Successful You, Successful Me
Theories to Make Teaching and Learning Successful
CORD 2015
Andrew Phillips and Gloria Kuhn

Strategies to Use in Lectures

These are taken from a recently published article Not Another Boring Lecture[1]

Pause	Allows time for thinking
One-minute paper: asks questions, learners write answer	Learners have time to think, make a decision, compare with others
Muddiest point	Learners can decide area of confusion, compare with others and get answers
Think-Pair-Share	Learner thinks of answer or question as an individual then compares with a partner
Case-based learning	Method of using stories /cases to help form mental schema and solve problems
Concept maps	Use to help learners link facts and concepts for future retrieval
Commitment activities	Learners are forced to commit in an effort to induce decision making and also correct misconceptions
Jig saw	Topic divided and each member of team, reads, becomes expert, explains to group and the complex problem or topic is then reassembled and explained to whole group
Team-based learning	Pre-class preparation /study /reading and then members of team teach each other solve problems with other members of team
Problem-based learning	Similar to above team-based learning. Similar to discovery learning.
Thinking hats	Learners approach problem from different perspectives i. e. discussion between Jehovah's witness who requires blood transfusion and the physician.

Steps in Preparing a Presentation

Pre-Preparation:

1. Ask audience what topic interests them
2. What questions they have about a topic

Preparation:

1. What should learner be able **to do** as a result of attending? (This requires practice either thinking, solving problems, or discussion)
2. Determine what questions will be answered as result of presentation
3. Pick a case to use and this is the story that helps form mental schema
4. Elaborate on the case and provide information /answer questions /encourage discussion / cases from audience
5. At end of presentation allow time for retrieval of information: item recall
6. Provide a SUMMARY: one thought
7. Questions from audience
8. REWARD
9. Glossary and / or bibliography for national presentation if appropriate

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Reason for Failure of lectures/presentations to teach:

1) Short-term memory is overwhelmed,
2) Long-term memory can't form mental schemas or links to stored mental schemas so information can be retrieved,
3) Too much is taught so the learner becomes too fatigued to process information,
4) There is no time for processing unfamiliar information or reflection,
5) Students are not interested, material is not relevant, and they don't have confidence they can learn,
6) Learners are not given a chance to practice what they are expected to learn so can't figure out how to use the information.

Glossary of Terms

Active learners: Become engaged in learning as a result of instructional strategies rather than passively listening to a lecture.

Advanced organizer: A brief statement telling students what will be taught.

Analogy: makes a direct comparison between the relationship of one set of ideas/concepts and another.

ARCS: Attention, Relevance, Confidence, Satisfaction. This is the concept of how an instructor can capture the attention of learners.

Case Studies:-are stories about patients that make a point or that provide a vehicle for discussion and learning.

Goals: General statement(s) of what will be learned/taught.

Learning theories: Describe the ways theorists believe people learn new ideas and concepts. Three of the best known theories are behaviorism, cognitivism, and constructivism.
Behaviorism Behaviorists believe that learning can only be judged to have occurred based on observable behavior that matches the actions that were taught.

Cognitive learning theory is concerned with the "how" people learn, process information, retain it, and retrieve it.

Constructivism learning theory believes that learners construct their own meaning from the learning situation as a result of their observations, beliefs and past experiences. The learners constructed meaning may not match that of the teacher.

Long Term Memory: information stored in the brain and retrievable over a long period of time. If the information is not retrievable it is called inert and can't be used to solve problems or for subsequent learning.

Mental Schema: a cluster of facts, memories, or images by which a person organizes information for later retrieval and use.

Objectives: What will be learned/taught in order for learners to reach the goal(s) of learning.

Outcomes or outputs: In designing instruction it is critical for the presenter to determine what learners need to be able to actually do at the end of teaching /learning.

Passive learners: attend a lecture/presentation but are not processing information, reflecting on it, and attaching it to a mental schema for later retrieval.

Reflection: is thinking about the meaning of what has been learned or done. Reflection is mandatory for learning to take place.

Sequencing in instruction: The order and organization of learning activities affects whether and how information is processed and retained by learners.

Below are some other suggestions in sequencing methods:

- Simple to complex
- Known to unknown
- Single task to multiple tasks
- General overview of topic to specific information
- The use of familiar analogies to explain unknown concepts of situations.

Short-term Memory: People can remember 7 $\pm$ 2 bits of information before storing it in long-term memory or forgetting it**.** OVERWHELMING SHORT-TERM

MEMORY IS ONE OF THE MOST IMPORTANT REASONS LEARNERS DO NOT LEARN, RETAIN OR ARE ABLE TO USE INFORMATION AS A RESULT OF A LECTURE.

Teaching: Those learning experiences that are facilitated by a human being, often called a teacher, but could be a mentor, parent or friend.

Transfer: Using what has been learned in one situation in a new or similar situation either to aid in new learning or in problem solving.

Our time together has been short and so I have put together a list of articles I hope some of you will consider looking at and perhaps reading. If you are to become expert teachers, you need to determine what strategies you will incorporate into your teaching based on research that has proven their value. You need to understand how humans learn and think. I wish you success in your future teaching and hope that each of you will make as great an impact on those you teach as your very best teachers made on you. --Best wishes in your future careers, Gloria Kuhn, DO, PhD

Wolff, M., et al., *Not another boring lecture: engaging learners with learning techniques*. J Emerg Med, 2015. 48(1): p. 85-93.	**Lists instructional strategies that can be used to engage learners so they are active rather than passive learners.**
Costa, M.L., L. van Rensburg, and N. Rushton, *Does teaching style matter? A randomised trial of group discussion versus lectures in orthopaedic undergraduate teaching.* Med Educ, 2007. **41**(2): p. 214-7.	Comparison of didactic lectures with interactive discussions. Students liked the discussion format better and did statistically better on the written but not oral exam. Single institution and small numbers.
Richardson, D., *Don't dump the didactic lecture; fix it.* Adv Physiol Educ, 2008. **32**(1): p. 23-4.	Opinion article on how to make lectures more interesting and interactive. Tips for making active learners.
Lujan, H.L. and S.E. DiCarlo, *Too much teaching, not enough learning: what is the solution?* Adv Physiol Educ, 2006. **30**(1): p. 17-22.	This article begins the discussion of what is wrong with many lectures and is continued in the DiCarlo article.
DiCarlo, S.E., *Too much content, not enough thinking, and too little fun!* Adv Physiol Educ, 2009. **33**(4): p. 257-64.	Continuation of Lujan article. Recommendations to solve the problems that interfere with learning during a lecture.
White, G., *Interactive lecturing*. Clin Teach, 2011. 8(4): p. 230-5.	**If you use this strategy you will find that everyone is learning and having fun doing it, including you. What an idea!**
Sherbino, J., T. Chan, and K. Schiff, *The reverse classroom: lectures on your own and homework with faculty*. Cjem, 2013. 15(3): p. 178-80.	**Like the "flipped classroom," this technique gives learners time to learn at their own pace and then discuss concepts, correct misconceptions and ask the instructor questions.**
Russell, I.J., W.D. Hendricson, and R.J. Herbert, *Effects of lecture information density on medical student achievement.* J Med Educ, 1984. **59**(11 Pt 1): p. 881-9.	This study showed a negative correlation between large numbers of facts in lecture and knowledge retention.
Graffam, B., *Active learning in medical education: strategies for beginning implementation.* Med Teach, 2007. **29**(1): p. 38-42.	Seven methods are provided for changing lecture format from talking at learners to engaing them in learning.
Coderre, S., et al., *Diagnostic reasoning strategies and diagnostic success.* Med Educ, 2003. **37**(8): p. 695-703.	Evidence that helping learners form mental schemas so that they can use pattern matching to diagnose diseases is more accurate than using the hypothetico-method for diagnosis.
Custers, E.J., H.P. Boshuizen, and H.G. Schmidt. The role of illness scripts in the development of medical diagnostic expertise: results from an interview study. *Cognition and Instruction*. 1998. 16(4):367-98.	This article discusses the illness script as used by experienced phsycians to evaluate, diagnose, and treat patient problems.
Jonassen, D.H. and J. Hernandez-Serrano, *Case-Based Reasoning and Instructional Design: Using Stories to Support Problem Solving.*	This article beautifully describes the power of stories to engage us and teach us. So easy to read and so wonderfully written
Schuller, M.C., D.A. DaRosa, and M.L. Crandall. *Using Just-in Time Teaching and Peer Instruction in a Residency Program's Core Curriculum: Enhancing Satisfaction, Engagement, and Retention*. Acad Med, 2014	**This is the most far reaching of the articles in suggestion of changing the curriculum to just in time learning and peer instruction. Your grand rounds may never again look the same.**

Bold indicates especially helpful articles.