

Instructional Methods

Once the objectives for an educational activity have been determined, the next step is to develop the teaching methods by which these objectives will be achieved. These educational strategies are the heart of the planning process. When choosing teaching methods, it is important to maintain congruence between the objectives and the methods. If you want the learner to demonstrate a skill, you would not choose, as your main teaching method, reading about the skill. You would want the learner to practice the skill through simulation or real-life experiences. Another general principle is to use multiple educational methods when designing an educational experience. ***A great resource of 228 interactive teaching techniques has been created by Kevin Yee of the University of South Florida and can be found at <http://www.usf.edu/atle/documents/handout-interactive-techniques.pdf>***

Interface of Cognitive (Knowledge) Learning Objectives and Teaching Strategies

Level	Teaching Strategy
Remembering	Lecture, visuals, video, audio, examples, illustrations, analogies
Understanding	Questioning, discussion, review, test assessment, reports, learner presentations, writing
Applying	Exercises, practice, demonstrations, projects, simulations, role play, microteaching
Analyzing	Problems, exercises, cases studies, critical incidents, discussion, questions, test
Evaluating	Case studies, projects, exercises, critiques, simulations, appraisals
Creating	Projects, problems, case studies, creative exercises, develop plans, constructs, simulations

Summary of Instructional Methods, Advantages, Disadvantages and Examples in Practice (partial list)

Method and description	Advantages	Disadvantages	Examples
Lecture – a talk by a single speaker	-Inexpensive -Accommodate large number of learners -Structured presentation of complicated topic	-Passive learning (can be enhanced with active learning techniques such as think-pair-share) -Teacher-centered -Quality depends on speaker and/or audiovisual material	A lecture based on the latest research or a synthesis of the current literature on nephrotic syndrome
Readings or other self-directed learning activities – learners are assigned chapter, articles, or other material	-inexpensive -cover fund of knowledge -minimal preparation time	-Passive learning -Learners must be motivated to complete	-Review an article on allergic rhinitis and write one examination question on the most significant learning point

		-Sometimes hard to determine whether they completed the activity	-Review the Clinician Educators Handbook on leading a case discussion and then lead a session with medical students and residents
Site visit – the learner goes to the site to see or visit the processes firsthand	-experiential learning -learners can be exposed to more in-situ experiences	-need to provide activities or they become passive learning experiences -need to provide opportunity to debrief and ask questions after visit	-Take a shopping trip for baby food – list prices, sizes of jars, differences between 1 st , 2 nd and 3 rd stage foods etc. -Go to the operating room and describe methods by which the sterile field is maintained
Discussion – learners address a question or issue under the guidance of a facilitator (similar to small group teaching although not limited by size of group)	-active learning -permits assessment of learner needs -allows learner to apply newly acquired knowledge -suitable for a wide range of objectives (knowledge and attitudes)	-more teacher intensive -group dependent -facilitator dependent	-Discussion of ethical issues related to adolescents -Discussion of safety issues identified on clinical rotation -Discussion of critical incidents related to professionalism
Reflection – individual or group reflection in the moment or after an experience	-promotes learning from experience -promotes self-awareness/mindfulness -can be done as a group or individually through assigned writings/portfolios	-facilitator dependent -learner dependent (some learners have limited experience with technique -requires time	-After a trainee has led a teaching session for his or her peers, the trainee reflects on the experience focusing on what he or she did well and what he or she will do differently the next time -Students write about a difficult patient encounter in the context of their own behaviors contributing to the outcome of this encounter
Small Group Learning – groups of 10 or fewer learners address a question or issue under the guidance of a facilitator	-active learning -suitable for team-based and problem-based learning, clinical decision making, and a host of other topics -incorporates discussion	-dependent on the group -can get “derailed” by conflict or individuals who monopolize the discussion -requires time	-Discuss the work-up and management of a patient with thrombocytopenia, including issues related to health economics, access to care, alternative and complementary medicine, and cultural aspects of care -a resident discusses COMSEP cases with a group of 3 rd year core pediatric clerkship students
Debate – groups of learners or individuals share opposing points of view on topics	-active learning -exposes learners to different perspectives	-can get emotionally charged -takes time -active only for those participating	Debate generational differences. Have the “baby boomers” debate the merits of “Gen Y” and have “Gen Y” debate the merits of the “baby boomers”

	-suitable for knowledge and attitude objectives		
Team Learning – preparatory readings are assigned and the learners come prepared to demonstrate their knowledge of the material first as individuals and then as a group. The group then applies this knowledge to selected problems	-active learning -students take responsibility for learning -facilitates higher cognitive objectives -collaborative process -uses less faculty than PBL and other small group teaching strategies	-developmental costs for Readiness Assurance Test (RATs) and application exercises -students need to be self-directed -requires teachers skilled in the technique -requires orientation of students to process of teamwork and peer evaluation	A group of students assigned to the core pediatric rotation discuss and apply current management strategies in the treatment of pneumonia
Problem Based Learning – learner groups are presented with a case and set their own learning objectives, often dividing the work and teaching each other, guided by a tutor-facilitator	-active learning -facilitates higher cognitive objectives -facilitates problem solving and clinical decision making -can incorporate objectives that cross domains: ethics, humanism, costs, etc.	-developmental costs -requires faculty facilitators and small groups -less efficient for transferring factual knowledge	A group of residents work through cases of common behavioral problems in children
Demonstrations – the instructor demonstrates a procedure so the learner can observe the action performed correctly	-efficient model for demonstrating skills/procedures	-passive learning -teacher centered -quality depends on teacher/audiovisual material	Suturing or physical examination skills
Prepared Audio/visual materials – the use of visual and auditory media such as pictures, diagrams, slides, movies, and sounds	-efficient method for demonstrating skills/procedures -useful for teaching attitudes -helpful adjunct to the learning process, especially for visual learners	-passive learning -teacher centered -quality depends on the audiovisual materials	-websites with heart and lung sounds; using portions of movies to demonstrate concepts or as attention getters -parent discussing vaccine hesitancy or effects of medical error
Role plays – the learner acts out a scenario and the experience is analyzed by members of the group	-suitable for objectives that cross domains: knowledge, attitudes and skills -efficient -inexpensive	-requires trained facilitators -learners need some basic knowledge or skills -some individuals are uncomfortable with this method of learning	-counseling families on how to use an albuterol inhaler and spacer -talking with the difficult patient -breaking bad news

	<ul style="list-style-type: none"> -can be structured to be learner-centered -safe environment to practice skills 		
Role modeling – the learner observes others performing clinical activities.	<ul style="list-style-type: none"> -models usually available -impact often seems profound 	<ul style="list-style-type: none"> -passive learning (although can be made active if the learner is asked ahead of the encounter to observe certain behaviors and then discusses those observations after the actual experience) -impact depends on interaction -outcomes multifactorial and difficult to assess -role models may not be modeling the appropriate behaviors 	<ul style="list-style-type: none"> -A new 3rd year medical student is asked to observe the interaction between a faculty member and a 3 year old child and report on the order of the examination, who the faculty member addressed first, body language, etc.) -A critical care fellow is asked to observe the discussion between a faculty member and a parent to gain consent for an autopsy
Simulation – the learner practices skills on a simulated patient, either a trained actor (standardized patient) or a mannequin	<ul style="list-style-type: none"> -safe environments to practice skills -learners can use at own pace (mannequins) -approximates “real life” more closely than role plays -can give feedback to learners on performance -can be reused for ongoing curricula 	<ul style="list-style-type: none"> -expensive -expertise required to develop and train standardized patients 	<ul style="list-style-type: none"> -intubation of mannequins -gynecologic exams on simulator that records pressure and location of touch -history taking skills on standardized patient
Computer-assisted – any instruction that makes use of a computer	<ul style="list-style-type: none"> -safe environment -can be used for knowledge, attitude or skills -can be programmed to give feedback -can fill gaps in curricula 	<ul style="list-style-type: none"> -can be expensive -developmental costs if not commercially available -may not be available for specific curriculum 	<ul style="list-style-type: none"> -x-ray diagnoses -pediatric board game -computer assisted simulations -Computer Assisted learning in Pediatrics Program (CLIPP) cases
Case presentations – oral presentations of history, physical, and laboratory findings, with subsequent discussion of case, including differential diagnosis; if diagnosis is	<ul style="list-style-type: none"> -active learning -facilitates higher cognitive objectives -facilitates problem solving and clinical decision making 	<ul style="list-style-type: none"> -must balance clinical care with teaching -is learner level dependent (can take more time when teaching novice learners) 	<ul style="list-style-type: none"> -typical learning activity utilized on inpatient rounds as well as in the outpatient setting -cognitive autopsy of the case to examine biases -root cause analysis of medical errors

known, may include discussion of that entity; more advanced learners will also delineate a management plan	-can incorporate objectives that cross domains: ethics, humanism, costs, etc.	-may be emotionally “hard” on the learner (cognitive autopsy, medical errors, morbidity and mortality conference, etc.)	
Learning activities and projects – specific tasks directed toward a predetermined outcome or product related to the learner’s needs or application of recent knowledge and skills	-active learning -learner sets individual learning objectives -learner-centered -promote, teach self-directed learning -suitable for higher order cognitive objectives	-learners need motivation -learners need basic skills to access and optimally uses learning resources -requires effective mentor	-create a resource handout for parents on respite care for children with autism -chart review for current practice habits with subsequent plan for improvement (quality improvement/safety projects using the plan-do-study-act cycle) -peer teaching
Real life experiences – the learner interviews or examines a patient or performs a procedure on a real patient	-active learning -“real life” -promotes learner motivation and responsibility -promotes higher level cognitive, attitudinal, skill and performance learning	-requires clinical material when learner is ready -requires faculty to supervise and to provide feedback -learner needs basic knowledge or skill -needs to be monitored for case mix, appropriateness -requires reflection, follow-up	-interviewing, examining, counseling, and performing procedures -also can be used in the context of performing a psychosocial interview focusing on the costs of the disease to the patient, economically and emotionally
Prepared cases – group discussion of a case under the direction of a discussion leader: deductive case discussion is where the learner begins with general concepts about the case and proceeds to the specific components (starts with unknown diagnosis); inductive discussion proceeds in the opposite direction, specific to general rules (starts with known diagnosis)	-ensures appropriate clinical material active learning -facilitates higher cognitive objectives -facilitates problem solving and clinical decision making -can incorporate objectives that cross domains: ethics, humanism, costs, etc.	-can require upfront time to develop -facilitator dependent -dependent on group processes and can be “derailed” similar to discussion and small group teaching -requires basic set of knowledge for inductive case discussion	-deductive case discussion of a patient with fever that ultimately progresses to a differential and a probable diagnosis -inductive case discussion would be a subspecialty case conference or morbidity and mortality rounds where a specific case is discussed and generalizations are made in regard to the information generated
Programmed instruction – textbooks or computers that present material in a sequential method, allowing learners to proceed at their own pace, identify their own deficiencies, set their own objectives and receive	-active learning -safe learning environment -immediate feedback on knowledge, clinical decision making	-can be expensive -developmental costs if not commercially available	-Pediatrics Review and Education Program (PREP) -specifically prepared readings with questions and patient case scenarios

immediate feedback, without direct human oversight	-learner applies new knowledge		
<p>Flipped Classroom – a type of blended learning in which, unlike the traditional lecture model, calls for presenting content as pre-class homework (may be reading, watching online videos or other activities) and using face-to-face time for learners to apply what they have learned from their pre-class work.</p> <p>A modification of this concept is where instead of assigning pre-work, a learner reads a brief overview of the content during the session (10-15 min) and then spends the remaining 45 minutes working on patient cases.</p>	<p>-learner-centered model of teaching (increased student control, increased collaboration, active engagement)</p> <p>-allows learners to apply what they have learned and get feedback</p> <p>-can be more efficient</p> <p>-learner can review pre-work and learn at his or her own pace</p>	<p>-pre-work is often not done</p> <p>-increased preparation time for the teacher</p> <p>-increased time for learners outside of class to prepare</p> <p>-if using videos for pre-work:</p> <ul style="list-style-type: none"> - costs of development - technological resources - lack of access to pre-work for some due to lack of comfort with technology, differing technological platforms, etc. 	<p>-Review and collect data on GER vs GERD EQIPP module prior to coming to face-to-face CME event. At CME event review commonly encountered problems in diagnosis and management using cases in small groups. Brainstorm ideas on how to implement changes in practice.</p> <p>-Listen to a pre-recorded 20 minute podcast on the management of headaches. At face-to-face event work through a series of patient cases who present with different headache scenarios.</p>

After Kern et al. Curriculum development for medical education: a six-step approach. JHU Press.