Out of Hours

Cognitive load theory and teaching in primary care

BECOMING A MASTER LEARNER

Educating undergraduates to become master learners during primary care rotations is no easy task. Typically, attachment to primary care is short and often block-based with more time spent in hospital ward settings. Furthermore, there is often no continuum from primary to secondary care with learners having limited opportunities following patients along their journey. Educators in this domain have the added pressure of ensuring sufficient coverage of curricula in a condensed period of time. Add to this the often longstanding relationships built up between patients and their primary care doctors further exacerbating the issue with regards to the interaction between the learner and patient.

When it comes to learning, adoption of learning theory is paramount.¹ This is a vast field in itself but in essence, effective learning relies on several aspects. This may include recognition of learner autonomy and sense of relatedness, freedom for learners to explore their own ideas without unnecessary critique, safeguards to avoid too rapid a move to gain competency beyond the learner's reasonable limits at a particular stage of training, self-reflection, feedback in a bi-directional non-judgemental fashion between educator and learner, creation of a safe learning environment, external peer-to-peer feedback, and self-directed learning.

These aspects comprise various recognised learning theory domains such as self-determination and situated cognition.

What is now apparent is that when delivering information, educators must ensure this is done in a way to ensure avoidance of information overload. Such loading of information, or more precisely cognitive load if done inappropriately, can hinder optimum learning through overconsumption of working memory available specifically for knowledge gain.

WHAT IS MEANT BY COGNITIVE LOAD?

In brief, cognitive load focuses on three aspects:²

- *intrinsic load* — namely, the complexity of the information being learned;
- *extraneous load* — the way the information is presented; and
- *germane load* — the processing of the

information so that learning can truly occur.

HOW CAN WE ENSURE OPTIMUM COGNITIVE LOAD?

- *Intrinsic*: educators can focus on information chunking or staging with movement from low to high complexity. Learners may practice a particular aspect alone and then in groups.
- *Extraneous*: educators can offer learners completed problems either partially or fully. Alternatively, various modalities can be provided such as visual and auditory (videos). The learner can observe a particular skill before performing it for themselves. The educator can also ensure the avoidance of potential distractions such as mobile phones or pager alerts.
- *Germane*: information presented in a random order, or the learner is exposed to a different patient demographic that they are not typically used to.²

How then could this apply to commonly-seen presentations in primary care? Here are three potential examples:

Diabetes

Intrinsic: educators can focus initially on delivering information regarding importance of lifestyle factors such as diet and exercise before moving on to the complexities of therapeutics of oral diabetic agents and insulin preparations alongside their side effects.

Rashes

Extraneous: educators can provide videos on an array of rashes before consulting with patients with actual pathology. Alternatively,

ADDRESS FOR CORRESPONDENCE

Neel Sharma

National University Health System, 1E Kent Ridge Road, Singapore 119228.

E-mail: drneelsharma@outlook.com

simple audio description can be provided (podcast) before video use.

Headache

Germane: educators can present details on an array of headaches (such as migraine, tension, or cluster), and then choose to mix up the order of presentation to better gauge retention.

The importance of cognitive load theory is now being recognised as key in ensuring the development of the master learner.¹

As alluded to earlier, in view of the short time constraints during primary care, rotations, optimisation of load can help to ensure adequate educational gains in the long term.

Neel Sharma,

Visiting Clinical Research Fellow, National University Hospital Singapore, Singapore and Visiting Scholar Faculty Member, Harvard Macy Institute, Boston, MA, US.

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