



# DEVELOPING REFLECTIVE CAPACITY

Using an AI Formative Assessment to Build Reflection in EiT



# OVERVIEW

- How core concepts of developmental psychology have evolved
- Formative developmental assessment
- Zone of proximal development and skill development
- Design of application for EiT

# JAMES MARK BALDWIN

- Father of human development as a field
- Introduced concepts such as;
  - Assimilation
  - Accommodation
  - Cognitive structures
  - Lines of development
- Major influence on Piaget and Vygotsky



# JEAN PIAGET







# JEAN PIAGET

- Genetic epistemology – Talking to kids about playing marbles
- Stages only as instruments of analysis
- Emphasis on cognitive processes
  - Equilibration
  - Reflective abstraction
  - Internalization

# LAWRENCE KOHLBERG

- Application of Piaget to moral development
- National attention (in the US) and influence on schools, prisons, military and politics
- Research – influenced a generation of students



# LAWRENCE KOHLBERG

- Stages defined by clear criteria:
  - Qualitatively different
  - Invariant sequence
  - Structured whole
  - Hierarchical integration
- Pre, Conventional and Post
- Methodology distinguishing structure from content

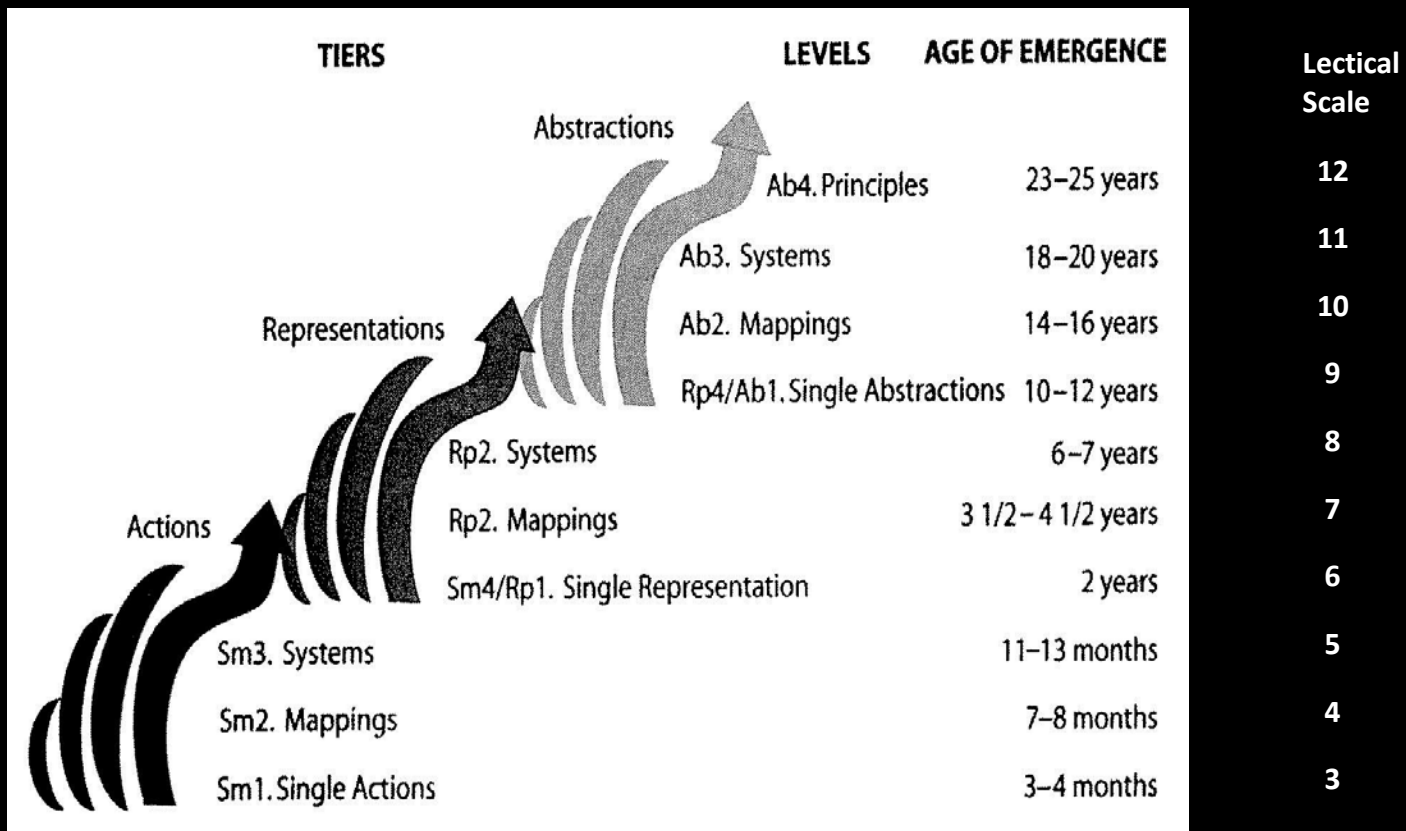


# KURT FISCHER

- Skill as an integrative concept
- Linked context (operant conditioning) with cognitive skills
- Dynamic variability of performance
- Learning is about building skills dynamically in contexts, with others
- Centrality of emotion in learning







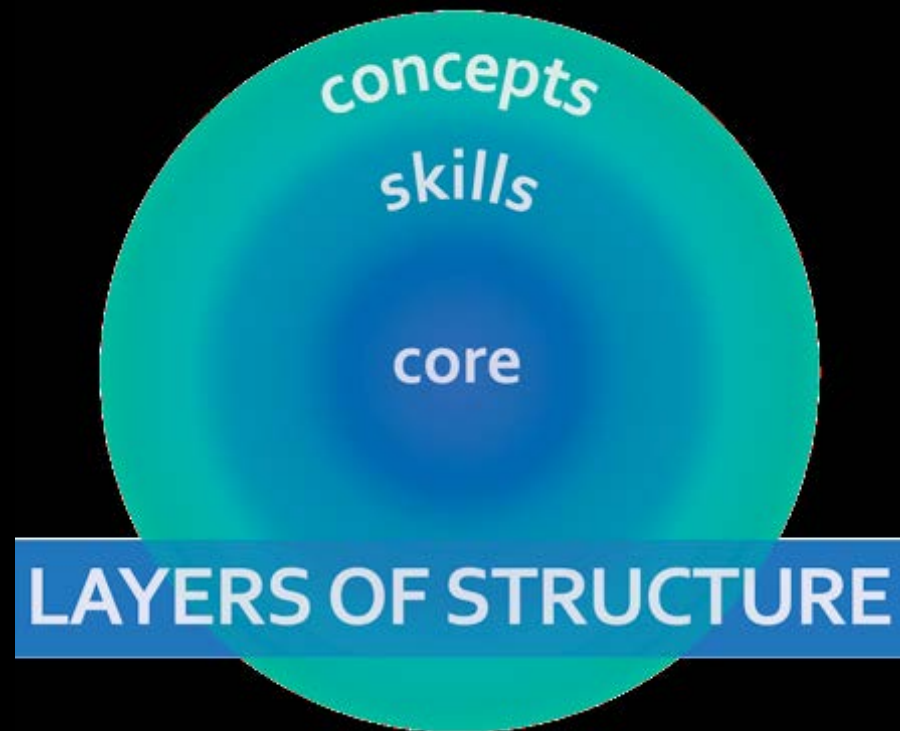
# THEO DAWSON

- Common core metric
- Domain independent Lectical assessment system
- Aim to bring developmental, formative assessments into K-12 education



# LECTICAL ASSESSMENT SYSTEM (LAS)

- Determination of
  - Explicit logical structure
  - Implicit conceptual structure
- In relation to hierarchical complexity of cognitive task demands





# CLAS

- Artificial intelligence computer program for scoring Lectical assessments
- Free demo version of Lectical Reflective Judgment Assessment (LRJA)
- Application to EiT



# EXPERTS IN TEAMS

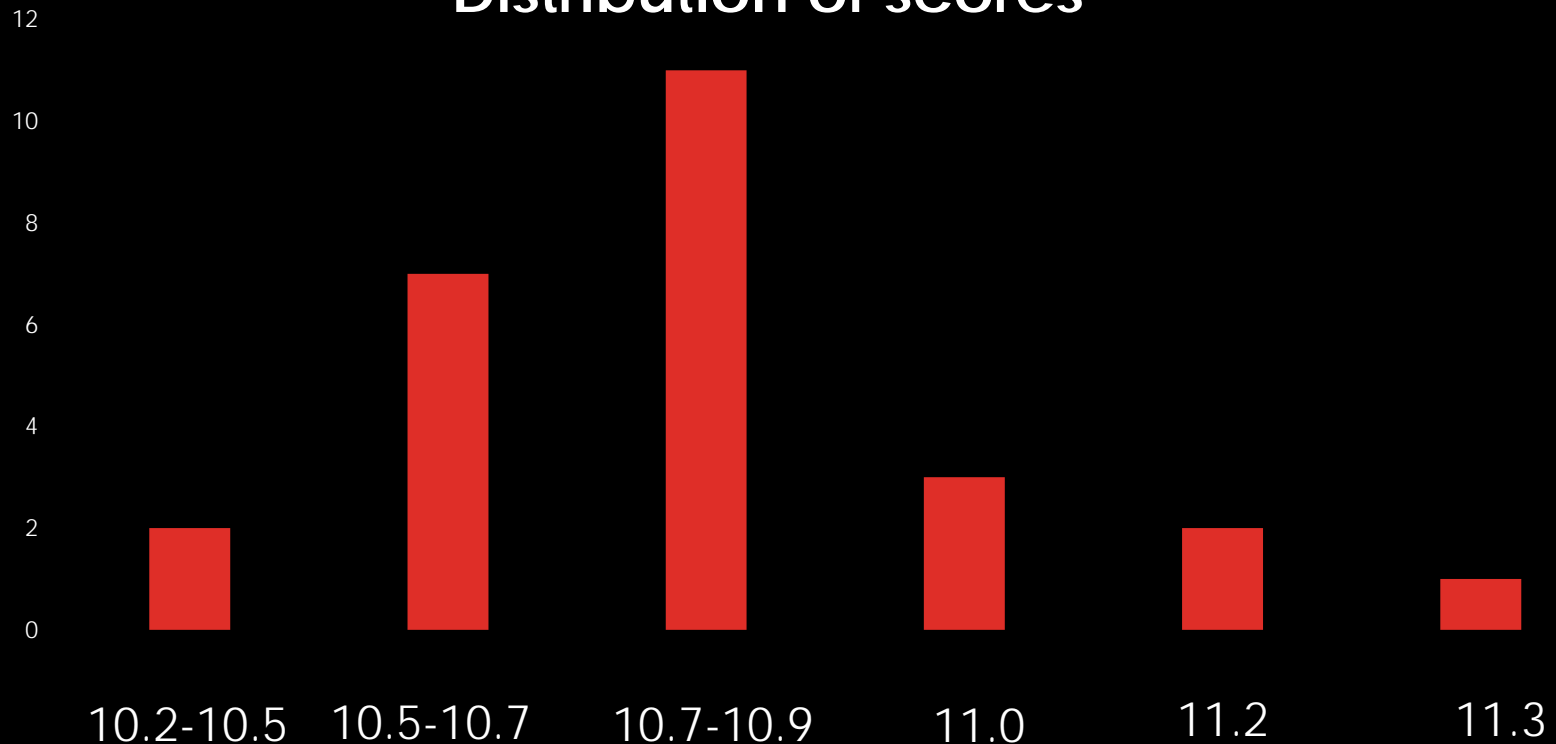
- Group process report as 50% of grade
- Reflection as key skill for this
- Anecdotal evidence of difficulties for some students in understanding expectations about reflective activities



# MAPPING THE GAP

- Invitation to students in three EiT villages and in RAD3700 to take LRJA demo. 26 participants.
- EiT Book of Reflections = 11.2

**Distribution of scores**



# CLOSING THE GAP

- Vygotsky's zone of proximal development (ZDP, or "Goldilocks Zone") and scaffolding
- Lectica's Virtuous Cycles of Learning (VCoLs)
- Design of learning activities keyed to Lectical scores on LRJA demo