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Connecting the Dots: Practical Strategies for Helping Learners Use Schema to Improve Long-term Memory

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Abstract

The concept of schema has been present in education for almost a century. In 1932, Fredrick Bartlett defined schema as “a structure that people use to organize current knowledge and provide a framework for future understanding.” (Bartlett, 1932) In medical education, schema building can be an important step in navigating huge amounts of particulate information. It is also a skill that our learners often lack. In Student Academic Support Service’s post- appointment surveys for AY2022-2023, 77% of learners working on study skills specifically named schema-building strategies as the takeaway that they were most likely to implement before their next appointment. These results suggest both the novelty and utility of these strategies. In their comments, learners reflect that when confronted with huge lists of medications, pathologies or anatomical structures, they had previously rushed straight ahead to memorizing details using tools like Anki and Quizlet, and found themselves unable to apply that knowledge when faced with board style questions or clinical scenarios.

The solution to these learning issues can be found in guiding students towards building schema. The importance of schema for memory formation has been documented in educational psychology and more recently in neuroscience research. Studies have shown that schema building strategies like previewing, elaboration, differentiation and others improve both the flexibility and the longevity of new memories. (for example, van Kesteren, et. al. 2020) Yet not only are learners often unaware of these strategies, they are furthermore reluctant to take on new learning activities when time is so tight. As educators, we not only need to educate our learners about how to create schema, but we also need to find compelling ways to convince them to do so.

In this workshop, we will help participants understand what schema building can look like in medical education, and we’ll share concrete active learning activities that they can use with their learners to help them explore the concept of schema building.

The workshop will discuss schema building for encountering new information as well as schema building as part of the memorization process. Our workshop will focus on strategies for pharmacology, pathophysiology, and anatomy, but they can absolutely be generalized to other medical education contexts.

Learning Objectives

1. Define Cognitive Schema
2. Describe the impact of memorizing information connectively on medical learners
3. Learn strategies to help students understand the importance of using schema
4. Learn connective learning strategies to share with students studying difficult topics like Pharmacology, Pathophysiology, Histology, and Anatomy

Active Learning Strategies + Session Plan:

1. Presenters will provide a theoretical framework for understanding schema and its importance to memory creation.
2. Activity 1: Participants will read a difficult text without previewing, and they will be quizzed on the content. They will then be provided a schema for understanding and remembering the text and then asked to read the text a second time followed by a repeat quiz. They will be given a chance to reflect.
3. Presenters will share strategies for Previewing and how it connects to building schema
4. Activity 2: Participants will be asked to memorize a list of random terms. They will then be quizzed. They will be given a schema for organizing the terms and then quizzed again, and allowed to reflect.
5. Activity 3: Participants will be asked to memorize a list of street names. They will then be quizzed. The questions will start out at “what” questions but will move to application level questions (which the participants will not be able to answer). The participants will be given a schema for organizing the information and asked new application level questions.
6. Presenters will share strategies for creating schema for memorizing medical information.
7. Application: Groups will be given a case study, and they will discuss which schema building strategies seem the most appropriate for that student.
8. Questions and wrap up

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