Active Learning- Backward Design

If you could choose one thing…

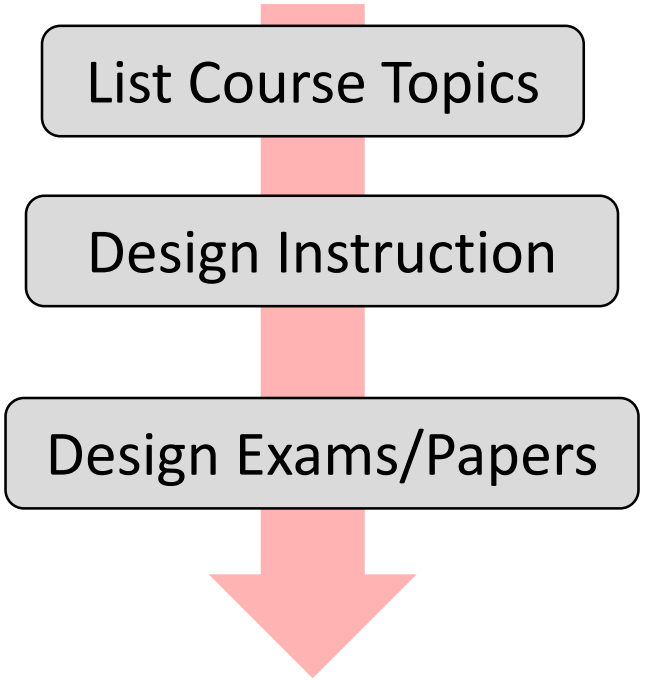
What would you want students to remember from your course in (1, 5, 10) years?

How do we design courses that facilitate this process?

Active Learning- Backward Design

"Traditional"

= Instructor-centered



Typical syllabus/textbook

- Week 1: Chapter 1
- Week 2: Chapter 2
- …

Typically grading:

- 1-2 midterms
- Final

Wiggins and McTighe (1998)

Active Learning- Backward Design

"Backward"

Desired Results-
What do they need to be able to know/do?
(Learning Objectives)

How will **you** know that **they** know?
(Assessment)

How will they get there?
(Class Activities)

= Student-centered

Typical syllabus

- Learning objectives
- Organization of course
- …

Typical grading (formative & summative)

- Weekly assignments
- Projects
- Exams

Wiggins and McTighe (1998)

Active Learning- Backward Design

Desired Results-
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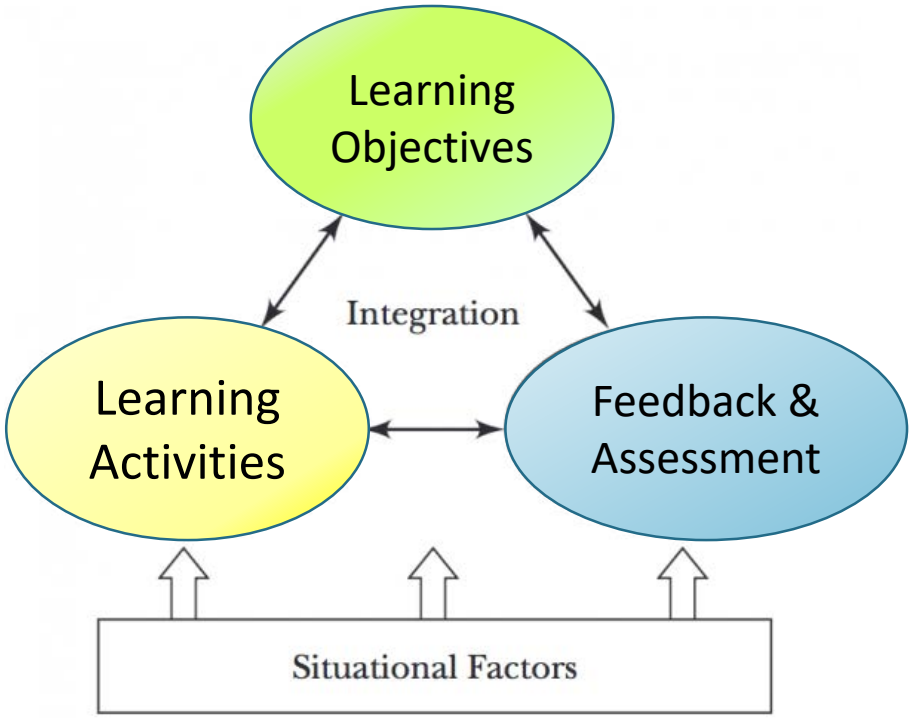


Wiggins and McTighe (1998)

Fink, L. Dee. (2013). Creating Significant Learning Experiences: An Integrated Approach to Designing College Courses. eBook: Jossey-Bass Higher and Adult Education Series.

Active Learning- Backward Design (Example)

Course Learning Objective

By the end of this course, you will be able to…

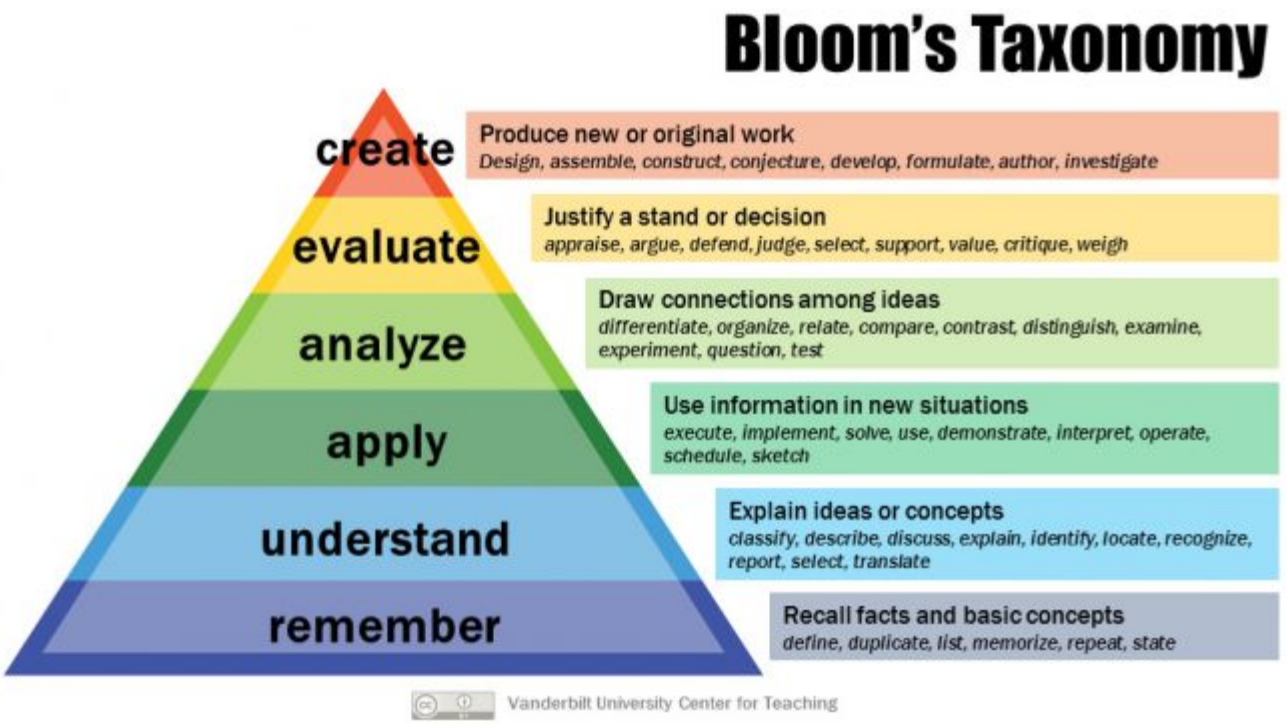
- *Identify* different monitoring data types and
- *Interpret* monitoring data to assess geologic hazards relevant to northern California and at tectonic plate boundaries.

- *Compare and contrast...*
- *Communicate* about Earth science events and processes

Desired Results-
What do they need to be able to know/do?
(Learning Objectives)

How will **you** know that **they** know?
(Assessment)

How will they get there?
(Class Activities)



https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/

Active Learning- Backward Design (Example)

Course Learning Objective

By the end of this course, you will be able to…

- *Interpret* monitoring data to assess geologic hazards relevant to northern California and at tectonic plate boundaries.
- *Compare and contrast...*
- *Communicate* about Earth science events and processes

Desired Results-
What do they need to be able to know/do?
(Learning Objectives)

Assessment

- Describe to the class your groups interpretations of one of the 4 monitoring data types for the volcano studied
- Defend the USGS alert level your group has assigned for the magmatic activity of the volcano. (verbal or written)

How will **you** know that **they** know?
(Assessment)

Active Learning- Backward Design (Example)

Course Learning Objective

By the end of this course, you will be able to…

- *Interpret* quantitative data to assess geologic hazards relevant to northern California and at tectonic plate boundaries.
- *Compare and contrast...*
- *Communicate* about Earth science events and processes

Desired Results-
What do they need to be able to know/do?
(Learning Objectives)

Assessment

- Describe to the class your groups interpretations of one of the 4 monitoring data types for the volcano studied
- Defend the USGS alert level your group has assigned for the magmatic activity of the volcano. (verbal or written)

How will **you** know that **they** know?
(Assessment)

How will they get there?
(Class Activities)

Activity

Jigsaw activity in which expert groups each exam 1 type of data for a volcano, then groups reorganize into mixed groups to learn the other data types and interpret volcanic activity using all data.

As a group use the USGS alert level matrix to identify the appropriate alert level and write a summary report for hazard managers to use in a press conference

Active Learning- Backward Design (Example)

Course Learning Objective

By the end of this course, you will be able to…

- *Interpret* quantitative data to assess geologic hazards relevant to northern California and at tectonic plate boundaries.
- *Compare and contrast...*
- *Communicate* about Earth science events and processes

NOW!

Assessment

- Describe to the class your groups interpretations of one of the 4 monitoring data types for the volcano studied
- Defend the USGS alert level your group has assigned for the magmatic activity of the volcano. (verbal or written)

NOW!

Activity

Jigsaw activity in which expert groups each exam 1 t… …ta for a volcano, then groups reorganize into mixed groups to learn … data types and interpret volcanic activity using all data.

As a group use the USG… …vel matrix to identify the appropriate alert level and write a summa… …or hazard managers to use in a press conference

LATER!

Active Learning- Backward Design (Example)

Aligning Assessments with Learning Outcomes-

Learner Outcomes **By the end of this course, you will be able to…**	**Assessments (in class)** **You will demonstrate your abilities through…**
Identify different monitoring data types	Pre- class questions (from video) In-class activities, exam
Interpret quantitative data to assess geologic hazards relevant to northern California and at tectonic plate boundaries.	In-class activities, exam
Communicate about Earth science events and processes	Out-of-class assignments, exam

Active Learning- Backward Design (Example)

Aligning Assessments with Learning Outcomes-

Work on your course/lesson:

1. Learning Objective(s)
2. Aligned Assessment