HUMAN COGNITIVE ARCHITECTURE

Biologically primary knowledge is knowledge that we have evolved to acquire over countless generations: learning how to listen and speak, recognising faces, solving unfamiliar problems and making plans for future events. Our cognitive systems have evolved to allow us to acquire these skills automatically and with limited effort.

Biologically secondary knowledge is knowledge we need because our culture has determined it is important. Our cognitive systems have not evolved separate structures or systems to enable us to acquire this information. We learn this secondary knowledge by piggy backing on to the cognitive structures and systems used to acquire biological primary knowledge.

THE FIVE BASIC BIOLOGICAL PRINCIPLES

OUR MOST EFFECTIVE TEACHING METHODS REQUIRE ALIGNMENT OF KNOWLEDGE ACQUISITION WITH THE FIVE BASIC BIOLOGICAL PRINCIPLES.

The Information Store Principle

Humans require a large store of readily available information in order to function effectively in the World. Long-term memory provides this store.

The Borrowing and Reorganising Principle

Humans' social nature allows them to learn from others. The vast bulk of information stored in long-term memory comes from other people.

The Randomness as Genesis Principle

If you don't already have the information in long term memory; it will need to be acquired using a random generate, test and evaluate process. During problem solving the effective elements are remembered.

The Narrow Limits of Change Principle

The working memory is severely limited when processing new information. Working memory depletion occurs after cognitive effort and recovers after rest.

The Environmental Organising and Linking Principle

There are no known limits when familiar, organised information from long-term memory is processed. Environmental cues are used to generate actions appropriate to an environment.

Reference:
Sweller, J., van Merriënboer, J. and Paas, F. (2019). **Cognitive Architecture and Instructional Design: 20 Years Later**. Educational Psychology Review.

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