Lippincott® Nursing Education Consensus Report

Evidence-based practices for deep learning

Purpose: To share foundational principles of the neuroscience of learning and highlight evidence-based practices that enhance student thinking and deep learning

Metacognition: Thinking about thinking

Benner et al. (2010) substantiated the need for nursing education to focus on applied learning, wherein knowledge is actualized in client-care experiences. This application requires thought, and metacognitive skills, to consider choices, develop priorities, and achieve positive client outcomes. The National Council of State Boards of Nursing's Clinical Judgment Measurement Model (NCSBN, 2022) guides the process of evaluating practice-based skills through recognizing cues, analyzing cues, prioritizing hypotheses, generating solutions, taking actions, and evaluating outcomes. Learners must consciously and purposefully reflect on these steps to engage in clinical judgment, whether in a testing environment or nursing practice. Safe care by the new nurse should be focused on translating thinking into prioritized actions, casting away the previous task-focused care by a nursing student. This problem-solving approach is best formulated through a metacognitive lens.

Metacognition, or thinking about thinking, provides a means for educators to frame teaching and focus on cultivating, assessing, and growing students' capacities for clinical judgment.

Neuroscience of learning

Current learning science theories and variables impacting deep learning should inform teaching practices. Concepts such as repetition, effort, retrieval practice, interleaving (interrupting forgetting), elaboration, spacing, metacognitive feedback, reflection, calibration, self-regulation of learning, and growth versus fixed mindsets provide relevant findings that may be applied to selecting teaching and evaluation strategies and suggestions on how students might improve their studying (Agarwal & Bain, 2019; Brown et al., 2014; Doyle & Zakrajsek, 2019). We should consider brain function as we endeavor to foster learning clinical judgment from a student-centered approach.

Learning occurs as the brain senses new information, integrates this information into known data, and responds to this information as the brain chooses priorities, alternatives, and solutions. Reflection allows learners to reinforce knowledge and establish priorities among learning "chunks." As memories are made, they are temporarily stored in the brain's hippocampus. These are later filed into the cortex of the brain during sleep. Inadequate sleep may cause these memories to be lost or "misfiled," highlighting the importance of adequate sleep for deep learning. Learning takes effort, such that students must engage in the material, actively interact with information, and answer questions or solve problems to create memories. Neurons transmit information that is attended to, engaged with, related to previous experiences, and connected with previously acquired knowledge. Repetition and novel exposure to new and building information allow learners to scaffold information and build decision-making skills. Clinical judgment is developed as learners retrieve information, adapt it to current context and circumstances, make decisions about actions, and reflect upon clinical experiences.

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Factors influencing learning

Myriad factors influence the learning process. The learner's interest in the material, attention span, and satisfaction with learning all have neuroscientific implications. As dopamine and norepinephrine are released when risk, excitement, and the pleasure centers are stimulated, active teaching methods also activate the brain's reward center, further enhancing the positive feelings associated with achievement and pride. The release of serotonin ensures learners are calm as they absorb new information. As such, positive and negative emotions may stimulate and detract from learning. Multisensory experiences, which produce dopamine, innervate multiple neurons, and stimulate neurons multiple times, are often the most effective. Learners must feel safe to be ripe for learning, with newer research substantiating the need for movement and exercise, adequate nutrition and hydration, and sufficient rest and sleep to learn. Learners also bring individual qualities and traits that foster or detract from learning. Learners must have the cognitive power to learn, perceive they are able to learn, and have the skills to self-regulate learning, along with a cognitive load that does not exceed learner capacities, to yield successful learning. Significant research is devoted to multitasking, attention span, and learning.

Multitasking interrupts learning and is theorized to "take double the time with twice as many errors." Although the ability to multitask is a very individual trait, most learning is limited by attempts at multitasking. This is, of course, dependent upon the tasks. For example, listening to instrumental music during study time demonstrates higher retention levels, whereas watching television or surfing the internet during studying may limit learning.

Educators may enhance learning and clinical judgment skills through brain-focused, evidence-based, student-centered, and objective-driven strategies.

Strategies to foster learning and metacognition in nursing education and practice

Chunking information
Giving "bite-sized" pieces of information at a time

Compare and contrast activities
Differentiating what is the same and different

Cognitive wrappers
Assigning short exercises to reinforce a "chunk" of material

Simulating a growth mindset
Encouraging students to take on challenges

Creating learning closure and using repetition
Ending a lesson that creates an impression

Building on previous experiences in a safe environment
Facilitating civility in the learning environment

Attending to learning preferences and multiple senses
Providing a variety of learning activities

Active strategies that stimulate the reward center of the brain
Providing supportive "feel good" learning

Involve effortful work, practice, and spacing
Raising the bar and students will work harder, interrupt forgetting

Reflective exercises that allow for elaboration and growth
Engaging in purposeful reflection that expands on the depth of thinking

Providing students with a learning environment that supports these principles substantiates brain science, metacognition, and active engagement. The nurse educator must consider escalating teaching practices to enhance the development of clinical judgment to promote safe and competent nursing care (Herrman, 2019).

References

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