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Framework for Assessment of Learning Outcomes Using Stated Pedagogical Goals in Architectural Curricula

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Agenda

9:30-9:55 am	Introductory presentation: Adil Sharag-Eldin and Diane Davis-Sikora
9:55-10:00 am	Break into three (3) groups/programs of approx. 15 ❑ Beginning/Fundamental ❑ Intermediate ❑ Advanced/Graduate
10:00-10:45 am	Break each program into three (3) subgroups of five (5) ❑ Seminar ❑ Lecture ❑ Studio Develop individual courses (seminar, lecture, studio): ❑ From Worksheet 1 (pp. 11), choose one or two areas for integration with environmental technologies ❑ Use diagram on page 6 to select the appropriate Taxonomy level for your course ❑ On Worksheet 2 (pp. 12) o Input class title, type, and level o Fill-in course integration mission statement based on wrksht 1 o List class objectives (try as much as possible, to list them based on priorities) o In front of every objective, list the measurable outcomes starting with verbs from Tables on pages 7-9 at the appropriate domains level (1a, 1b, etc). Use definitions in page 5 to help o At the Assessment Method column, write project, homework, exam, etc…(use list in page 3) ❑ On worksheet 3 (pp. 12-13), list objective keywords and the accreditation outcome addressed
10:45-11:00 am	Program level assessment of learning outcomes ❑ Program level groups to reassemble ❑ Fill-in wksht 6 (pp. 17) ❑ Evaluate programs ❑ Prepare for a 10-minute presentations
11:00-11:30 am	Program Presentations ❑ Beginning/Fundamental (10 minutes) ❑ Intermediate (10 minutes) ❑ Advanced/Graduate (10 minutes)
11:30-11:30 am	Conclusionary Remarks

Program Assessment Methods and Tools

- **Course Objectives and Students Outcomes**
  - Examinations
  - Projects
  - Assignments
  - Written report assessments
  - Lab reports
  - Research papers
  - Oral presentation and Jury assessment documentation
  - Special Projects
  - Portfolios
  - Teamwork Assessment forms
  - Coop/Internship evaluation
  - Class grades
  - Etc…
- **Capstone Classes**
  - Comprehensive Studio student performance rubric
- **GPA**
  - Major
  - Overall
- **Surveys**
  - Pre and Post-class surveys
  - Exit interviews
  - Faculty survey
  - Alumni
  - Employer satisfaction
  - Etc…
- **External Evaluations**
  - GRE scores
  - Professional examinations
  - Other standardized tests
  - Etc…
- **Professional/Honor Society Involvement**
  - AIAS
  - ASID
  - Tau Sigma Delta
  - Etc…
- **Advisory Board/s Evaluations**
  - Professional advisory groups
  - Industry advisory board
  - Community
  - Etc…
- **Etc…**

Meanings of Understanding from Webster:

- to grasp the meaning or reasonableness of
- to have thorough or technical acquaintance with or expertness in the practice of
- to be thoroughly familiar with the character and propensities of
- to accept as a fact or truth or regard as plausible without utter certainty
- to interpret in one of a number of possible ways
- to supply in thought as though expressed

From: “Understanding By Design” by Grant Wiggins and Jay McTighe. 1998

Taxonomy of Understanding

Facet #1 - **EXPLANATION**: Sophisticated and apt explanations and theories, which provide knowledgeable and justified accounts of events, actions, and ideas,: Why is that so? What explains such events? What accounts for such action? How can we prove it? To what is this connected? How does this work? What is implied?

Facet #2: I**NTERPRETATIONS**: Narratives, translations, metaphors, images, and artistry that provide meaning. What does it mean? Why does it matter? What of it? What does it illustrate or illuminate in human experience? How does it relate to me? What makes sense?

Facet #3 - **APPLICATION**: Ability to use knowledge effectively in new situations and diverse contexts. How and where can we use this knowledge, skill, process? How should my thinking and action be modified to meet the demands of this particular situation?

Facet #4- - **PERSPECTIVE**: Critical and insightful points of view. From whose point of view? From which vantage point? What is assumed or tacit that needs to be made explicit and considered? What is justified or warranted? Is there adequate evidence? Is it reasonable? What are the strengths and weaknesses of the idea? Is it plausible? What are its limits? So what? What is a novel way to look at this?

Facet #5 - **EMPATHY**: The ability to get "inside" another person's feelings and world view. How does it seem to you? What do they see that I don't? What do I need to experience if I am to understand? What was the author, artist or performer feeling, seeing, and trying to make me feel and see?

Facet #6 - **SELF-KNOWLEDGE**: the wisdom to know one's Ignorance and how one's patterns of thought and action inform as well as prejudice understanding. How does who/I shape my views? What are the limits of my understanding? What are my blind spots? What am I prone to misunderstand due to prejudice, habit, style?

Taxonomy of Educational Outcomes

Cognitive Domain…(*Ability to acquire knowledge)*

Level 1: Knowledge (Remembering)
Remember previously learned materials

Level 2 Comprehension
Grasp the meaning of material

Level 3: Application
Use of learned material in new and realistic situations

***Level 4:* Analysis**
Understand the organizational structure of an issue by breaking it down into its component parts

Level 5: Synthesis
Combine parts to form a new whole

Level 6: Evaluation
Judge the value of material for a given purpose

Affective Domain *(Ability to appreciate)*

Level 1: Receiving
Willingness to attend to particular phenomena or stimuli

***Level 2:* Responding**
Participation actively on the resolution of a problem

***Level 3:* Valuing**
Attach worth or value to a particular object, phenomenon, or behavior

Level 4: Organization
Bring together different values, resolve conflicts between them, and begin to build an internally consistent value system

Level 5: Value Complex
Develop a characteristic life style based on a value system that has controlled behavior for a sufficient length of time

Psychomotor Domain…(*Ability to do)*

Level 1: Perception
Use of senses to obtain cues that guide motor activity

Level 2: Set
Stimulate readiness to take action.

Level 3: Guided Response
Learn a complex skill using examples as well as trial and error

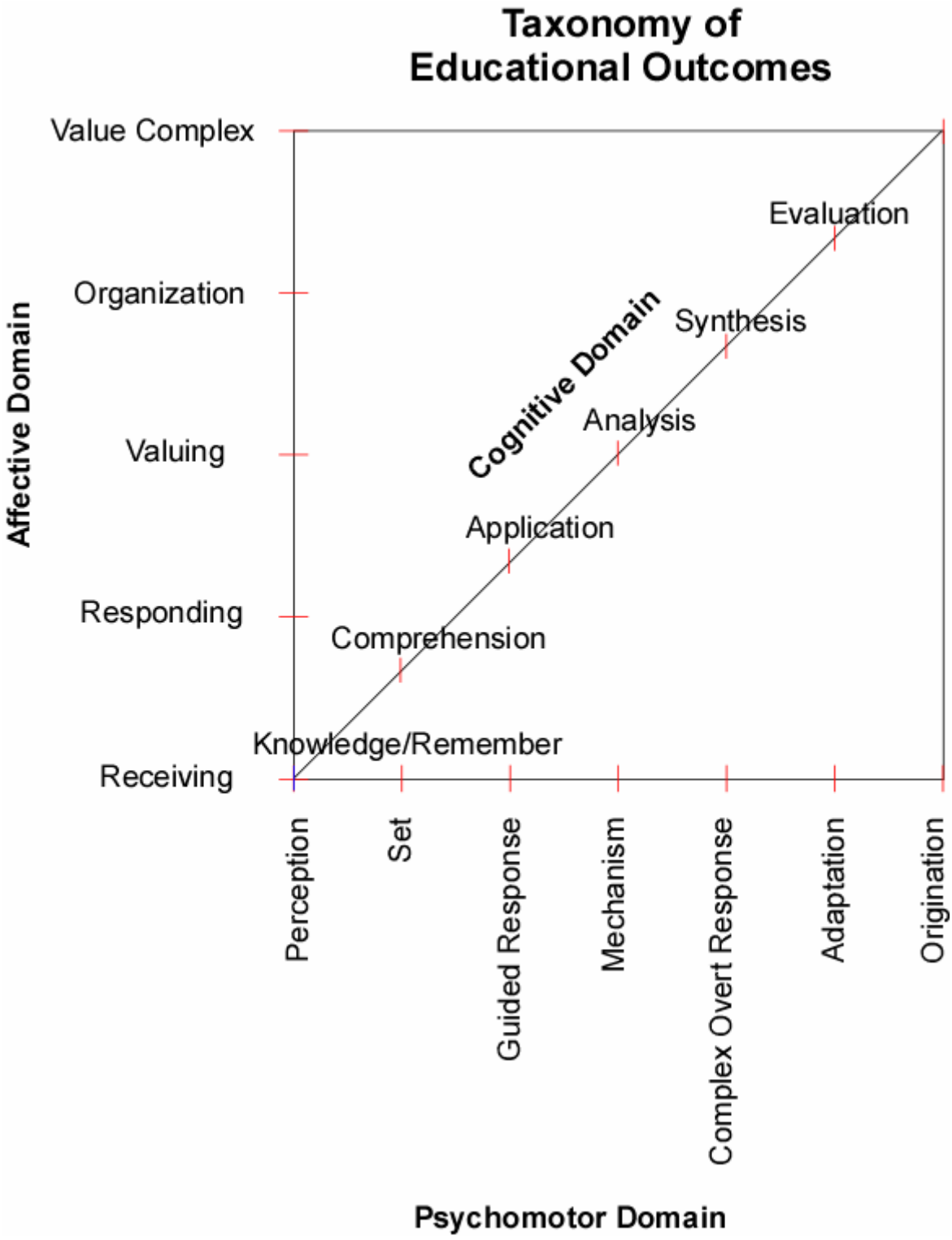
Level 4: Mechanism
Perform acts where the learned responses have become habitual and the movements perform confidence and proficiency.

Level 5: Complex Overt Response
Skillful performance of abilities that involve complex decision-making

Level 6: Adaptation
Skill to modify knowledge to fit new situations

Level 7: Origination
Develop an original skill that replaces the initially learned skill

Relationship between the Domains of Educational Learning Outcomes



Cognitive Domain Verbs					
Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***	***Level 6***
Knowldge	**Comprehension**	**Application**	**Analysis**	**Synthesis**	**Evaluation**
Define	Change	Administer	Assess	Adapt	Analyze
Describe	Cite	Apply	Breakdown	Anticipate	Appraise
Diagnose	Classify	Articulate	Classify	Categorize	Ascertain
Enumerate	Construct	Assess	Compare	Collaborate	Choose
Examine	Convert	Calculate	Contrast	Combine	Compare
Identify	Decode	Change	Correlate	Communicate	Conclude
Label	Defend	Chart	Deduce	Compare	Contrast
List	Define	Collect	Define	Compile	Criticize
Match	Describe	Compute	Determine	Compose	Critique
Name	Discriminate	Construct	Diagnose	Conceive	Decide
Outline	Discuss	Contribute	Diagram	Construct	Defend
Read	Distinguish	Control	Differentiate	Contrast	Describe
Recall	Estimate	Demonstrate	Discriminate	Create	Discriminate
Recite	Explain	Determine	Distinguish	Design	Explain
Recollect	Extend	Develop	Examine	Devise	Interpret
Record	Generalize	Discover	Focus	Establish	Judge
Relate	Illustrate	Employ	Identify	Explain	Justify
Reproduce	Infer	Establish	Illustrate	Express	Reframe
Select	Paraphrase	Extend	Infer	Facilitate	Relate
State	Predict	Find	Limit	Formulate	Resolve
View	Recognize	Illustrate	Outline	Generate	Summarize
	Restate	Implement	Point out	Imitate	Support
	Rewrite	Include	Prioritize	Incorporate	Validate
	Solve	Inform	Recognize	Individualize	
	Summarize	Instruct	Relate	Integrate	
	Write	Interpret	Segregate	Interpret	
		Locate	Select	Intervene	
		Manipulate	Separate	Invent	
		Modify	Subdivide	Model	
		Operate		Modify	
		Organize		Negotiate	
		Participate		Organize	
		Predict		Originate	
		Prepare		Plan	
		Preserve		Progress	
		Produce		Propose	
		Project		Rearrange	
		Provide		Reconstruct	
		Relate		Reinforce	
		Report		Relate	
		Show		Reorganize	
		Solve		Revise	
		Teach		Rewrite	
		Transfer		Structure	
		Use		Substitute	
		Utilize		Summarize	
				Tell	
				Translate	
				Validate	
				Write	
Knowldge	**Comprehension**	**Application**	**Analysis**	**Synthesis**	**Evaluation**
Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***	***Level 6***

Affective Domain Verbs				
Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***
Receiving	**Responding**	**Valuing**	**Organizing**	**Value Complex**
Acknowledge	Answer	Accept	Adapt	Act
Ask	Articulate	Adopt	Adhere	Advocate
Attend	Ask	Approve	Alter	Behave
Choose	Assist	Choose	Arrange	Characterize
Describe	Communicate	Commit	Categorize	Collaborate
Diagnose	Compile	Complete	Classify	Conform
Examine	Conform	Contribute	Combine	Continue
Find	Contribute	Cooperate	Compare	Defend
Follow	Cooperate	Decide	Complete	Devote
Give	Discuss	Describe	Defend	Disclose
Hold	Express	Desire	Diagnose	Discriminate
Identify	Help	Determine	Establish	Display
Listen	Inquire	Differentiate	Examine	Encourage
Locate	Label	Display	Explain	Endure
Name	Listen	Endorse	Formulate	Facilitate
Point to	Obey	Exhibit	Generalize	Function
Receive	Participate	Explain	Group	Implement
Reply	Perform	Express	Identify	Incorporate
Select	Practice	Follow	Integrate	Influence
Show	Prepare	Form	Modify	Interact
Tolerate	Present	Initiate	Order	Justify
Use	Pursue	Invite	Organize	Lead
View	Question	Join	Prepare	Listen
Watch	React	Justify	Rank	Maintain
	Read	Participate	Rate	Modify
	Recite	Prefer	Relate	Negotiate
	Reply	Propose	Synthesize	Pattern
	Report	Question	Systemize	Perform
	Request	Read		Practice
	Respond	Report		Preserve
	Seek	Research		Propose
	Select	Sanction		Qualify
	Tell	Segregate		Question
	Verify	Select		Resolve
	Visit	Share		Support
	Volunteer	Study		Uphold
	Write	Work		Use
				Verify
Receiving	**Responding**	**Valuing**	**Organizing**	**Value Complex**
Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***

Psychomotor Domain Verbs						
Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***	***Level 6***	***Level 7***
Perception	**Set**	**Guided Response**	**Mechanism**	**Complex Overt Response**	**Adaptation**	**Origination**
Associate	Adjust	Adapt	Assemble	Achieve	Adapt	Arrange
Choose	Arrange	Assemble	Build	Adjust	Adjust	Combine
Compare	Begin	Attempt	Calibrate	Assemble	Alter	Compose
Describe	Comprehend	Build	Complete	Build	Change	Construct
Detect	Demonstrate	Calibrate	Construct	Calibrate	Conduct	Create
Diagnose	Diagnose	Construct	Dismantle	Collect	Convert	Design
Differentiate	Display	Copy	Display	Combine	Coordinate	Develop
Distinguish	Examine	Correct	Dissect	Construct	Correct	Direct
Examine	Explain	Dismantle	Evaluate	Coordinate	Customize	Establish
Hear	Find	Display	Fasten	Dismantle	Integrate	Formulate
Identify	Identify	Dissect	Fix	Display	Manage	Invent
Inspect	Locate	Duplicate	Follow	Dissect	Modify	Originate
Investigate	Move	Evaluate	Grind	Draw	Order	
Isolate	Organize	Fasten	Heat	Evaluate	Originate	
Listen	Proceed	Fix	Manipulate	Fasten	Rearrange	
Notice	React	Grind	Measure	Fix	Reorganize	
Recognize	Recognize	Heat	Mend	Graph	Repair	
Relate	Respond	Imitate	Mix	Grind	Revise	
Scan	Select	Manipulate	Mould	Heat	Standardize	
Segregate	Show	Match	Organize	Illustrate	Vary	
Select	Start	Measure	Perform	Integrate		
Separate	Volunteer	Mend	Play	Manipulate		
Smell		Mimic	Produce	Mao		
Taste		Mix	Shape	Measure		
		Organize	Sketch	Mend		
		Practice	Work	Mix		
		Repeat		Monitor		
		Reproduce		Operate		
		Simulate		Organize		
		Sketch		Perform		
		Try		Plot		
		Work		Prepare		
				Regulate		
				Sketch		
				Solicit		
				Work		
Perception	**Set**	**Guided Response**	**Mechanism**	**Complex Overt Response**	**Adaptation**	**Origination**
Level 1	***Level 2***	***Level 3***	***Level 4***	***Level 5***	***Level 6***	***Level 7***

Worksheets

Worksheet 1
Brief Description of Program Learning Areas

Program Learning Areas	
Communication Skills	Ability to communicate effectively through aural, written, graphical, and visual forms
Design Skills	Ability to synthesize meaningful design decisions based on implementation of critical think, thoughtful evaluate of observation of a stated problem
Socio-Cultural Issues	Understanding of diverse socio-cultural and humanistic traditions
History/ Theory	Understanding of the role of history in shaping contemporary issues and the theoretical context of architectural design and the society in general
Diversity/ Global Issues	Recognition of the role of professionals in a diverse and global society
Collaborative Skills	Ability to work effectively in teams
Contemporary Issues	Understanding the role of architecture in shaping contemporary issues and how it is affected by these in return
Technical Issues	Understanding of selected technical specialties
Professional/ Ethics	Recognition of ethical and professional responsibilities

Worksheet 2
Course Objectives addressed by Students Learning Outcomes

Course Title: _____

Course Type (circle one): Lecture Seminar Studio

Course Level (Circle one): Fundamental (Yrs. 1 & 2) Intermediate (Yrs. 3 & 4) Advanced (Above Yr. 4)

Integration (Mission) Statement: _____
_____
_____
_____

Class Primary Objectives		Course Learning Outcomes and Assessment		
Non-measurable e.g. understand, appreciate, explore, etc…		Measurable, use domain verbs from lists at appropriate course level		Assessment Method
1		a b c		
2				
3				

Worksheet 3
ARCHITECTURE ACCREDITATION PERFORMANCE CRITERIA ADDRESSED BY CLASS OBJECTIVES

Course Title: _____

Course Type (circle one): Lecture Seminar Studio

Course Level (Circle one): Fundamental (Yrs. 1 & 2) Intermediate (Yrs. 3 & 4) Advanced (Above Yr. 4)

Class Primary Objectives		**Accreditation Outcome Addressed**	**Students Performance Criteria (Outcomes)**			
1			1	Speaking and Writing Skills	2	Critical Thinking Skills
2			3	Graphics Skills	4	Research Skills
3			5	Formal Ordering Systems	6	Fundamental Design Skills
4			7	Collaborative Skills	8	Western Traditions
5			9	Non-Western Traditions	10	National and Regional Traditions
6			11	Use of Precedents	12	Human Behavior
7			13	Human Diversity	14	Accessibility
8			15	Sustainable Design	16	Program Preparation

Class Primary Objectives	Accreditation Outcome Addressed	Students Performance Criteria (Outcomes)			
		17	Site Conditions	18	Structural Systems
		19	Environmental Systems	20	Life Safety
		21	Building Envelope Systems	22	Building Service Systems
		23	Building Systems Integration	24	Building Materials and Assemblies
		25	Construction Cost Control	26	Technical Documentation
		27	Client Role in Architecture	28	Comprehensive Design
		29	Architect's Administrative Roles	30	Architectural Practice
		31	Professional Development	32	Leadership
		33	Legal Responsibilities	34	Ethics and Professional Judgment

Worksheet 4
Assessment of Learning Outcomes through intersecting the Knowledge Domain with the Knowledge Dimension

The Knowledge Dimension		**The Cognitive Process Dimension**					
		Knowledge (Remember)	Comprehension	Application	Analysis	Synthesis	Evaluation
A	Factual Knowledge						
B	Conceptual Knowledge						
C	Procedural Knowledge						
D	Meta-Cognitive Knowledge						

THE KNOWLEDGE DIMENSION: *From*: "A Taxonomy for Learning, Teaching, and Assessing" by Anderson, et. al. 2001

- ***FACTUAL KNOWLEDGE***

The basic elements students must know to be acquainted with a discipline or solve problems in it

  - Knowledge of terminology
  - Knowledge of specific details and elements

- ***CONCEPTUAL KNOWLEDGE***

The interrelationships among the basic elements within a larger structure that enable them to function together

  - Knowledge of classifications and categories
  - Knowledge of principles and generalizations
  - Knowledge of theories, models, and structures

- ***PROCEDURAL KNOWLEDGE***

How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods

  - Knowledge of subject-specific skills and algorithms
  - Knowledge of subject-specific techniques and methods
  - Knowledge of criteria for determining when to use appropriate procedures

- ***META-COGNITIVE KNOWLEDGE***

Knowledge of cognition in general as well as awareness and knowledge of one's own cognition

  - Strategic knowledge
  - Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge
  - Self-knowledge

Worksheet 5

Assessment Example: Project

Project Learning Outcomes as Derived from Course and Program Outcomes

Course Title_____

Course Type (circle one): Lecture Seminar Studio

Course Level (Circle one): Fundamental (Yrs. 1 & 2) Intermediate (Yrs. 3 & 4) Advanced (Above Yr. 4)

Project Mission Statement: _____
_____
_____
_____

	Project Primary Objectives (derived from knowledge domain and Dimension Matrix- Worksheet 4)		Project outcomes (use domain verbs from lists at appropriate course level pp. 7-9)	Course Objectives addressed (use numbers)	Course Outcomes (use numbers and letters)	Accreditation Criteria

Worksheet 6
Level Students Learning Outcomes addressed by Program Learning Areas

Course Level (Circle one): Fundamental (Yrs. 1 & 2) Intermediate (Yrs. 3 & 4) Advanced (Above Yr. 4)

Program Assessment										
Prioritized Students Learning Outcomes		***Program Learning Areas***								
		Communication	Design Skills	Socio-Cultural	History/ Theory	Diversity / Glob	Collaborative	Contemporary Issues	Technical	Professional/ Ethics
a										
b										
c										
d										
e										
f										
g										
h										
i										