturing in order to have a stronger grip over what happens in their classrooms.
 - May be harder to convey the instructor’s enthusiasm if they are not actively speaking.

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Barriers to Active Learning (2)

- Some instructors think, “There just isn’t enough time to fool around in class.”
 - The content transmitted is indeed less than if the instructor talked all the time but the retention and recall rate is typically much higher.
 - *“Most of us are so busy “covering the material” that we miss the chance to “uncover it” with our students.”*
-- Dawkins
 - After all, the point of classes is for students to learn, not for the instructor to exercise their speaking skills.

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Barriers to Active Learning (3)

- It takes time to come up with all those activities; it’s much easier to follow textbook and tell a story.
 - You don’t have to come up with all the activities yourself; there are collections of tried and true activities available.
 - You may have to adapt some to your specific classroom circumstances (class size, goals, mix of students, etc.).
 - Example: For kinesthetic activities, look here:
 - Example: For other activities, one place to look at are the “Nifty assignments” sessions at educational conferences.

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Barriers to Active Learning (4)

- Some students prefer to just sit quietly and absorb.
 - Quiet does not mean not active!
 - They may still actively seek connections with prior knowledge quietly in their minds.
 - That number is higher for some cultures than for others.
- Inertia may lure instructors to resort to old-style ineffective teaching techniques.
 - If you don’t try something new, you’ll never know what you might be missing.

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Barriers to Active Learning (5)

- It’s harder and trickier to evaluate the contributions of individuals when students work in groups.
 - True, but the team-based approach can still be used effectively when grading is not the primary goal.

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Advice: When You Are Doing Active Learning Exercises...

- Be sure to explain to students what you're doing and why it is good for them.
 - Some may be quite skeptical if they haven't experienced this approach or if it didn't work in the hands of previous instructors who tried it.
 - "I paid my tuition to learn from professors, not my classmates, who don't know as much."
- Mix it with more traditional teaching approaches to make it more palatable to your audiences and to leverage the strengths of all approaches.

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Meta-Lessons: Teaching Techniques We Used Today

- Having students prepare for class by reading a short related material
- Tying material to prior lessons
- Using classroom technology to engage everyone
- Active learning, jigsaw-style
- In-group discussions
- Shifting gears between presentation and discussion
- Meta-cognition
 - This is what we are doing right now

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