

Adaptive Expertise

- the ability to use knowledge and experience to learn in unanticipated situations

13th Annual Office of Superintendent of Public Instruction
January Conference and High School Summit



Challenge Based Design Invokes
Learning with Deeper Understanding

A mind is not a vessel to be filled, but a fire to be kindled (Plutarch)

A Century of Learning

- Pavlov - 1890s (salivating dogs)
- Watson - 1900s elaborated and extended Pavlov
- Thorndike -1913 (hungry cats in puzzle box) Stimulus response. Trial and error.
- Skinner - 1950s (pigeons)
- Behaviorism with a small “b”
- Cognitive Science - new field emerges 1950s
- Quantitative and qualitative research
- [The Five Minute University](#)

A Brief History of Learning

Early Part of Twentieth Century

- Focus on acquisition of literacy skills (3Rs) Reading, writing, arithmetic.
- Not generally important to train people to:
 - think critically
 - read critically
 - express themselves clearly, persuasively
 - solve complex problems in science/math

A Brief History of Learning

Later Part of Twentieth Century

- Focus on higher literacy needs in order to successfully negotiate the complexities of contemporary life.
- Consequence to historical change:
 - skill demands for work increased dramatically
 - change in response to competitive pressures
 - participation in democratic process – global

A Brief History of Learning

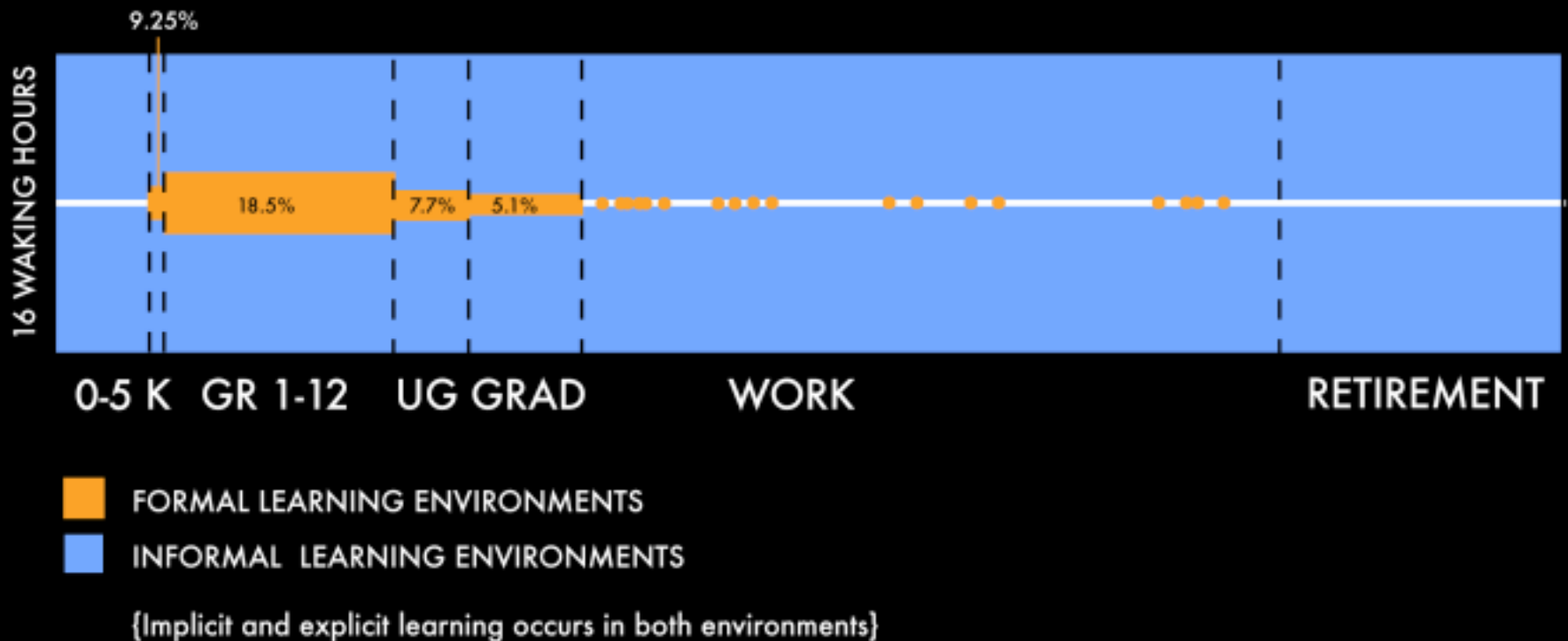
Twenty-first Century

- What had changed?
- Information and knowledge was growing at a far more rapid rate than ever before in the history of humankind
- Meaning of KNOWING shifted from:
being able to 'remember and repeat' information to
being able to 'find and use' it.

(Herbert Simon, Cognitive Psychologist and Nobel Laureate Economics)

Life-Wide and Life-Long View of Learning

- Formal and Informal landscape of learning
- Implicit and explicit learning takes place all the time
- 16 hours waking time

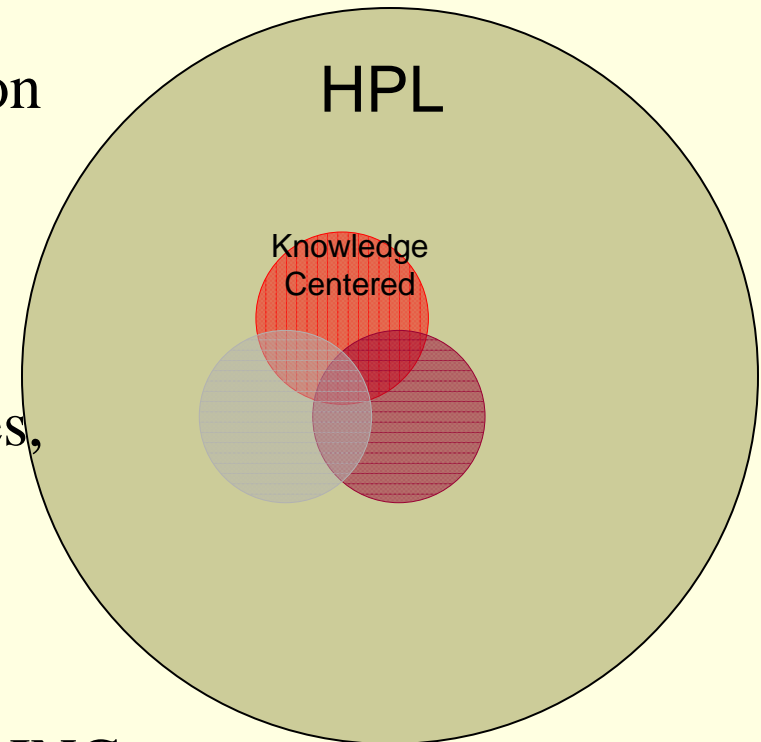


Adaptive Expertise

- Adaptive Expertise - the ability to use knowledge and experience to learn in unanticipated situations
- Routine experts are adept at solving routine problems every day
- Adaptive experts need to be flexible – today, workplace regulations and working knowledge base will change significantly over the course of workers' careers
- Flexibility - means we change our mind, admit we were wrong... Issues relating to equity, diversity, multi-culturalism and more
- So how do we get there? What does it look like?

How People Learn

- **Knowledge Centered**
Scope and sequence – building on prior knowledge
- Driven by need/reason –
“Oh, I see... ah, I get it”
- Explicit meta-cognitive strategies,
transfer to future learning
- Hands-on, active learning?
NOT ENOUGH –
- **DOING WITH UNDERSTANDING**

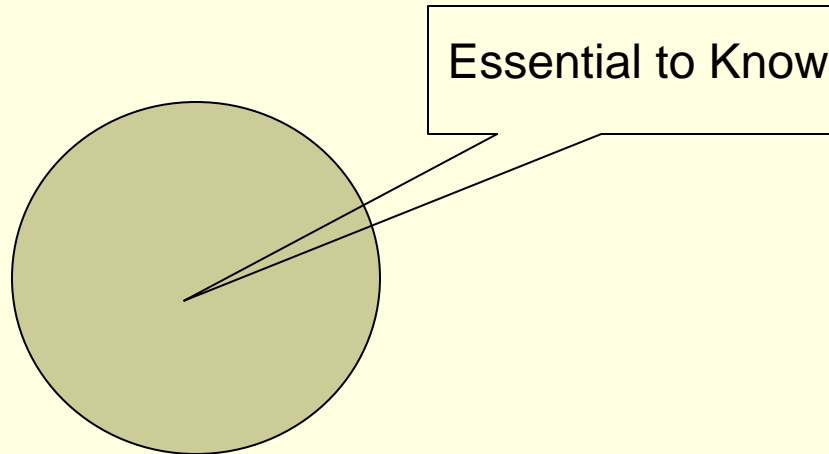


Knowledge - Enduring Idea



Backwards Design

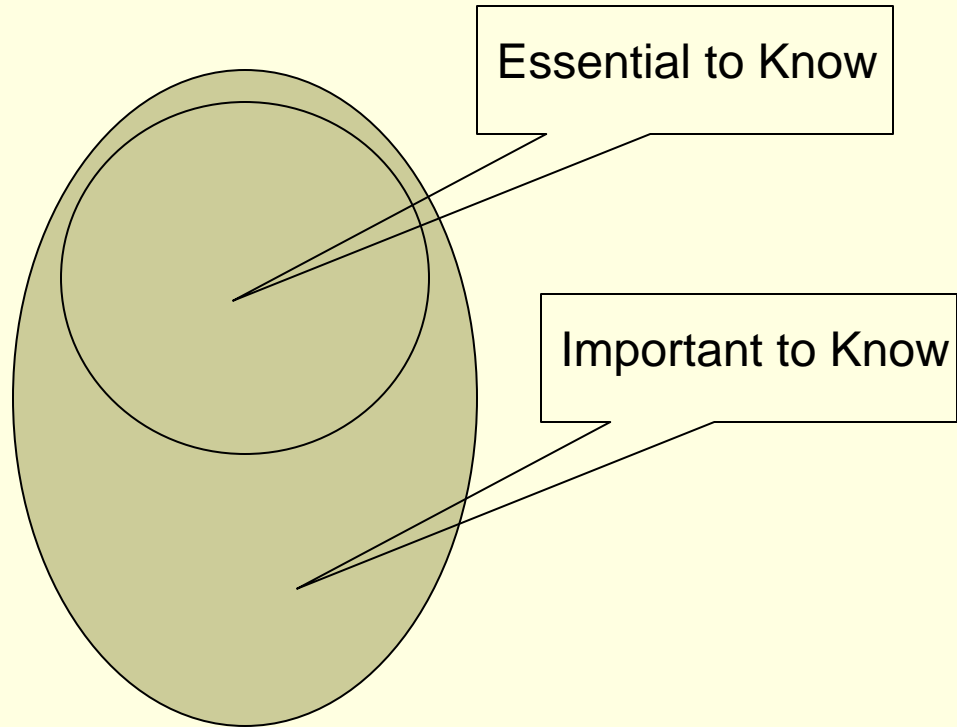
The backwards design model centers on the idea that the design process should begin with identifying the desired results and then "work backwards" to develop instruction.



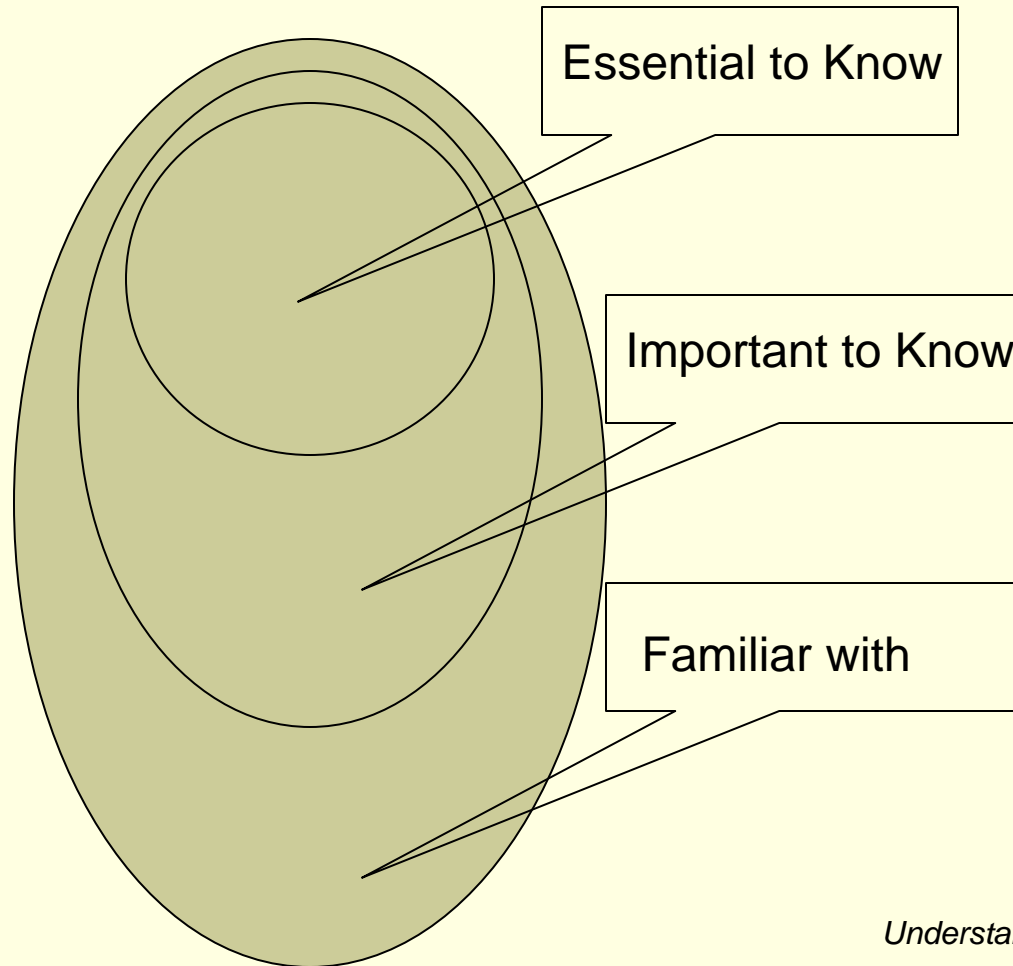
Enduring Ideas



This is different from the traditional approach which is to define what topics need to be covered.



Enduring Ideas

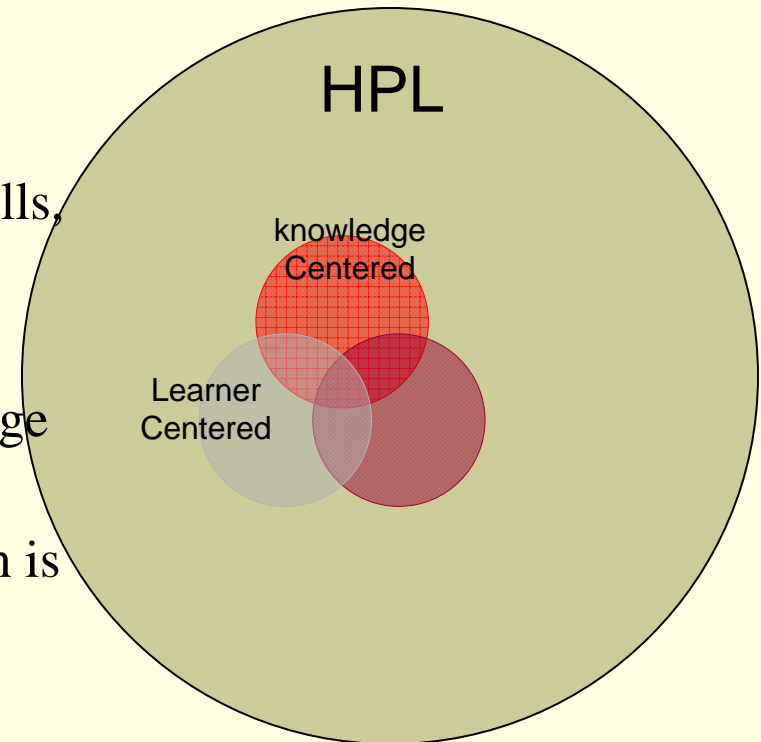


How People Learn

■ Knowledge Centered

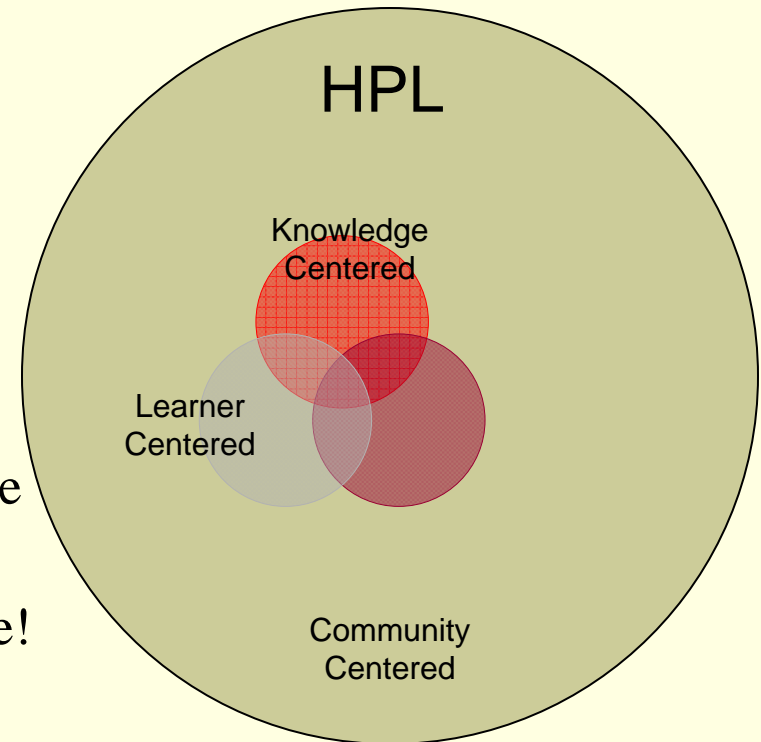
■ **Learner Centered**

- Conceptual and cultural: knowledge, skills, attitudes, and beliefs
- Preconceived ideas - Fish is Fish
- Make visible the students prior knowledge
- Key: ASK the challenge question and PROBE for why the challenge question is relevant...
- Balance - rigor that engages but not discourages



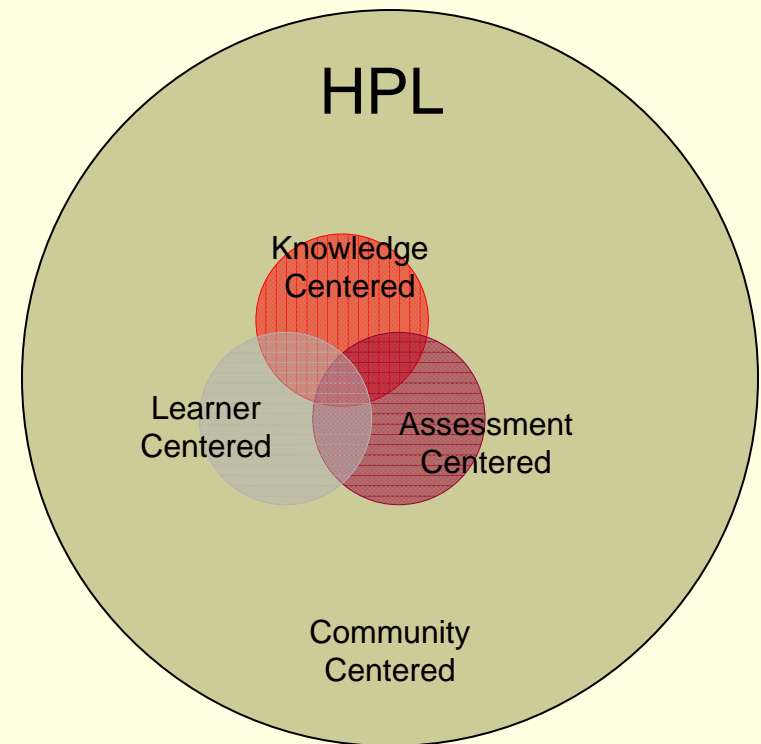
How People Learn

- Knowledge Centered
- Learner Centered
- **Community Centered**
 - Context, context, context
 - NORMS – okay to take risks and revise thinking?
 - Trust! Be Curious! Respect perspective!
 - Intellectual community -
COLLABORATIVE, not competitive



How People Learn

- Knowledge Centered
- Learner Centered
- Community Centered
- **Assessment Centered**
 - Formative
 - Visible to teacher AND student –
MONITORED by both
 - Opportunities to revise, seek, revise –
ITERATIVE process
 - Become comfortable that it takes time to get some
things – encouraged by progress of learning
 - Summative

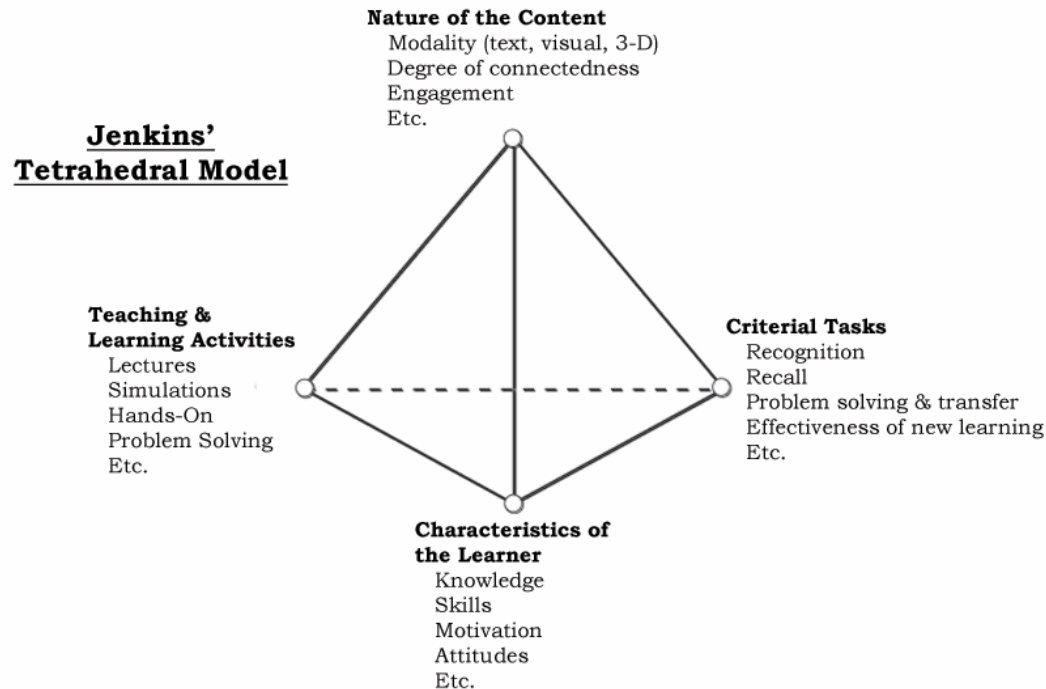


A simple teaching Methodology

- Veins and Arteries - a teaching strategy
- What do you think?

A simple teaching Methodology

- Veins and Arteries - a teaching strategy
- What do you think?
- Another perspective



Model of Adaptive Expertise

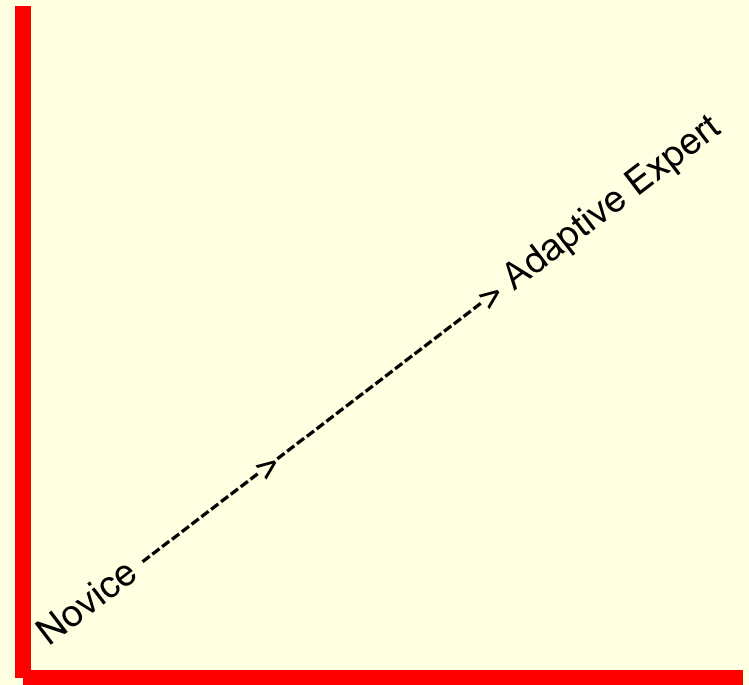
Vertical Axis

- Innovation
- Creativity

Horizontal Axis

- Efficiency
 - Routine Expert
 - Long Lists of Objectives
 - Rote Learning
 - Memorization
 - Conveyor Belt

Innovation - Piaget, Dewey inquiry learning



Efficiency - Thorndike, behaviorism

Efficiency

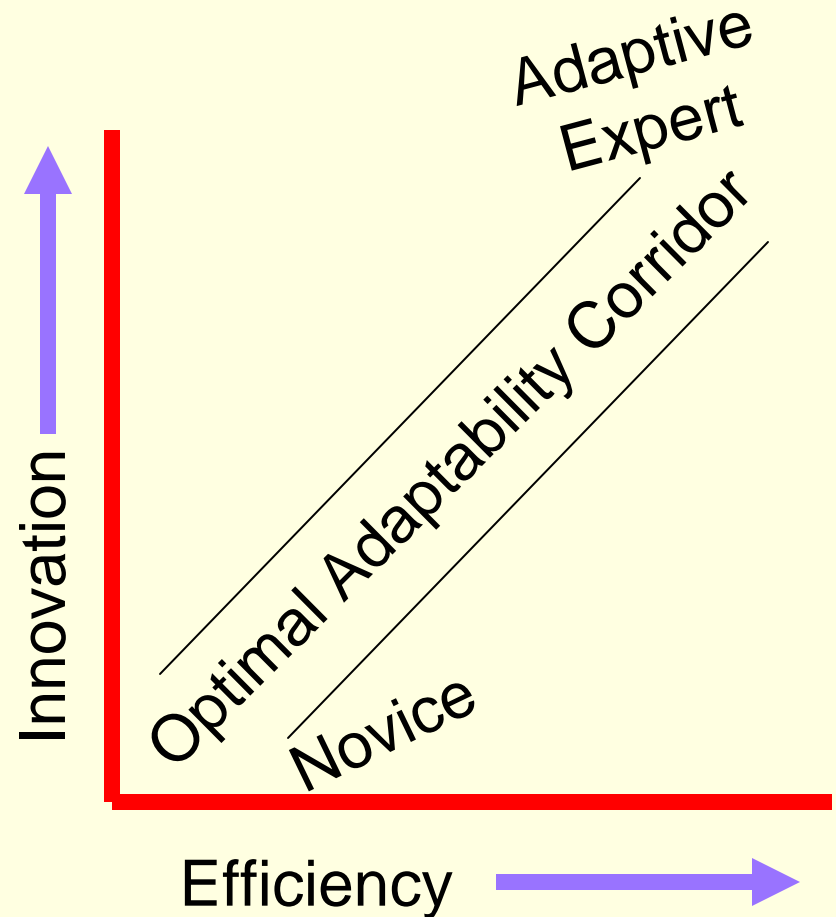
- Schooling might seem like a conveyor belt to many students, parents and teachers.

- Conveyor Belt



OAC Combines the Strength of Both

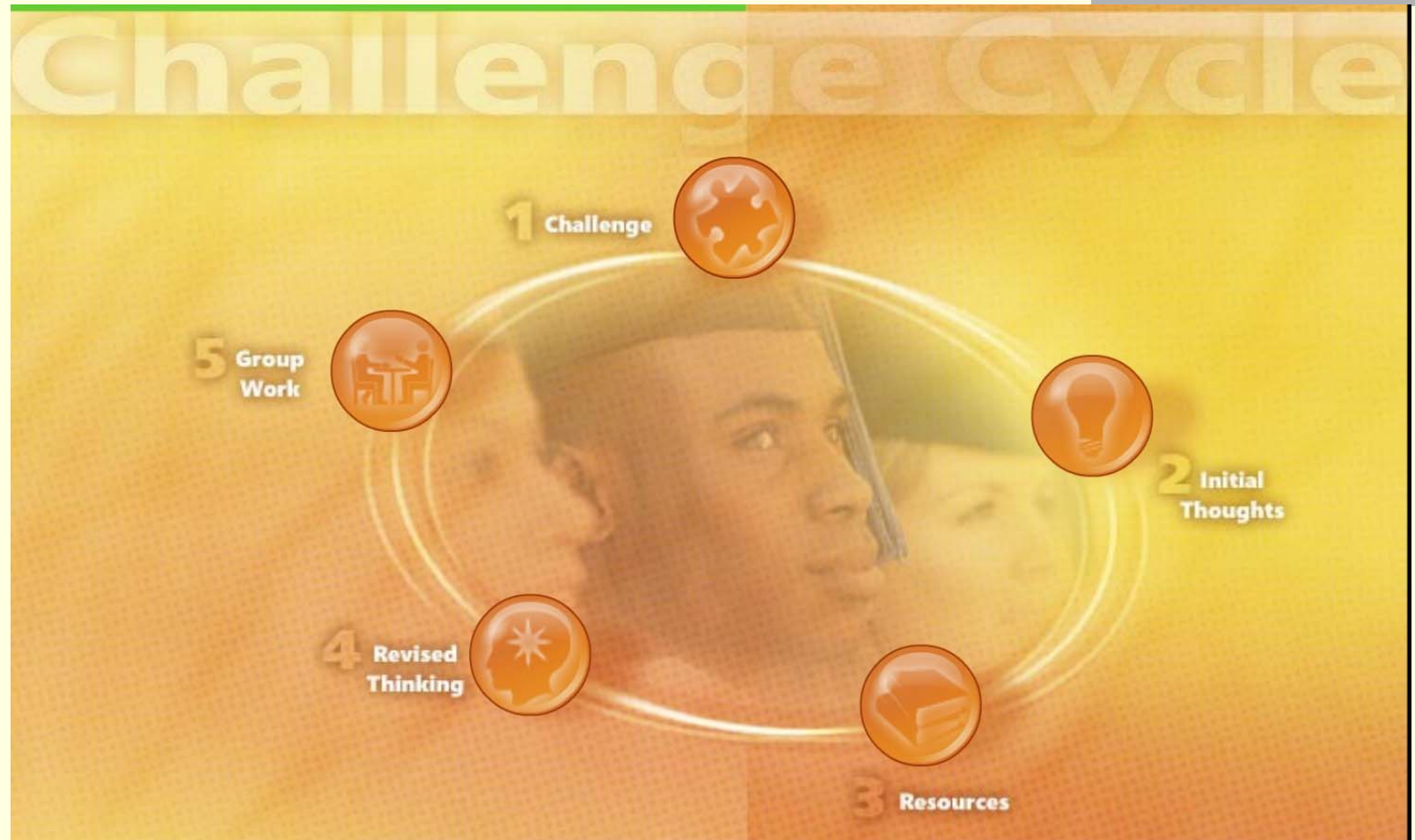
- Adaptive Experts
- Innovation
- Efficiency
- Formative Assessment
- Metacognition
- Preconceived Ideas
- Optimal Adaptability Corridor



The Cycles of Life and School

- An alternative to the conveyor belt model for learning and school is to think in terms of cycles.
- A cycle is a simple concept model that goes a long way to fostering a learning environment.
- Quasi repetitive activity cycles enhance adaptive expertise.
- Cycles of Learning

Cycle of Learning



Brain Challenge

- How the brain functions?

- 1. Formed at birth - ready to record anything that experience provides it?
- 2. Critical period - first three years?

Resources: John Bruer
Author of “A Bridge too Far”

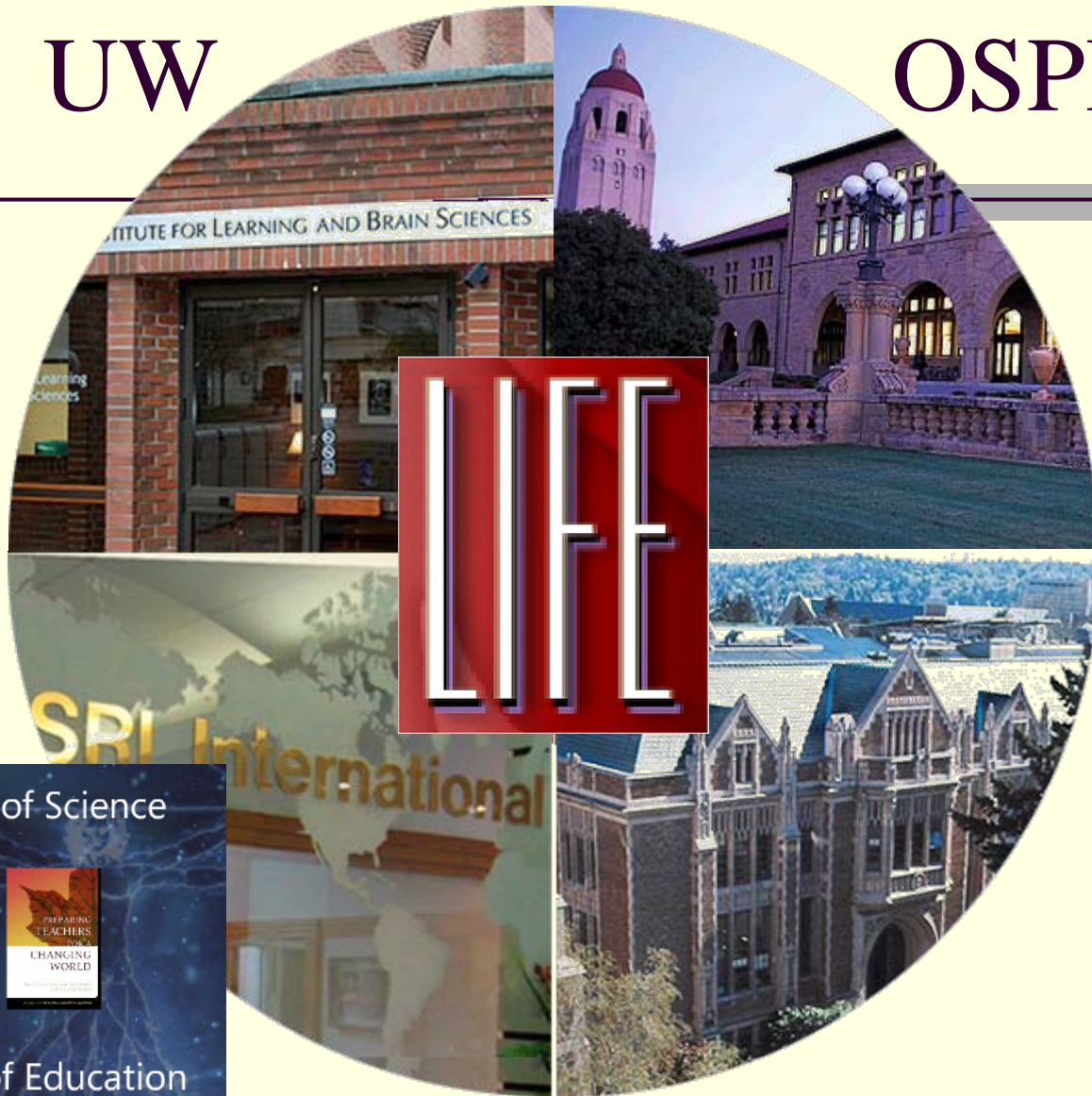


How Sure Are We?

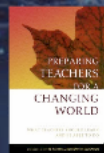
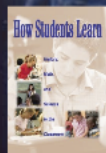
- Exercise in Neural Commitment
- <http://viscog.beckman.uiuc.edu/grafs/demos/15.html>

UW

OSPI



National Academy of Science



National Academy of Education

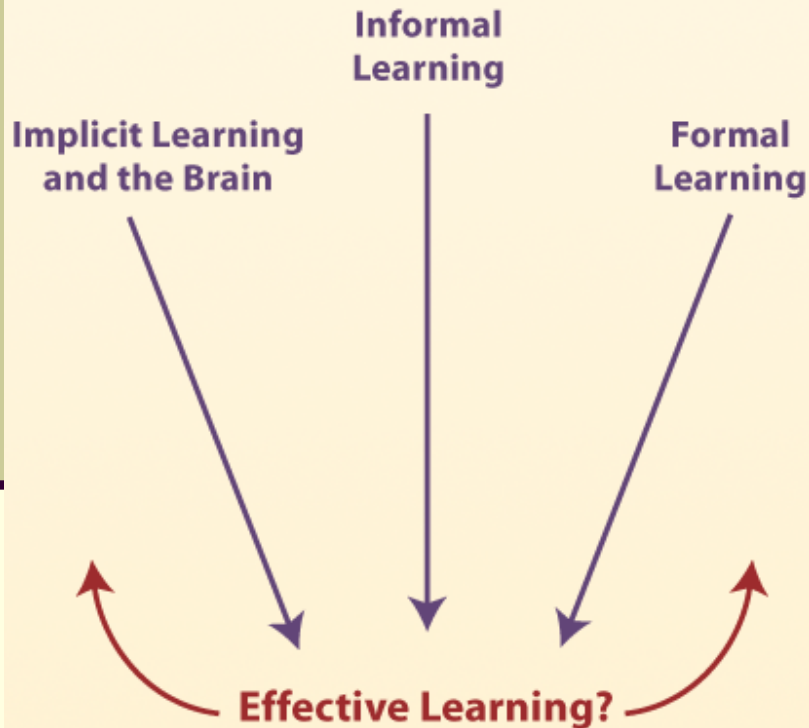
LIFE: Learning in Informal & Formal Environments

LIFE's Purpose

To **help** transform the sciences of learning

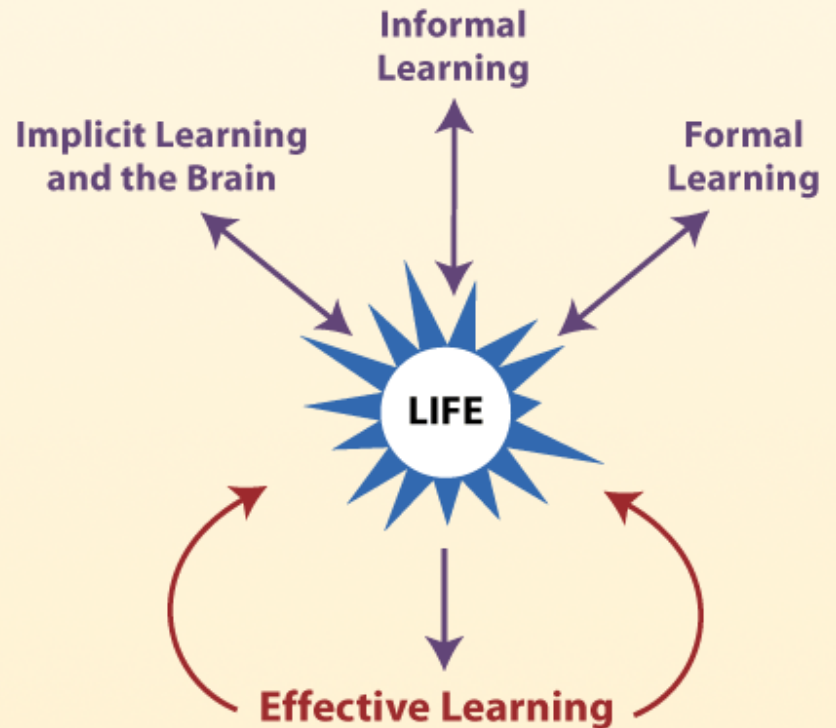
Before:

*Three Separate
Partial Conversations*



After:

*One Integrated,
Coherent Conversation*



Collaborative Endeavor

- Teachers
- Parents
- State
- Industry
- Academia
- Students
- You and I

Thank you for being a good audience.

Brenda Hood
Office of Superintendent
of Public Instruction
bhoo@ospi.wednet.edu

Kieran O'Mahony
LIFE Center, College of Education
University of Washington
tko2@u.washington.edu

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