How to Design Online Teaching for Engaged Learning

Merging Instructional Design with Teaching and Learning Research

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My Background

- 25+ years as educ development centre director (after 10 years as faculty, UCLA)
- Author of 7 books on college teaching, incl. *Online Teaching at Its Best* (2018, 2021)
- Given 550+ keynotes, webinars, and live workshops on college teaching

Webinar Takeaways

- Course design focused on and aligned with key program-level learning outcomes
- Teaching practices from instructional design, cognitive psychology, and teaching and learning research
- Assessments and adequate preparation for students to perform well on them

Webinar Organization - Blocks

- Course design, learning outcomes
- Teaching principles from cognitive psychology and instructional design, then teaching and learning research
- Assessments and how to prepare students to perform well on them

Learning Outcome for You

After this webinar, you will be able to design and teach a logical, cohesive course in any mode with assessable student learning outcomes, a logical student learning process, a clear topical organization, effective, research-based teaching techniques, and appropriate assessments on which students can perform well.

The Logic of Alignment

Teaching Methods/Learning Experiences to Help Students Achieve Outcomes

(the means to the ends)

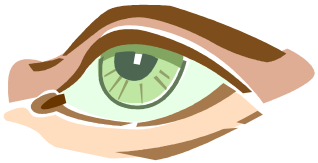
Learning Outcomes = Performance Assessments

(the foundation, the ends) *(measurements of students' progress to the ends)*

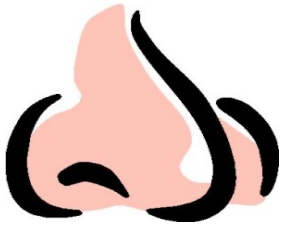
Well-Formulated, Assessable Course Learning Outcomes

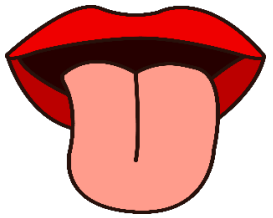
- Statements of what your students should *be able to do* by end of unit or course.
- Reflect program-level outcomes
- Assessable "performances" using active verbs

Assessable =



You can ***observe/perceive*** the performance with 1 or more senses.





Unassessable, Internal-State Verbs

Know

Learn

Understand

Feel

Appreciate

Sequencing Outcomes

- Start by setting ***ultimate*** outcomes.
- Work backwards through ***mediating*** outcomes.
- Identify ***basic*** background abilities (***foundational*** outcomes) to develop in first few days/weeks.

Bloom's Hierarchy of Cognitive Operations

- **Knowledge**: memorize or recognize facts, terms
- **Comprehension**: restate in one's own words
- **(Novel) Application**: utilize, make useful
- **Analysis**: compare/contrast; identify assumptions; deduce implications
- **Synthesis**: make connections, identify relationships
- **Evaluation**: assess validity; select and defend

Design course or modules to move students from lower-level to higher-level cognitive outcomes.

Also a Foundational Outcome: Help Students Abandon Their Faulty Ideas/Mental Models

Ask yourself: What faulty ideas/ mental models do students bring into your class?

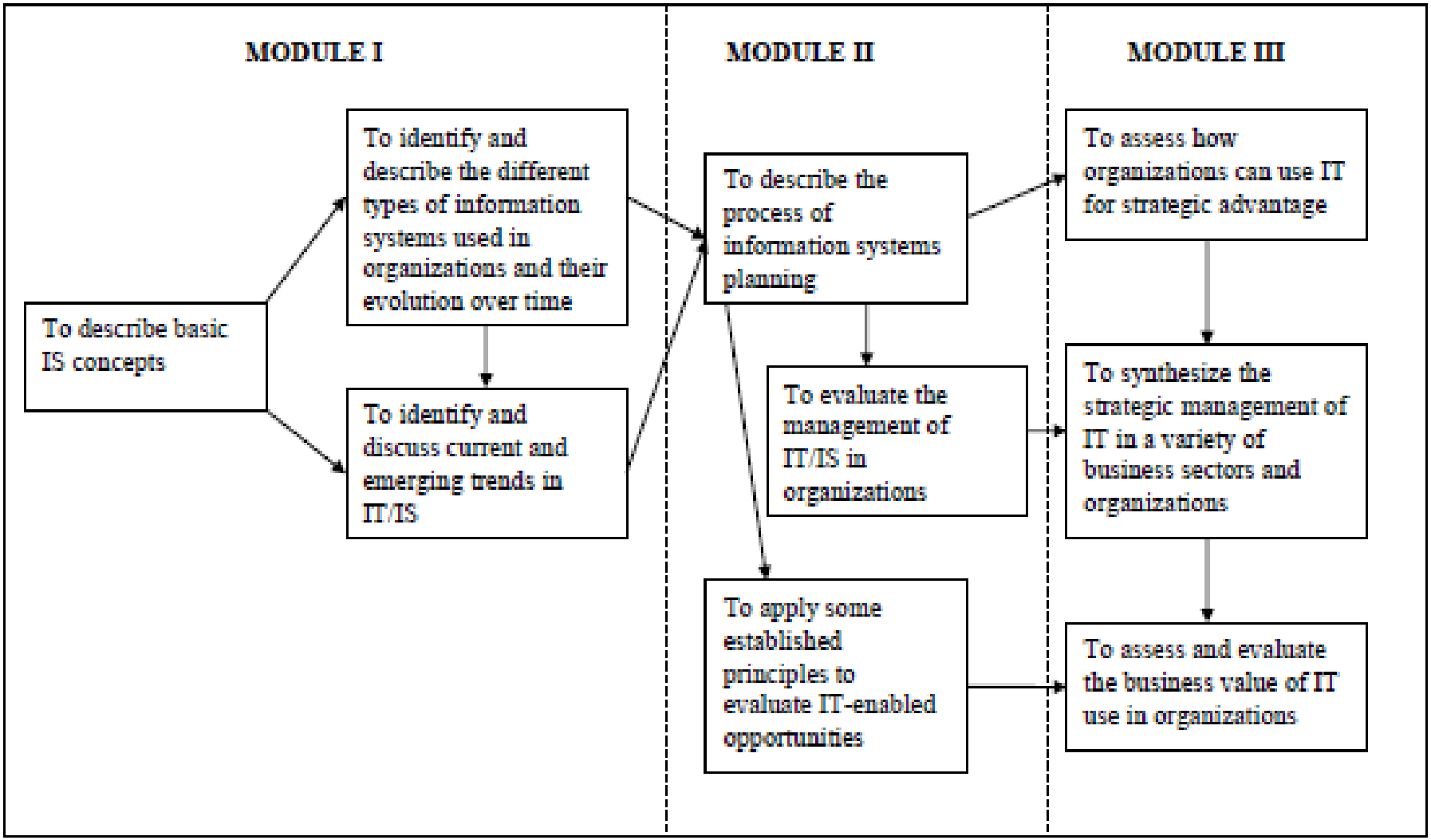
Show students the learning process you plan for them with an outcomes map.

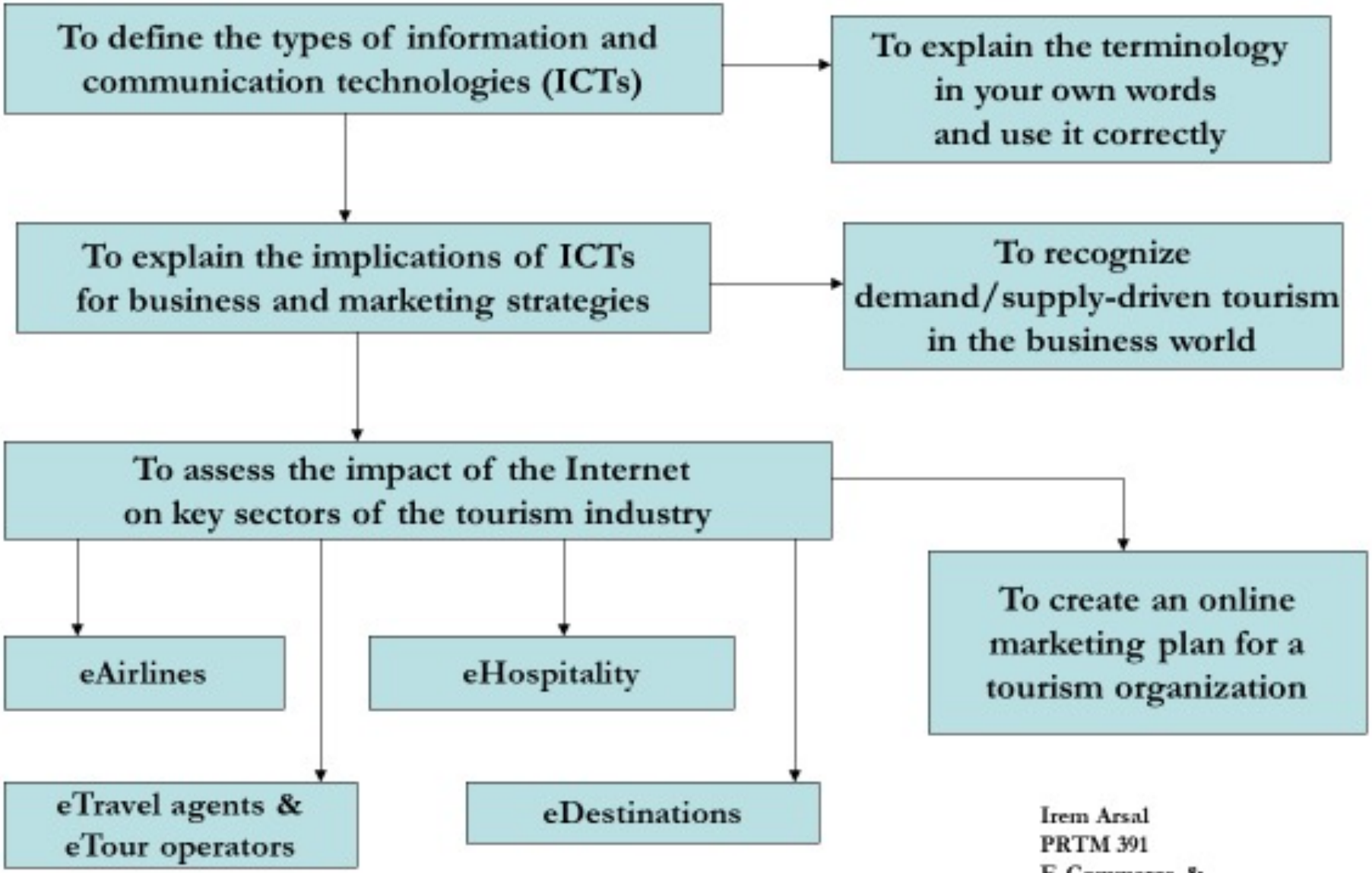
Outcomes Map

Flowchart of the sequence and organization of your learning outcomes in a course—that is, the learning process you have planned for your students

Samuel Otim
Clemson University
Department of Management

MGT 490: Strategic Management of Information Technology
Outcomes Map





Irem Arsal
PRTM 391
E-Commerce &
Tourism Marketing

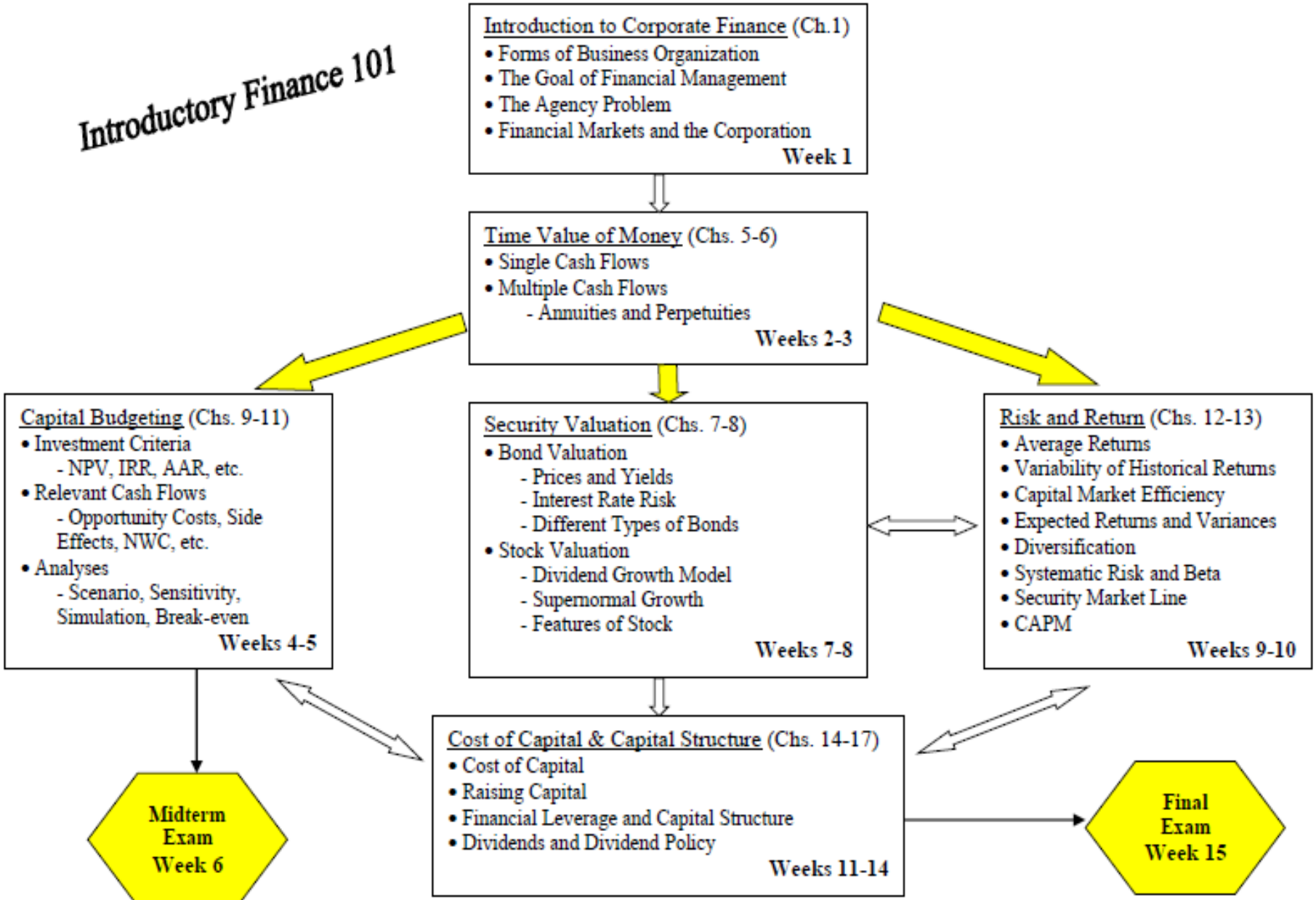
Show students how and why you organized your course content as you did—and therefore how you see the subfield your course covers.

Graphic Syllabus

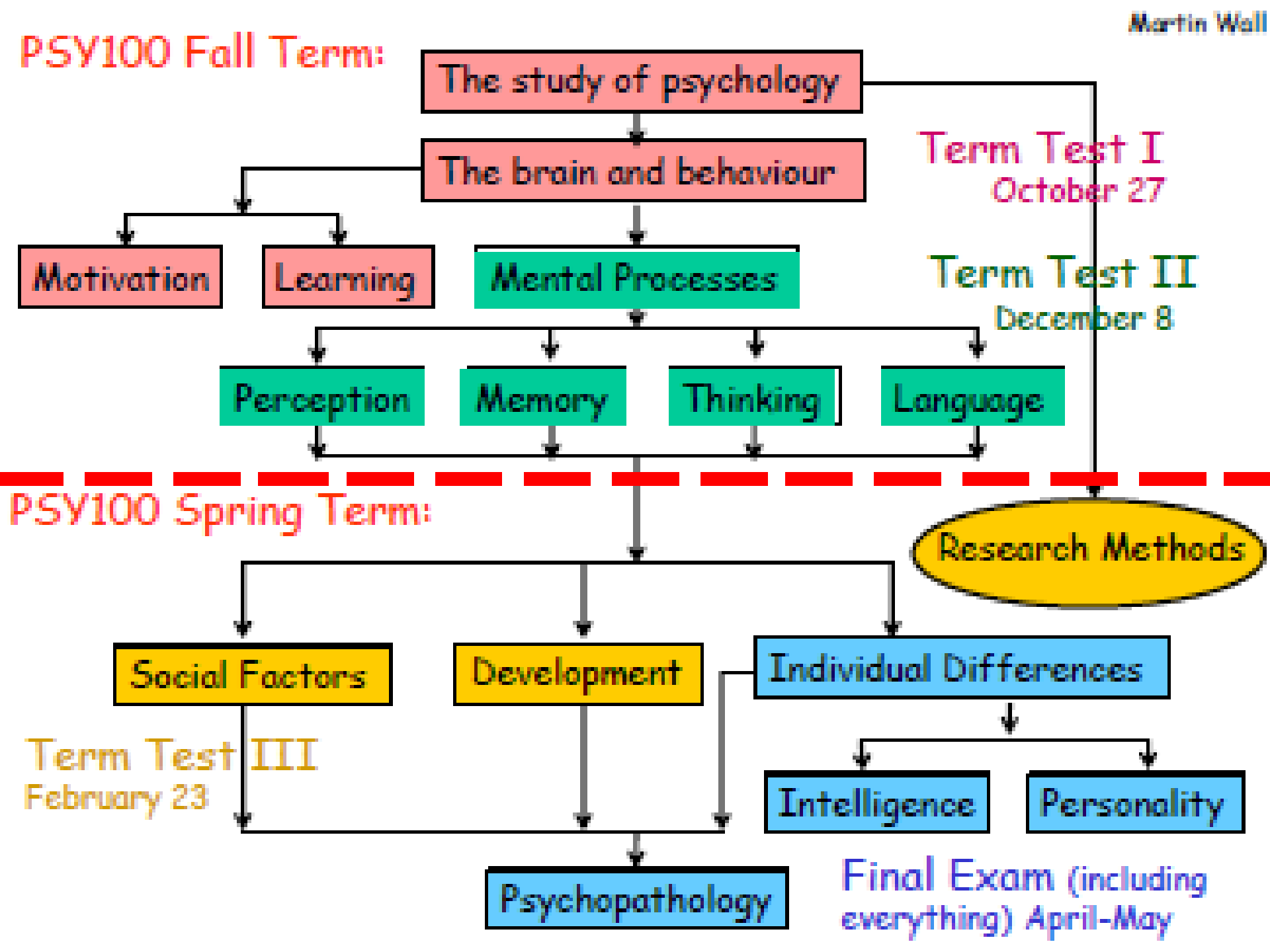
Diagram, flowchart, or concept map showing the organization of and interrelationships among your course topics.

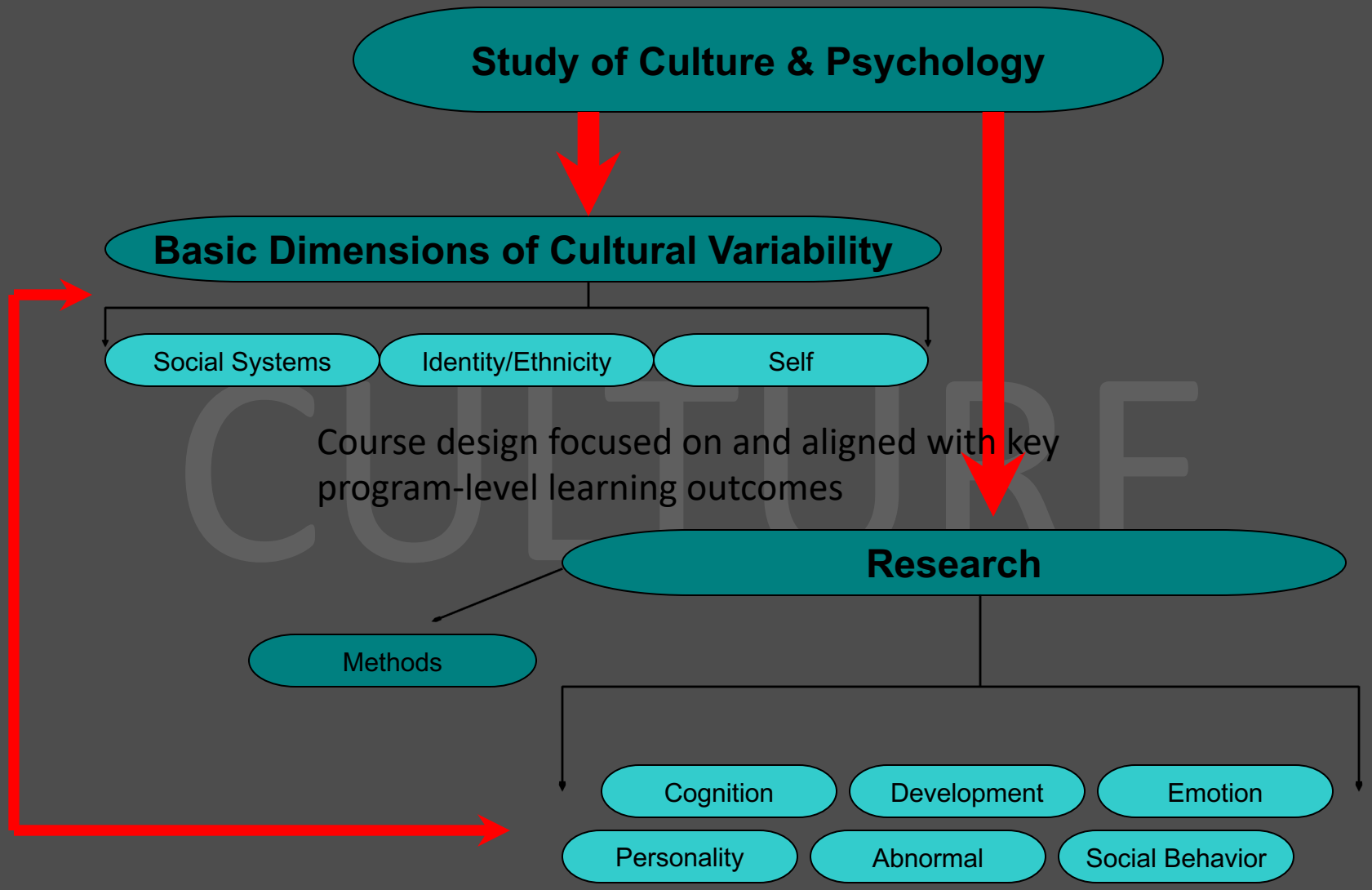
Graphic Syllabus for the Introductory Finance Course, Prof. Ernest Biktimirov

FIGURE 2: An Example of Graphic Syllabus for the Introductory Finance Course



Martin Wall


PSY100 Fall Term:
The study of psychology
The brain and behaviour
Motivation
Learning
Mental Processes
Perception
Memory
Thinking
Language
Term Test I
October 27
Term Test II
December 8
PSY100 Spring Term:
Research Methods
Social Factors
Development
Individual Differences
Intelligence
Personality
Psychopathology
Term Test III
February 23
Final Exam (including everything) April-May


Study of Culture & Psychology
Basic Dimensions of Cultural Variability
Social Systems
Identity/Ethnicity
Self
Course design focused on and aligned with key program-level learning outcomes
Research
Methods
Cognition
Development
Emotion
Personality
Abnormal
Social Behavior

Takeaway:

Your course design should be focused on assessable learning outcomes and aligned with key program-level learning outcomes.

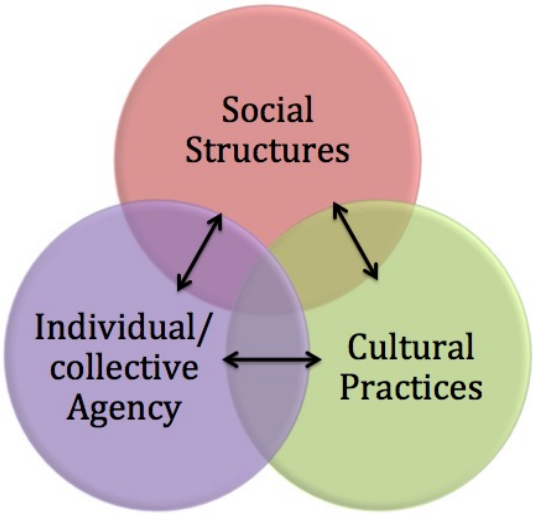
Break for Q&A

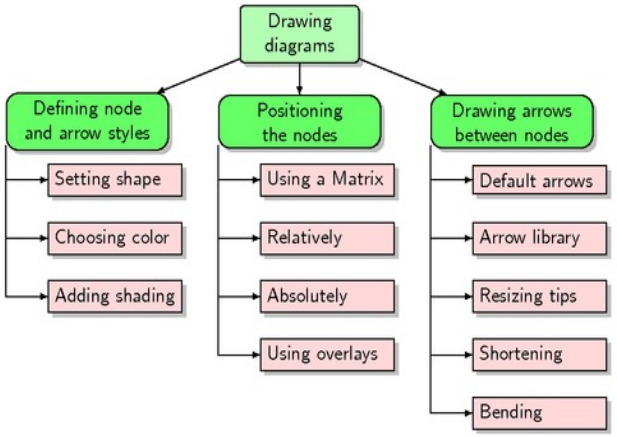
Then onto teaching principles from cognitive psychology, instructional design, and teaching and learning research

Teaching Principle from Cognitive Psych and Instructional Design:

Use Visuals (and Why)

- Show structure of knowledge
  (e.g., your course, relationships among concepts, categories, theories)





	Duration	Causes	How Started	Positive Effects	Negative Effects
World War I					
World War II					
Korean War					
Vietnam War					
Desert Storm					
Iraq					

- Lower cognitive load; require less working memory and fewer cognitive transformations than text, so students can *think* about the content
- Cue text, details; help retrieval
- Cross-cultural

- When students make their *own* visuals, they integrate and organize knowledge → better conceptual understanding, deeper learning, longer-term retention, and easier retrieval.

Teaching Principle from Cognitive Psych and Instructional Design:

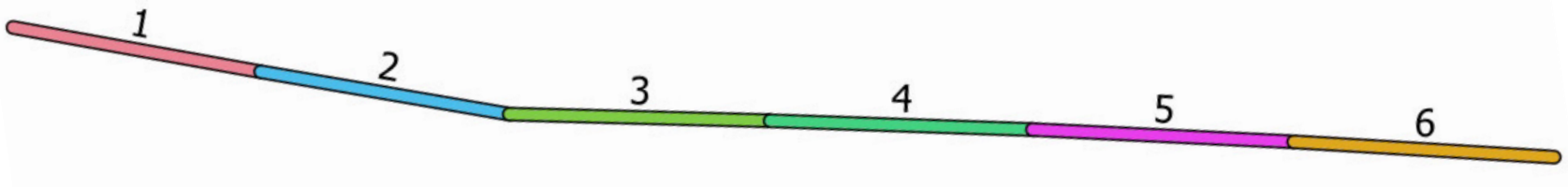
Lower Cognitive Load

- ***WHY?*** Working memory has limited capacity to hold and process information.

- ***HOW?***

"Chunk" (Categorize) Content

Cut Content (video, audio, text) into Short Segments ("Segmentation Principle")



Scaffold Learning

How to scaffold learning

- Your modeling
- Models
- Examples
- Worked and partially worked problems
- Step-by-step hints
- Graphic organizers (previews of the organization; example on next slide)

Graphic Organizer for an Argument or Persuasive Paper

Topic_____

Claim_____

Thesis Statement_____

_____

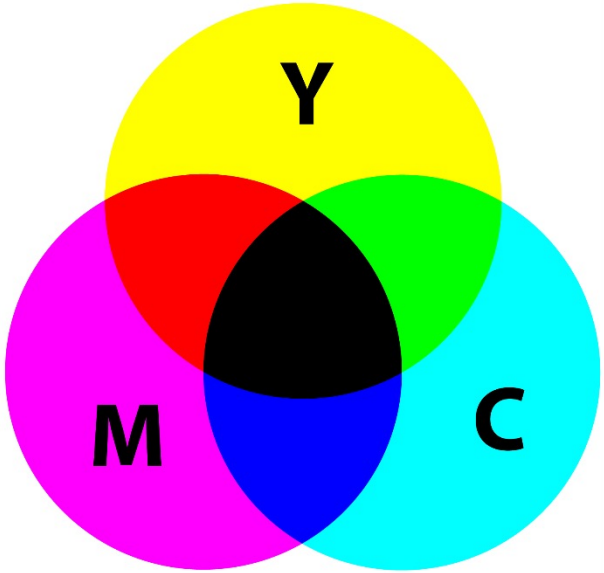
_____

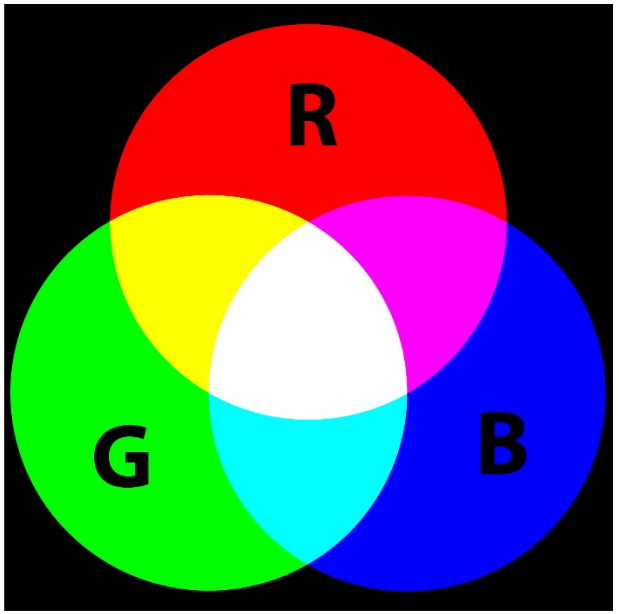
Reason	Reason	Reason
evidence	evidence	evidence
evidence	evidence	evidence

Counter claim

Rebuttal

Text and Graphics Close Together





OR Explain Graphics in Audio, But *Not* with Text Simultaneously

Audio Narration Is Better Than Text

Present Main Points Only

Working Title --

Opening Topic Sentence --

Significance of Topic (practical, clinical, research) --

Background --
- Key Idea/Definition --

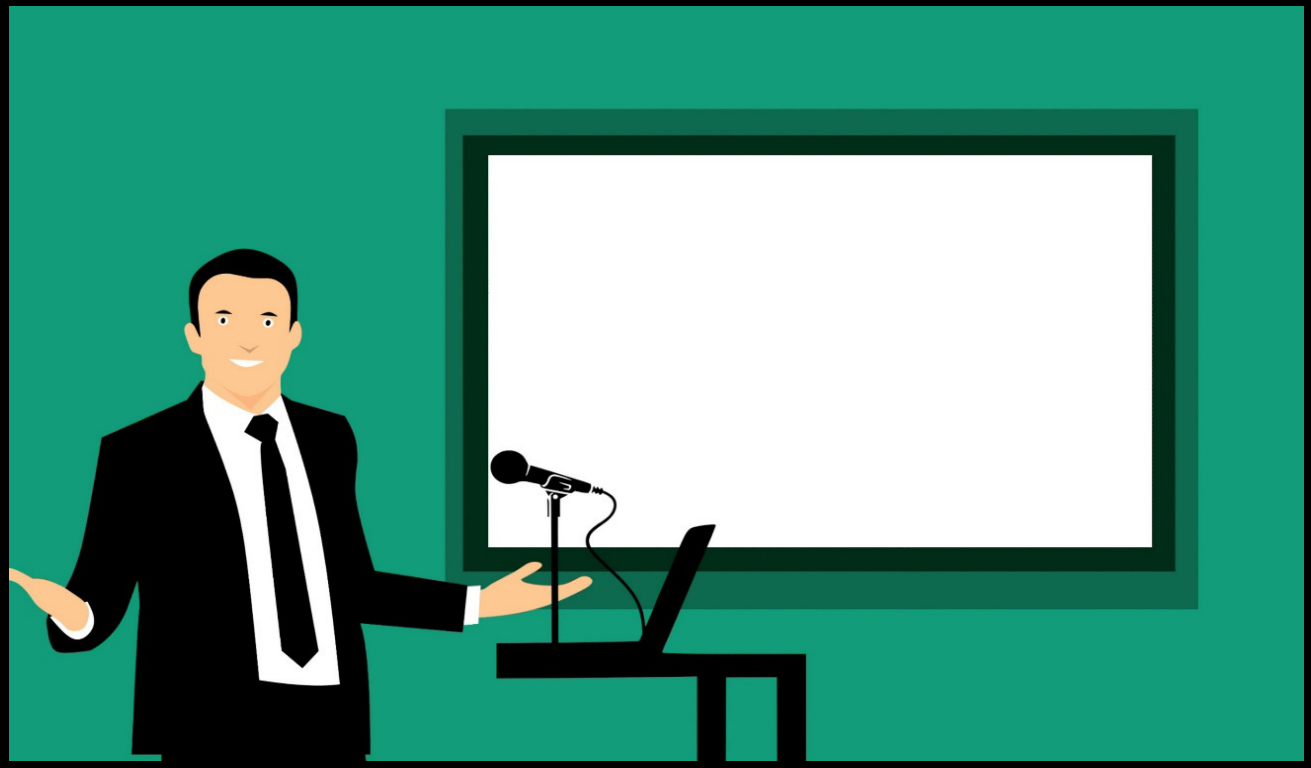
- Key Idea/Definition --

Gap or Conflict --

Overview Statement --
- Focus --

- Preview --

Show Your Face, Speak Informally



Teaching Principle from Cognitive Psych and Instructional Design: Error Correction

- Students re-solve incorrect or similar problems and write out error analysis and/or correct strategy.
- “Test Autopsy” or reflection on graded exam

Question Profile			Reason Answer Was Incorrect			
Question Missed	Points Lost	Type of Question	Carelessness	Unfamiliar Material	Misinterpreted Question	Did no finish

Reflection on Graded Exam

1. Compare your expected and actual performance.
2. How do you feel about your grade?
3. How many hours did you study – enough?
4. How did you study?
5. Why did you lose points? Any patterns?
6. Design study plan for next exam. What will you do differently?

Teaching Principles from Teaching and Learning Research

Most Effective Learning Activities for Different Outcomes

from Davis, J.R. & Arend, B.D. (2013). *Facilitating Seven Ways of Learning.* Sterling, VA: Stylus.

Outcomes: ***Building skills*** (physical and procedural requiring accuracy, precision, and efficiency)

Learning Activities: *Tasks, procedures, modeling demo's, skill practice exercises*

Outcomes: *Acquiring knowledge*

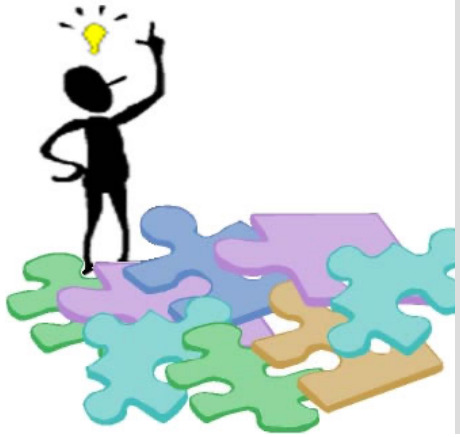
(info, concepts, disciplinary terminology)

Learning Activities: *Presentations, demo's, explanations, practice in disciplinary language*

Outcome: ***Developing critical, creative, and dialogic thinking*** (better thinking, reasoning)

Learning Activities: *Question-driven inquiries, discussions, debates, metacognitive activities*

Outcomes: ***Developing problem-solving and decision-making abilities*** (mental strategies for solving and deciding)



Learning Activities: *Labs, problems, cases, problem-based learning, projects*

Outcomes: ***Exploring attitudes, feelings, perspectives*** (awareness of others and own biases, ability to collaborate)

Learning Activities: *Group activities, team projects*

Outcomes: ***Practicing professional judgment*** (appropriate appraisal and action in complex, context-dependent situations)

Learning Activities: *Simulations, role plays, games, dramatic scenarios (cases) of increasing complexity over time*

Outcomes: ***Reflecting on experience*** (self-discovery and personal growth from real-life experience)

Learning Activities: *Service-learning, field work, study abroad, internship—all followed by reflection*

Takeaway:

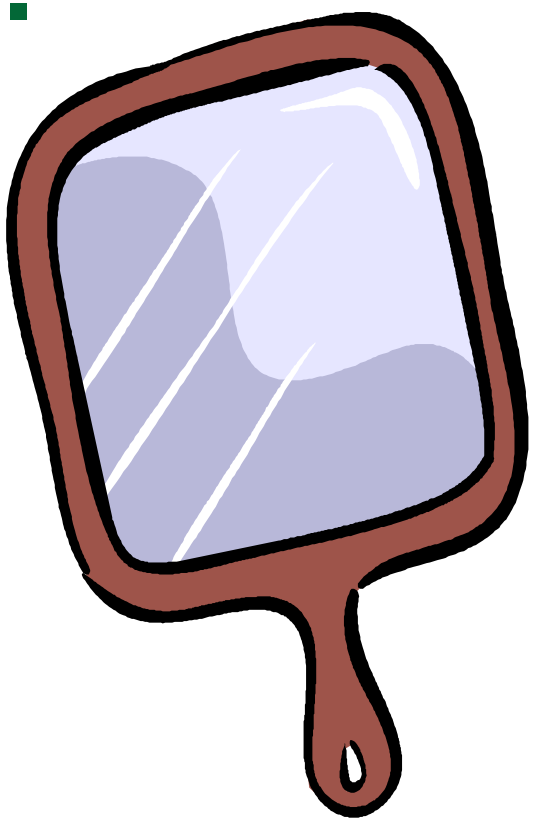
Use research-backed teaching practices from instructional design, cognitive psychology, and teaching and learning research

Break for Q&A

Then onto developing appropriate assessments and preparing students to perform well on them

Assessments Should Mirror Outcomes.

Outcome



Assessment

Assessment Guidelines

- If you want students to be able to do X, Y, and Z, have them ***do*** X, Y, and Z to assess how well they can.
- Formally (for a grade) assess the *same* skills you teach and have students practice.

- Assess *informally* (not for grades) while giving students practice.
- Feedback (from you, colleagues, or other students) should follow practice.
- Informal assessment tells you when to move on—not until almost all students have made "acceptable progress."

Informal Assessments = Teaching Techniques = Learning Activities

- Low-stakes quiz
- Problem to solve (indiv, pair, group)
- Correct the error, or reorder the steps (pair, group)
- Multiple choice question (conceptual or applied, see the web) * poll * pair or triad discussion * poll again

- Worksheet/exercise (indiv, pair, group)
- List examples of new concept (indiv, pair)
- Quick case study (indiv, pair, group)
- Discuss complex, open-ended Q & come to conclusion/consensus (pair, group)
- One-minute paper on the most important, useful, valuable, interesting, or surprising point(s)

- Question for future test (pair, group)
- Draw concept or mind map, compare-contrast matrix, flowchart, or other visual of verbal or text material (indiv, pair, group)

***Hold students accountable** by:*

- *cold-calling on some randomly or*
- *having them record discussion on Google Docs.*

Takeaway:

Develop assessments that reflect your program and course learning outcomes, and give students adequate preparation to perform well on them.

Break for Q&A

Then onto final reflection

Concluding Reflection

What are the most important or most valuable things that you learned during this webinar?