Fundamentals of Teaching & Learning
(formerly the Course Director Orientation)

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"The act of teaching is becoming more about designing the educational context and engaging students as they learn to approach materials in more insightful and demanding ways. We are not transmitters of knowledge very often today."

Judith Ramaley, Educause Review, March/April 2013, p. 8.

Goals

- To provide faculty with practical information and theoretical background to support the effective design of courses and improved assessment of student learning.

- To support faculty in the application of modern course design elements in a safe environment.

- To foster a cohesive learning community for ongoing exchange, collaboration and support on issues related to effective teaching, learning, and assessment.

Learning objectives

1. To apply the concept of **backward design** to at least one instructional unit in your course.

2. To write meaningful **learning objectives** to support identified learning outcomes in your course.

3. To practice **aligning** learning objectives, delivery method, and assessment in at least one instructional unit in your course.

4. To apply at least one new **active learning** strategy in your course.

5. To use available **technology** tools at the school to support active learning.

6. To apply at least one alternative **assessment** strategy in your course.

7. To interpret basic **psychometric properties** of examinations.

Expectations

- Complete the short online module

- Participate in both F2F sessions

- Complete the lesson redesign project

- Five CDE credits

- A digital badge
  - https://credly.com/credit/12705866

Online module analytics

ⓜ Average Score	ⓐ High Score	ⓢ Low Score	ⓢ Standard Deviation	ⓒ Average Time
84%	100%	44%	2.57	20:42
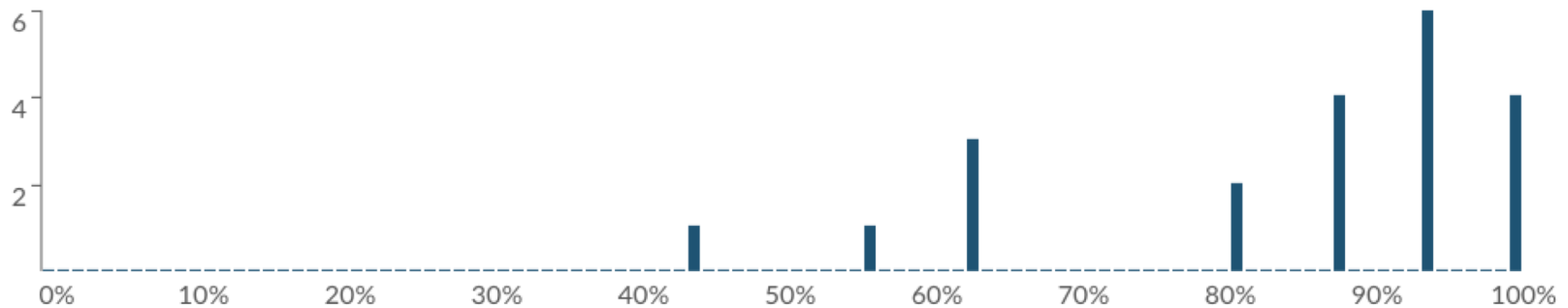
N=28

Online module analytics

First faculty to complete the module

- Dr. Galicia

Faculty who got a a full score

- Dr. Lee
- Professor Laughter
- Dr. Lundergan
- Dr. Thor
- Professor Radif

Q: Has your perception about ExamSoft as a learning tool changed as a result of reading the paper? How?

*#1 "After reading the paper, I realize student learning is enhanced by releasing the reports, especially the Strengths and Opportunities report. I am now more **inclined to make this available** for students. I also realize I need to spend more focused time on **categorizing questions** to enhance the reports. I have not been utilizing Examsoft to its full potential and, therefore, not giving the students the best learning experience possible."*
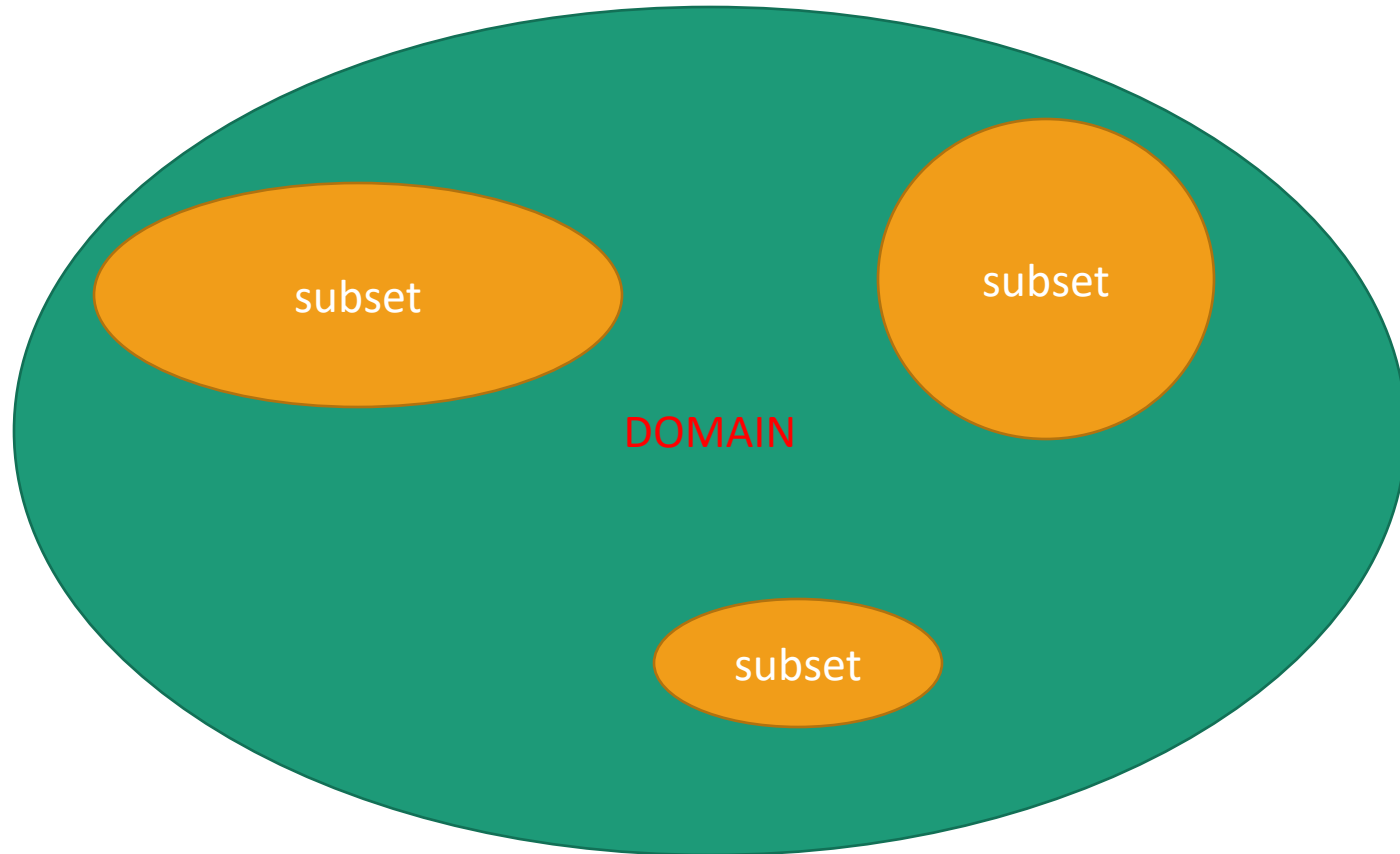
*#2 "I no longer view it as just an alternative to a paper exam but as a good tool to help with **self-directed and autonomous learning**, particularly if the students receives rich **feedback** in the form of the Strength and Opportunities report and the rationale for answers."*
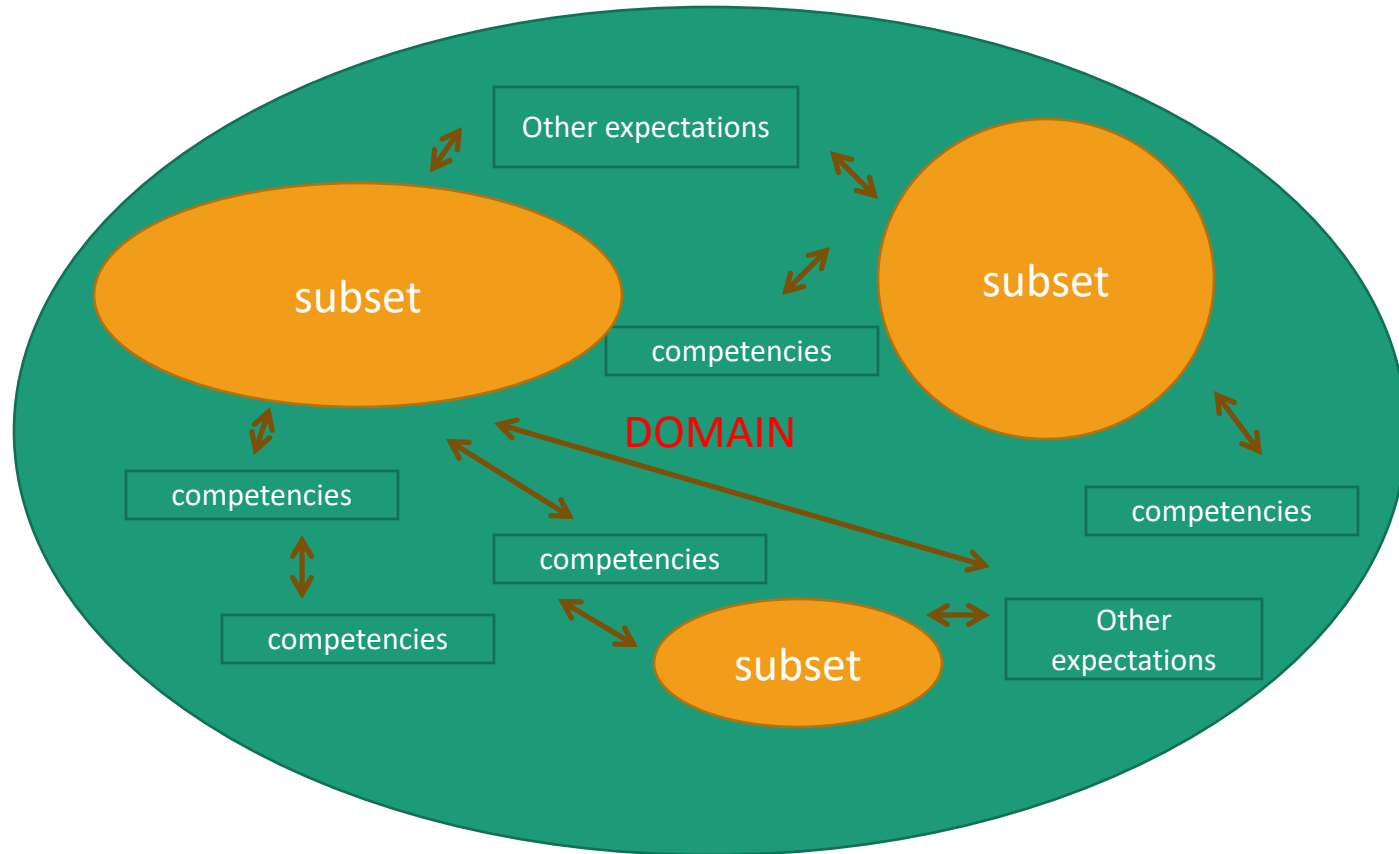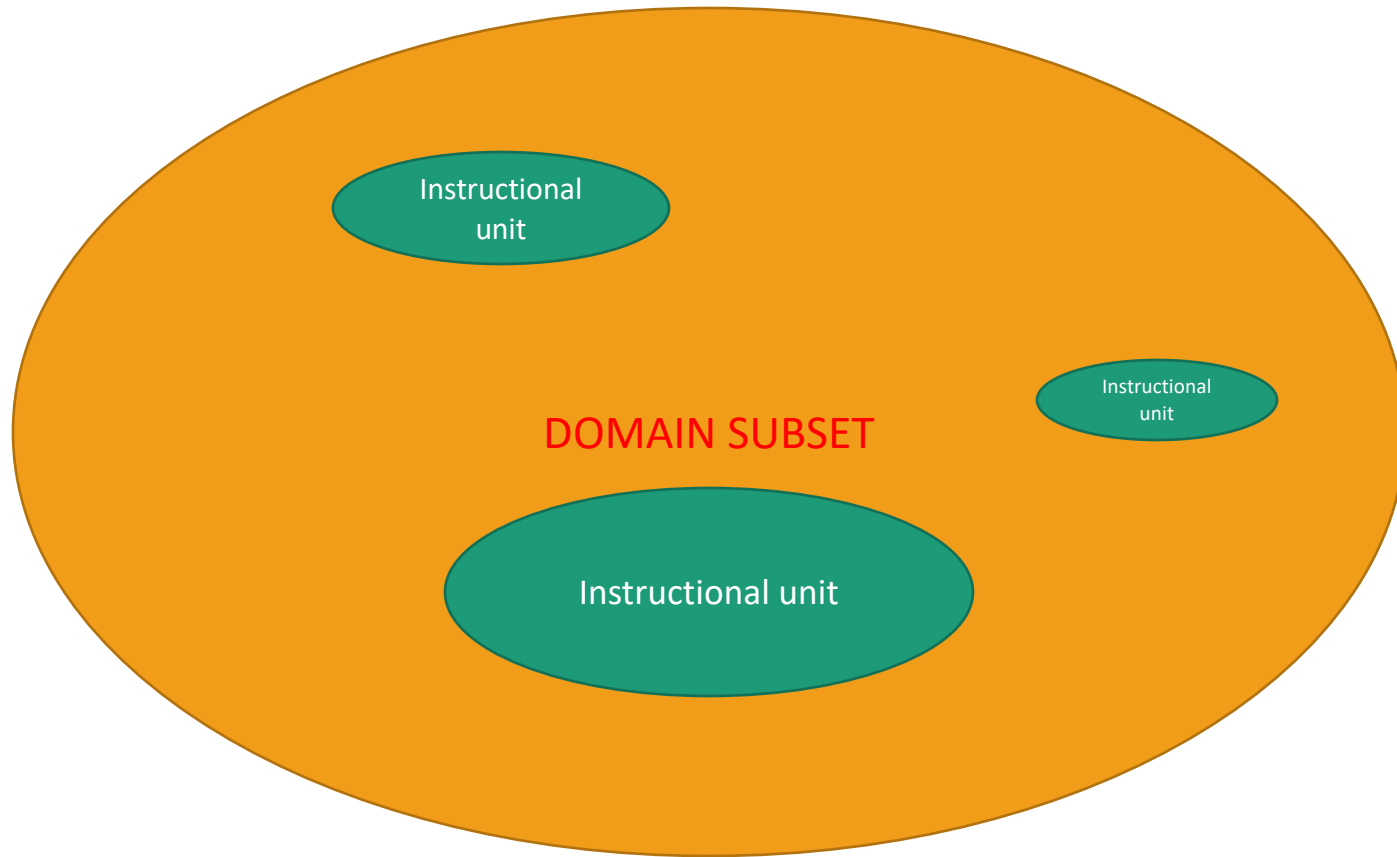
Backward design

DOMAIN
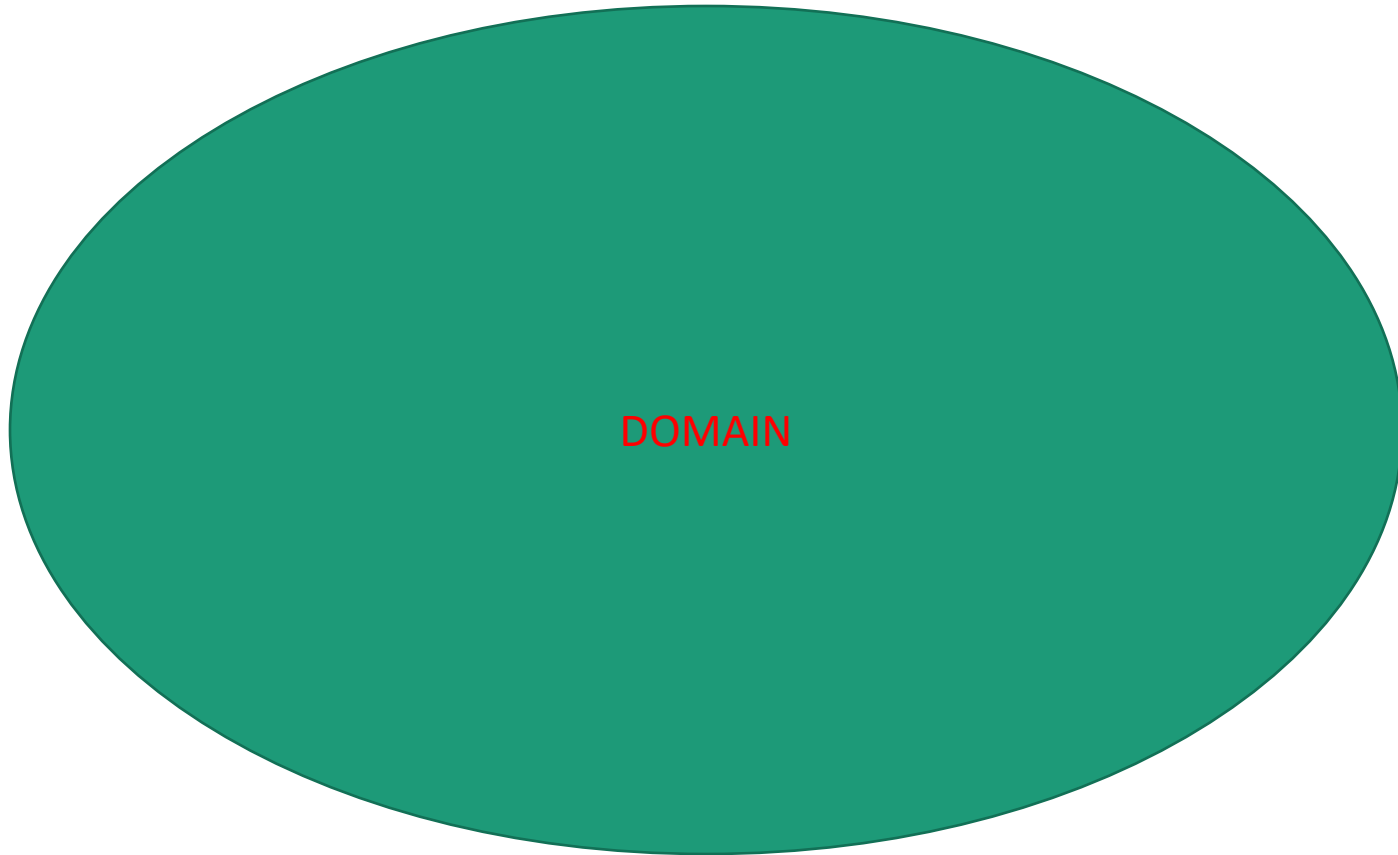
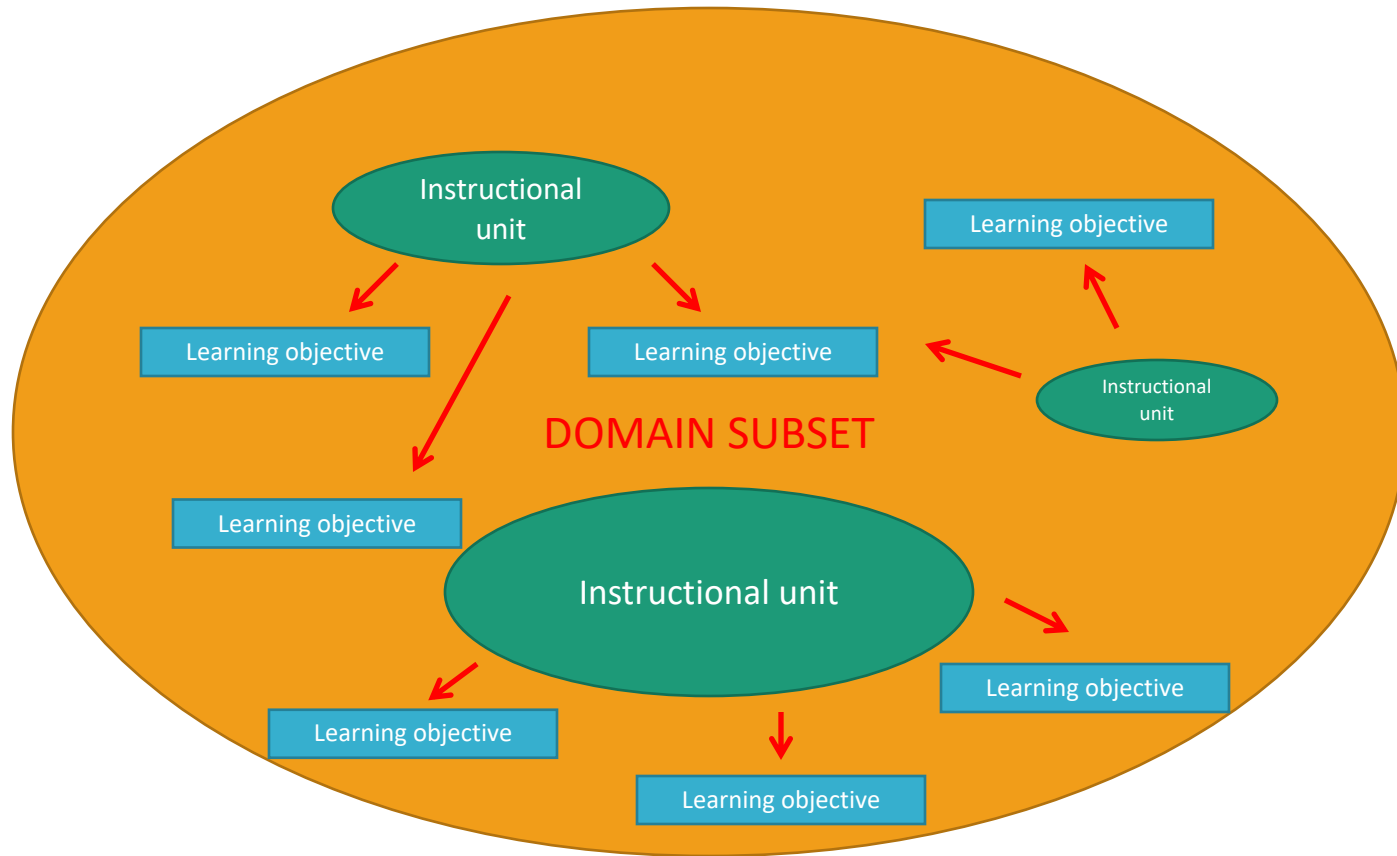# Backward design

Backward design

Backward design

Backward design

Backward Design

Identify Outcomes
- What should students be able to know and/or do?

Determine Assessments
- How will you know that the outcome was met?
- Examples: Skill Demonstration, Test, Project

Plan Learning Experiences
- How will you impart knowledge and/or skill?
- Examples: Lecture, Class Discussion, Role Play

Learning Objectives

Institutional Mission, Values, & Outcomes

College Mission, Values, & Outcomes

Global (Curriculum) Outcomes

Broad (Course) Outcomes

Specific (Unit or Session) Outcomes

Learning objectives

- Learning objective
  - "A tool to help educators clarify and communicate what they intend students to learn as a result of instruction" (Anderson & Krathwohl, et al.,1999, p.23)
  - "Describes what students should be able to demonstrate, represent, or produce based on their learning histories" (Maki, 2004, p. 60)
  - "Describe our intentions about what students should know, understand, and be able to do with their knowledge when they graduate" (Huba & Feed, 2000, p. 9-10)

 - Guide to student learning; guide to the development of test items

Learning objectives

Key elements:

- "Student-oriented, learning-based, explicit, and assessable statements of intended cognitive outcomes" (Anderson & Krathwohl, et al., 1999, pp. 4-5)

- Clear, concise, measurable

- 3-5 objectives for a 50 minute class

- Capture the main concepts/skills you want students to know or develop

- Action verb (cognitive process) + noun (knowledge):

  - *Example: Students will distinguish between Class I, Class II and Class III preparations.*

Learning objectives

"Cognitive dimensions" (Bloom's revised taxonomy, Anderson & Krathwohl, 1999)
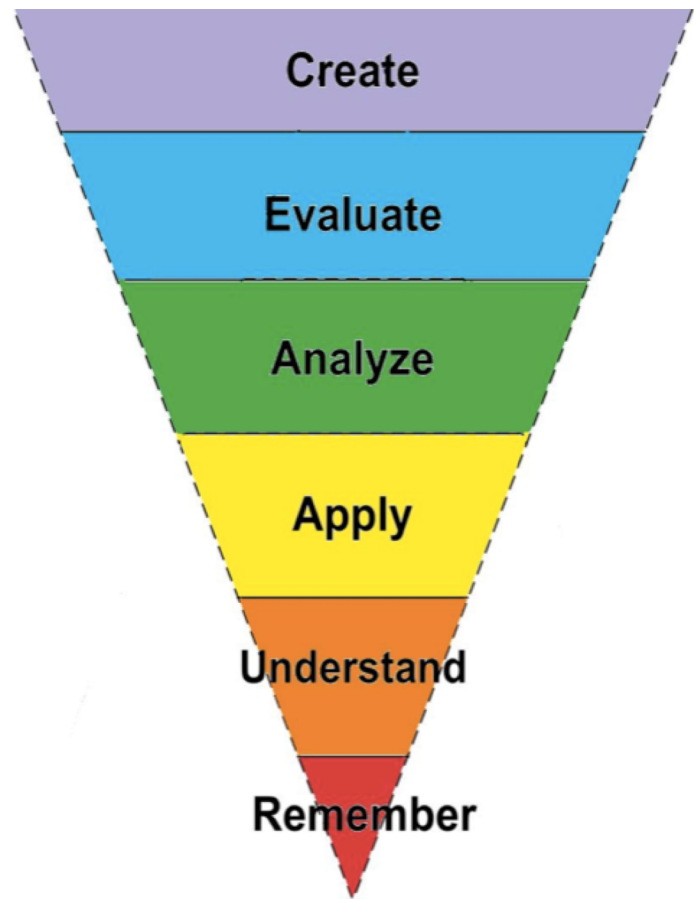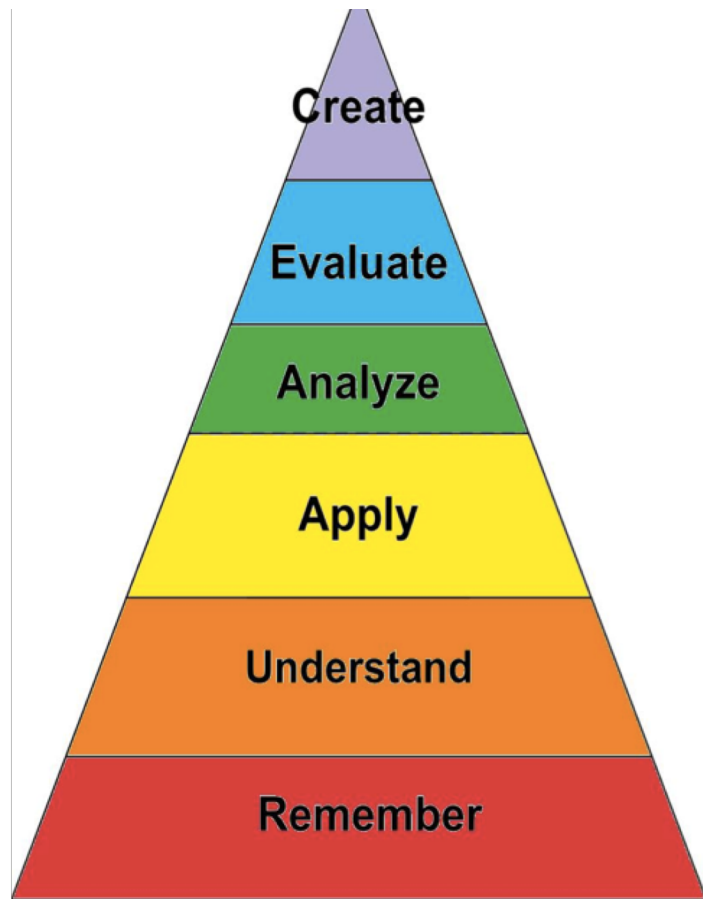
Learning objectives: Examples

1. To apply the concept of backward design to at least one instructional unit in your course.

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7. To interpret basic psychometric properties of examinations.

Research on Learning Outcomes

(Driscoll, ALA VII, 2016)

- Students can focus more and put effort into learning priorities (Halpern & Hakel, 2003)
- Students engage in deep learning when they understand expectations (Biggs, 1999)
- Students remember more and are able to transfer learning to new situations (Halpern & Hakel, 2003)
- Promotes confidence in students' learning efforts (Driscoll & Wood, 2007)
- Promotes habits of self-assessment and dialogue about student work (Shepperd, 2000)
- Promotes students' sense of fairness of evaluation processes (Suskie, 2000)
- Promotes timely and meaningful feedback to students (Stevens & Levi, 2005)

Activity:
Writing learning objectives

Lesson Redesign project

Part 1: Redesigned lesson plan initial draft--planning
- Due: 5 pm, Wednesday, March 13, 2019
- Upload on Canvas

Part 2: Redesigned lesson plan final version
- Due: 5 pm, Wednesday, March 20, 2019
- Upload on Canvas

Part 3: Implementation of redesigned lesson
- Due: One year from the conclusion of this course

Lesson Redesign Project Worksheet

Instructions: Choose a topic taught in your course. Review your "old" lesson plan for this topic. Redesign the lesson based on what you have learned about backward design and alignment. Your redesigned lesson plan should reflect the implementation of at least one NEW instructional strategy and/or tools that you have learned in this short course.

Your name: Course title:

Type of course: Year in program:

Quarter(s) offered: Meeting day/time:

Class size: Length (in minutes):

Instructional unit/Lesson title:

Learning objectives:

Delivery method(s):

Learning activity(ies):

Assessment approach(es)

Fundamentals of Teaching & Learning
(formerly the Course Director Orientation)
(Session 2)

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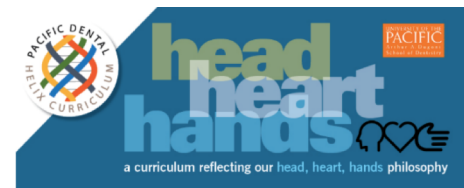
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Lesson design initial draft update

- 16 lesson plans posted
- Application of new learning
    - Wrote learning objectives
    - Flipped classroom; small group in-class activities
    - Pre assigned readings and Canvas online quiz
- Highlights of online learning behaviors
    - Post early
    - Interactions with colleagues
    - Learn anywhere, anytime

Peer interactions on Canvas: Examples

Asking colleagues questions

> **Debra Woo**
> 3:37pm
>
> I like the oral based examination! What do you envision the grading rubric to be? Will more than one faculty member assess the student? How much time will this take to implement?
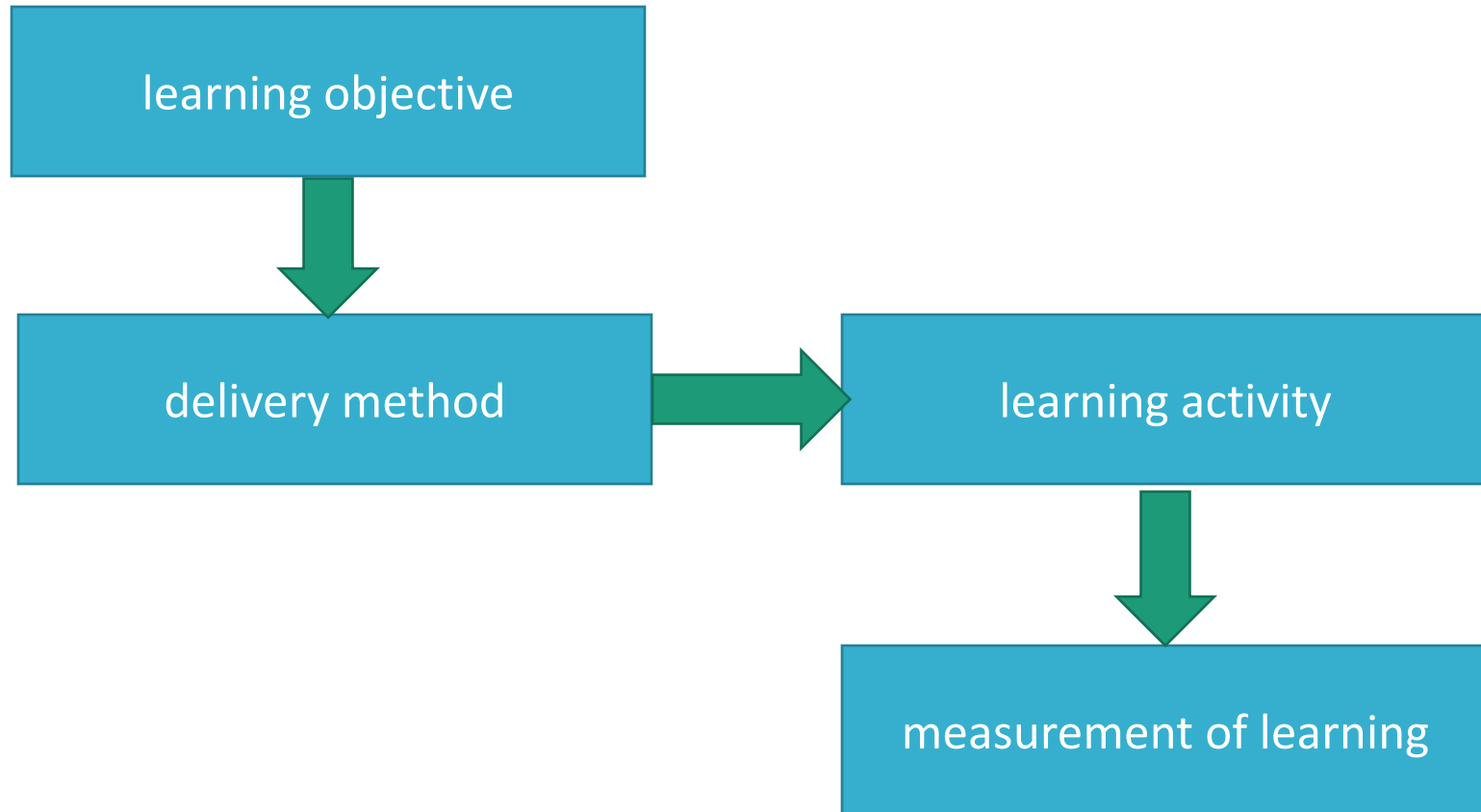
Potential application of new ideas learned from colleagues

> **Natasha Lee**
> 1:36pm
>
> Also, I'd like to schedule a time with you to learn more about the Think-Pair-Share tool that Ben mentioned in his lesson redesign since he mentioned it works well for large classes with a single instructor.
>
> ↩ Reply   👍 (1 like)

Alignment

Delivery approaches

Traditional delivery approaches
- Lectures, seminars, case studies
- Simulation
- Clinic

Alternative delivery approaches
- Collaborative/team-based learning
- Discussion (in-class or online)
- Writing/reflection activities
- Peer instruction
- Blended/online learning
- Flipped classroom

Assessment

- measurement of knowledge or ability
  - →provide feedback to improve performance
    - formative, summative
    - low stakes, high stakes
    - written, verbal, skills-based; authentic
    - aligned with objectives and delivery → variety!
    - frequent, clear, consistent:
      - continuous assessment > self-assessment
    - communicate results to students promptly
    - in line with syllabus: transparent to students

Assessment approaches

Traditional assessment approaches

- SBA MCQs, short answers, fill-in-the-blanks

- practical exams

- papers, essays

Alternative assessment approaches

- informal questioning (and answering!), PollEverywhere

- writing (essays, reflections)

- presentations, projects (group, individual)

- observations, video reviews

- OSCE (Objective Structured Clinic Examination)

- self- and peer-assessment (e.g., polling, gameplay, quizzes)

- portfolio

An example.

- Knowledge domain: EBD

- Competency #55
  - " … base dental decisions on evidence and theory."

- Competency #6
  - "…combine diagnostic and prognostic data with a science base and patients' values to form an individualized, comprehensive, sequenced treatment plan."

An example.

- Internal/external expectations
  - CATs paper, reflective portfolio, PR 250, ICS III
  - ideal practice in general dentistry, CODA

- Domain subset
  - Introduction: Principles of EBD

- Instructional unit
  - PICO questions

- **Learning objectives (Step 1)**
  - identify and define elements of a PICO question.
  - write a PICO question.

An example.

- Steps 2-3: delivery & learning activities
  - lecture on elements of a PICO question.
  - guided practice in identifying elements.
  - small group activity: write a PICO question.
  - using a case-based scenario + report back.
  - online module.

- Step 4: assessment
  - SBA/MBA MCQ on fundamentals
  - short answer
  - write a PICO question (case-based)

Example 1.

PICO is an acronym used for formulating research questions. What does PICO stand for?

a. Problem, investigator, conditions, outcome.
b. Problem, investigator, control, outcome.
c. Population, intervention, control, outcome.
d. Population, intervention, clinical question, outcome.
e. None of the above.

Example 2.

Please define what each letter in 'PICO' stands for and provide a short description of each element.

P: _____

I: _____

C: _____

O: _____

Example 3.

A good PICO question helps guide the search for evidence when you are faced with a new or otherwise challenging patient question or clinical situation. Consider the following scenario:

Mrs. Jones is a 35-year-old Type I diabetic patient of record. She presents in your office after a nearly two-year absence. She reports that she almost always remembers to take her insulin, and generally follows the dietary plan recommended by her physician. Her most recent HbA1C is 9.2%. Her oral hygiene is fair with pocket depths ranging from 5 to 9 mm. Your exam shows that tooth #19 needs to be restored. You present treatment options to Mrs. Jones including an implant or a root canal and crown. Mrs. Jones asks, is an implant better for me than a root canal and crown?

Write a PICO question you could use to search for evidence to answer Mrs. Jones' question.

Assessment

- pre-administration
  - alignment
  - frequency, timing
  - "chunking": scope and proximity
  - appropriate type and format
    - Kramer GA, et al. (2009). Dental student assessment toolbox. J Dent Ed 73(1): 12-35.
  - drawn from learning objectives
  - faculty review for grammar, content, logic
  - develop a test bank: pilot test items

- post-administration
 - review performance with class (exam report)
  - review item analysis

Active learning

"Critical thinking cannot be taught in a learning environment where the dental educator always lectures, tells students what ought to be undertaken during patient treatment, or shows students how to do a procedure correctly."

-- Overview of Critical Thinking Skills, ADEA, 2008
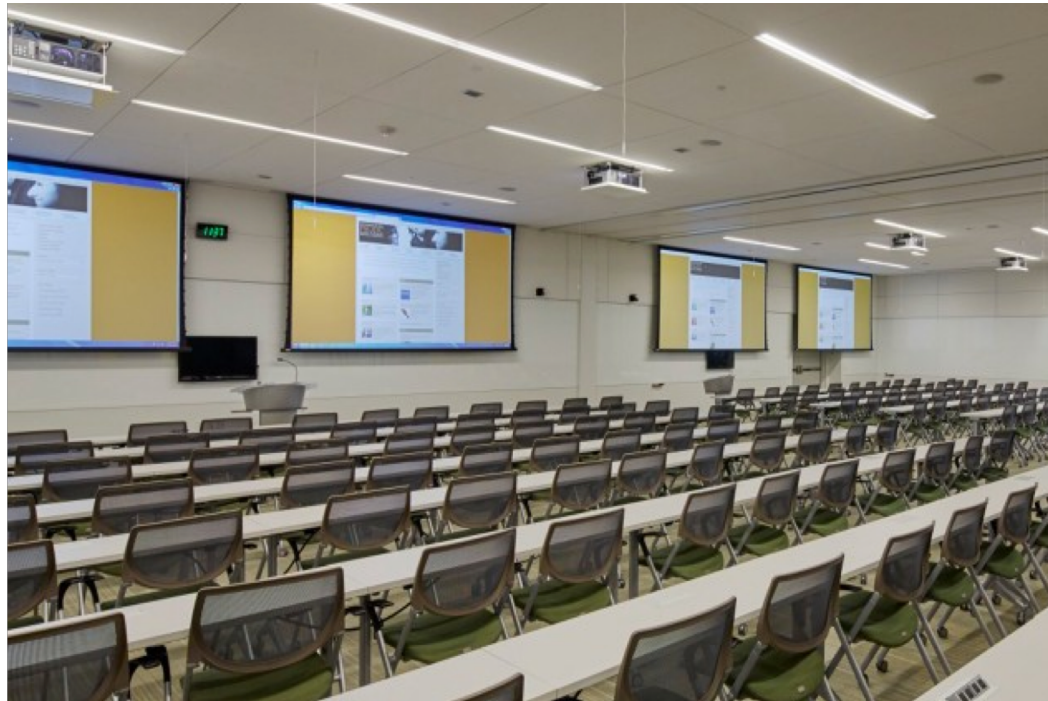
Active learning: No-tech approaches

• Chunking content into smaller segments
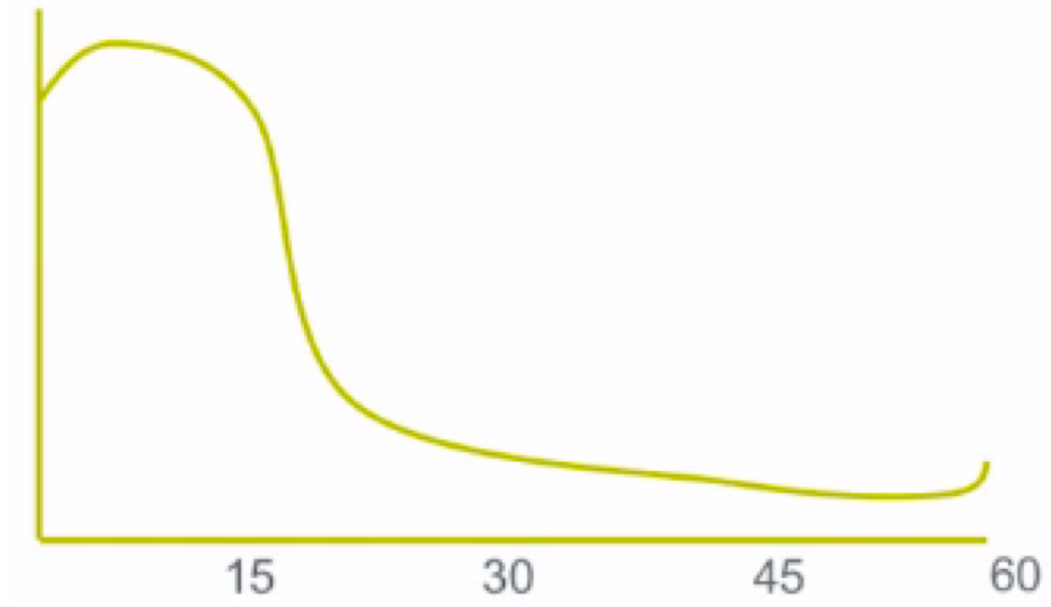
Attention level decreases after 10-15 mins (Gibbs; 1992; Bligh, 2000)

Image: http://geoffcain.com/blog/mlearning/podcasting-and-the-attention-curve/
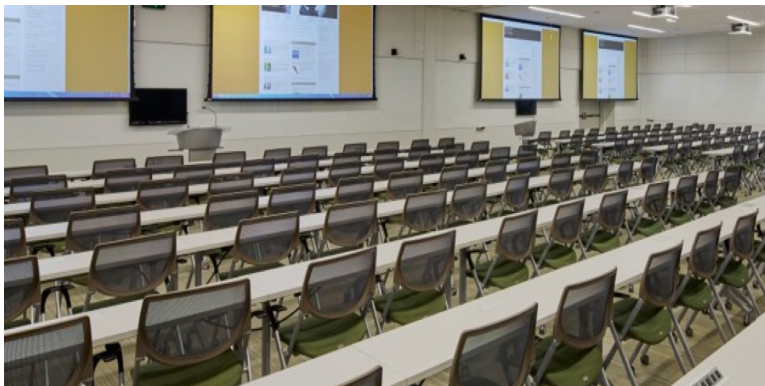
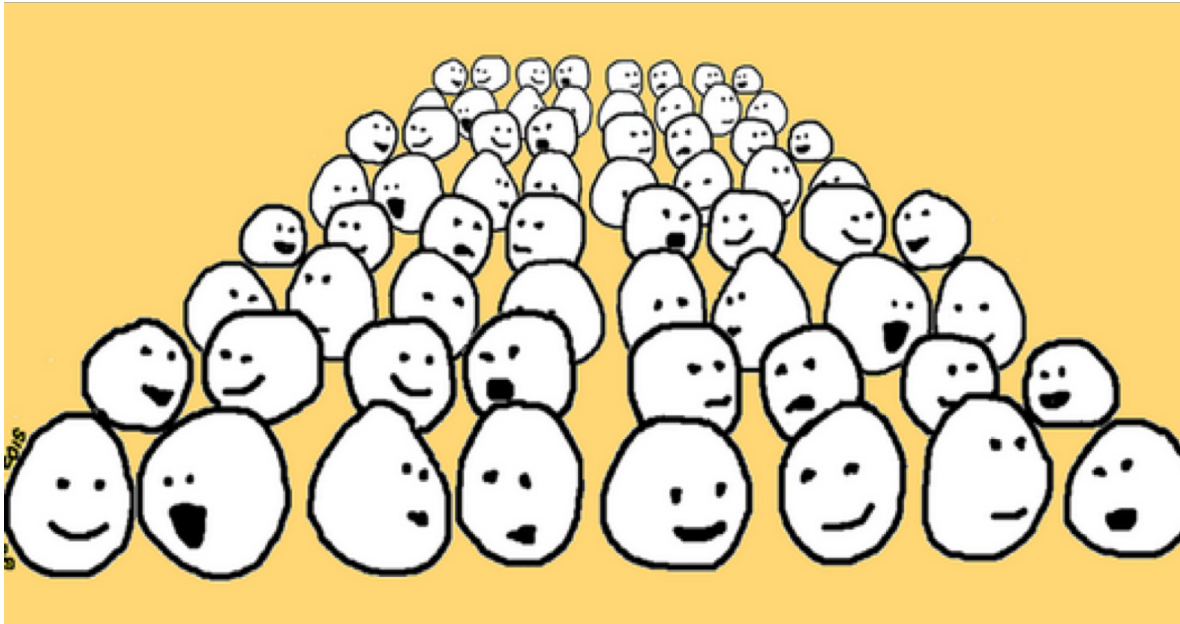# Active learning: No-tech approaches

- Walk around in the room

Active learning: No-tech approaches

- Questioning techniques
  - Ask students stimulating questions (examples)
  - Give "wait time"
  - Ask follow-up, probing questions (examples)
  - Ask students to comment on peers' responses (examples)
  - Engage students in the back

Active learning: No-tech approaches

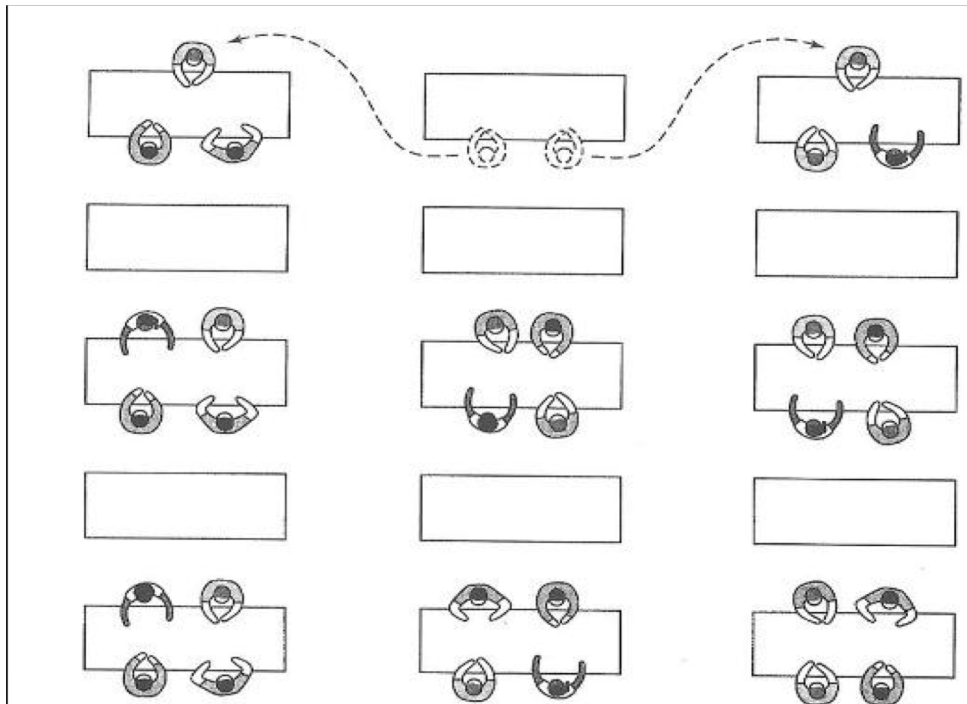- Think-pair-share; Think-*write*-pair-share

Image: https://www.cultofpedagogy.com/think-pair-share

Active learning: No-tech approaches

- Snowball groups

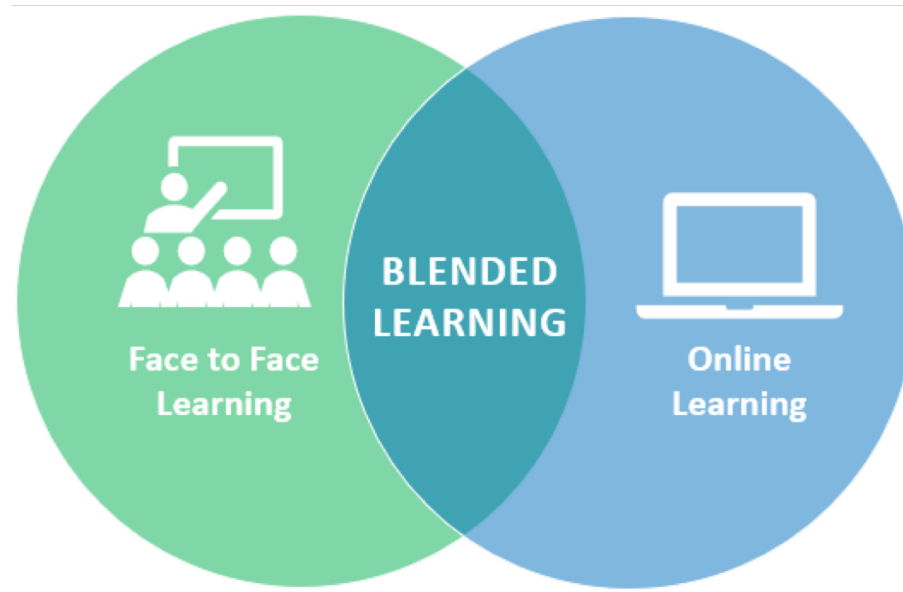# Active learning: No-tech approaches

- Buzz groups

Blended/online learning
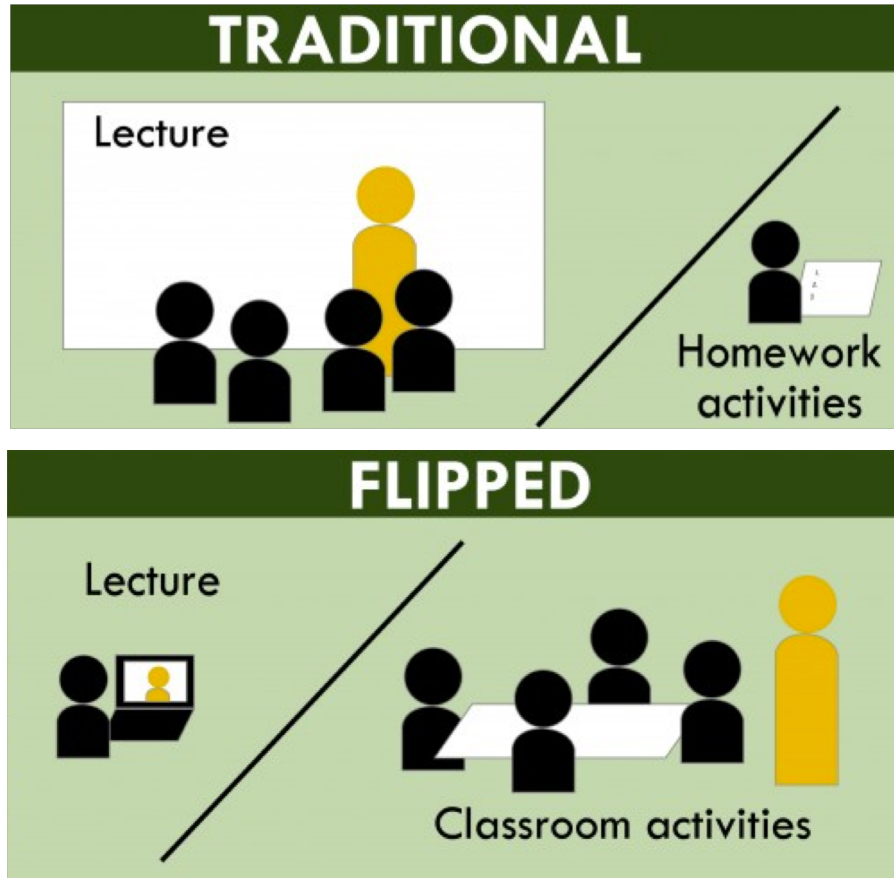

Examples of interactive online lessons

https://softchalkcloud.com/lesson/serve/yYIWdTV4QHnxLw/html
 (Dr. Leticia Ferreira)
https://www.softchalkcloud.com/lesson/serve/Xb6f4mnlTKp9is/html
(Dr. Geraldine Gerges Gaid)

Flipped classroom

Examples:
- Videos
- Textbook
- PDF
- Journal papers
- Websites

Examples:
- Mini lecture
- Q&A
- Polling (Polleverywhere)
- Small group discussions
- Case presentations
- Hands-on projects

Pollevereywhere

- Mobile audience response system
- MCQ, short answer, word cloud, hot spot

  https://www.polleverywhere.com

Tell us how you feel now with one word (happy, awesome, sad, upset, sleepy, etc.)

Visual settings

Activate

Show results

Lock

Clear results
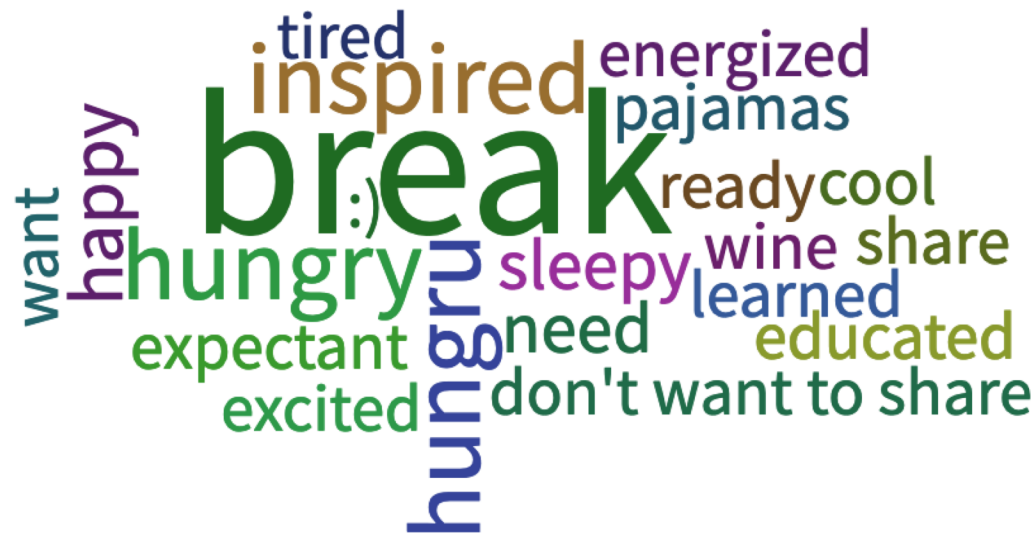
Fullscreen

tired
inspired
energized
pajamas
happy
break
want
hungry
ready cool
:)
wine share
sleepy
learned
expectant
need
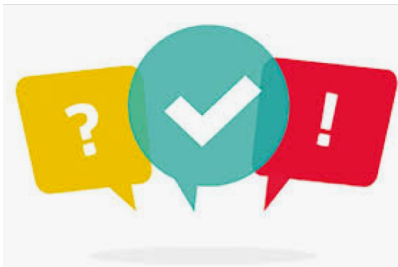educated
excited
hungru
don't want to share
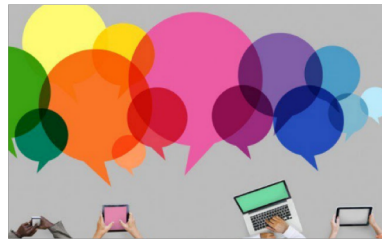
Next

Previous

Total Results: 70

Canvas

- Canvas template
- Syllabus template
- Canvas site and syllabus review rubric

How can you use Canvas as a learning tool?

| Quizzes | Online discussions | Online assignments | Feedback giving |

Image: https://adhdhomestead.net/accepting-breaks/
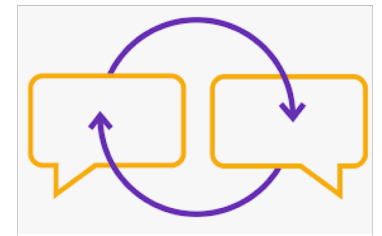
Psychometric Analysis: Distribution and Reliability
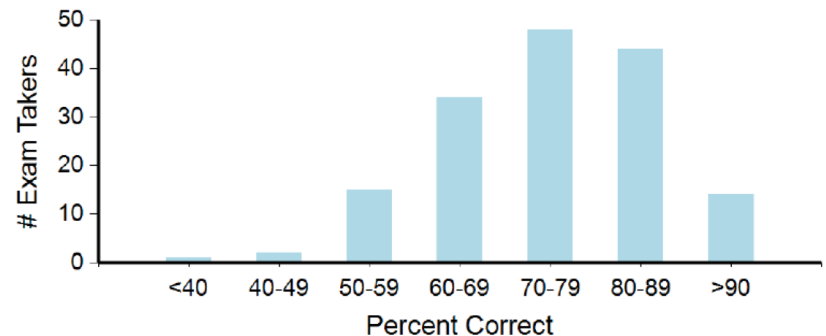
Reliability

- Measure of consistency or score stability

- Conceptual formula: Obtained Score = True Score + Error

- Reliability is a necessary, but not sufficient, condition for validity

Sources of measurement error: test construction and administration

- Changes in time limits
- Changes in directions
- Different scoring procedures
- Interrupted testing session
- Time the test is taken
- Sampling of items
- Ambiguity in wording
- Misunderstood directions
- Effects of heat, light, ventilation, etc., in the testing situation
- Differences in observers

Sources of measurement error: the person taking the test

- Reactions to specific items
- Health
- Motivation
- Mood
- Fatigue
- Luck
- Fluctuation in memory or attention
- Attitudes
- Test-taking skills
- Ability to comprehend instruction
- Anxiety

Types of Reliability Estimates

- **Stability:** obtained from scores on the same test taken on two occasions (i.e., test-retest)

- **Equivalence:** obtained from scores on two different forms of the same test taken at the same time (i.e., parallel forms)

- **Equivalence and stability:** obtained from scores on parallel forms of a test, one of which is taken at one time and the other at a later time

- **Internal consistency:** obtained from scores on a single test artificially split into two halves

- **Agreement:** established by determining the extent to which two or more people agree about what was observed or rated (i.e., inter-rater reliability)

KR-20

(Kuder-Richardson Formula 20)

- Measure of internal reliability
- Higher values indicate stronger relations between items on the test
- A value of at least .70 is desirable
- Scores may range from 0.00 - 1.00

Psychometric analysis: Test Items

QUESTION PERFORMANCE
(Items; Shows Up to 5 Distractors/Choices per Question)

Seq #	Item ID	Item Stem	Correct	Upper 27%	Lower 27%	Point BiSerial	Disc Index	Response Frequencies A	B	C	D	E
1	42784	Aung is in Piaget's...	82%	100%	64%	0.45	0.36	*136	7	15	8	
2	42785	You decide that you...	90%	93%	82%	0.27	0.11	*150	7	6	0	3
3	42815	Administering 2 carp...	99%	100%	97%	0.15	0.03	0	*146	*18	2	
4	42816	You are planning to...	95%	96%	94%	0.07	0.02	4	*157	5	0	
5	42817	Which of the followi...	58%	84%	39%	0.42	0.45	*97	1	5	18	45
6	42818	You are preparing to...	75%	95%	57%	0.46	0.38	0	38	4	*124	0
7	42819	Based on your clinic...	81%	91%	75%	0.27	0.16	4	4	3	*135	20
8	42826	For restoration of A...	91%	95%	84%	0.27	0.11	1	2	*151	10	2

Discrimination Index

- The difference in question performance within an exam between top performing students and bottom performing students. If lower performing students are getting this question correct more often than your top performing students, this could indicate a problem with the item.

Point Biserial

- Indicates whether getting the question correct correlates positively or negatively with performing well on the exam as a whole. Unlike the discrimination index, point biserial incorporates performance of all students instead of the two specific subgroups.

Resources

- Faculty Resources webpage
  - http://dental.pacific.edu/information-for/faculty-and-staff/faculty-resources
- Canvas Template site
- Teaching and Learning Seminars

Due dates

- Part 2: Redesigned lesson plan final version

  Revise your lesson plan initial draft based on:
  - Feedback from department chair/colleagues
  - Your new learning from the 2nd F2F session

  Your lesson plan should reflect the implication of at least one NEW idea learned from this course.
  - Due: 5 pm, Wednesday, March 20, 2019

- Part 3: Implementation
  - Due: One year from the conclusion of this course