

CE 203 Civil Engineering Synthesis I

Chapter 1-4

REVIEW – Blooms Taxonomy - ABET

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Taxonomy of Learning

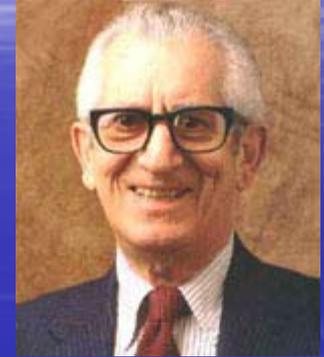
- Professor Benjamin Bloom of Chicago University and co-workers devised a stairway with six major steps to learning (1948 to 1953).
- The six steps (read: levels) are rough estimates.
- These are not absolute, nor do they take up great *symbol* learning as confluent imagery resting on sane evaluations and estimates.



Benjamin Bloom (1913-99)

Bloom's Revised Taxonomy

- Taxonomy of Cognitive Objectives
- 1950s- developed by Benjamin Bloom
- Means of expressing qualitatively different kinds of thinking
- Adapted for classroom use as a planning tool
- Continues to be one of the most universally applied models
- Provides a way to organize thinking skills into six levels, from the most basic to the higher order levels of thinking
- 1990s- Lorin Anderson (former student of Bloom) revisited the taxonomy
- As a result, a number of changes were made

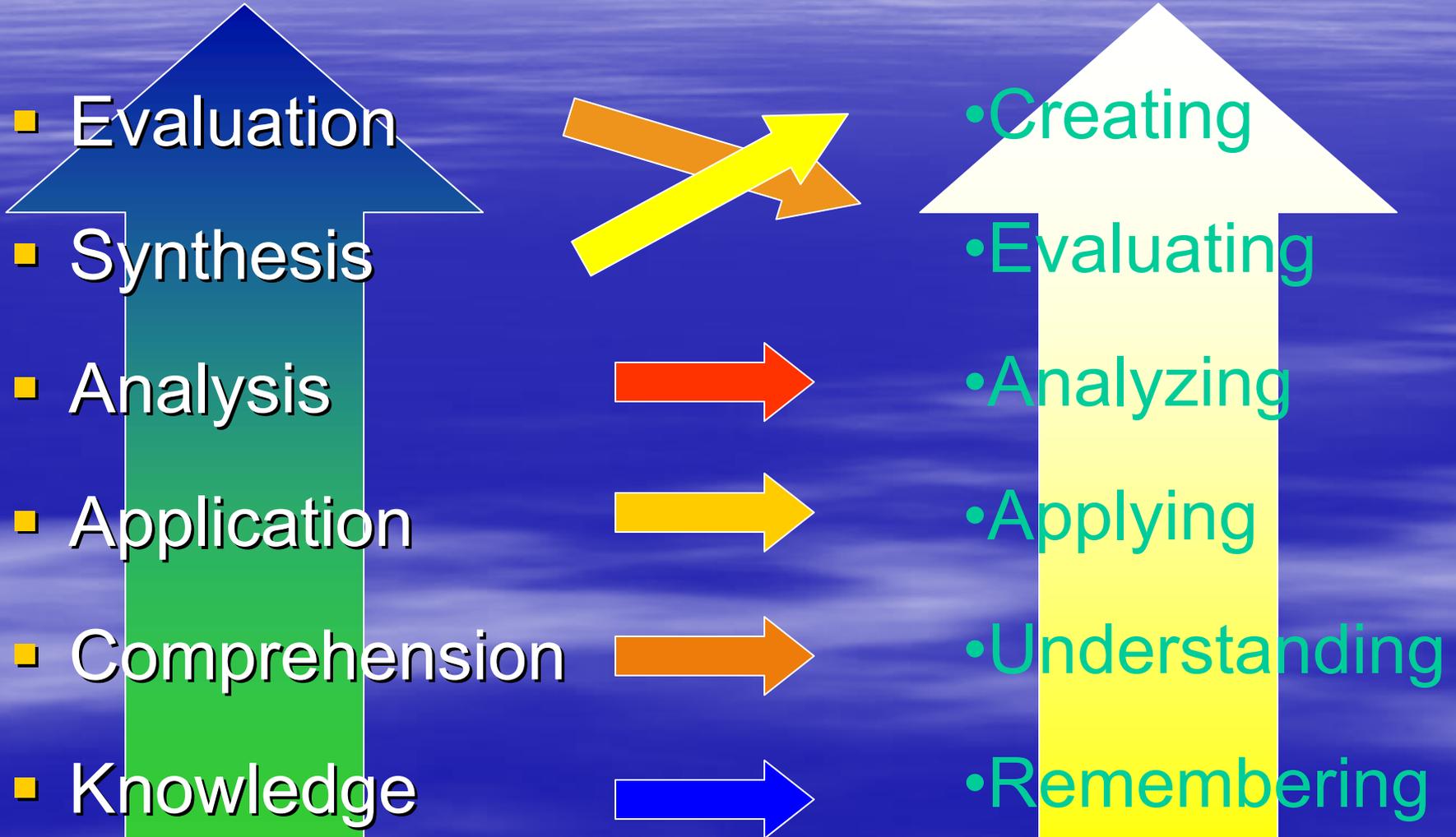


Benjamin Bloom (1913-99)

(Pohl, 2000, Learning to Think, Thinking to Learn, pp. 7-8 adapted from Denise Tarlinton)

Original Terms

New Terms



BLOOM'S REVISED TAXONOMY

Creating

Generating new ideas, products, or ways of viewing things
Designing, constructing, planning, producing, inventing

Evaluating

Justifying a decision or course of action
Checking, hypothesising, critiquing, experimenting, judging

Analyzing

Breaking information into parts to explore understandings and relationships
Comparing, organising, deconstructing, interrogating, finding

Applying

Using information in another familiar situation
Implementing, carrying out, using, executing

Understanding

Explaining ideas or concepts
Interpreting, summarising, paraphrasing, classifying, explaining

Remembering

Recalling information
Recognizing, listing, describing, retrieving, naming, finding

Remembering

The learner is able to recall, restate and remember learned information.

- Recognizing
- Listing
- Describing
- Identifying
- Retrieving
- Naming
- Locating
- Finding



Can you recall information?

Remembering cont'

- List
- Memorise
- Relate
- Show
- Locate
- Distinguish
- Give example
- Reproduce
- Quote
- Repeat
- Label
- Recall
- Know
- Group
- Read
- Write
- Outline

- Listen
- Group
- Choose
- Recite
- Review
- Quote
- Record
- Match
- Select
- Underline
- Cite
- Sort



Products include:

- Quiz
- Definition
- Fact
- Worksheet
- Test
- Label
- List
- Workbook
- Reproduction
- Vocabulary

Classroom Roles for Remembering

Teacher roles

- Directs
- Tells
- Shows
- Examines
- Questions
- Evaluates

Student roles

- Responds
- Absorbs
- Remembers
- Recognises
- Memorises
- Defines
- Describes
- Retells
- Passive recipient

Remembering: Potential Activities and Products

- Make a story map showing the main events of the story.
- Make a time line of your typical day.
- Make a concept map of the topic.
- Write a list of keywords you know about....
- What characters were in the story?
- Make a chart showing...
- Make an acrostic poem about...
- Recite a poem you have learnt.

Understanding

The learner grasps the meaning of information by interpreting and translating what has been learned.

- Interpreting
- Exemplifying
- Summarising
- Inferring
- Paraphrasing
- Classifying
- Comparing
- Explaining

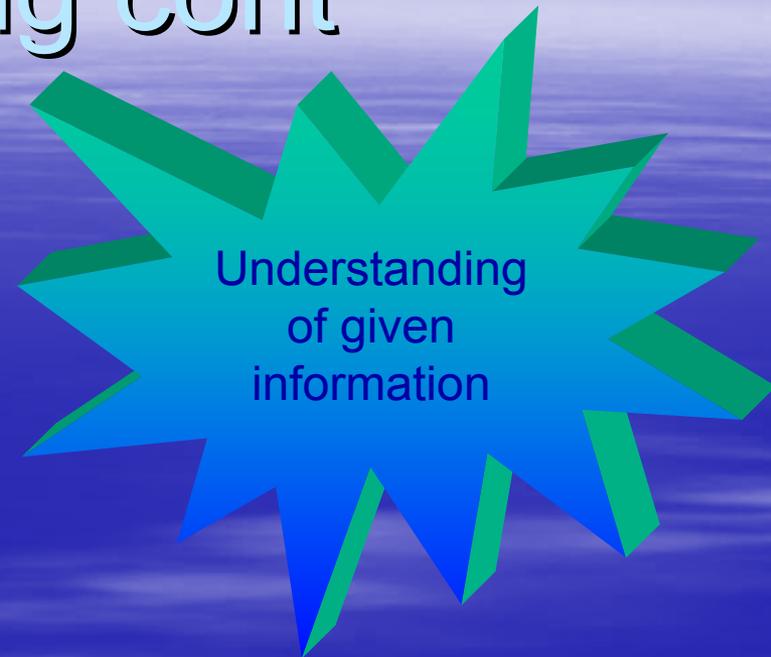


Can you explain ideas or concepts?

Understanding cont'

- Restate
- Identify
- Discuss
- Retell
- Research
- Annotate
- Translate
- Give examples of
- Paraphrase
- Reorganise
- Associate

- Describe
- Report
- Recognise
- Review
- Observe
- Outline
- Account for
- Interpret
- Give main idea
- Estimate
- Define



Products include:

- Recitation
- Summary
- Collection
- Explanation
- Show and tell
- Example
- Quiz
- List
- Label
- Outline

Classroom Roles for Understanding

Teacher roles

- Demonstrates
- Listens
- Questions
- Compares
- Contrasts
- Examines

Student roles

- Explains
- Describes
- Outlines
- Restates
- Translates
- Demonstrates
- Interprets
- Active participant

Understanding: Potential Activities and Products

- Write in your own words...
- Cut out, or draw pictures to illustrate a particular event in the story.
- Report to the class...
- Illustrate what you think the main idea may have been.
- Make a cartoon strip showing the sequence of events in the story.
- Write and perform a play based on the story.
- Write a brief outline to explain this story to someone else
- Explain why the character solved the problem in this particular way
- Write a summary report of the event.
- Prepare a flow chart to illustrate the sequence of events.
- Make a colouring book.
- Paraphrase this chapter in the book.
- Retell in your own words.
- Outline the main points.

Applying

The learner makes use of information in a context different from the one in which it was learned.

- Implementing
- Carrying out
- Using
- Executing



Can you use the information in another familiar situation?

Applying cont'

- Translate
- Manipulate
- Exhibit
- Illustrate
- Calculate
- Interpret
- Make
- Practice
- Apply
- Operate
- Interview

- Paint
- Change
- Compute
- Sequence
- Show
- Solve
- Collect
- Demonstrate
- Dramatise
- Construct
- Use
- Adapt
- Draw



Using strategies,
concepts, principles
and theories in new
situations

Products include:

- Photograph
- Illustration
- Simulation
- Sculpture
- Demonstration
- Presentation
- Interview
- Performance
- Diary
- Journal

Classroom Roles for Applying

Teacher roles

- Shows
- Facilitates
- Observes
- Evaluates
- Organises
- Questions

Student roles

- Solves problems
- Demonstrates use of knowledge
- Calculates
- Compiles
- Completes
- Illustrates
- Constructs
- Active recipient

Applying: Potential Activities and Products

- Construct a model to demonstrate how it looks or works
- Practise a play and perform it for the class
- Make a diorama to illustrate an event
- Write a diary entry
- Make a scrapbook about the area of study.
- Prepare invitations for a character's birthday party
- Make a topographic map
- Take and display a collection of photographs on a particular topic.
- Make up a puzzle or a game about the topic.
- Write an explanation about this topic for others.
- Dress a doll in national costume.
- Make a clay model...
- Paint a mural using the same materials.
- Continue the story...

Analyzing

The learner breaks learned information into its parts to best understand that information.

- Comparing
- Organising
- Deconstructing
- Attributing
- Outlining
- Finding
- Structuring
- Integrating

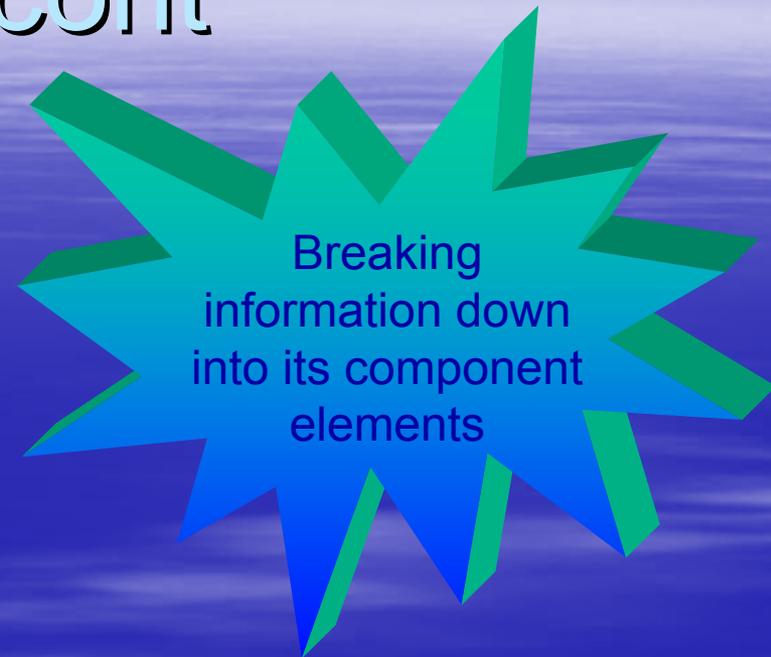


Can you break information into parts to explore understandings and relationships?

Analyzing cont'

- Distinguish
- Question
- Appraise
- Experiment
- Inspect
- Examine
- Probe
- Separate
- Inquire
- Arrange
- Investigate
- Sift
- Research
- Calculate
- Criticize

- Compare
- Contrast
- Survey
- Detect
- Group
- Order
- Sequence
- Test
- Debate
- Analyse
- Diagram
- Relate
- Dissect
- Categorise
- Discriminate



Products include:

- Graph
- Spreadsheet
- Checklist
- Chart
- Outline
- Survey
- Database
- Mobile
- Abstract
- Report

Classroom Roles for Analyzing

Teacher roles

- Probes
- Guides
- Observes
- Evaluates
- Acts as a resource
- Questions
- Organises
- Dissects

Student roles

- Discusses
- Uncovers
- Argues
- Debates
- Thinks deeply
- Tests
- Examines
- Questions
- Calculates
- Investigates
- Inquires
- Active participant

Analyzing: Potential Activities and Products

- Use a Venn Diagram to show how two topics are the same and different
- Design a questionnaire to gather information.
- Survey classmates to find out what they think about a particular topic. Analyse the results.
- Make a flow chart to show the critical stages.
- Classify the actions of the characters in the book
- Create a sociogram from the narrative
- Construct a graph to illustrate selected information.
- Make a family tree showing relationships.
- Devise a role-play about the study area.
- Write a biography of a person studied.
- Prepare a report about the area of study.
- Conduct an investigation to produce information to support a view.
- Review a work of art in terms of form, colour and texture.
- Draw a graph
- Complete a Decision Making Matrix to help you decide which breakfast cereal to purchase

Evaluating

The learner makes decisions based on in-depth reflection, criticism and assessment.

- Checking
- Hypothesising
- Critiquing
- Experimenting
- Judging
- Testing
- Detecting
- Monitoring



Can you justify a decision or course of action?

Evaluating cont'

- Judge
- Rate
- Validate
- Predict
- Assess
- Score
- Revise
- Infer
- Determine
- Prioritise
- Tell why
- Compare
- Evaluate
- Defend
- Select
- Measure

- Choose
- Conclude
- Deduce
- Debate
- Justify
- Recommend
- Discriminate
- Appraise
- Value
- Probe
- Argue
- Decide
- Criticise
- Rank
- Reject



Judging the value of ideas, materials and methods by developing and applying standards and criteria.

Products include:

- Debate
- Panel
- Report
- Evaluation
- Investigation
- Verdict
- Conclusion
- Persuasive speech

Classroom Roles for Evaluating

Teacher roles

- **Clarifies**
- **Accepts**
- **Guides**

Student roles

- **Judges**
- **Disputes**
- **Compares**
- **Critiques**
- **Questions**
- **Argues**
- **Assesses**
- **Decides**
- **Selects**
- **Justifies**
- **Active participant**

Evaluating: Potential Activities and Products

- Write a letter to the editor
- Prepare and conduct a debate
- Prepare a list of criteria to judge...
- Write a persuasive speech arguing for/against...
- Make a booklet about five rules you see as important. Convince others.
- Form a panel to discuss viewpoints on....
- Write a letter to. ..advising on changes needed.
- Write a half-yearly report.
- Prepare a case to present your view about...
- Complete a PMI on...
- Evaluate the character's actions in the story

Creating

The learner creates new ideas and information using what has been previously learned.

- Designing
- Constructing
- Planning
- Producing
- Inventing
- Devising
- Making



Can you generate new products, ideas, or ways of viewing things?