CONTENT SPECIFICATION STATEMENTS

DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS (DBP)
AMERICAN BOARD OF PEDIATRICS

PRINCIPLES OF TEACHING AND LEARNING

Karen J. Miller, MD; January 2014- revised

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•*ABP Content Specifications* PRINCIPLES OF TEACHING AND LEARNING in handout only

XXXIII. Core Knowledge in Scholarly Activities
D. Principles of Teaching and Learning
D1. Educational Theory

"A mind is a fire to be kindled, not a vessel to be filled" Plutarch

Understand the basic principles of adult learning theory (Knowles 1984)
Self-directed –- able to determine and pursue own learning needs

Experiences — provide framework and foundation for new knowledge and skills

Goal-directed — values learning to advance in current role

Problem-centered --- application to authentic problems in everyday life

Internal (intrinsic) motivation -- Internal desire to succeed, the satisfaction of learning and personal goals have greater effect on *maintaining* motivation than external incentives and rewards

Curriculum is not something that is transmitted to, or acts upon, the students. The learner is an active contributor in the learning process. The physician-learner is stimulated to learn through interactions in the practice environment.

Understand the attributes of an effective learning environment

Physically and emotionally comfortable

Learners feel safe to freely express themselves without judgment

Learning objective, goal or desired outcome

Relevant to the learner

- Involve learners in mutual planning of content and learning process
- Ensure meaningfulness to trigger internal (intrinsic) motivation
- Provide task-relevant knowledge
- Learners are encouraged to take control of their learning
- Involve in diagnosing their own learning needs
- Formulate their own learning objectives
- Identify resources and strategies to get their needs met
- Learners involved in evaluating their own learning

Modeling or demonstrations of skill, behavior or process (e.g. talk through clinical reasoning)

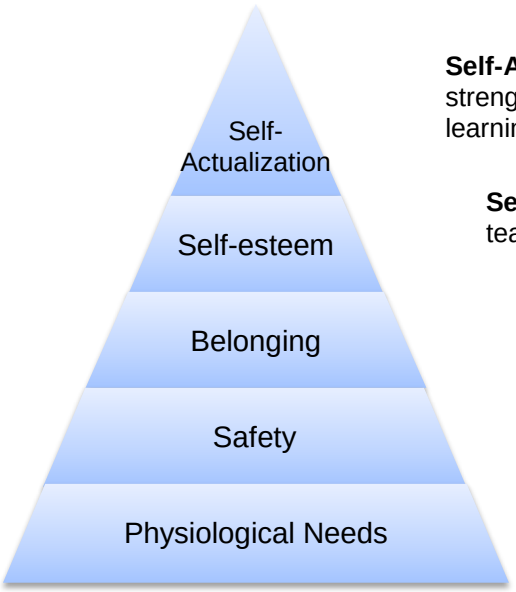
- Observation gives image of desired skill/behavior as guide or standard of performance
- Guided practice and positive feedback solidifies skills (doing right)
- Corrective feedback is integral to effective learning (not doing right)

Knowledge-building requires opportunity to make meaningful (cognitive)

Skill-building requires opportunity to practice (physical)

Attitude-building requires opportunity have experience (emotional)

Abraham Maslow's "Hierarchy of Needs" Applied to Education (Maslow 1970)



Self-Actualization- Aware of own individual needs; knows strengths and learning gaps; prioritizes, plans and pursues learning based on interests and career goals.

Self-Esteem Needs- feels respected as a learner and/or as a teacher. Sense of competence

Belonging Needs- feels accepted in a community, accepted in social role (e.g. senior resident).

Safety Needs- physical safety, emotional safety, social safety and "grade" safety

Physical Needs-comfortable temperature, can hear the speaker, not hungry, bladder empty, etc

Understand the importance of "reflective practice" in teaching and learning (Shön 1987)

Formal theoretical knowledge is often not useful to the solution of messy, indeterminate problems of real-life practice.

Theory and practice inform each other. Theory guides practice and is interpreted in light of personal current and past experiences. Practitioners are positioned to test and revise theories through practice. They do so by reflection and action.

Reflectivity in practice is a learned skill of critical thinking and situation analysis.

Teacher models and fosters this creative process.

- Demonstrates the skill and shares examples
- Facilitates learner's ability to perceive options and reframe the problem
- Assists learners to reflect on the actions and options they chose and the knowledge and values that influenced the choice
- Helps them to critically consider what was learned and integrate the new knowledge
- Facilitates ongoing systematic experiential learning, on-the-spot experimentation, reflection on process, actions and outcomes
- Comments positively when observing that reframing has occurred to make the learner consciously aware of the process of learning.

Identify strategies that motivate learners

Learning is most effective and motivating when it is relevant to the solution of real-life needs or problems. (Swanwick 2010)

Passing exams is a real-life problem, is an extrinsic motivator for learners, intrinsically rewarding when passed [rose to challenge and triumphed!]

Experiential learning theory (Kolb 1984) states that learning is best achieved in an environment that considers both concrete experiences and conceptual models.

Active learning strategies requires arousal (attention), engagement and increases learning

- Low tech—questions, cases, discussions, role plays, standardized patients, games

High tech---audience response system (clickers), simulation labs, online modules

Blended learning—an online component to live educational activity

Problem-based learning uses patient problems as a context for students to acquire knowledge by problem-solving with clinical reasoning skills and identifying learning needs in an interactive process, self-study, applying newly gained knowledge to the problem and then by summarizing what has been learned, evaluating the information sources used and analyzing how they might have better managed the patient problem.

Situated learning theory (Lave 1991) describes the transformative experience of participation in community activities (e.g. medical community or community-based experience).

Learning occurs through collaboration with other learners and more senior members of the community carrying out activities

Learning occurs through social interaction. Acquires knowledge through "talk" of the community and observes behaviors of more senior members

Learn values, shared knowledge and practices of the community

Motivate by supporting sense of self-efficacy (Bandura-social cognitive theory-1986)

Judgment of your own capability will affect how much effort invested, how long will persist and whether task is approached anxiously or with confidence

Based on authentic experiences of mastery, often task-specific

Vicarious experience (seeing someone else do it successfully) can raise belief that you can perform the new task too

Verbal persuasion (encouragement) can be influential

Past experience and knowledge will affect perceptions of self-efficacy, which will, in turn affects the choice of new experiences and goals.

Learners' values, attitudes and beliefs influence their learning and actions and building self-awareness is important for learner development.

Motivate by developing Self-Directed Learning (SDL) (Tolsgaard MG et al 2013)

Essential in the development and maintenance of professional competence; a hallmark of best practice

Create learning environment supportive of inquiry and respectful discourse

Challenge existing knowledge structures (schema) to provoke uncertainty

Critical reflection on one's own learning and experience

Identify knowledge gaps

Develop competency at asking questions

Determine additional learning needs and set goals accordingly

Critical appraisal of new knowledge

Ongoing, life-long process

Recognize the impact of the "hidden curriculum" on learning (Hafferty 1994)

Formal curriculum—that which is stated

Informal curriculum--can be explicit, implicit or serendipitous goals occurring in interactions between the learner, the teacher, clinical environments, other students and through personal interests.

Hidden curriculum—practices and routines of the community, particularly in relation to coping and thriving. Often teaches values and moral judgments; may be found in policies, language, assessment strategies and allocation of resources in an institution. Often unintentionally imparted through actions, discussions and relationships among members of the community.

Communities of Practice (Lave 1991)-- a persistent, sustaining social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history and experiences focused on common practice and/or mutual enterprise. (e.g. SDBP; AAP)

D2. Feedback and Evaluation

Identify components of effective feedback

Explicitly call it "feedback" otherwise they may not realize they received any
Timely, specific, respectful, supportive and an expected component of the experience
Public if routine and involves group in learning and models of giving/receiving feedback
Private if significant correction or professionalism violation
First invite self-reflection "How do you think that went?"
Use active listening and specific probes
Own your observations "I noticed that…", "I felt that…","It seemed to me that …"
Focus on observed behaviors and facts
Use of checklists assists observation of specific behaviors e.g Mini-CEX (Norcini 1995)
Goal--identify and encourage learner recognition of own strengths and acquired skills
    Teaching point--we build on existing competencies and expand; strength-based
Goal--identify skill or knowledge gaps; areas that need improvement
    Teaching point--Identification of gap is good; otherwise it is a hole to fall into
Goal--develop self-reflection and self-directed learning
    Teaching point--provide follow-up opportunity to display the acquired knowledge
Conclusion--feedback is understood by learner who develops action plan with follow-up

Distinguish between formative and summative feedback

Theme: *Begin with the end in mind*
Clarify learning goals and expectations for learner
Review expectation of feedback
Types:
    Formative
    Mid-cycle
    Summative

Formative Feedback

    Feedback to learners about their progress and areas needing further development
    Informal, ongoing, frequent, non-judgmental and short
    Integral to the teaching and learning process
    Active and dynamic interaction engages and encourages deeper learning
    Allows more detailed and specific feedback
    Offers help with specific remediation and fosters self-directed learning
    Develops the teacher's skills of observation, interactive instruction and active listening
    Informs curriculum development (e.g. need for simulation of giving difficult news)

(suggested) Mid-cycle Review

    Scheduled formal feedback session midway through rotation
    Enables learner to improve performance with specific feedback

Summative assessment

        Scheduled, formal feedback at the end of a course, rotation or periodic review
        Measures attainment of relevant goals and objectives

Data driven- review of formal assessments (e.g. tests), preceptor evaluations, peer-to-peer evaluations, multi-source "360" evaluations (.e.g. nursing), multiple observations and observers

Portfolio review--examples of work products (Friedman 2005)

Decision making-- met or did not meet criteria for advancement

Decision making--need for remediation

Distinguish between evaluation and feedback

Evaluation: formal assessment that has been constructed for decision making purposes; makes judgment; Includes a variety of sources and testing modalities.

Feedback: assessment that is formative and informs the learner about their current performance; dynamic and interactive;

Understand strengths and weaknesses of various methods to evaluate learners (Epstein 2007)

Reliability: are the results reproducible?

Validity: the extent to which the competence that the assessment claims to measure is actually measured?

Educational impact of assessment

"Students don't do what you expect, they do what you inspect"

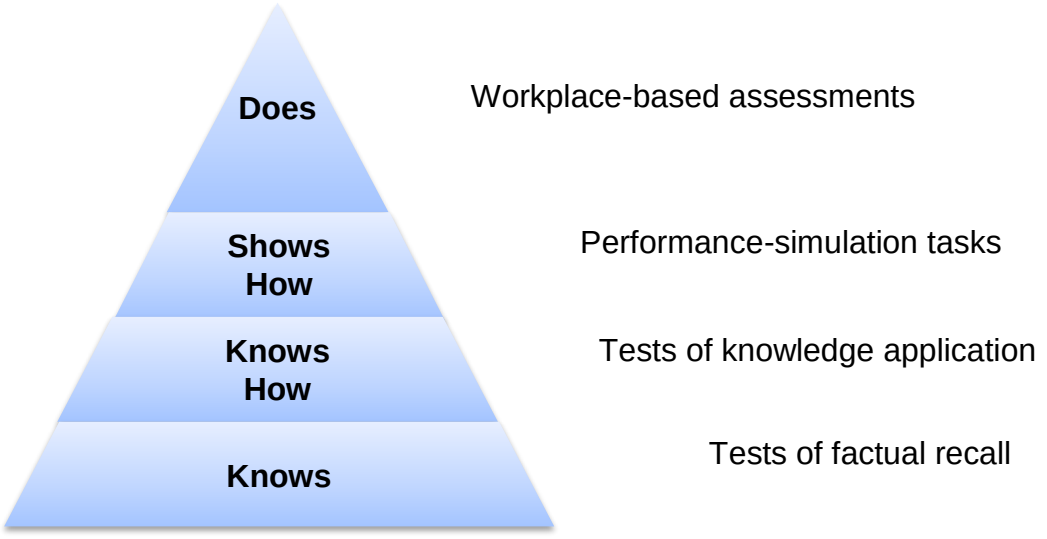
Seek balance in assessment; be realistic

Assessment must balance rigor (reliability and validity) against practicality (feasibility, cost and acceptability). (Crossley 2002)

Quantitative versus Qualitative

"Do not assume that quantitative data are more reliable, valid or useful than qualitative data." (Epstein 2007)

Miller's Pyramid for Assessing Clinical Competence (Miller GE 1990)



METHODS OF EVALUATION:

Method	Strengths	Weaknesses
Multiple Choice Questions (MCQ) exams (e.g. Board exams)	-assesses knowledge -standardized -content specified -large number of students -cost-effective -computer analysis yields strengths/weak areas	-arbitrary cutoffs pass/fail -does not assess clinical competence (performance) -single assessment -particularly difficult to write MCQs in developmental-behavioral pediatrics as often many variables to consider.
Computerized testing	-Variety of applications -e.g. case-based with immediate feedback -Self-assessments -Useful for foundation skills (e.g. CITI training for research education)	-complex to develop -unclear transfer to clinical or "live" settings
Written short answer or essay	-Assess synthesis of information, reflections, attitudes -formative or summative evaluation	**-**grading is time-consuming and dependent on training of grader
Simulations (with or without standardized patients)	-standardized assessment -specific skills **-**can assess communication skills as well as clinical -multiple learners rotate through -multiple observers (examiner and or "patient" assessments)	**-**challenging to orchestrate -cost -artificial -short time at each station -parts of an encounter
Global Evaluation (e.g. end of rotation)	**-**makes faculty to provide regular feedback -computerized versions facilitate completion and analysis	-content, scales and usefulness vary widely -Milestones Project will cause systems change
Multisource "360" Evaluations	-solicits multiple viewpoints -validates team input -feedback culture -peer to peer -self-assessment -patient/parent feedback	-collection and interpretation challenging -may not be representative -confidentiality challenges -excess impact of limited interactions

Direct Observation	**-**supervising physician observes portion of exam and gives feedback -standard checklist (mini-CEX) increases validity -use of video may decrease impact on work flow	-time requirements to review and give feedback -variability of patients and problems that present
Portfolio	-can include variety of work products and accomplishments -promotes self-reflection -examples of written reports -reflections on experiences (field trips) or topics -PowerPoints from talks	-time consuming to collect and review -variable review standards across mentors

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Swanwick (2010); Ende (2010)

3. Teaching Methods

Understand the strengths and weaknesses of various teaching methods

Method	Strengths	Weaknesses
Lecture	-Economical -Large groups -Provide coverage of topic -Can bring new perspectives	-Individual needs not addressed -Can be too broad or too narrow -Passive learning -Can be boring
Small Group	-Optimize student: teacher ratio -Can be modified for learners -Explores and integrate knowledge -Active participation -Face to face contact	-Additional faculty needed -Faculty skills may be lacking -Variability in learning experience across groups
Bedside Teaching	-Motivating to students -Demonstration/Observation -Modeling interpersonal skills -Role model of hidden curriculum	-Variability of patients available -Feeling intimidated/vulnerable -Time constraints -Risk of inappropriate actions
Simulation	-Powerful learning tool -Safe, learner-centered -Deliberate practice of skills -Debriefing essential	-Can be expensive -Time-consuming -Question of transfer of skills -Risk of over-confidence

Understand that individuals may learn more effectively with certain teaching methods (eg, reading, hearing, doing) than with others

Learning styles are a popular concept that intended to identify how people learn best. Although there is little evidence that personal learning preferences influence learning results, it is useful to employ multi-modal teaching methods. Neil Fleming's **VARK** model, developed in 1987, is one of the most popular versions. In Fleming's model, sometimes referred to "VARK learning style", learners are identified by whether they have a preference for Visual learning (pictures, movies, diagrams), Auditory learning (music, discussion, lectures), Reading and writing (making lists, reading textbooks, taking notes), or Kinesthetic learning (movement, experiments, hands-on activities). http://www.vark-learn.com

Cognitive Load Theory (Mayer 2010) A cognitive theory of multimedia learning based on three main assumptions: there are two separate channels (auditory and visual) for processing information; there is limited channel capacity; and that learning is an active process of filtering, selecting, organizing and integrating information.

Active Learning. Active learning is generally defined as any instructional method that engages students in the learning process. Active learning requires students to do meaningful learning activities and think about what they are doing. http://cetl.ucdavis.edu/wp-content/uploads/2010/10/Active-learning.pdf

Skill acquisition requires practice, formative feedback and more practice. You don't become a good skier by discussion, reading books or watching videos though you may be able to see what everyone else is doing wrong.

D4. Educational Planning

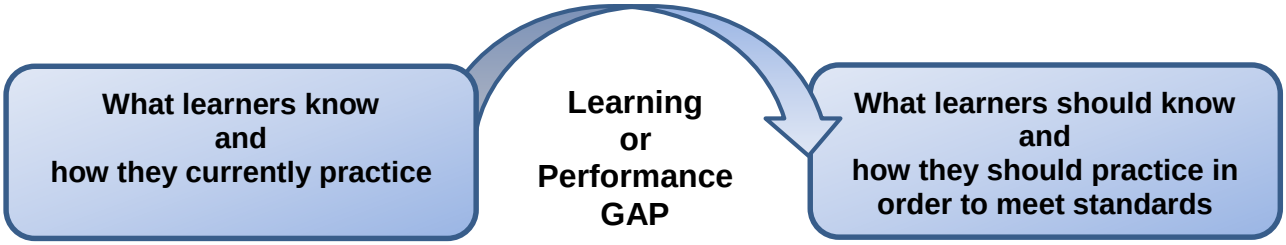
Understand the role of needs assessment in educational planning

Begin with the end in mind or as Yogi Berra said "*If you don't know where you are going you might not get there"*

Needs Assessment is a critical component to planning an educational activity and is a required component when planning a Continuing Medical Education activity (now known as **CPD**-Continuous Professional Development).

A Needs Assessment gathers data from a variety of sources in order to:

- Identify the current state (shortcomings) of the target group-- the LEARNING GAP
- Determine the type of gap- Knowledge, Skill or Attitude (**KSA**)
- Identify the type of deficit the activity will address – either competence, performance or patient outcomes.
- Explain how the educational needs were determined Identify and list the resources and references used – i.e., QI data, chart audits, physician surveys, clinical guidelines, competence guidelines, etc.
- Identify the desired outcomes and the level at which the target audience will perform after the activity
- Identify and list 3 or 4 learning objectives that will help close the "Learning Gap"



Distinguish between goals and learning objectives (Turner et al, 2008)

Goal-general a general statement that communicates the overall purpose of instruction. Goal statements tend to be broad and vague. An example of a goal would be, "The student will be familiar with the management of ADHD." Rather like a zipcode gives you the general area.

Objectives- describe specific and measurable outcomes. An objective might be, "At the end of the session, the participant will be able to outline at least two options for the medical management of ADHD in adolescents." Rather like a street address and you can tell if they arrived at the right house.

Identify components of well-formulated learning objectives

Stating learning objectives can be made easier by asking the questions:

What is the intended result of the instruction in terms of the learner?

What should the attendee be able to do as a result of the educational experience?

The objective should focus on an attendee outcome rather than only what will be taught.

When possible, include objectives from all three domains: **knowledge, skills, and attitudes**.

Knowledge--cognitive-knowing,

Skill--psychomotor-doing,

Attitudes--affective-feeling.

Identify both lower and higher level cognitive objectives, and place a greater emphasis on higher levels of cognitive learning (application, analysis, synthesis, and evaluation).

For learning objectives to be most effective, they should help in identifying appropriate learning activities and describe, clearly and precisely, what the learner will do to demonstrate achievement.

Use SPECIFIC ACTION VERBS. The choice of verbs depends on the type of material.

Strive to introduce the statement of objectives as:

"By attending this session, the learner (participant) will BE ABLE TO…"

Knowledge (cognitive) Learning Objectives (Bloom's Taxonomy, 1956)

a. Information	**Remembering learned material**			
	cite	indicate	outline	state
	define	list	recognize	update
	describe	name	summarize	write
b. Comprehension	**Explaining material that has been learned**			
	assess	differentiate	explain	locate
	classify	discuss	interpret	review
	demonstrate	distinguish		
c. Application	**Using knowledge to find or develop new solutions**			
	apply	develop	practice	select
	complete	examine	prescribe	use/utilize
	demonstrate	interpret	report	treat
d. Analysis	**The ability to break down material into parts so that its organizational structure can be understood**			
	analyze	compare	distinguish	summarize
	contrast	differentiate	measure	
e. Synthesis	**Using end results to develop general rules**			
	combine	formulate	organize	prepare
	document	manage	plan	specify
f. Evaluation	**Judging the value of something for a given purpose**			
	appraise	choose	decide	evaluate
	assess	critique	determine	recommend

Examples: *After completing DB:PREP the participant will be able to*:

- Identify predictors of successful adolescent functioning
- distinguish between methods of toilet training based on social learning versus behavioral therapy
- plan the evaluation for children with ADHD

Resources:

- Bloom's Taxonomy according to *Pirates of the Caribbean*: http://www.youtube.com/watch?v=cT4Q2n8S4bk
- Verb Lists: http://www.csus.edu/uccs/training/online/design/bloom.doc.

Skills (Psychomotor) Learning Objectives

- Psychomotor skills are often easier to write objectives for as they are observable.
- Use Application verbs (see above).

Consider using the mnemonic **SMARTER** to help formulate objectives:

S = Specific (objectives should have a specific, not broad, outcome)
M = Measurable
A = Action oriented
R = Relevant to the material being studied
T = Time limited or time specific
E = can be Evaluated
R = Realistic

Example: After participation in the genetics seminar the resident will be able to demonstrate and write up the examination of a child for dysmorphic features utilizing the checklist provided at least once during their DBP rotation.

Competence Continuum of Learning a Skill: Tying Shoelaces

LEVEL		**EXAMPLE**
Unconscious Incompetent	Doesn't know can't do	One year baby thinks shoelaces are for chewing on
Conscious Incompetent	Knows but can't do	Three year old knows about shoelaces but can't tie
Conscious Competent	Knows but has to think about doing it	Six year old can tie but has to think hard while doing it
Unconscious Competent	Knows but doesn't have to think about it anymore	Sixteen year old can tie shoelaces while talking on phone

Usually attributed to Abraham Maslow

Attitudes (Affective) Learning Objectives

- Krathwohl's Taxonomy for Objectives in the Affective Domain (1964)

Level	Judgment	Examples of objectives
Receiving (attending)	Learners are willing to receive the subject matter	The resident will listen attentively while the parent expresses his/her beliefs about the cause of child's anxiety
Responding	Learners prefer the subject matter	The resident will answer a call for volunteers to work with community program
Valuing	Learners are committed to the subject matter	The physician will express appreciation for the contributions of all team members in the care of patients seen in clinic that day
Organization	Learners are forming a life philosophy	The resident will use empathic statements when working with medical students
Characterization by value or value complex	The learners' values consistently guide their behaviors without conscious forethought	The physician will habitually abide by the standards outlined in the Hippocratic Oath

After Turner TL et al (2008) and Brightman HJ

Recognize the strengths and weaknesses of various educational outcome measures (eg, participant satisfaction, acquisition of knowledge and skills, behavioral change, patient outcomes)

Move from **PROCESS** (educational approaches) to **PRODUCT** (expected learning outcomes)

In 2013 the Accreditation Council for Graduate Medical Education (ACGME) launched the Next Accreditation System (NAS). The ACGME and specialty groups developed outcomes-based **Milestones** for resident performance within the six domains of clinical competence. The Milestones are competency-based developmental outcome expectations that can be demonstrated progressively by residents and fellows from the beginning of their education through graduation to the unsupervised practice of their specialty. The Milestones will also be used by the ACGME to demonstrate accountability of the effectiveness of graduate medical education. www.acgme.org

See GE Miller's Assessment of Clinical Competence above

Outcomes-based Evaluations:

The **Moore, Green, and Gallis model** (2009) describes 7 Outcome Levels:

Level		**How Evaluated; examples**
Level 1	Participation	Sign in; registration
Level 2	Satisfaction	Standard activity evaluation form: level of satisfaction
Level 3A	Learning: Declarative Knowledge (Knows)	-Standard activity evaluation form: attendee opinion-were learning objectives met? -Expanded activity evaluation form: Quiz at end asking for response to learning objectives e.g. list 3 stimulant medications. -Written examinations e.g. Board examination
Level 3B	Learning: Procedural Knowledge (Knows How)	-Can explain knowledge/skill/attitude verbally or in written form
Level 4	Learning: Competence (Shows How)	-Can demonstrate in simulation or practice situation
Level 5	Performance (Does)	-Uses new knowledge/skill/attitude in practice (real-life)
Level 6	Patient Outcome	-Improvement in patient outcome measures -example: 25% reduction in ADHD rating scale scores
Level 7	Community Health	-Improvement in systems (clinic, hospital, community) -Impact beyond your own patients -example: schools screen using Vanderbilt ADHD scale

Outcome Measures:

Outcome Measure	**Strengths/Weaknesses**
Behavior Change	-Educational activities should be transformative; -If there is no change in behavior after an educational activity then at best, it was entertainment; at worst, it was a waste of time. -Assessing behavior change is difficult and expensive -Behavior Change may be a planned change, an observed change or a reported change. -Behavior Change that is unobserved may be the most important kind as it reflects internalization of the knowledge, skill or attitude.
Sign-in sheet	-"*Eighty percent of success is showing up*"-Woody Allen -Does not indicate learning, retention or change in performance (outcome)
Satisfaction Survey	-Attendee's opinion whether met stated educational objectives (outcome) -Can be done electronically -Can provide feedback to faculty on content and delivery

	--May not necessarily predict learning, retention or change in performance.
Pre-test/post-test	-Activity participants complete multiple choice questions concerning activity content before and immediately after activity. -This method measures learning that occurred as a result of the activity. -Strength is immediate feedback for participants and the faculty regarding what learning has occurred -May not predict retention of the learning or change in performance.
Audience Response System	-Electronic live audience response system (ARS) uses "clickers" or web-based smartphone application (app) such as Poll Everywhere (www.polleverywhere.com) -Anonymity gives more accurate assessment of audience's understanding but not of individual learner's needs -Can be combined with Case-based/Vignettes to tap into higher order skills -Can be used as pre-test/post-test -Data can be saved; used to revise educational activity or class progress
Post-activity assessment	-Can be incorporated into standard activity evaluation form or separate quiz -ex. Multiple choice from lecture; relevant Board question(s); factual short answer or reflection on lecture, activity or experience - One Minute Paper- talk to peer or write down key point, questions that session raised, points that weren't clear; can occur during or at end; -Variable response and response quality -Verbal responses invite more participation but hard to quantify impact -Written response needs time to write, score and analyze -Written responses can be collected into Portfolio for future mutual review with individual
Direct Observation	-Direct observation of student for use and application of new skills. -Checklist (Mini-CEX) standardizes observations -Patient problems vary in clinic -Variable quality of skill performance across learners -Multiple observations of same individual increases validity -Difficult to schedule observation and review -Multiple agendas challenging to balance
Simulation/ Standardized patient/parent	-Skill acquisition monitoring (Formative) -safe environment to try it out, make mistakes, get feedback and review; -Can be Competency Assessment (Summative); demonstrates meets a standard -Complicated to arrange; expensive; time-consuming
Commitment to Change (CTC)	-Participants are asked to write one to three changes that they plan to make a change as a result of our activities (Level 4 measurement). -evidence that stating in writing a **commitment to change** (CTC) predicts actual change in practice (Domino 2011); -Measured effectiveness (**performance in practice**-Level 6) requires system for follow-up letter, fax-back or electronic survey and subsequent analysis -Self-report measure but there is data supporting indicative of change. -Requires ongoing contact with learner; needs administrative staff

Patient Outcome	-If learners within the same system can use electronic health record to compare before/after educational activity -Quality improvement methodology can be used -Patient/Family surveys useful for professionalism/communication
Portfolios	-If learners within your program/rotation can collect evidence of change (presentations; written reports; reflections; learning plans; literature searches; community activities; quality improvement projects, etc) -Encourages self-directed learning and "deep learning" -hard to measure; hard to compare learners;
"Community" outcomes	-Difficult to measure broad impact -Maintenance of Certification (MOC) -Participation in "Communities of Learning" might enable systems of measurement as use of Milestones expands to include "Expert" learners.

And lastly, a little **lagniappe** (***LAN****-yap*), Louisiana French meaning a little something extra.

Here is my **favorite educational planning mnemonic**

GNOME, (Roberts K, 1996) is very helpful when planning educational experiences.
G = goals
N = needs assessment
O = objectives
M = methods
E = evaluation

You'll have to go to the article for the full explanation. Enjoy teaching (and learning)!

RESOURCES:

1. Turner TL, Palazzi DL, Ward MA. (2008) *The Clinician-Educator's Handbook*. Free download from www.bcm.edu/pediatrics/clinician_educator_handbook accessed 11/1/13; also from www.mededportal.org/publication/7749; excellent resource;
2. Granieri R. *Enhancing Teaching Skills for Clinical Educators*. syllabus for medical education training program. http://www.icre.pitt.edu/courseCatalog/Syllabus/130.pdf accessed 11/7/13;
3. Swanwick T (2010). *Understanding Medical Education: Evidence, theory and practice*. Wiley-Blackwell, London; [second edition coming out Jan. 2014]
4. Dent JA, Harden RM (2013) *A Practical Guide for Medical Teachers, 4th ed.* Elsevier, London
5. Davis M and Forrest K. (2008) *How To Teach Continuing Medical Education.* Wiley-Blackwell, London.
6. MedEdPORTAL: Providing Online Resources To Advance Learning. Association of American Medical Colleges. www.aamc.org/mededportal ; repository of peer-reviewed educational materials of all types e.g. curricula, workshops and presentations. Place to publish educational scholarship.
7. The Derek Bok Center for Teaching and Learning: http://www.bokcenter.harvard.edu
8. Center for Teaching Excellence: Univ. of Medicine and Dentistry of New Jersey; http://cte.umdnj.edu
9. AMEE guides-Association Medical Education Europe guides, e.g. AMEE Guide 25: The assessment of learning outcomes for the competent and reflective physician. *Medical Teacher*. 2003; 25:569-584.
10. BEME guides-Best Evidence Medical Education; e.g. BEME Guide no. 7; Systematic review of the literature on assessment, feedback and physicians' clinical performance. *Medical Teacher*. 2006;28-117-128.

11. Iowa State University. *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. http://www.celt.iastate.edu/teaching/RevisedBlooms1.html accessed 11/14/13; Interactive website.
12. Bloom's Taxonomy according to the movie *Pirates of the Caribbean* http://www.youtube.com/watch?v=cT4Q2n8S4bk

References:

1. Srinivasan M, Li ST, et al (2011) "Teaching as a Competency": competencies for medical educators. *Academic Medicine*.86::1211-20
2. Knowles M (1984) *Andragogy in Action: applying modern principles of adult learning.* Jossey-Bass, San Francisco.
3. Torre DM, Daley BJ et al. (2006) Overview of learning theories for medical educators. *American Journal of Medicine.* 119: 903-7.
4. Dennick R (2012) Twelve tips for incorporating educational theory into teaching practices *Medical Teacher* 34: 618-624
5. Bandura A (1986) *Social Foundations of Thought and Action. A social cognitive theory.* Prentice-Hall, Englewood Cliffs, NJ.
6. Vygotsky LS (1973) *Mind in Society: the development of higher psychological processes.* Harvard University Press, Cambridge, MA
7. Maslow AH (1970) *Motivation and Personality* (2e). Harper and Row, New York.
8. Schon DA (1987) *Educating the Reflective Practitioner: toward a new design for teaching and learning in the professions*. Jossey-Bass, San Francisco, CA.
9. Crandall S (1993) How expert clinical educators teach what they know. *Journal of Continuing Education in the Health Professions*. 13:85-98.
10. Slotnick HB (1996) How doctors learn: the role of clinical problems across the medical school-to-practice continuum. *Academic Medicine*. 71(1):28-34.
11. Moon J (2004) Using reflective learning to improve the impact of short courses and workshops. *Journal of Continuing Education in the Health Professions*. 24:4-11.
12. Kolb DA.(1984) *Experiential Learning: experience as the source of learning and development*. Prentice Hall, Englewood Cliffs, NJ.
13. Lave J and Wenger E (1991) *Situated learning: legitimate peripheral participation*. Cambridge University Press, New York.
14. Jaques D (2003) ABC of learning and teaching in medicine: Teaching small groups. *British Medical Journal*. 326:492-494.
15. Pink D. (2011) *Drive: The Surprising Truth About What Motivates Us*. Riverhead Books
16. Hafferty F, Franks R (1994) The hidden curriculum, ethics, teaching, and the structure of medical education. *Academic Medicine*. 76: 598-605
17. Davis DA, Thomson MA, Oxman AD and Haynes RB (1992) Evidence for the effectiveness of CME: A review of 50 randomized controlled trials. *Journal of the American Medical Association*. 268:1111-17.
18. Triggs P and Joph P (2004) From transaction to transformation: information and communication technology, professional development and the formation of communities of practice. *Journal of Computer Assisted Learning*. 20: 426-39.
19. Grant J. (2002) Learning needs assessment: assessing the need. *BMJ*;324:156-9.
20. Perol D, Boissel J-P, Broussolle C, et al (2002). Simple tool to evoke physicians' real training needs. *Academic Medicine*;77:407-10.
21. Tolsgaard MG, Arendrup H, Pedersen P, Ringsted C. (2013) Feasibility of self-directed learning in clerkships. *Medical Teacher.* 35:e1409-15
22. Roberts DH, Newman LR, Schwartzstein RM. (2012) Twelve tips for facilitating Millennials' learning. *Medical Teacher*.34(4):274-8.
23. Ende J (1983) Feedback in clinical medical education. *Journal of the American Medical Association; 250: 777-81*
24. Norcini JJ, Blank LL, Arnold GK and Kmball HR (1995) The mini-CEX (Clinical Evaluation Exercise): *Annals of Internal Medicine*. 123: 795-9

25. Motola I, Devine LA, et al. Simulation in healthcare education: a best evidence practical guide. AMEE Guide No. 82. *Medical Teacher*. 2013 Oct;35(10):e1511-30.
26. Thistlethwaite JE, Davies D
27. et al. (2012) The effectiveness of case-based learning in health professional education. Medical Teacher. 34:e421-44. A BEME systematic review:
28. Nelson C, Hartling L, et al. (2012).The effects of audience response systems on learning outcomes in health professions education. *Medical Teacher.* 2012;34(6):e386-405 BEME Guide No. 21.
29. Lake FR, Vickery AW, Ryan G. Teaching on the Run Tips No. 7: Effective use of questions. *Medical Journal of Australia.* 182:126-127. (part of Teaching on the Run series)
30. Brown G and Manogue M (2001). AMEE Medical Education Guide No. 22: Refreshing lecturing: a guide for lecturers. *Medical Teacher.* 23:231-44.
31. Mayer, RE. (2010) Applying the science of learning to medical education. *Medical Education*, 44:543–549. also Google "Five Ways to Reduce PowerPoint Overload" by Richard E. Mayer for illustration
32. Neher JO, Gordon KD, Meyer, B, Stevens N. (1992)A five-step "microskills" model of clinical teaching. *Journal of the American Board of Family Practice*. 5:419-424.
33. Baker D. Writing Objectives: Rationale and Strategies. Available at http://med.fsu.edu/education/FacultyDevelopment/clinicalfaculty.asp. Accessed 11/2/13
34. Baker D. Information about behavioral objectives and how to write them. Available at http://med.fsu.edu/education/FacultyDevelopment/objectives.asp. Accessed 11/2/13
35. Bloom BS (Ed) (1956) *Taxonomy of Educational Objectives Handbook I.The Cognitive Domain.* London, UK: Longmans.
36. Brightman HJ. *Georgia State University Master Teacher Program: On Objectives*. Available at http://www2.gsu.edu/~dschjb/wwwobj.html. Accessed 11/12/13
37. Krathwohl DR, Bloom BS, Masia BB. (1964) *Taxonomy of Educational Objectives: Handbook II.* The Affective Domain. NY, NY. David McKay Company, Inc;
38. Friedman Ben David M, Davis MH et al. (2005) Portfolios as a method of student assessment. *Medical Teacher* 23: 535-51.
39. Crossley J et al. (2002) Assessing Health Professionals. *Medical Education.* 36:800-4.
40. Miller GE (1990) The assessment of clinical skills/competence/performance. *Academic Medicine*. 65(9):s63-7.
41. Epstein R (2007) Assessment in medical education. *New England Journal of Medicine.* 356: 387-96
42. Case S and Swanson D (1998) *Item Writing Manual (3e).* National Board of Medical Examiners, Philadelphia PA (http://www.nbme.org/publications/item-writing-manual-download.html)
43. Langlois JP, Thanch S (2001) Evaluation using the GRADE strategy. *Family Medicine*.3:158-60.
44. Dreyfus HL, Dreyfus SE. (2005) Expertise in real world contexts. *Organisational Studies*. 26:779-792
45. Kern D et al.(1998) *Curriculum Development for Medical Education: a six-step approach*. Johns Hopkins University press, Baltimore, MD.
46. Moore, D, Green, J, Gallis, H. (2009) Achieving Desired Results and Improved Outcomes: Integrating Planning and Assessment Throughout Learning Activities. *Journal of Continuing Education in the Health Professions.* Winter 29: 1 – 15.
47. Shumway JM, Harden RM (2003) AMEE Guide 25: The assessment of learning outcomes for the competent and reflective physician. *Medical Teacher*. 25:569-584
48. Lockyer, J, Fidler, H, Hogan, D, Pereles, L, Wright, B, Lebus, C, Gerritsen, C. (2005) Assessing Outcomes Through Congruence of Course Objectives in Reflective Work. *Journal of Continuing Education in the Health Professions*. 25: 76-86.
49. Harden RM: (2007) Learning outcomes as a tool to assess progression. *Medical Teacher* 29:678-682
50. Domino FJ, Chopra S et al. (2011) The impact on medical practice of commitments to change following CME lectures: A randomized controlled trial. *Medical Teacher*. 33: e495–e500
51. Van Tartwijk J, Driessen EW (2009): Portfolios for assessment and learning: AMEE Guide 45, *Medical Teacher* 31:790-801.
52. Roberts K. (1996) Educational Principles of Community-Based Education. *Pediatrics*.98:1259-63 and 1289-92. [GNOME mnemonic]