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SPANNING THE SPECTRUM OF ACTIVE LEARNING: FROM SHORT AND SIMPLE TO COMPREHENSIVE AND COMPLEX

OBJECTIVES

- Describe various models and methodologies for integrating active learning in a curriculum
- Match active learning style to level of cognitive development of PharmD students
- Discuss the benefits and limitations associated with different styles of active learning
- Describe examples of successful active learning types in various schools of pharmacy
- Design active learning activity for use in own course or classroom.

WHAT IS ACTIVE LEARNING?

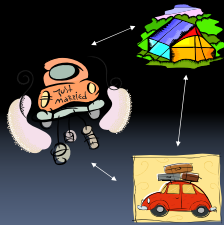
- Active learning as a teaching method implies several things:
 - The responsibility for learning is on the learner
 - Students must actively engage the topic
 - Utilize at least one of four skills: writing, reading, talking/listening, reflecting
 - These skills must result in higher level learning (Analysis, Synthesis, Evaluation)

WHY ACTIVE LEARNING?

- VARK studies suggests multi-modal learning strategy is preferred by students
 - V=visual, A=aural, R=read/write, K=kinesthetic
- Active learning is equivalent to lecture for learning content BUT superior to lecture in developing cognitive skills

KNOWLEDGE CONSTRUCTION

... IS ACTIVE BY DEFINITION



- Learning is creating and reinforcing relationships in working memory
 - i.e., consciously activating, creating and retracing the linkages between concepts
- NO learning without linkage to EXISTING memories
- Working memory \equiv THINKING
 - Long term memory is directly and linearly proportional to thinking time (study time)
- Biologically:
 - Reinforcing synapses

COMPONENTS OF KNOWLEDGE

- Concepts \longleftrightarrow
 - Principles \longleftrightarrow
 - Context \longleftrightarrow
 - What is unique about this situation
 - What do you do in this situation
- Alcohol, Friends, Party
 - Peer Pressure, Leadership
 - MY friends, My PARENTS

- Hierarchical
- Increasing Levels of Complexity As We Develop Expertise
- Domain Dependent



LOW RISK STRATEGIES

ACTIVE LEARNING: LOW RISK STRATEGIES

- Require less time to prepare
- Limited in time needed to complete
- Beneficial for those who are fearful of "losing control" of the classroom
- Better for students without active learning experience

EVEN WITH LOW RISK...DON'T FORGET...

- Explain your objectives
- Sell the benefits
- Speak slowly when giving directions
- Divide students into subgroups before giving directions
- Demonstrate the activity if the procedures are complicated
- Challenge the student
- Discuss the activity afterward
- Carefully structure the experience

FOUR TIPS BEFORE YOU START

1. Define the goal of the activity
2. Establish the outcomes you expect of students
3. Describe the procedure they should follow
4. Limit the time for the activity

ACTIVE LEARNING: FOUR CATEGORIES

- Individual
- Paired
- Informal small groups
- Cooperative groups

ACTIVE LEARNING: BASIC ELEMENTS

- Thinking / Reflecting
- Writing
- Talking / Discussing / Sharing
- Listening
- Reading
- Reflecting / Synthesizing

LOW RISK ACTIVE LEARNING

- Pause Procedure:
 - Consolidate notes for 2-3 minutes during a lecture (Ruhl, Hughes, and Schloss 1987)
- Discussion Time / Ten – Two Strategy
 - 3-4 minutes to discuss the material every 10-15 minutes (typical attention span). (Flash, Tzenis, Waller, 1995, 29)
- One Minute Write / Free Writing

- 3 -2-1 Strategy
 - 3 ideas / issues / concepts presented
 - 2 examples or uses of the idea / information covered
 - 1 unresolved/remaining question / area of possible confusion

- Knowledge Probe
 - Question is presented to the class
 - Students alone or in groups come up with an answer
 - Use of “clickers” or audience response systems
 - Allows immediate feedback on knowledge and opportunity to correct mis-learned information
 - Team Based Learning

LOW RISK ACTIVE LEARNING

- Think – Pair – Share
 - Summarize what was just presented
 - Pause and answer “why” or “how” questions
 - Predict conclusions
 - Identify major points
 - Create another example of the concept being discussed
- Write – Pair – Share

LOW RISK ACTIVE LEARNING

- Question and Answer Pairs
 - Students create one or two questions about the pre-class reading or material presented either before / in class
 - Pose these questions to their partner and vice versa
 - Instructor may collect questions and post or discuss

LOW RISK ACTIVE LEARNING

- Two Column Write
 - Groups work to determine what a problem
 - 1) Does look like
 - 2) Does NOT look like
 - Helpful when applying concepts, differential diagnosis of drug related problems, comparing and contrasting diseases
- Roundtables
 - Groups answer questions
 - Pass their answers to other groups
 - Other groups evaluate those answers and compare with their own answers

LOW RISK ACTIVE LEARNING

- Minute papers
 - (1) What is the most significant thing you learned today?
 - (2) What questions do you have? (Angelo & Cross, 1993)
- Muddiest concept
 - Students write a question that remains unclear

TO FACILITATE DISCUSSION

- Silberman, 1996
 - Compliment a comment
 - Paraphrase what a student has said
 - Elaborate / disagree on a student's point
 - Summarize the ideas presented
 - Ask for evaluation of the ideas presented
 - Mediate differences of opinion
 - Use humor

BREAKOUT SESSION

HIGHER RISK ACTIVE LEARNING STRATEGIES

ACTIVE LEARNING: HIGHER RISK METHODS

- Methods
 - Role playing
 - Small-group presentations
 - Presentations by individuals
 - Guided imagery exercise
 - Unstructured small-group discussion
 - Responsive lecture (Bonwell book)

HIGHER RISK: STRENGTHS

- Higher level of learning
- Student-centered learning

HIGHER RISK: LIMITATIONS

- Time consuming
- Higher vulnerability
- Assessment challenges
- New skills need
 - Teacher
 - Student

COURSE METHODS

COURSE OR COURSE SECTION METHODS

- Problem Based Learning (PBL)
- Inquiry Based Learning
- Team Based Learning

Team-Based Learning (TBL)

- Group Formation & Management
- Student Accountability
- Team Assignments
- Facilitator Feedback

TBL Methods

- Independent Study
 - Required readings, reading objectives
- Individual Accountability
 - Individual readiness assessment test (IRAT)
- Team Accountability
 - Team readiness assessment test (TRAT/GRAT)
 - In-class team assignment
 - Peer assessments

Evidence for TBL Success

Topic	IRAT (mean)	TRAT (mean)	Difference
Medication Therapy Management	8.5	9	+5%
Anticoagulation	7.4	8.5	+11%
Tobacco Cessation	8.3	10	+17%
COPD	7.75	9.5	+17.5%
Hypertension	8.75	9.5	+8%
Dyslipidemia	7.9	9.5	+16%
Heart Failure	8.75	10	+12.5%
Diabetes Part 1	7.3	8.8	+15%
Diabetes Part 2	7.4	9	+16%
Asthma	8.25	9.5	+12.5%
Overall	8.025	9.33	+13.05%

TBL Limitations

Faculty

- Knowledge dispensers
- Development of materials
- Development of meaningful peer evaluation process

Students

- Self-directed learning method
- Working with teams

TBL Strengths

Faculty/Administration

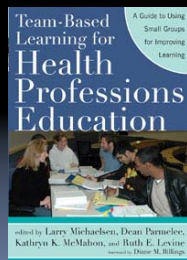
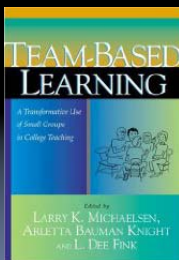
- Student preparation
- Classroom participation
- Professional satisfaction
- "It's about learning, not about teaching"
- Minimize time and resource commitment

Students

- Depth of understanding
- Development of life-long learning skills
- Effective communication and work in teams
- Appreciation of the value of team work

TBL Resources

- Special Session: Trials, Tribulations and Triumphs of Team-Based Learning in Pharmacy Practice Education



Problem Based Learning

- Creating the problems
 - Must have trigger to stimulate inquiry/questions
 - May be more than one answer
 - Must be bigger than one student can handle
- Team structure: students plus facilitator
- Student motivation and accountability
 - New material, no confirmation of answer
- Setting timelines
- Assessment
 - Must assess how you teach (problems/cases)

PBL Methods

- Team assignments (provided with case)
- Establishment of team roles
- Clear process of approach must be established
- Students identify/discover their own "Learning Issues (LI)"
- Individual students
 - Research assigned LI
 - Students teach group members their findings
 - Continue until no further LIs
- Must reach consensus/conclusion on case

PBL Limitations

- Highly time intensive for faculty
 - Development of materials
 - Development of assessments
 - Peer review of materials
 - Serve as facilitators
- Less efficient than traditional lectures
- Requires a strong peer-review process for facilitators
- Requires self-motivation of student
- Requires team/social skills and collaboration from student
- Implementation can be very difficult if not curriculum-wide method

PBL Strengths

- Students develop strong problem-solving skills
 - Approach to problem solving
 - Resources available
- Students develop characteristics of life-long learners
- Students develop strong verbal and written communication skills
- Students have accountability for their learning (must teach teammates)
- Students develop collaborative skills

BREAKOUT SESSION

RESOURCES

- Bonwell CC, Eison JA. Active Learning: Creating Excitement in the Classroom. 1991.
- Chickering, Arthur W., and Zelda F. Gamson. March 1987. "Seven Principles for Good Practice." *AAHE Bulletin* 39: 3-7.
- University of Minnesota Center for Teaching and Learning.
<http://www1.umn.edu/ohr/teachlearn/tutorials/active/strategies/indx.html>
