

ECODE

&

C-CAP

Continuous Conceptual Assessment Project

Overview

Over the past 50 years, the learning sciences have made incredible advances in the understanding of how we think and learn. Yet by far the most significant is the giant leap in the field was what Howard Gardner called the “Cognitive Revolution”—the departure of the isolated, the behaviorist view of learning and the emergence of a new set of ideas that centered on the key notion of a ‘mental representation.’

The tremendous challenge is that this understanding has not yet been translated into the structure and function of the education system. The system is still designed on a behavioristic model, where learning is organized in very linear pathways, often using very linear teaching methods. Yet the learning sciences have made a great shift to understand that we don’t learn in a linear fashion, and in fact, we advance in our learning by continually developing and reconfiguring internal representations over time. This understanding has continued to show up in growing pedagogies, such a project-based learning, and the influx of online educational resources and learning games. With the system still stuck in this old model, these educational innovations that are built on our current model of best learning practices will always struggle to be integrated effectively into practice—that is, until we have a paralleling mechanism for measuring learning in the new paradigm as well.

ECODE is a platform that was designed in, and for, this new paradigm. The ECODE platform maps an individuals cognitive artifacts and conceptual change over time. In this way, the assessment platform is devoid of the rigidity of the current structures of the educational system and can follow and support an individual learner over a lifetime. The C-CAP project is the research initiative for the development and implementation of the ECODE platform in both formal and informal learning environments.

Direct Teaching versus Conceptual Change

Gardner explains that cognitive psychologists came to an emerging view that “individuals have ideas, images, and various ‘languages’ in their mind-brain. He explains that these representations are real and important, and susceptible to study by scientists and to change by educators” (1999, p. 67). This simple shift to representations induced a revolution because we no longer just focused on behaviors, but rather the mental representations that operate behind the scenes to cause that behavior. Gardner goes on to explain that these representations will change, as a function of maturation, consequence of experience, and as a result of interactions with other representations. Ultimately, for cognitive scientists, “learning” shifted to a focus of actual mental representations, and how they might be altered. However, Gardner also notes that this revolution didn’t necessarily exert consequential influence on the world of practice, positing that “everywhere, most educators are only dimly aware of these changes in the thinking of psychological research,” resulting in the need to “translate these new understandings into innovative educational practices...which have powerful educational implications” (1999, p. 68).

The ECODE Platform

Ultimately, the C-CAP project is about exploring how to move from a system that maps the teaching experiences a student has encountered over time, to the learning pathways that the student progresses along over time.

The ECODE platform enables the realization of the learning science in practice. ECODE provides a mechanism to capture and map these mental representations, or conceptual artifacts, for each learner. As you capture, measure, and build on each student’s ‘mental representation’ you create a new unit of analysis by which a student can be guided through his or her own learning pathway; similarly, that unit of analysis can be viewed over time to help them understand their larger metacognitive capacities. Over time, ECODE users can generate their ‘cognitive ecology’ to produce a clearer picture of the learner’s current developmental levels, conceptual structures and sticking points.