Making Coursework Clear, Coherent, Connected, and Consequential

A WORKSHOP FOR GRADUATE STUDENTS WHO TEACH AT

Northern Arizona University

3:00 to 5:00 PM on Thursday 1 November 2007

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Goal Ranking & Matching Exercise

What do you hope to get out of this workshop? Will it address your needs and expectations? This is a Classroom Assessment Technique (CAT) designed to help you identify your expectations and share them with the session leader -- and each other. You'll also review the presenter's goals are for this workshop, and see how well those goals match yours.

1. On the lines below, please list three or four goals you hope to achieve -- things you hope to learn or questions you hope to answer -- through participating in this workshop.

Your learning goals/burning questions for this workshop

_____

_____

_____

Buzz Groups

Useful for stimulating engagement in discussions and, and encouraging students to rehearse, express, and compare their ideas, opinions, and/or reactions with others.

Estimated Time and Effort Required for

Faculty to prepare this CoLT	*LOW*
Students to use this CoLT	*LOW*
Faculty to assess/follow up	*LOW*
Complexity	*LOW*
Risk of Failure	*LOW*

Duration & Location *10-20 minutes/In class or online*

Group Size & Structure *Triads to Quintets Informal/Little or no pre-organizing*

Description

Buzz groups give students the opportunity to exchange ideas, opinions, and information in a low stress environment. Because buzz groups can build interest in and enthusiasm for a subject, they are useful in introducing a new topic and in assessing students' prior knowledge or beliefs about that topic. Buzz Groups can also serve as in-class lead-ins to out-of-class assignments.

Procedure

1. The instructor prepares a list of open-ended discussion questions that will tap students' ideas, prior knowledge, or opinions about the topic at hand.
   These should be questions for which there is no one correct answer.

2. In the context of a semi-structured, time-limited conversation, small groups of students discuss their responses to the prepared questions.
   It may be useful to assign roles such as time keeper, summarizer, and reporter.

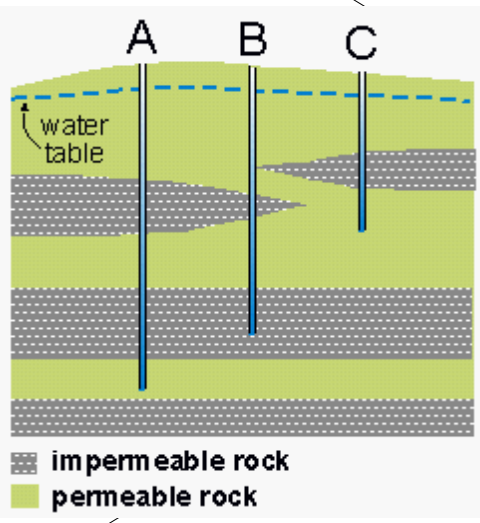
3. Groups summarize their responses – including the range of agreement and diversity – and report them to the instructor in writing and/or, if useful, to the entire class, orally.
   Alternately, in a large class, the instructor can sample responses from a few groups.

Seven Links in a Virtuous Cycle of Research-led Teaching and Deep Learning

- Prior Knowledge & Experience
- Collaboration
- Motivation
- Assessment & Grading
- Feedback
- Application
- Critical Thinking

Linking prior knowledge and feedback . . .

Conceptest



Liquid hazardous waste is disposed of by pumping it down injection wells. Which well location would be the most suitable to use for an injection well? Why?

A B C

Thanks to Dr. David McConnell, of the University of Akron, for the Geology ConcepTest above.

STATISTICS FOR EVERYDAY LIFE – SPRING 2004 - ANGELO

FIRST CONCEPT REVIEW: STANDARD DEVIATION

Circle the one variable in each row that you would expect to have the <u>largest</u> relative standard deviation:

1.	*adult humans' heights*	*adult humans' weights*
2.	*domestic dogs' weights*	*domestic cats' weights*
3.	*language skills of 12-year-olds*	*math skills of 12-year-olds*
4.	*hours students spend <u>in</u> this classroom*	*hours students spend studying <u>for</u> this class*

Think-Pair-Share

A useful Collaborative Learning Technique for stimulating engagement in discussions, checking students' understanding of concepts, and encouraging students to rehearse, express, and compare their understandings with those of others

Estimated Time and Effort Required for

Academic staff to prepare this CoLT	*VERY LOW*
Students to use this CoLT	*VERY LOW*
Academic staff to assess/follow up	*VERY LOW*
Complexity	*VERY LOW*
Risk of Failure	*VERY LOW*

Duration & Location *5-15 minutes/In class*

Group Size & Structure *Pairs or triads/Informal/No pre-organizing needed*

Description and Purpose:

The name of this CoLT, "Think-Pair-Share," captures the essential steps. In response to a question posed by the teacher, students think and perhaps write on their own for a few minutes, quickly pair up with classmates, and then share, discuss, and compare their responses in pairs before responding to the teacher or sharing with the entire class.

This technique provides students with the opportunity to formulate responses and practice communicating them with their peers. Since *Think-Pair-Share* can dramatically improve students' willingness and readiness to participate, it's often used as a "warm up" or "step up" to a whole class discussion.

Procedure

1. Pose an engaging question to the class, giving students ample time to think about the question individually and to devise individual responses.
2. Ask students to pair with another student nearby to share responses and, if useful, to create a joint response by building on each other's ideas.
3. Ask the pairs to share their responses with the whole class. If time is limited and/or the class is large, randomly call on student pairs.
4. If appropriate, provide the class with the correct or expert response, allowing them to check and, if needed, correct their individual and pair responses.

Linking Prior Knowledge, Self-assessment, and Feedback . . .

Political Science 100, Section 20 -- T.A. Angelo -- 1/28/91

Background Knowledge Probe #1

In response to each name, term, or concept in bold print below, circle the number that best represents your current knowledge:

	No. of Responses
1. Federalism	
(1) Have never heard of this	0
(2) Have heard of it, but don't really know what it means	14
(3) Have some idea what this means, but not too clear	15
(4) Have a clear idea what this means and can explain it	1
2. Separation of Powers	
(1) Have never heard of this	1
(2) Have heard of it, but don't really know what it means	6
(3) Have some idea what this means, but not too clear	18
(4) Have a clear idea what this means and can explain it	5
3. Republic	
(1) Have never heard of this	0
(2) Have heard of it, but don't really know what it means	5
(3) Have some idea what this means, but not too clear	23
(4) Have a clear idea what this means and can explain it	2
4. The *Constitution* of the U. S.	
(1) Have never heard of this	0
(2) Have heard of it, but don't really know what it means	2
(3) Have some idea what this means, but not too clear	8
(4) Have a clear idea what this means and can explain it	18
5. The *Articles of Confederation*	
(1) Have never heard of this	7
(2) Have heard of it, but don't really know what it means	13
(3) Have some idea what this means, but not too clear	6
(4) Have a clear idea what this means and can explain it	4
6. James Madison	
(1) Have never heard of this person	3
(2) Have heard of him, but don't really know who he was	8
(3) Have some idea who this was, but not too clear	15
(4) Have a clear idea who this was and can explain	

Five Points to Consider on Prior Knowledge and Learning

We learn by making connections between prior knowledge and new information

It is easier to make those critical connections when we understand the relationships between new information and prior knowledge

With adults, the biggest hindrance to learning is not usually lack of prior knowledge, but rather incorrect or incomplete prior knowledge

We are generally reluctant to give up or change our prior knowledge and beliefs

Thus, learning can often be difficult and emotionally costly, and sometimes involves resistance, loss, and grieving

Jigsaw

This CoLT is particularly effective in helping students master a large body of information that can be divided into discrete, though related, sub-topics. It puts into practice the adage, "To teach is to learn twice." Variations of the Jigsaw have long been used by medical and law students.

Estimated Time and Effort Required	*MEDIUM*
Complexity	*MEDIUM*
Risk of Failure	*MEDIUM*
Duration & Location	*30 minutes to several hours/In class or out of class*
Group Size & Structure	*Triads to Quintet/Some pre-organizing required*

Description

The name of this CoLT refers to jigsaw puzzles, in which a number of disparate pieces are brought together to form a coherent picture. Students learn best by teaching other students, and in the Jigsaw, each member of a team assumes responsibility for becoming the master and the teacher of one specific part of a topic, issue, or problem. This CoLT can help students learn new subject matter and/or provide opportunities for them to practice solving complex problems. It's particularly useful in courses where students are required to master a large body of information. Jigsaw also creates opportunities for equal participation and achievement; since each student has the chance to be in the spotlight. It requires that students assume responsibility for their learning, gives them double exposure to material, and allows for peer coaching. It also requires positive interdependence, since all members of the group need each other – and need to collaborate effectively – in order to put all the pieces together and succeed individually.

Procedure

1. The instructor presents a list of related topics to be learned, making the division of the material into component parts clear. The number of topics should be equal to or a small multiple of the number of students in each group; and usually no more than 3-5 per person.

2. With the proviso that all assigned topics must eventually be learned by all students, learners may be given the option to identify topic preferences.

3. Students work in "expert" groups -- with the other students who have selected or been assigned the same topic(s) -- to master their common topic(s). They also must determine the best ways to help others learn the material they've mastered.

4. Once the expert groups have mastered their material, the class splits into new groups in which each student serves as the only expert on a specific topic(s). In these new "tutorial" or "study" groups, topic experts take turns teaching the material and leading the discussion.

5. When student groups indicate that they have gained a full knowledge and understanding of the topics covered, the instructor holds a full class discussion on all topics or gives an assignment, quiz, or exam to assess their individual and collective learning.

Linking critical thinking and feedback . . .

Defining Features Matrix

Comparing Confusible Concepts

Directions: In the left-hand column below are features we could use to identify, distinguish, and classify reptiles and amphibians. Place plus signs "+" next to features that typically characterize reptiles and/or amphibians. Place minus signs (-) next to features which do not.

DEFINING FEATURES	Reptiles	Amphibians
Are vertebrates		
Are tetrapods (four-limbed)		
Are exothermic (warm-blooded)		
Usually lay eggs in water		
Usually lay eggs on land		
Usually have scaly, dry skin		
Usually have damp, smooth skin		
Some are native to AZ		
Many species are endangered		

Linking assessment, grading, and feedback . . .

AN EXAMPLE OF GRADING STANDARDS

Freshman Writing Seminar
EN 010-01 -- T. A. Angelo
Boston College -- Fall 1993

Grading Standards for Writing in Seminar Portfolios

"A" work	(1) Responds fully to the assignment; (2) Expresses its purpose clearly and persuasively; (3) Is directed toward and meets the needs of a defined audience; (4) Begins and ends effectively; (5) Provides adequate supporting arguments, evidence, examples, and details; (6) Is well-organized and unified; (7) Uses appropriate, direct language; (8) Correctly acknowledges and documents sources; (9) Is free of errors in grammar, punctuation, word choice, spelling, and format; and, (10) Maintains a level of excellence throughout, and shows originality and creativity in realizing (1) through (7).
"B" work	Realizes (1) through (9) fully and completely -- and demonstrates overall excellence -- but shows little or no originality or creativity.
"C" work	Realizes (1) through (9) adequately -- and demonstrates overall competence -- but contains a few, relatively minor errors or flaws. A "C" paper may show great creativity and originality, but those qualities don't make up for poor or careless writing. A "C" paper usually looks and reads like a next-to-final draft.
"D" work	Fails to realize some elements of (1) through (9) adequately -- and contains several, relatively serious errors or flaws, or many minor ones. A "D" paper often looks and reads like a first or second draft.
"F" work	Fails to realize several elements of (1) through (9) adequately -- and contains many serious errors or flaws, and usually many minor ones, as well. An "F" paper usually looks and reads like a zero draft.

A SAMPLE ASSESSMENT/GRADING RUBRIC

Title of piece: _____ Author: _____ Date: _____

(1) Responds fully to to the assignment	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
(2) Expresses its purpose clearly and persuasively	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
(3) Is directed toward and meets the needs of a defined audience	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
(4) Begins and ends effectively	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
(5) Provides adequate supporting arguments, evidence, examples, and details	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
(6) Is well-organized and unified	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
(7) Uses appropriate, direct language	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
(8) Correctly acknowledges and documents sources	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
(9) Is free of errors in grammar, punctuation, word choice, spelling, and format	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
(10) Maintains a level of excellence throughout	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
Shows originality and creativity in realizing (1) through (7)	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR
OVERALL EVALUATION	EXCELLENT	VERY GOOD	ADEQUATE	FAIR	POOR

COMMENTS:

The Minute Paper

Please answer each question in 1 or 2 sentences:

1) What was the most useful or meaningful thing you learned during this session?

2) What question(s) remain uppermost in your mind as we end this session?

Reference: Angelo, T. A. & Cross, K. P. Classroom Assessment Techniques: A Handbook for College Teachers, 2nd edition. San Francisco: Jossey-Bass, 1993, pp. 148-153.

*The "Muddiest" Point**

What was the "muddiest" point in this session?
(In other words, what was least clear to you?)

* This Classroom Assessment Technique was developed by Dr. Frederick Mosteller, a distinguished professor of statistics at Harvard University. For a detailed account of its development and use, see his article, *The "Muddiest Point in the Lecture" as a Feedback Device* in On Teaching and Learning: The Journal of the Harvard-Danforth Center, Vol. 3, April 1989, pp. 10-21.

Linking Prior Knowledge, Self-assessment, and Feedback . . .

The RSQC2 Technique

Recall

Summarize

Question

Comment

Connect

Reference: Angelo, T.A. & Cross, K.P. Classroom Assessment Techniques: A Handbook for College Teachers, 2nd edition. San Francisco: Jossey-Bass, 1993, pp. 344-348

WHY GIVE LEARNERS FEEDBACK?

- TO IMPROVE PERFORMANCE & ACADEMIC SUCCESS
- TO INCREASE INTEREST & MOTIVATION TO LEARN
- TO ILLUMINATE AND UNDERMINE MISCONCEPTIONS
- TO PROMOTE SELF-ASSESSMENT
- TO DEVELOP INDEPENDENCE

TO USE FEEDBACK WELL, LEARNERS NEED M.O.M.

- MOTIVATION – *REASONS TO USE IT*
- OPPORTUNITIES – *FOR SAFE, GUIDED PRACTICE*
- MEANS – *KNOWLEDGE & SKILLS FOR IMPROVEMENT*

THE ORDER IN WHICH WE GIVE FEEDBACK MATTERS.

CONSIDER THE FOLLOWING FIVE STEPS:

1ST - GOOD NEWS: WHAT WAS DONE *WELL*

2ND - BAD NEWS: WHAT STILL NEEDS *IMPROVEMENT*

3RD - OPTIONS: WHAT *CAN BE DONE* TO IMPROVE IT

4TH - PLANS: WHAT THE LEARNER *INTENDS* TO DO

5TH - COMMITMENTS: WHAT BOTH PARTIES *AGREE* TO DO, HOW, TO WHAT STANDARD, AND BY WHEN

Linking self-assessment, applications, and motivation . . .

Applications Card

DIRECTIONS: Please take a moment to recall the ideas, techniques, and strategies we've discussed -- and those you've thought up -- to this point in the session. Quickly list as many possible applications as you can. Don't censor yourself! These are merely possibilities. You can always evaluate the desirability and/or feasibility of these application ideas later.

Interesting IDEAS/TECHNIQUES from this session	*Some possible APPLICATIONS of those ideas/techniques to my work*

Reference: Angelo, T.A. & Cross, K.P. Classroom Assessment Techniques: A Handbook for College Teachers, 2nd edition. San Francisco: Jossey-Bass, 1993, pp. 236-239.

Several Strategies for Promoting Motivation

- Provide positive first impressions of the subject, course, and instructor [Demonstrate that you love your subject and care about student learning.]
- Break down anonymity and help students connect
- Show and tell students what you expect in terms of the quality of their learning and their interactions – and of what they can expect of you and the course
- Make sure that grading is criterion and not norm-based, and that the criteria for grading are clearly understood
- Show students where they'll be going and how they will get there – and that they can get there
- Show students that investing time and energy in the course will be valuable and engaging
- Gather initial data on their beliefs, interests, and goals
- Help students see connections between their goals and interests and the course content and outcomes
- Provide some choices, however small, in learning tasks
- Provide timely, specific feedback on learning and goal attainment

Classroom Strategies for Discouraging Discrimination and Encouraging Inclusive Engagement among Diverse Students

Dr. Christine Asmar, Senior Lecturer
Institute for Teaching & Learning
The University of Sydney

- Introduce yourself in the first class and disclose some personal details, including aspects of your cultural background that you are willing to share. Then …
- Get students to introduce themselves to another student not already known to them, find out something about that student's background that they are willing to share.
- If possible, learn students' names (and how to pronounce them) and make sure all students do the same.
- Be aware of your own potential for bias, and help your students to become aware of theirs. Support students in reflecting on these issues.
- Model inclusive behavior towards minority students, neither 'spotlighting' them in ways that may be unwelcome, nor overlooking them when they want to contribute.
- Familiarize yourself with conflict management techniques such as one-to-one counseling of students exhibiting inappropriate behaviors.
- Encourage students to do assignments on topics of personal interest to them, including aspects of their religion/culture; make sure all contributions are valued.
- Encourage students to tell you about their cultural and religious sensitivities in relation to classroom or lab activities. For example, Muslim or some Asian students are often uncomfortable in close one-to-one interactions with a student of the opposite sex; or with exposure to nudity (e.g., in a life drawing class).
- In consultations with students of the opposite sex, always leave the door open, and allow students to be accompanied by another student if they prefer.
- Avoid humor or jokes which target any specific group, religion or culture, and actively discourage such references on the part of students.
- Bring in guest speakers from a range of backgrounds to address topics outside your area of expertise.
- Use role plays or simulations in which students research and then act out unfamiliar roles. Get them to reflect on this experience.
- Select course material from a range of cultures, societies and religions; for example, in a course on accounting, consider referring to the Islamic prohibition on interest.
- Ensure that cross-cultural learning experiences and perspectives are integrated into the outcomes, curriculum and assessment of your course, not just as 'add-ons'.

SEVEN LEVERS FOR HIGHER LEARNING

Research-based Guidelines for more Effective Teaching and Learning

In general, research suggests that virtually all students can learn more – and more deeply – when we help them to . . .

Become explicitly aware of their own relevant prior knowledge, beliefs, preconceptions, and values – and <u>un</u>learn, as needed

Set and maintain realistically high and personally meaningful learning goals and expectations for academic success

Learn how to learn effectively – given their own individual histories, talents, preferences, and goals – so they become increasingly self-directed and independent learners

Understand the criteria, standards, and methods used in assessing and evaluating their learning and get useful, timely feedback on their performance against those standards

Seek and find connections to and real-world applications of what they are learning in class

Collaborate regularly and productively with other learners and with their teachers to achieve meaningful, shared learning goals

Invest as much actively engaged time and high-quality effort as possible in their academic work

A Few Key References on Learning & Teaching

Anderson, L.W. & Krathwohl, D.R. (Eds.). A Taxonomy of Learning, Teaching, and Assessment: A Revision of Bloom's Taxonomy of Educational Objectives. New York: Longman, 2001.

Barkley, E.F., Cross, K.P. & Major, C.H. Collaborative Learning Techniques: A Handboook for College Faculty. San Francisco: Jossey-Bass, 2005.

Biggs, J. Teaching for Quality Learning at University. Buckingham, UK: SRHE and Open University Press, 1999.

Boice, R. First-Order Principles for College Teachers: Ten Basic Ways to Improve the Teaching Process. Bolton, MA: Anker, 1996.

Bransford, J.D., Brown, A.L., & Cocking, R.R. (Eds.). How People Learn: Brain, Mind, Experience, and School. Washington, DC: National Academy Press, 1999.

Cross, K.P & Steadman, M.H. Classroom Research: Implementing the Scholarship of Teaching. San Francisco: Jossey-Bass, 1996.

Davis, B.G. Tools for Teaching. San Francisco, CA: Jossey-Bass, 1993.

Halpern, D.F. Thought and Knowledge: An Introduction to Critical Thinking, (3rd ed.). Mahwah, NJ: Erlbaum, 1996.

McKeachie, W.J & Associates. Teaching Tips: Strategies, Research, and Theory for College and University Teachers, 11th Edition. Boston: Houghton Mifflin, 2002.

Ramsden, P. Learning to Teach in Higher Education, (2nd Ed.). London, New York: RoutledgeFalmer, 2003.

Theall, M., (Ed). Motivation from Within: Approaches for Encouraging Faculty and Students to Excel. *New Directions for Teaching and Learning*, 78(Summer), 1999.

Walvoord, B.E. & Anderson, V. Effective Grading: A Tool for Learning and Assessment. San Francisco: Jossey-Bass, 1998.

Weimer, M. Learner-Centered Teaching: Five Key Changes to Practice. San Francisco, CA: Jossey-Bass, 2002.

And a Few Useful Websites on Teaching & Learning

THE ACTIVE LEARNING SITE. HTTP://WWW.ACTIVE-LEARNING-SITE.COM/INDEX.HTML

THE CARNEGIE FOUNDATION FOR THE ADVANCEMENT OF TEACHING. HTTP://WWW.CARNEGIEFOUNDATION.ORG/HOME.HTM

THE CENTER FOR ACADEMIC TRANSFORMATION AT RPI. HTTP://WWW.CENTER.RPI.EDU/

THE IDEA CENTER AT KANSAS STATE U.. HTTP://WWW.IDEA.KSU.EDU/

THE NATIONAL INSTITUTE FOR SCIENCE EDUCATION (NISE). HTTP://WWW.WCER.WISC.EDU/NISE/

University of Queensland. Teaching Large Classes: AUTC Project. http://www.tedi.uq.edu.au/largeclasses/

University of California, Berkeley Office of Educational Development. Tools for Teaching: Preparing to Teach the Large Lecture Course. http://teaching.berkeley.edu/bgd/largelecture.html

VARK: A GUIDE TO LEARNING STYLES. HTTP://WWW.VARK-LEARN.COM/

Mini-Evaluation Form

Tom Angelo NAU Workshop for GTAs

1. Please rate the overall quality of this session on the scale below:

1	2	3	4	5
very poor	poor	acceptable	good	excellent

2. Please rate the overall usefulness of the session below:

1	2	3	4	5
useless	not very	somewhat	very	extremely

3. What did you learn that you can apply to your work? (Please be specific.)

4. How could the workshop have been more useful to you? (Please be specific.)

5. What kinds of follow up at NAU would be most useful to you? (Please be specific.)