**Problem-based Learning (PBL)**

Problem based learning (PBL) is a teaching strategy that involves group problem solving with real-life situations (case or scenario) that stimulates critical thinking. True PBL learning also is a process of discovery in that students learn concepts/content by working through the activity – in other words the content is self-taught by the group. PBL is always done as small group work, and occurs over more than one class session. Introductory information is briefly presented describing the situation but the problem is not readily defined. It is up to the learners within a group to identify key issues, and determine what additional information is needed. Through the process of discussion and discovery, the group arrives at solutions to the problem.

**The Procedure**

1. To begin a PBL session, students are divided into several small groups (groups of 5 is ideal) and presented with a problem.
2. Students in groups first discuss the problem and brainstorm as to what the key concepts are in the problem.
3. Group identifies a) what is known, and b) what is not known. Based on this, student groups develop a list of learning issues and divide among members within the group to research for the next class.
4. In subsequent classes, group members share information on what they have discovered about their assigned topic to help shed light on the problem, and to fill in the “what is known” and “what is not known”. In some PBL activities, the instructor adds new information along to the way.
5. The group writes the problem definition and identifies causes of the problem, and finally identifies solutions to the problem.
6. In closure, the instructor leads a discussion about the process and the conclusions reached.

**Advantages**

* Stimulates discovery learning and critical thinking
* Active learning process
* PBL is motivational for students (once accustomed to the method)

**Disadvantages**

* Learning to teach by PBL and preparation of learning materials is time intensive
* Students may be initially unhappy with strategy; they may feel they are doing all the work, and expect that role from the instructor
* Instructors often anxious about not covering “content”

**Jigsaw**

Jigsaw is a cooperative learning strategy that involves group learning. The name “Jigsaw” is given for the structure of activity within the group. Each group is given a task or problem within a packet of information. Within the group, each member is given one part of the packet (a “piece of a puzzle”) to learn. Each member then shares what they have learned with other group members – the goal is that all group members eventually learn all the information within the packet, but with the help of group members. The group depends on each individual in order to accomplish the task.

**The Procedure**

* **Preparatory Work**

The instructor must identify an article to read, a problem or a task for the group to accomplish. The instructor must then develop packets of information needed to accomplish the task. Within the packet, the information is divided into 4 or 5 parts – so that each group member will have a different part of the whole package. It is best to label each of these parts (i.e. #1, #2, #3, #4). Instructor should also attempt to make each of these parts equitable.

* **Implementation**

Students are divided into working groups (4-5 per group) with general instructions. Packets are distributed to the group; group members each take one part of the packet.

* Phase I: Each member studies their individual part of the packet – the instructor needs to consider an appropriate amount of time for this initial work phase.
* Phase II: Each member discusses/teaches their specific information to other group members.
* Phase III: Group members complete the task.

**Advantage**

* Stimulates discovery learning and critical thinking
* Active learning process

**Disadvantage**

* Preparation of group packets is time intensive.
* Students may be initially unhappy with strategy; they may feel they are doing all the work, and expect that role from the instructor.
* Instructors often anxious about not covering “content”

**Concept Map**

Concept map is like mind map. The goal is for the students to ‘draw’ what they have learned using graphic organizers (flow charts, comparison tables, Venn diagrams, cause-effect flow charts, fishbone charts, etc.). This can be done individually, in pairs or in groups.

**The Procedure**

1. Instructor first establishes concept map parameters for students. Parameters include:

* What items should be represented (this can vary significantly from instructor to instructor)
* Universal colors/symbols/labels for various types of problems/data
* Universal symbols to indicate type of relationships between concepts/data

1. Student identifies the concepts/problems (based on established criteria such as data collection)
2. Student places concepts/problems on a page and uses appropriate symbol (as directed by the instructor) to show the relationship between concepts
3. Ideally student should present map (individually or in small group) and explain the problems/relationships; this allows opportunity to assess and clarify connections and relationships made by the student

**Advantage**

* Concept maps can significantly improve student critical thinking abilities (Daley, Shaw, Ballistrieri, Glasenapp, & Placentine, 1999; Wheeler & Collins, 2003).
* Shows cause, effect and relationships to patient problems far beyond what a traditional nursing careplan allows
* Focus is on multiple problems (as opposed to one or two problems common to the typical nursing careplan format)

**Disadvantage**

* Time consuming to get layout of map to work; may require redrawing several times in order to optimize presentation of concepts.
* Concept maps can become so complex and “cluttered” that it is difficult to see the bigger picture.
* Grading can be challenging.

**Think-Pair-Share**

This activity requires students to think about an issue raised by the facilitator for a minute or two. Then, students share their comments, or answers in pairs. The pair then share their response with the class.

**The Procedure**

1. The instructor poses a question or prompt to the whole class with the explicit instruction that all students are expected to think independently about their answer(s) in silence (and possibly jot notes for themselves).
2. After a minute or so (the duration will depend on the complexity of the prompt), the instructor directs the students to pair up with a nearby or assigned student. In pairs (or trios) the students compare their thoughts.
3. Depending on the prompt, the instructor may guide the pairs to reach a consensus, pick the most convincing response, generate many responses, etc.
4. After the students have talked in pairs the professor gets everyone’s attention and asks pairs to share their responses with the full class. The instructor may select pairs by cold calling, asking for volunteers, requesting diverse responses, going around the room, etc. The instructor may also assign students to record the responses.

**Advantages**

Think-Pair-Share offers multiple benefits. First, the moment set aside to think quietly communicates that *all* students are expected to think about the issue posed. It thereby reduces the chances that when an instructor poses a question to the class that most students will skip thinking an answer, counting on an eager or attention-seeking classmate to save the day. Similarly, dedicating time to think quietly also allows students who need just an extra moment to organize their thoughts (or gather their courage) a chance of contributing to the discussion. Not only does Think-Pair-Share encourage all students to think, it allows all students to talk. Thus, students experience the advantages of explaining their responses to a peer, vetting their thoughts, and revising. This one-on-one conversation is often much more comfortable for students than if the same question had been posed to the class and a single volunteer response elicited. With every student talking, the “pair” phase inevitably brings a burst of activity to the classroom – this phase alone can provide a quick and important change of pace to a lecture where energy and/or engagement are lagging. Students who might never talk in front of the full class are actively articulating their thoughts to a peer. Finally, in the “share” phase of this activity the instructor randomly calls on student pairs to report out. This “cold calling” sets the important tone that during Think-Pair-Share all students are expected to think and to talk, while minimizing the stress of cold calling an individual student. All pairs have vetted their points before they are raised to the full group, etc.

**Disadvantages**

* Some students can be too dominating that the others are just passively listening and don’t get the chance to share.
* The class can be noisy when pairs are sharing their opinions.
* Grading can be challenging.

**Round Table**

The instructor asks students to collaborate in small groups on a specific prompt that can generate multiple responses. Students share a single piece of paper that gets passed around their circle rapidly. The goal is to generate as many responses as possible from all members of the group in a defined period of time.

**The Procedure**

1. The students work in big groups (around 5 or 6).
2. Instructor gives a question or an intriguing statement on a piece of paper.
3. The paper is circulated around the table for the group to brainstorm as many responses as possible by circulating the paper for each member to write their response. The goal is to get as many responses as possible from the members within a specified period of time.
4. Then, the group reports their responses to the class (the amount of responses they manage to collect, the three most interesting responses, the summary of the responses, etc. )
5. Instructor can highlight key points for students to remember or discuss further.

**Advantages**

Like many other active learning strategies Roundtable ensures that every student in the classroom is generating knowledge and contributing to a discussion simultaneously. Roundtables are particularly well suited to brainstorming exercises, but can easily be adapted to other situations where there are multiple responses. Roundtables can quickly transform the energy within a lecture hall because multiple groups are simultaneously engaged in animated conversations or contests.

**Disadvantages**

* Limited time to think of a quality answer
* Limited time to discuss and share in the group