A RESOURCE FOR ALIGNING PEDAGOGY WITH BLOOM'S LEVELS OF COGNITION

These resource handouts are designed to assist faculty in their course design process. Typically, pedagogical decisions follow the processes of developing student learning outcomes, determining what evidence will demonstrate achievement of those learning outcomes, and articulating the curriculum to be addressed in the teaching/learning process.

A careful examination and analysis of student learning outcomes will assist in selecting or creating pedagogy (teaching and learning activities) to support students in their achievement of the learning outcomes.

These resource handouts are designed as an ongoing collection of ideas and activities to enhance courses and to especially align pedagogy with the cognitive level of student learning outcomes. Faculty are urged to seek colleagues who teach to similar levels of cognition and share pedagogies. Faculty collaboration will enhance the richness of pedagogical strategies and their greater effectiveness in supporting students to achieve specified learning outcomes.

Contents:
1. Bloom' Taxonomy of the Cognitive Domain – definitions and descriptions
2. Bloom's Taxonomy with appropriate verbs to use in student learning outcomes for each level of the Cognitive Domain
3. Individual levels of the Taxonomy of the Cognitive Domain with appropriate questions, tasks, and pedagogy strategies

Sources:

Ash, S. (2009). Generating, deepening learning: The power of critical reflection in applied learning. *Journal of Applied Learning in Higher Education, 1,* 25-48.

Barkley, E. F. (2010). *Student engagement techniques: A handbook for college faculty.* San Francisco: Jossey-Bass.

Bloom, B., Englehart, M., Furst, E., Hill, W., & Krathwohl, D. (1956). *Taxonomy of educational objectives: The classification of educational goals, Handbook I, Cognitive domain.* New York: McKay.

Freiberg, J., & Driscoll, A. (2005). *Universal teaching strategies.* Boston: Allyn & Bacon.

BLOOM'S Taxonomy for the COGNITIVE DOMAIN

1. *__Knowledge__*: the lowest level, asks your learners to remember previously learned material or to make a factual observation. When you want learners to tell you when, how many, who, or where, they are using knowledge.

2. *__Comprehension__*: asks your learners to grasp the meaning of information, to interpret ideas, and to predict knowledge. Learners are asked to translate knowledge into their own words. When asked why, to explain, or to summarize, they are using comprehension.

3. *__Application__*: asks your learners to use previously learned knowledge in new and concrete situations, to use information, and to do something with knowledge.

4. *__Analysis__*: requires your learners to break something into its constituent parts. They are asked to organize, to clarify, to conclude, or to make references. The process of analysis helps learners to understand "big ideas" and the relationship of parts.

__5a. Evaluation__: requires a judgment. Your learners must give defensible opinions with criteria for their judgment. Students may be judging accuracy or consistency or logic of information or argumentation. They may also be using selected criteria.

__5b. Synthesis__ (Create): is the putting together of elements and parts to form a whole. It involves the combining of elements in such a way as to create a pattern or structure not clearly seen before (Bloom, 1956)

Note: The most recent work with Bloom's taxonomy has proposed that Evaluation and Synthesis are of equal difficulty level.

Bloom's Cognitive Domain and Learner Outcome Descriptions

__Knowledge__   defines, repeats, lists, names, labels, asks, observes, memorizes, records, recalls, listens, identifies, matches, recites, selects, draws, cites, recognizes, indicates, enumerates, reproduces

__Comprehension__   restates, describes, explains, tell, identifies, discusses, recognizes, reviews, expresses, locates, reports, estimates, distinguishes, paraphrases, documents, defends,

	generalizes, summarizes, discusses, classifies, converts, traces
Application	changes, computes, demonstrates, shows, operates, uses, solves, sequences, tests, classifies, translates, employs, constructs, dramatizes, illustrates, draws, interprets, manipulates, writes, applies,
Analysis	dissects, distinguishes, differentiates, calculates, tests, contrasts, debates, solves, surveys, appraises, experiments, diagrams, inventories, relates, maps, categorizes, subdivides, defends, analyzes, categorizes, illustrates, prioritizes
Evaluation	compares, concludes, contrasts, criticizes, justifies, supports, states, appraises, discriminates, recommends, rates, decides, selects, assesses
Synthesis	creates, composes, proposes, formulates, sets up, assembles, constructs, manages, invents, produces, hypothesizes, plans, designs, speculates, prepares, organizes, facilitates, negotiates, structures, substitutes

Teaching and Learning Activities to Promote Bloom's Levels of Cognitive Processes

Knowledge Domain: Involves memory, factual information, and simple observations

QUESTIONS and TASKS:

Name the five parts of…
What is the major issue facing…?
Define the terms…
Label the kinds of….
Listen to the following poem/story/case/description and identify the ….
Record the activities of the ….

ACTIVITIES:

- o Background Knowledge Probe using key terms, short answer questions, events, concepts, etc. (before teaching new content)
- o Knowledge surveys
- o Significant points cards
- o Groups of students gather to create a composite of their knowledge (pre-post)
- o Matching games
- o Developing lists from memory (individual and group)
- o Labeling diagrams, items in the newspaper,
- o Developing timelines
- o Watch video and record what happened
- o Crosswords
- o Brainstorm previous learning about a subject (individual or group)
- o Fill in the blanks activities
- o Define terms in learning outcomes
- o Practice with true/false items, matching items, and fill in the blank items on tests
- o Display a collection of artifacts related to course content – have students describe, explain, and connect to course content
- o Collection of quotes, photos, statistical data, specimens, or students' own artifacts

Comprehension Domain: Involves a higher level of understanding than memory, requires learners to make connections, make meaning, and to translate:

QUESTIONS AND TASKS:

What will happen if…?
How does the process of….work?
Help us to understand the words of…
Describe the concept in your own words…
Why is this happening?
Why do we need ….?

TEACHING AND ACTIVITIES:

- o Watch Film or video and predict ending
- o Have students work in pairs and practice active listening to both academic content and personal content

- Read and restate exercises
- Look at scenarios, case studies, and examples to distinguish between them
- Peer work in explaining concepts, examples, ideas
- Map work – locating, identifying
- Estimation exercises
- Recording experiences, events
- Summarize a person, event, argument, decision
- Summarize book chapters, articles, paragraphs, and presentations
- Have students summarize mini-lectures every 3 minutes
- Using different images of an event for discussion of viewpoints, compare and contrast
- Display photos of disease symptoms and ask for description, explanation
- Focused reading or lecture notes with varied frameworks
- Cards with quotes are distributed and students respond to their quotes
- Student exhibits/posters/display of study focus
- Team Jeopardy game

Application Domain: Using information and skills in situational contexts (real or simulated):

QUESTIONS AND TASKS

Answer the following questions…
Fill in the steps of the process of…
Change the ending of a historical event and describe the results
How does the concept of ….relate to your life?
Show us how to…
In what situations can you use…?
What are some situations in your life when you can use…?

TEACHING AND LEARNING ACTIVITIES

- Modeling and demonstrations
- Projects and constructions
- Problem-based scenarios, case studies
- Role play or simulations
- Mosaics, murals
- Illustrations of ideas with visual representations
- Service or community-based learning
- Teach peer, family member, friends how to do a task
- Write the steps of …
- Sort photos into sequence

o Design a rubric

Analysis Domain: Take knowledge apart and make connections

TASKS AND QUESTIONS

Describe how each of these are connected…
What are all the components of the process of…
Assemble the steps of the recipe in order

TEACHING AND LEARNING ACTIVITIES

- o Analysis of case studies
- o Problem solving that involves analyzing the problem, solutions, etc.
- o Task analysis of a skill, concept, or situation
- o Order steps of a process
- o Develop a set of varied solutions and analyze each for effectiveness
- o Design rubrics with rating scales
- o Read news articles, video and analyze for different perspectives
- o Classification of items, specimens, or cards with information on them – sorted into categories—analyze for differences or similarities
- o Frames – students receive a set of sentence stems that can shape a short essay with no content specified
- o Conduct "fishbowl" discussions
- o Belief or Doubt – analyze text for author's perspective and values, for viewpoints and objections (or use 2 articles)
- o Students take opposing sides (opinions) in an argument in the discipline and research to support their opinions
- o Controversy projects
- o Split room debate
- o Student groups divide into roles and specific tasks for reading text, for listening to a speech, for watching a video, or listening to a lecture (roles include proponent, critic, example-giver, summarizer, questioner or others)
- o Students or groups create graphics or webs to represent relationships between concepts and content (series of events chain; spider map; network tree; or student designed map)

Evaluation Domain: Expects learners to make decisions and judgments, and to develop opinions.

QUESTIONS AND TASKS

Which is the better choice…?
Rate the following…
After watching the three performances, select the top…
Take a stand on the current issue of…
If you had 20 seconds to decide, what would you do…Why?
What information do you need to help you decide about…
What argument will compel you to decide…

TEACHING AND LEARNING ACTIVITIES

- o Use rubrics designed in class to evaluate/critique the work of a peer, an anonymous paper, or…
- o Peers critique displays, posters, exhibits using a rubric
- o Students critique their own entries in portfolios explaining their choices
- o Critique the decisions of a historical figure, current leader, prominent scientist, artist, engineer, etc.
- o Evaluate a scientific process, architectural blueprint, medical diagnosis, ethical decision, project, etc.
- o Compare authors, cultures, historical eras, places, etc.
- o Write a letter to the editor taking a stand on a current community issue and support ideas

Synthesis Domain: Beyond summaries and paraphrases to the creation of something new.

QUESTIONS AND TASKS

How would you describe this? Why?
If this was your story, how would you end it? Why?
Use your own words to complete this poem
Select three words of the author and provide your substitute

TEACHING AND LEARNING ACTIVITIES

- o Create an altered version of a story, history, musical composition, or a work of art --Variations
- o Write letters from an important or famous person to another who holds a different perspective
- o Create a dialogue between 2 people who want to achieve the same end with different approaches

- o Role play an alternative version of an event, a debate, etc.
- o Role play a scenario with multiple stakeholders represented in the drama (switch roles after a time and re-enact the drama)
- o Create posters/exhibits/displays to represent a new understanding of concepts
- o Have students reteach a lesson
- o Students create commercials, websites, power point presentations to convince or sell others on an idea
- o Using a common set of materials, have students invent and describe purposes for their inventions
- o Develop rhymes to communicate an elaborate idea
- o Synectics – analogies
- o Reflective writing – "Articulated Learning" (using stems—I learned that…I learned this when…This learning matters…In light of this learning…)