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.

Interface of Cognitive (Knowledge) Learning Objectives and Teaching Strategies

<table>
<thead>
<tr>
<th>Level</th>
<th>Teaching Strategy</th>
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<tbody>
<tr>
<td>Remembering</td>
<td>Lecture, visuals, video, audio, examples, illustrations, analogies</td>
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<tr>
<td>Understanding</td>
<td>Questioning, discussion, review, test assessment, reports, learner presentations, writing</td>
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<tr>
<td>Applying</td>
<td>Exercises, practice, demonstrations, projects, simulations, role play, microteaching</td>
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<tr>
<td>Analyzing</td>
<td>Problems, exercises, cases studies, critical incidents, discussion, questions, test</td>
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<tr>
<td>Evaluating</td>
<td>Case studies, projects, exercises, critiques, simulations, appraisals</td>
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<tr>
<td>Creating</td>
<td>Projects, problems, case studies, creative exercises, develop plans, constructs, simulations</td>
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Summary of Instructional Methods, Advantages, Disadvantages and Examples in Practice (partial list)

<table>
<thead>
<tr>
<th>Method and description</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Examples</th>
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</table>
| 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  
- Sometimes hard to determine whether they completed the activity | -Review an article on allergic rhinitis and write one examination question on the most significant learning point  
- 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 | -Take a shopping trip for baby food – list prices, sizes of jars, differences between 1st, 2nd and 3rd stage foods etc.  
- Go to the operating room and describe methods by which the sterile field is
| 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 3rd year core pediatric clerkship students |
| --- | --- | --- | --- |
| Team Learning – preparatory readings are assigned and the learners comes 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 |

**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)  

- 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

- 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

**Debate** – groups of learners or individuals share opposing points of view on topics

- active learning  
- exposes learners to different perspectives  
- suitable for knowledge and attitude objectives

- 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”
<table>
<thead>
<tr>
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<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
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<td>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</td>
<td>-active learning -facilitates higher cognitive objectives -facilitates problem solving and clinical decision making -can incorporate objectives that cross domains: ethics, humanism, costs, etc.</td>
<td>-developmental costs -requires faculty facilitators and small groups -less efficient for transferring factual knowledge</td>
<td>A group of residents work through cases of common behavioral problems in children</td>
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<td>Demonstrations – the instructor demonstrates a procedure so the learner can observe the action performed correctly</td>
<td>-efficient model for demonstrating skills/procedures</td>
<td>-passive learning -teacher centered -quality depends on teacher/audiovisual material</td>
<td>Suturing or physical examination skills</td>
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<td>Prepared Audio/visual materials – the use of visual and auditory media such as pictures, diagrams, slides, movies, and sounds</td>
<td>-efficient method for demonstrating skills/procedures -useful for teaching attitudes -helpful adjunct to the learning process, especially for visual learners</td>
<td>-passive learning -teacher centered -quality depends on the audiovisual materials</td>
<td>-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</td>
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<td>Role plays – the learner acts out a scenario and the experience is analyzed by members of the group</td>
<td>-suitable for objectives that cross domains: knowledge, attitudes and skills -efficient -inexpensive -can be structured to be learner-centered -safe environment to practice skills</td>
<td>-requires trained facilitators -learners need some basic knowledge or skills -some individuals are uncomfortable with this method of learning</td>
<td>-counseling families on how to use an albuterol inhaler and spacer -talking with the difficult patient -breaking bad news</td>
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<td>Role modeling – the learner observes others performing clinical activities.</td>
<td>-models usually available -impact often seems profound</td>
<td>-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</td>
<td>-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</td>
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<td>Simulation – the learner practices</td>
<td>-safe environments to practice -expensive</td>
<td>-intubation of manequins</td>
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<td>skills on a simulated patient, either a trained actor (standardized patient) or a mannequin</td>
<td>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</td>
<td>-expertise required to develop and train standardized patients -gynecologic exams on simulator that records pressure and location of touch -history taking skills on standardized patient</td>
<td>Computer-assisted – any instruction that makes use of a computer -safe environment -can be used for knowledge, attitude or skills -can be programmed to give feedback -can fill gaps in curricula</td>
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<td>-must balance clinical care with teaching -is learner level dependent (can take more time when teaching novice learners) -may be emotionally “hard” on the learner (cognitive autopsy, medical errors, morbidity and mortality conference, etc.) -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</td>
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<td>Case presentations – oral presentations of history, physical, and laboratory findings, with subsequent discussion of case, including differential diagnosis; if diagnosis is known, may include discussion of that entity; more advanced learners will also delineate a management plan</td>
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<td>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</td>
<td>-active learning -learner sets individual learning objectives -learner-centered -promote, teach self-directed learning -suitable for higher order cognitive objectives</td>
<td>-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</td>
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<td>Real life experiences – the learner interviews or examines a patient or performs a procedure on a real patient</td>
<td>-active learning -“real life” -promotes learner motivation and responsibility -promotes higher level cognitive, attitudinal, skill and performance learning</td>
<td>-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</td>
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<td>Prepared cases – group discussion of</td>
<td>-ensures appropriate clinical</td>
<td>-can require upfront time to</td>
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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)

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<th>Development</th>
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<td>active learning</td>
<td>-facilitator dependent</td>
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<tr>
<td>-facilitates higher cognitive objectives</td>
<td>-dependent on group processes and can be</td>
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<tr>
<td>-facilitates problem solving and clinical decision making</td>
<td>“derailed” similar to discussion</td>
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<td>-can incorporate objectives that cross domains: ethics, humanism, costs, etc.</td>
<td>and small group teaching</td>
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<td></td>
<td>-requires basic set of knowledge for inductive case discussion</td>
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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
immediate feedback, without direct
human oversight

-active learning
-safe learning environment
-immediate feedback on
knowledge, clinical decision
making
-learner applies new
knowledge

-can be expensive
-development costs if not
commercially available

-Pediatrics Review and Education Program
(PREP)
-specifically prepared readings with questions
and patient case scenarios

**After Kern et al. (see references)**