Curriculum Development: Theory and Science

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| Theory |
| Learning-Oriented Teaching (LOT) modelThe goal is to adapt teacher activities to the learning process. The learning process includes three dimensions: cognitive, affective, and metacognitive. Most curriculum does not address the affective level (purpose, motivation). |
| Cognitive level: Study what? |
| *Content Conception of Learning*What am I to become? | *Cognitive Processing*What should I study? |
| Affective level: Why study? |
| *Purpose Conception of Learning*Why do I attend medical school/residency? | *Motives and Feelings*Why should I start studying now? |
| Metacognitive level: How to learn? |
| *Method Conception of Learning*What is studying about? | *Metacognitive regulation*How do I go about studying? |
| Implications:* Design clear learning objectives, outcomes
* Allow learners to periodically choose topics that interest them
* Help learners understand the purpose of curriculum and their personal motives for learning
* Provide a variety of tools for learners to use (e.g., articles, book chapters, videos, role plays)
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| Source: ten Cate, O., Snell, L., Mann, K., & Vermunt, J. (2004). Orienting teaching toward the learning process. *Academic Medicine*, *79*(3), 219-228. |
| Adult Learning Theory (andragogy)Assumes that adult learners move toward self-directed learning, draw on life experiences to aid learning, are ready to learn when assuming new roles, focus on problem-solving, and are motivated by internal, not external, factors. |
| Implications:* Set a cooperative climate for learning in the classroom;
* Assess the learner’s specific needs and interests;
* Develop learning objectives based on the learner’s needs, interests, and skill levels;
* Design sequential activities to achieve the objectives;
* Work collaboratively with the learner to select methods, materials, and resources for instruction; and
* Evaluate the quality of the learning experience and make adjustments, as needed, while assessing needs for further learning.
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| Source: <https://teal.ed.gov/sites/default/files/Fact-Sheets/11_%20TEAL_Adult_Learning_Theory.pdf>  |
| Bloom’s Taxonomy Revised: A Taxonomy for Teaching, Learning, and AssessmentA framework for understanding and implementing a standards-based curriculum based on six categories of cognitive processes and four types of knowledge |
| Category1. Remember
2. Understand
3. Apply
4. Analyze
5. Evaluate
6. Create
 | Cognitive Process* Retrieve relevant knowledge from long-term memory
* Construct meaning from instructional messages and content
* Carry out or use a procedure in a given situation
* Break material into parts, determine how parts relate
* Make judgments based on criteria and standards
* Put elements together to form a coherent or functional whole
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| Source: <https://www.ccri.edu/ctc/pdf/Blooms_Revised_Taxonomy.pdf>  |

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| Science |
| Brain RulesTake advantage of brain research by following these rules:1. Exercise boosts brain power
	1. Allow students to move every 30 minutes during didactics
2. Every brain is wired differently
	1. Discover how each learner learns best
	2. We have a great number of ways of being intelligent, many of which don’t show up on IQ tests.
3. People don’t pay attention to boring things
	1. Make your presentations interesting and engaging
	2. Learners check out after 10 minutes, but you can grab their attention back by telling narratives or creating events rich in emotion
4. Repeat to remember
	1. You can improve the chances of remembering something if you reproduce the environment in which you first put it into the brain
	2. Repeat information throughout a rotation
5. Remember to repeat
	1. The way to make long-term memory more reliable is to incorporate new information gradually and repeat it in timed intervals
	2. Avoid presenting large amounts of information all at once
6. Sleep well, think well
	1. Loss of sleep hurts attention, executive function, working memory, mood, quantitative skills, logical reasoning, and even motor dexterity
	2. Encourage your residents to sleep!
7. Stressed brains do not learn the same ways as non-stressed brains
	1. Under chronic stress, adrenaline creates scars in your blood vessels that can cause a heart attack or stroke, and cortisol damages the cells of the hippocampus, crippling your ability to learn and remember
	2. Monitor your resident’s stress levels, especially chronic stress
8. Stimulate more of the senses at the same time
	1. Our senses evolved to work together—vision influencing hearing, for example—which means that we learn best if we stimulate several senses at once
	2. Introduce multi-sensory experiences and activities into your presentations
9. Vision trumps all other senses
	1. Vision is by far our most dominant sense, taking up half of our brain’s resources
	2. Use videos, images when teaching
10. We are powerful and natural explorers
	1. Some parts of our adult brains stay as malleable as a baby’s, so we can create neurons and learn new things throughout our lives
	2. Anybody can learn! Find out what residents are curious about
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| Source: <http://www.brainrules.net/pdf/brainrules_summaries.pdf>  |