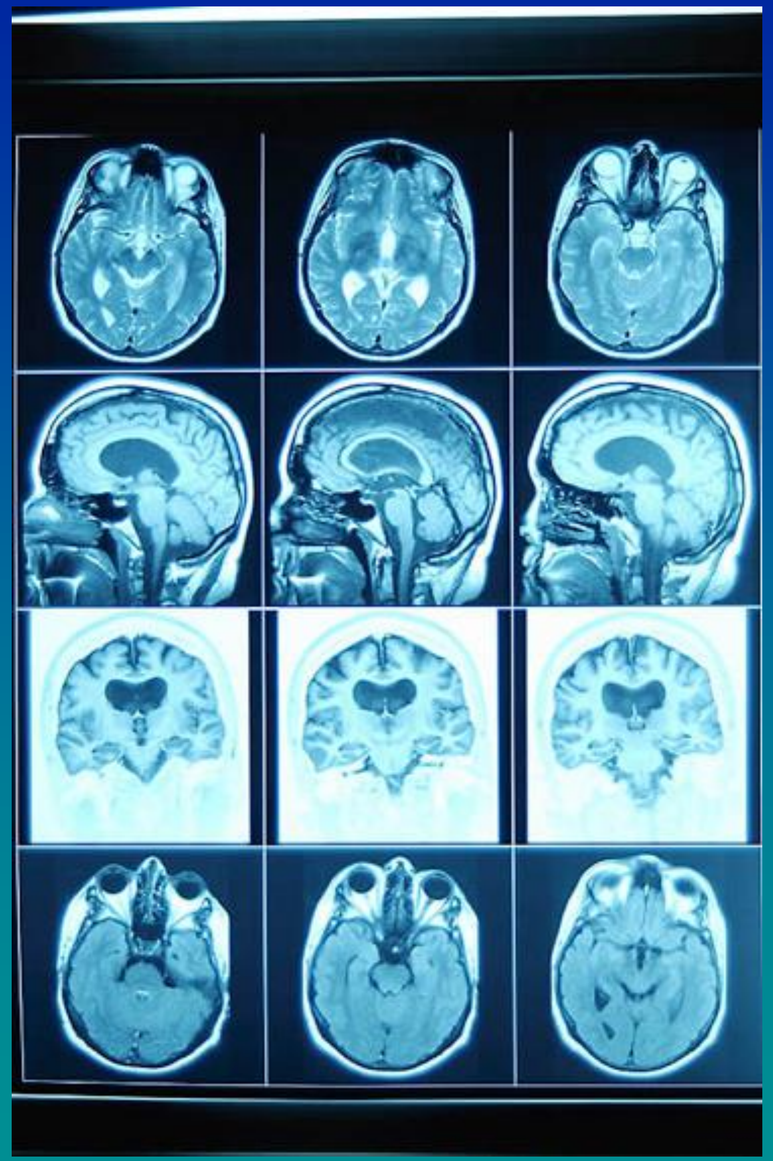
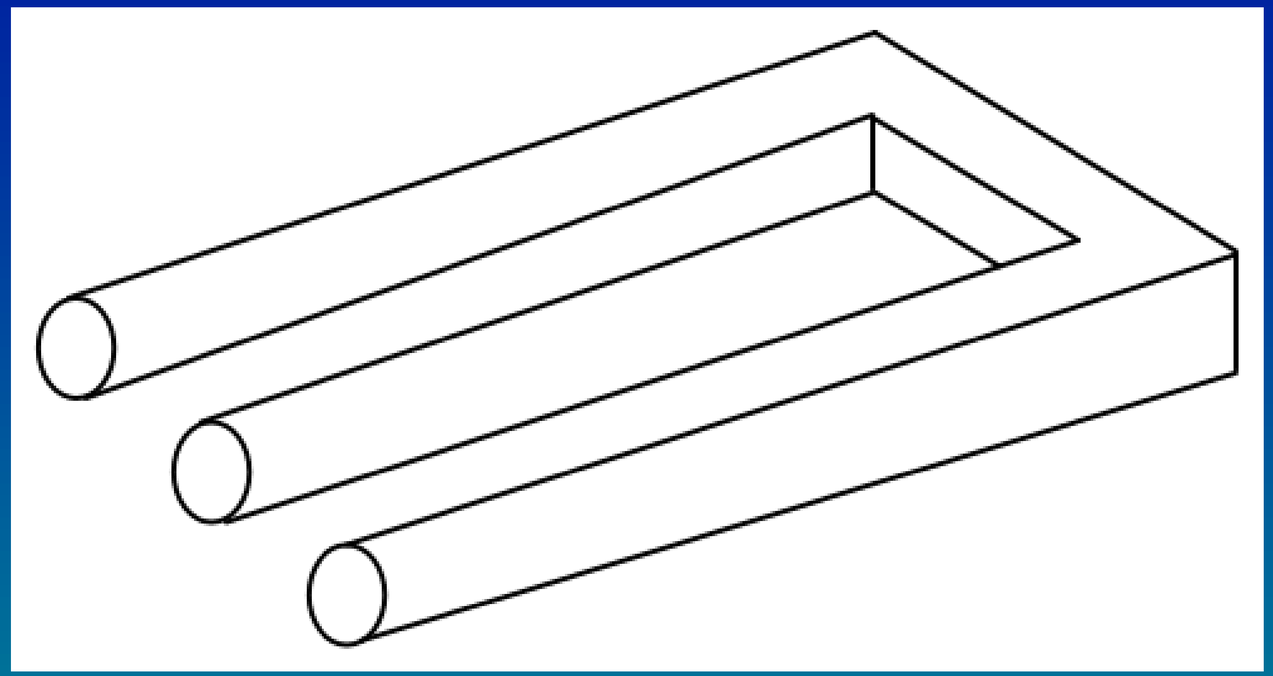
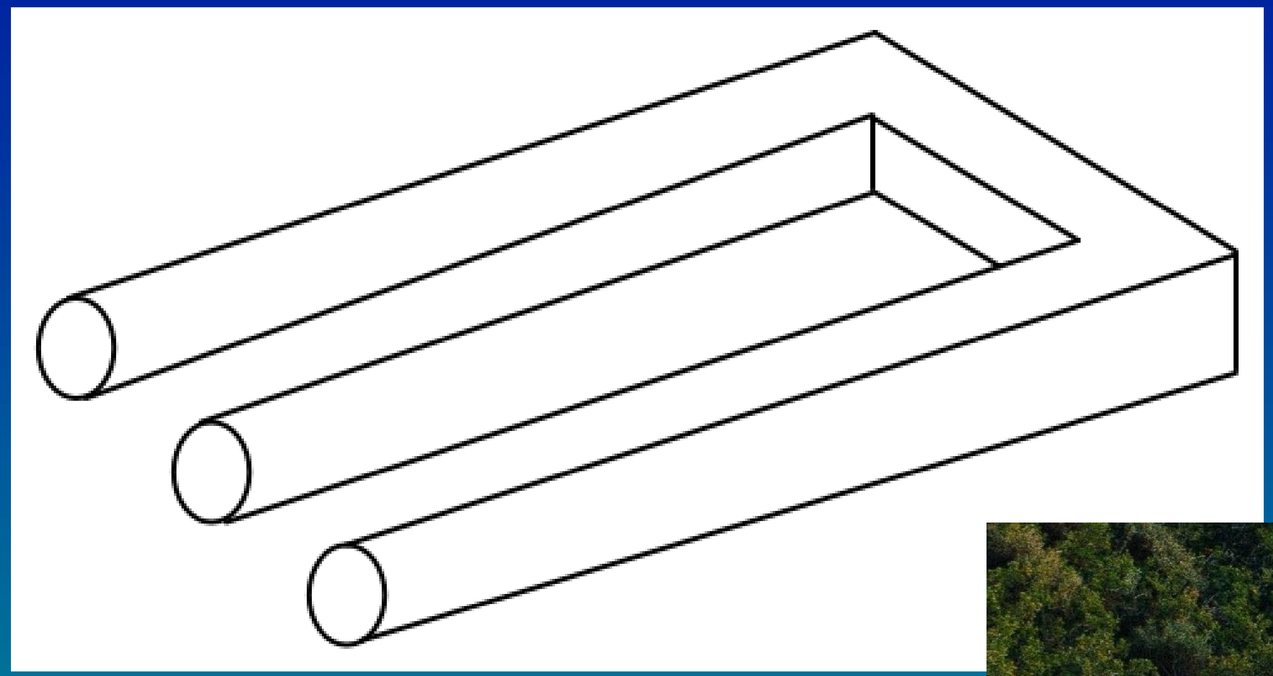




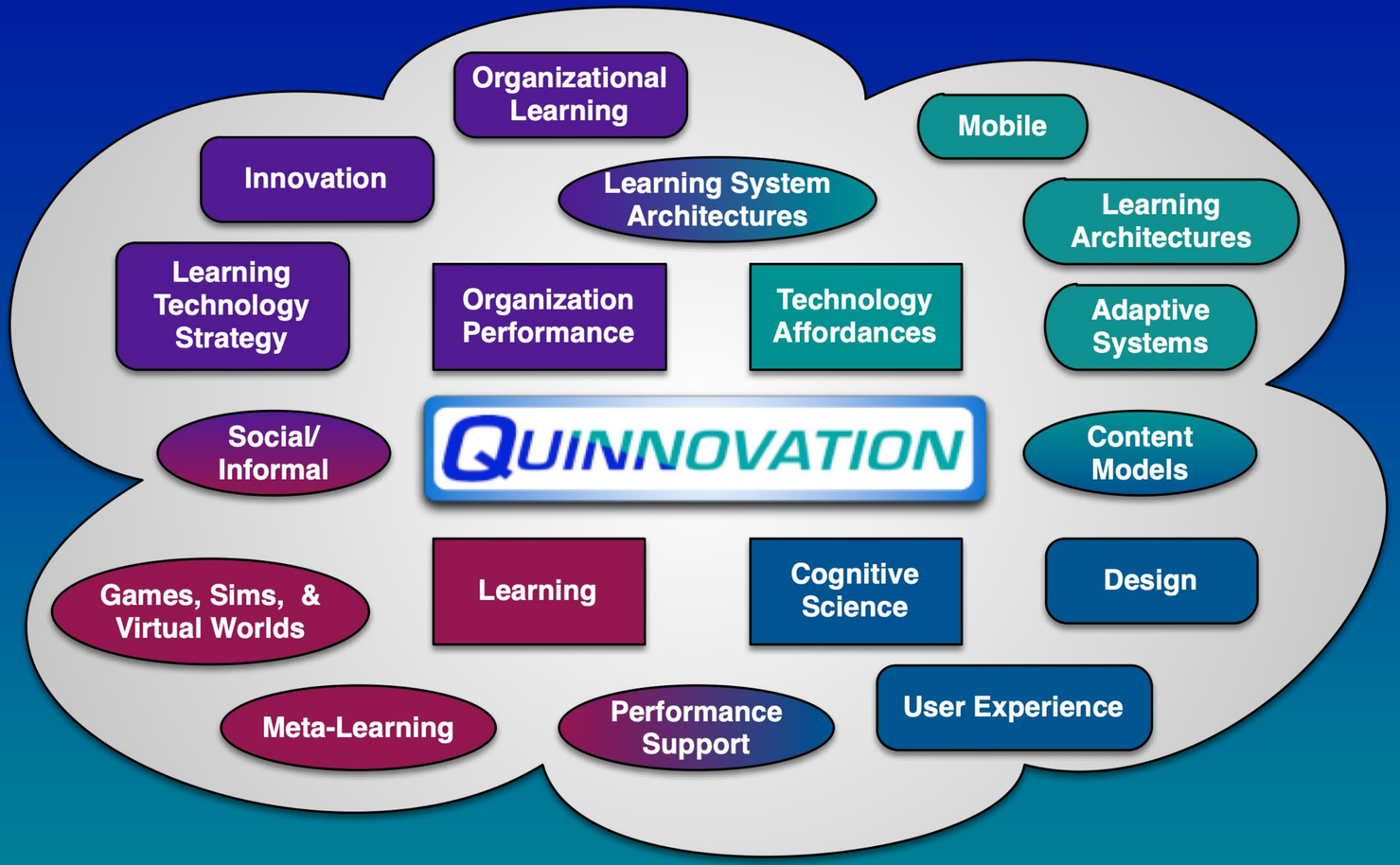


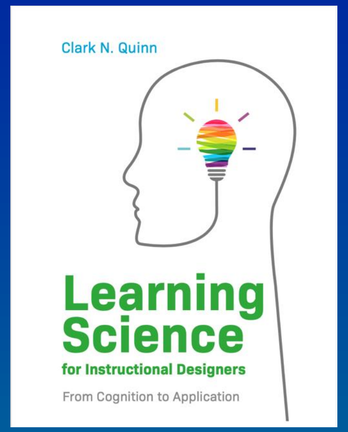
Beyond Logic: Designing for the Flaws in our Cognitive Architecture

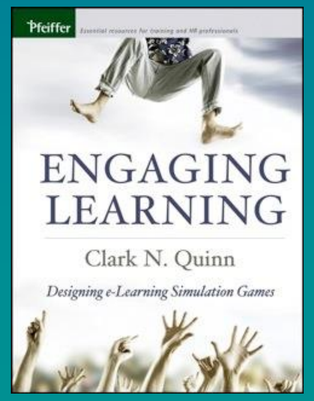
Clark Quinn, Ph.D.

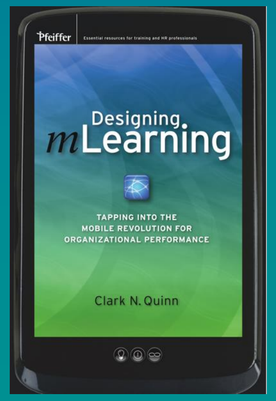
QUINNOVATION

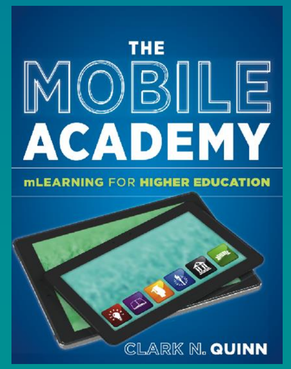
@quinnovator

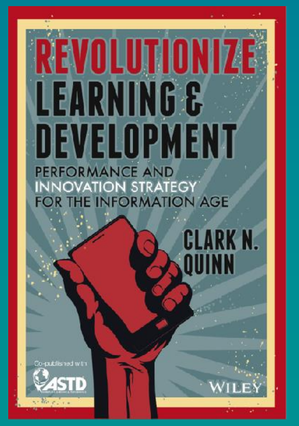

Organizational Learning
Mobile
Innovation
Learning System Architectures
Learning Architectures
Learning Technology Strategy
Organization Performance
Technology Affordances
Adaptive Systems
QUINNOVATION
Social/ Informal
Content Models
Games, Sims, & Virtual Worlds
Learning
Cognitive Science
Design
Meta-Learning
Performance Support
User Experience

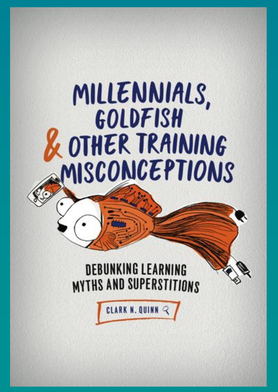

Clark N. Quinn
Learning Science
for Instructional Designers
From Cognition to Application


Pfeiffer
ENGAGING LEARNING
Clark N. Quinn
Designing e-Learning Simulation Games


Pfeiffer
Designing mLearning
TAPPING INTO THE MOBILE REVOLUTION FOR ORGANIZATIONAL PERFORMANCE
Clark N. Quinn


THE MOBILE ACADEMY
mLEARNING FOR HIGHER EDUCATION
CLARK N. QUINN


REVOLUTIONIZE LEARNING & DEVELOPMENT
PERFORMANCE AND INNOVATION STRATEGY FOR THE INFORMATION AGE
CLARK N. QUINN
ASTD
WILEY


MILLENNIALS, GOLDFISH & OTHER TRAINING MISCONCEPTIONS
DEBUNKING LEARNING MYTHS AND SUPERSTITIONS
CLARK N. QUINN

...


digital
PDP-12
OFF LINE
OFF LINE

flies like
flies like

Time flies like an arrow
flies like

Time flies like an arrow
Fruit flies like a banana

Time flies like an arrow

Fruit flies like a banana

flies=flies

?

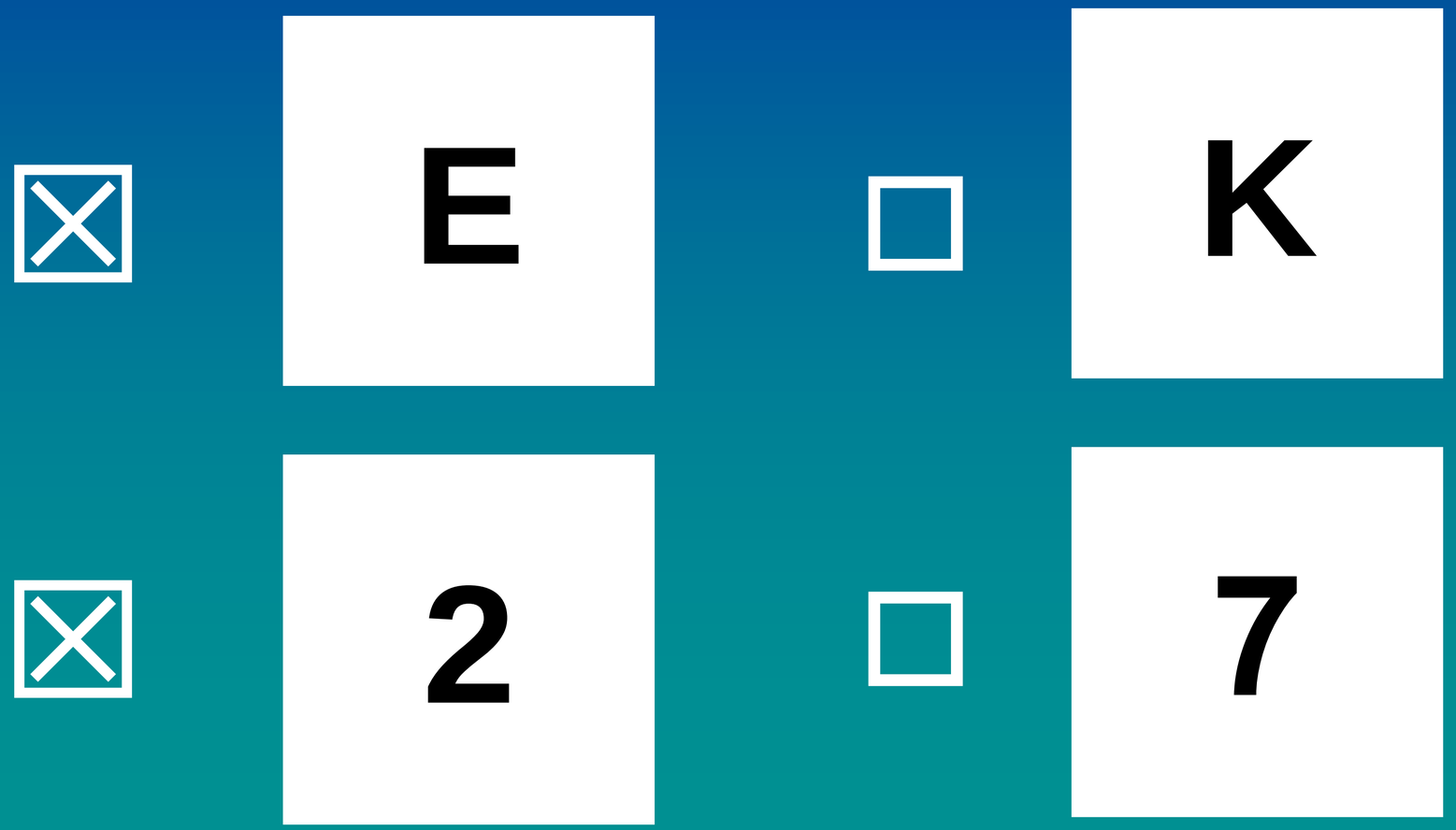
Contextual!

Contextual!
(aka situated/emergent)

Given:
set of cards;
letter on one side,
digit on the other;
and a rule that must not be violated

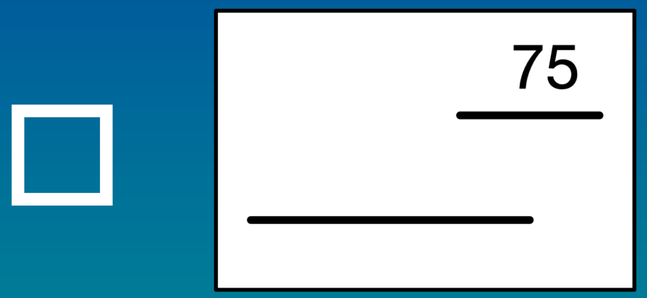
Rule: if vowel, then odd.
Which turn over to verify rule not violated?

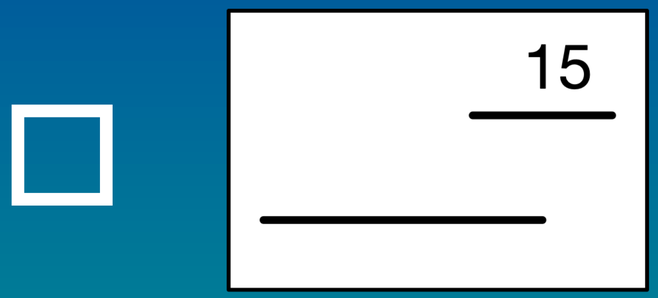
Rule: if vowel, then odd.
Which turn over to verify rule not violated?

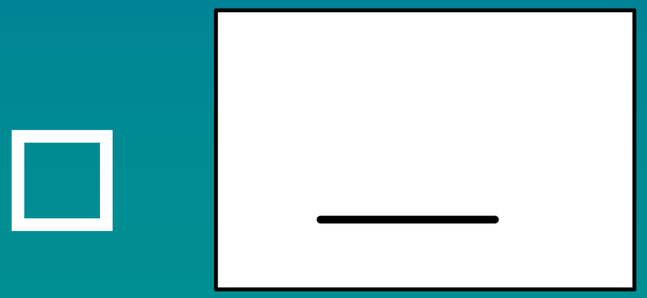


Given: set of checks; amount on one side, space for signature on the other;
and a rule that must not be violated

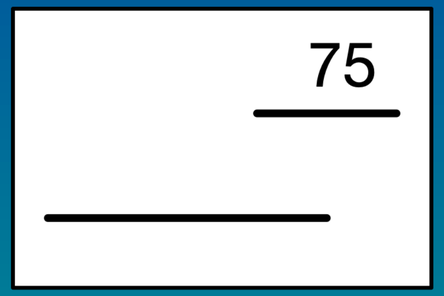
Rule: if >$25, then signature.
Which turn over to verify rule not violated?

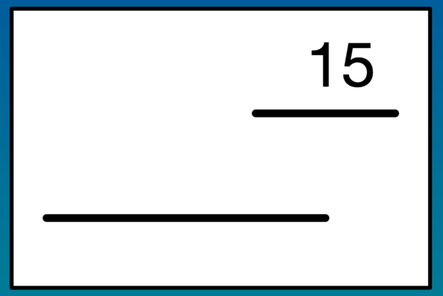


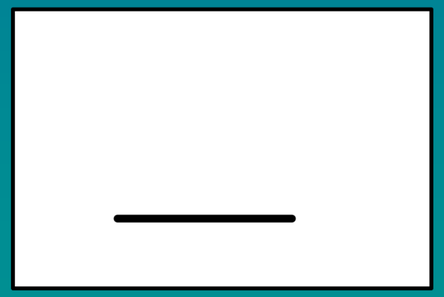




Rule: if >$25, then signature.
Which turn over to verify rule not violated?

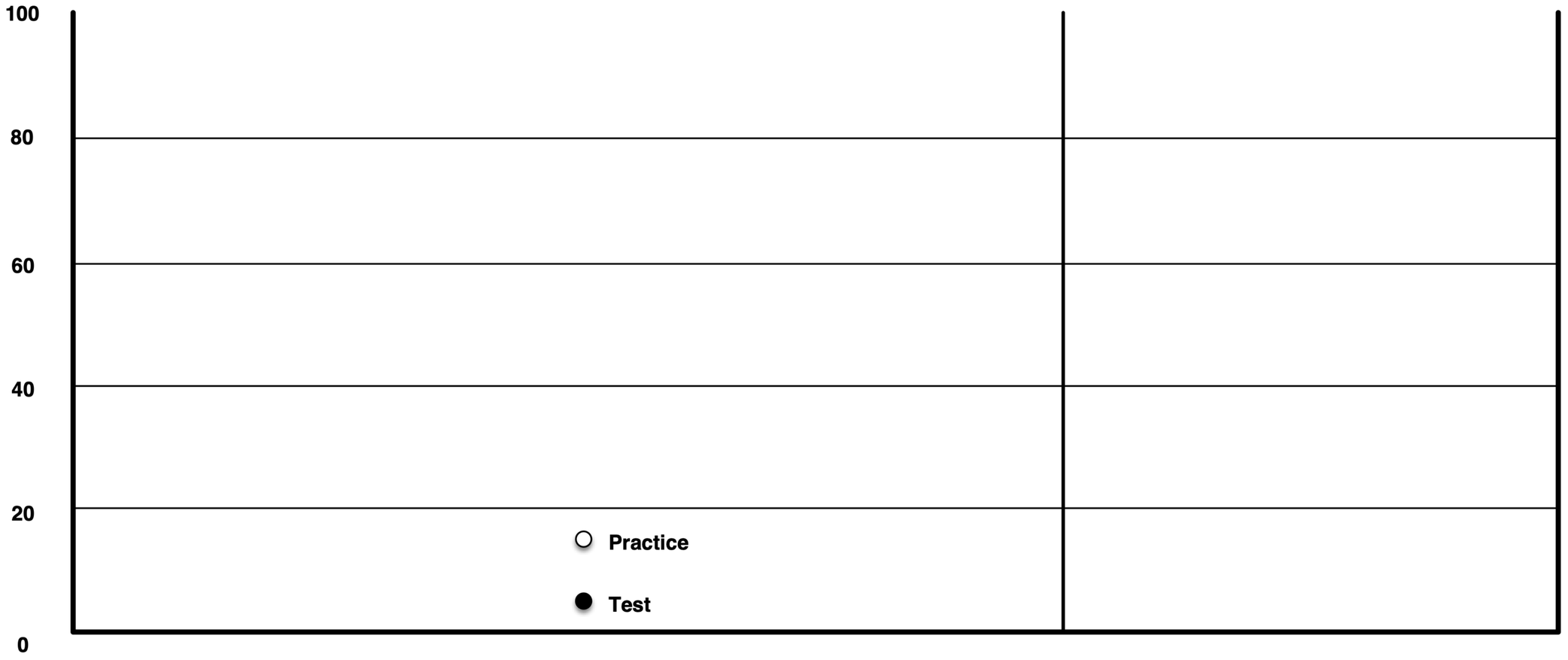
☒ 

☐ 

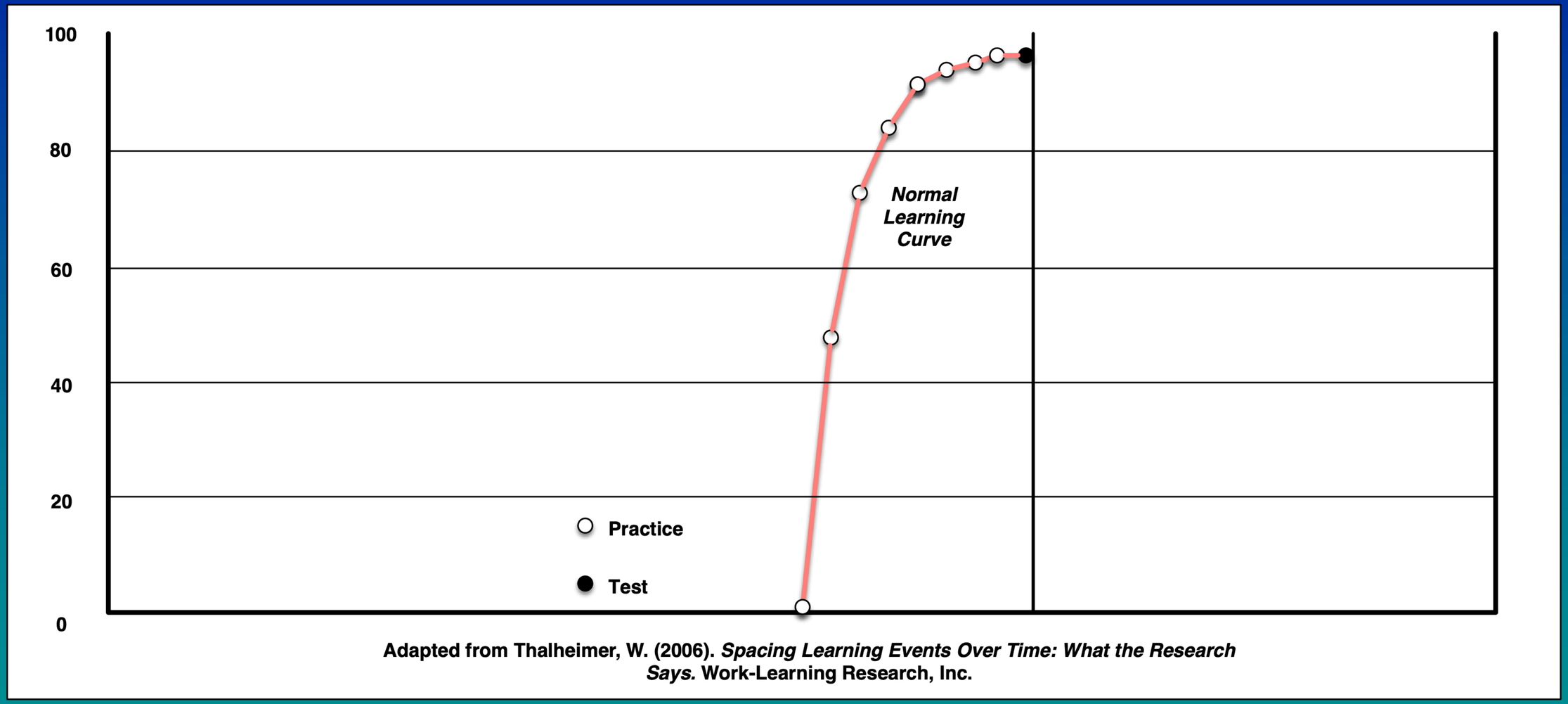
☒ 

☐ 

But wait, there's more…



Adapted from Thalheimer, W. (2006). *Spacing Learning Events Over Time: What the Research Says.* Work-Learning Research, Inc.



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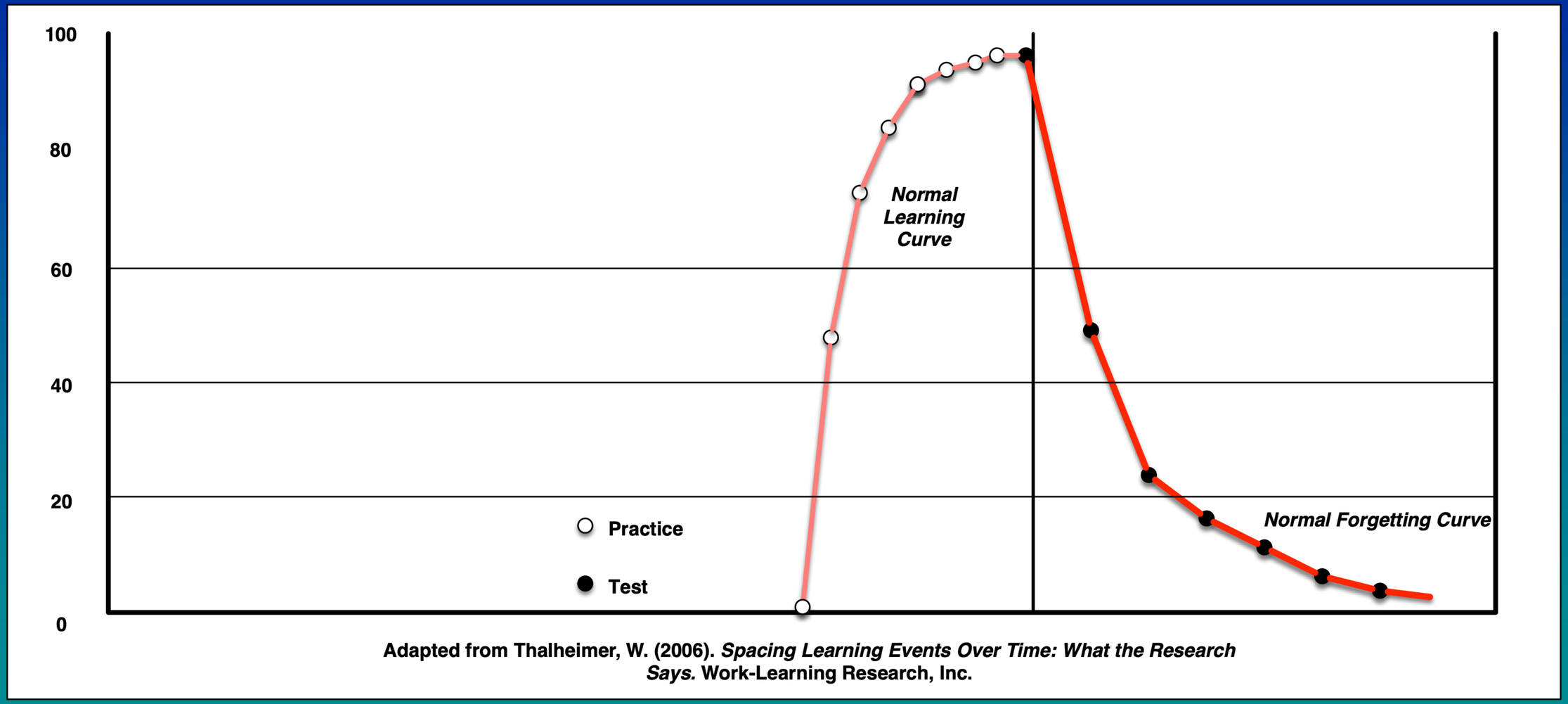

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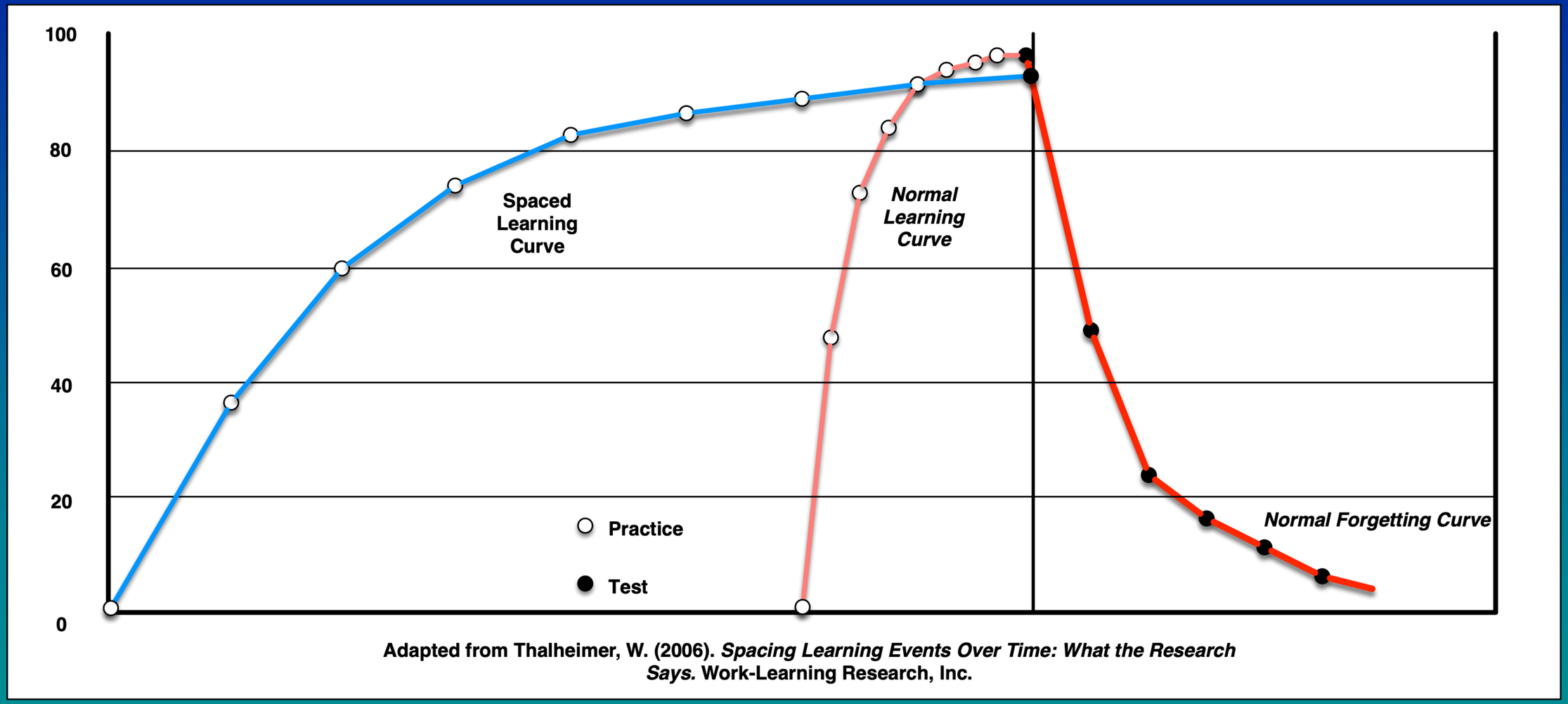

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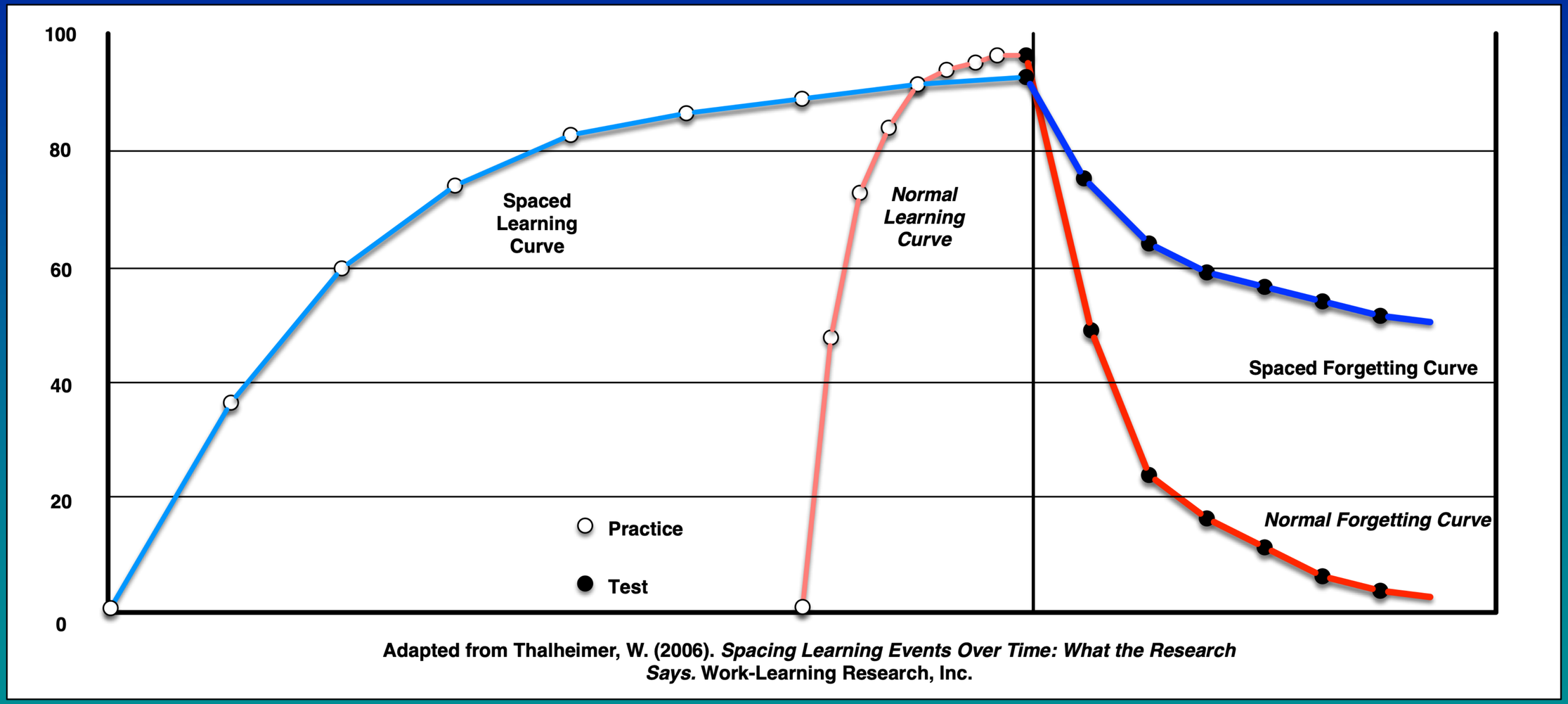

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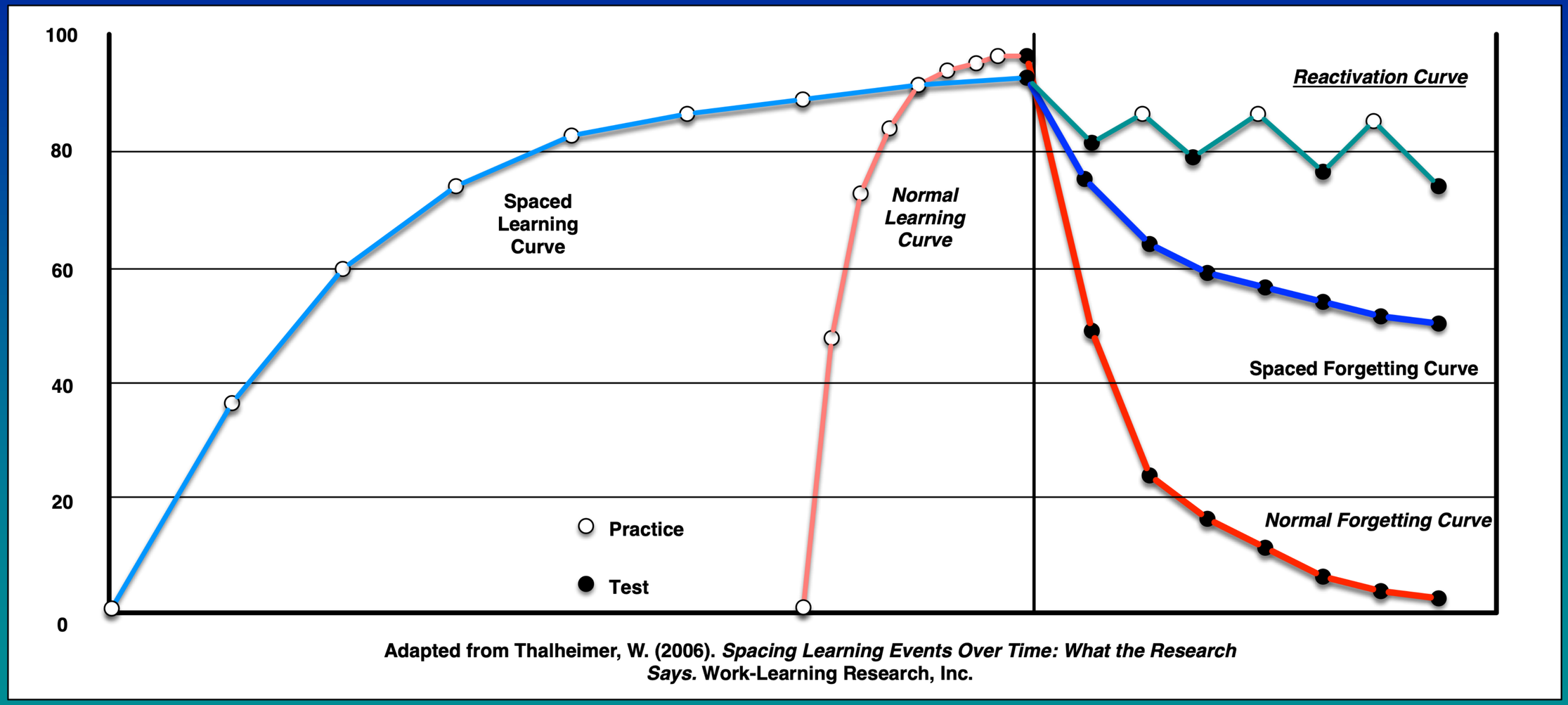

Adapted from Thalheimer, W. (2006). *Spacing Learning Events Over Time: What the Research Says.* Work-Learning Research, Inc.

Select Treatment

Hello c

HELP EXIT

POINTS

TIME
09:15:16 am

PAIN LEVEL
5

ADVERSE EFFECTS

ANXIETY
0%

RESPIRATORY
0%

HYPOTENSION
0%

PATIENT PROFILE

DOCTOR PRESCRIPTION

What treatment do you want to give?

Select an appropriate treatment and click Submit.
You can read about the medication chosen by clicking on the 'What is this?' button.

- Iboprufen 400mg
- Percocet 1 tablet
- Morphine Sulphate 5 gms
- Morphine Sulphate 10 gm
- Morphine Sulphate 15 gm
- Alert head nurse Immediately
- Wait and see
- Treat Adverse Effect

What is this? Submit

$$1288 \div 56 =$$

$$1288 \div 56 =$$

A. I can do in my head
B. I can do with pencil & paper

Distributed!

Well	Poorly

Well	Poorly
Pattern-matching	

Well	Poorly
Pattern-matching	
Meaning	

Well	Poorly
Pattern-matching	
Meaning	
Language	

Well	Poorly
Pattern-matching	
Meaning	
Language	
Motion	

Well	Poorly
Pattern-matching	
Meaning	
Language	
Motion	
Social	

Well	Poorly
Pattern-matching	Arbitary
Meaning	
Language	
Motion	
Social	

Well	Poorly
Pattern-matching	Arbitary
Meaning	Rote
Language	
Motion	
Social	

Well	Poorly
Pattern-matching	Arbitary
Meaning	Rote
Language	Abstract
Motion	
Social	

Well	Poorly
Pattern-matching	Arbitary
Meaning	Rote
Language	Abstract
Motion	Quantity
Social	

Well	Poorly
Pattern-matching	Arbitary
Meaning	Rote
Language	Abstract
Motion	Quantity
Social	Accuracy

Well	Poorly
Pattern-matching	Arbitary
Meaning	Rote
Language	Abstract
Motion	Quantity
Social	Accuracy
Biologically Primary	

Well	Poorly
Pattern-matching	Arbitary
Meaning	Rote
Language	Abstract
Motion	Quantity
Social	Accuracy
Biologically Primary	Biologically Secondary

Cognitive Limitation	

Cognitive Limitation	Support

Cognitive Limitation	Support
Sensory Store	

Cognitive Limitation	Support
Sensory Store	Capture

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations
Recall Limits	

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations
Recall Limits	Lookup/Search

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations
Recall Limits	Lookup/Search
Skip/Forget Steps	

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations
Recall Limits	Lookup/Search
Skip/Forget Steps	Checklists

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations
Recall Limits	Lookup/Search
Skip/Forget Steps	Checklists
Previous Biases	

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations
Recall Limits	Lookup/Search
Skip/Forget Steps	Checklists
Previous Biases	Lateral Prompts

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations
Recall Limits	Lookup/Search
Skip/Forget Steps	Checklists
Previous Biases	Lateral Prompts
Premature Evaluation	

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations
Recall Limits	Lookup/Search
Skip/Forget Steps	Checklists
Previous Biases	Lateral Prompts
Premature Evaluation	Data

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
Working Memory Limits	Calculators
Rehearsal Limits	External Representations
Recall Limits	Lookup/Search
Skip/Forget Steps	Checklists
Previous Biases	Lateral Prompts
Premature Evaluation	Data
Intuition/Fatigue	

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
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Rehearsal Limits	External Representations
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Previous Biases	Lateral Prompts
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Intuition/Fatigue	Templates

Cognitive Limitation	Support
Sensory Store	Capture
Attention Limits	Notifications
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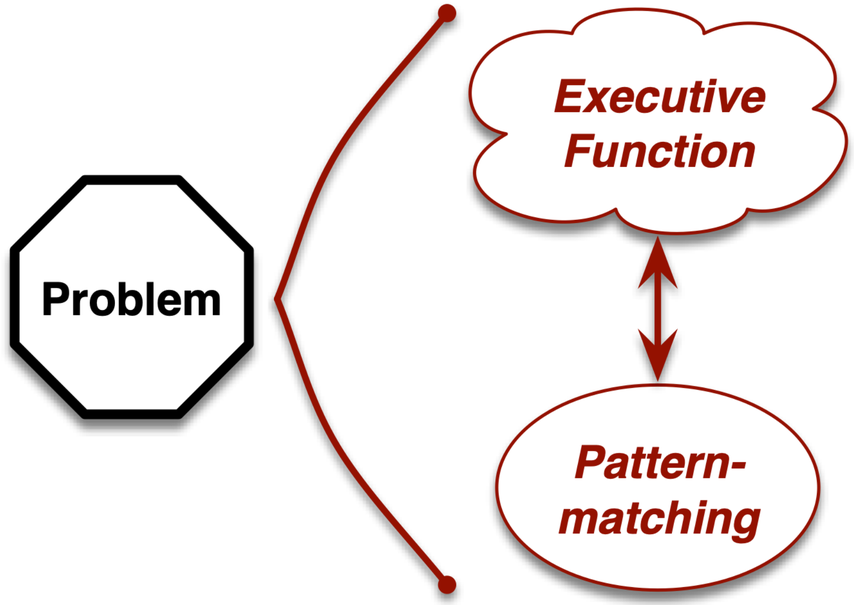
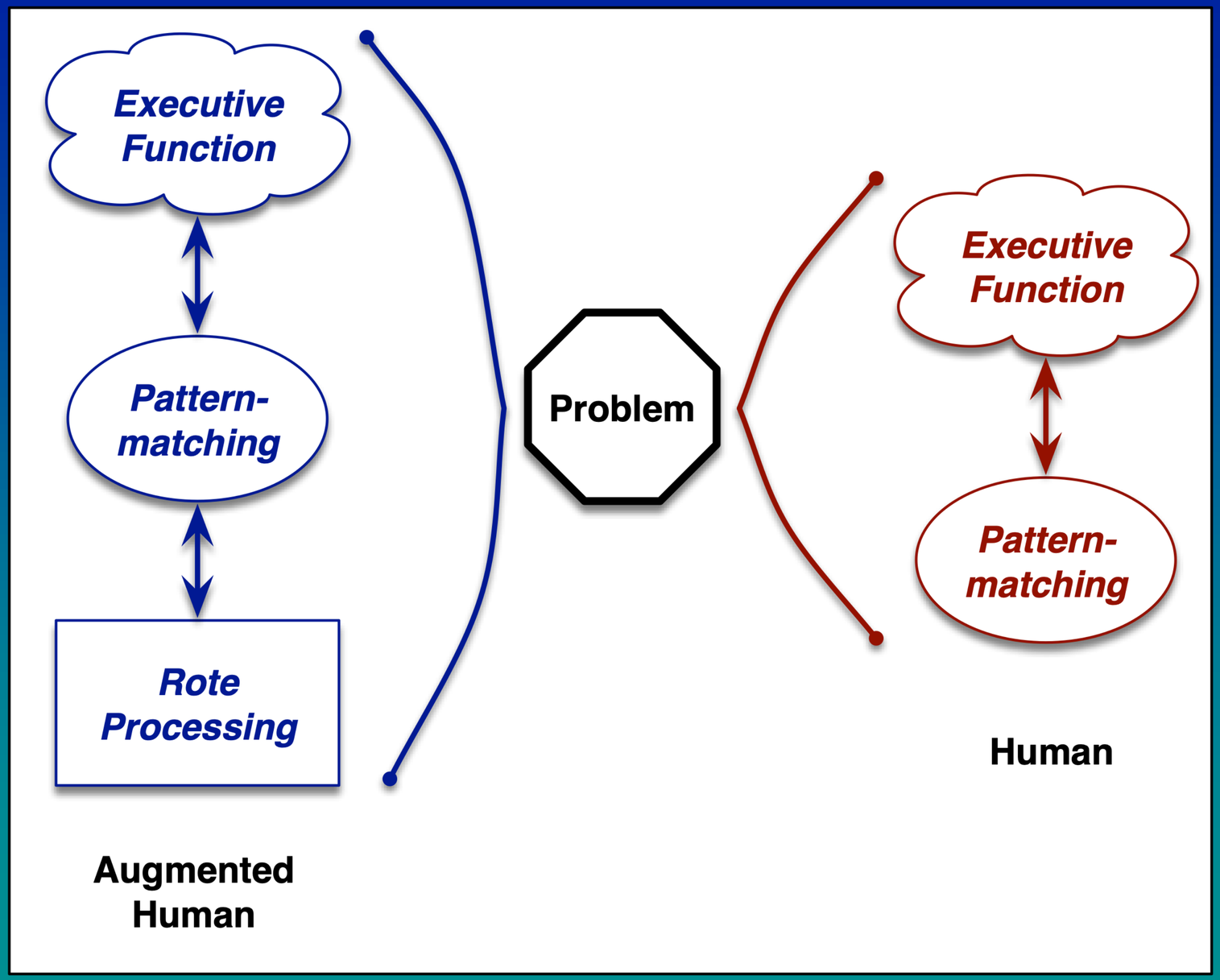
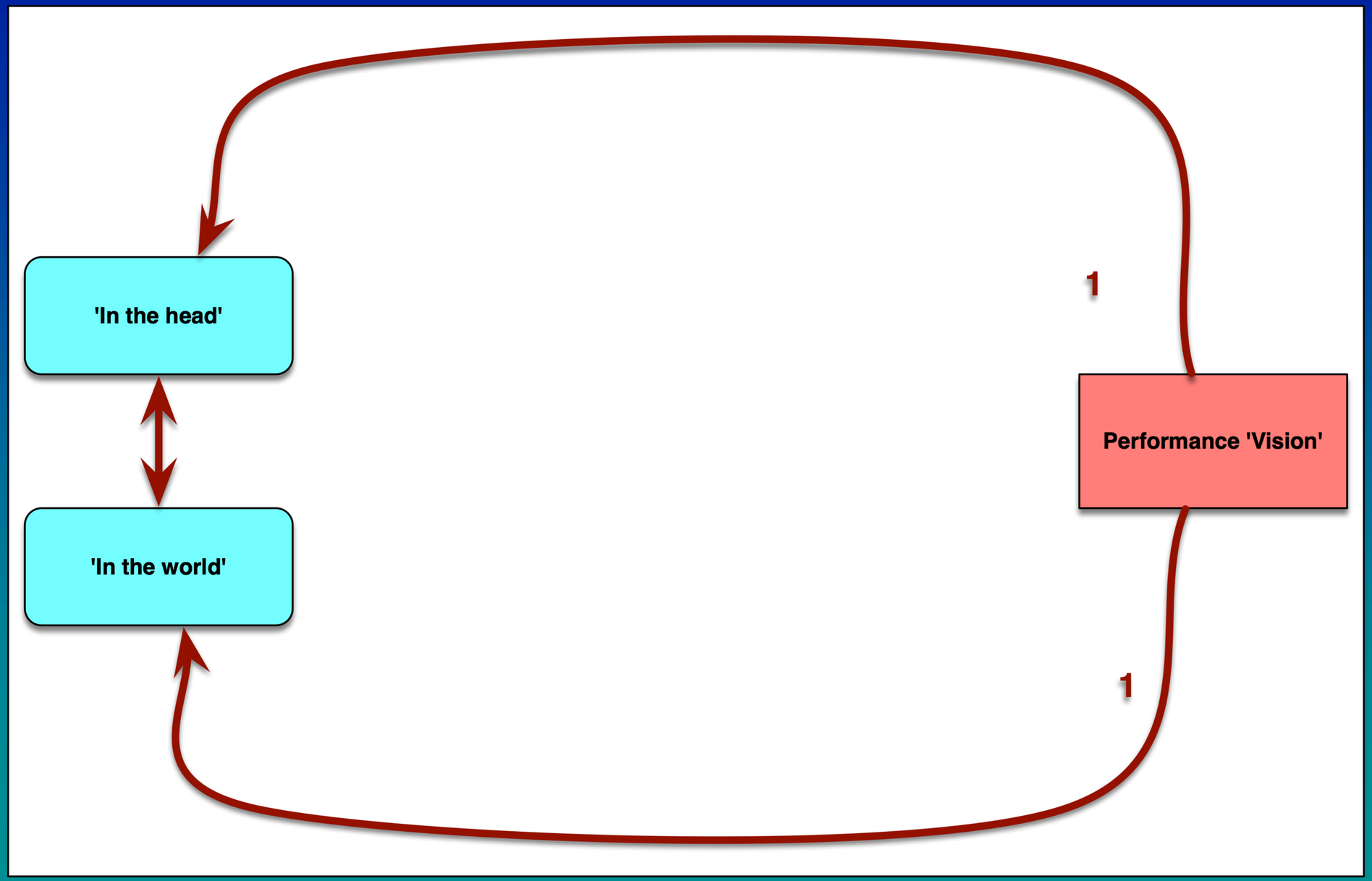
Intuition/Fatigue	Templates
…	…

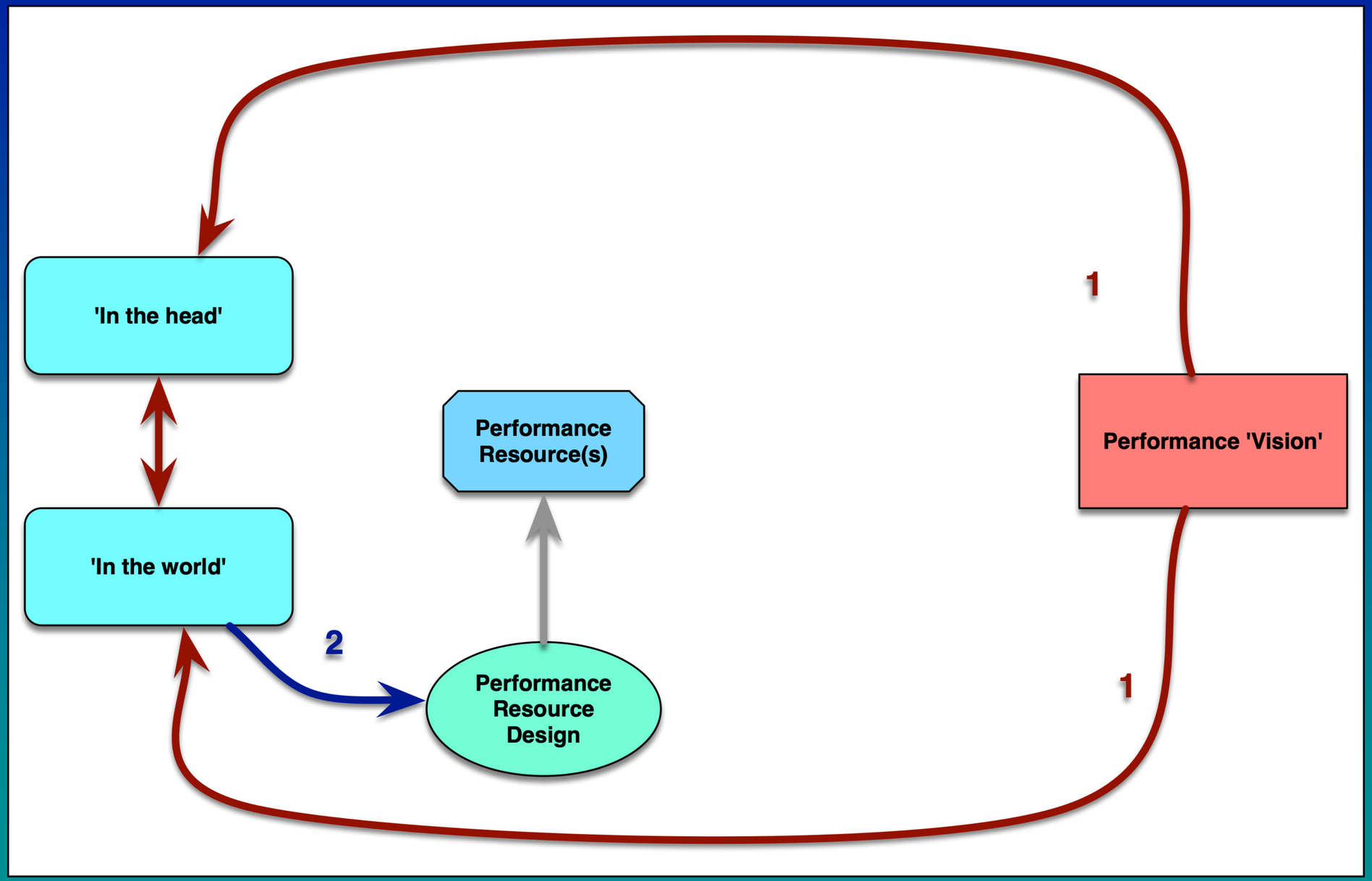


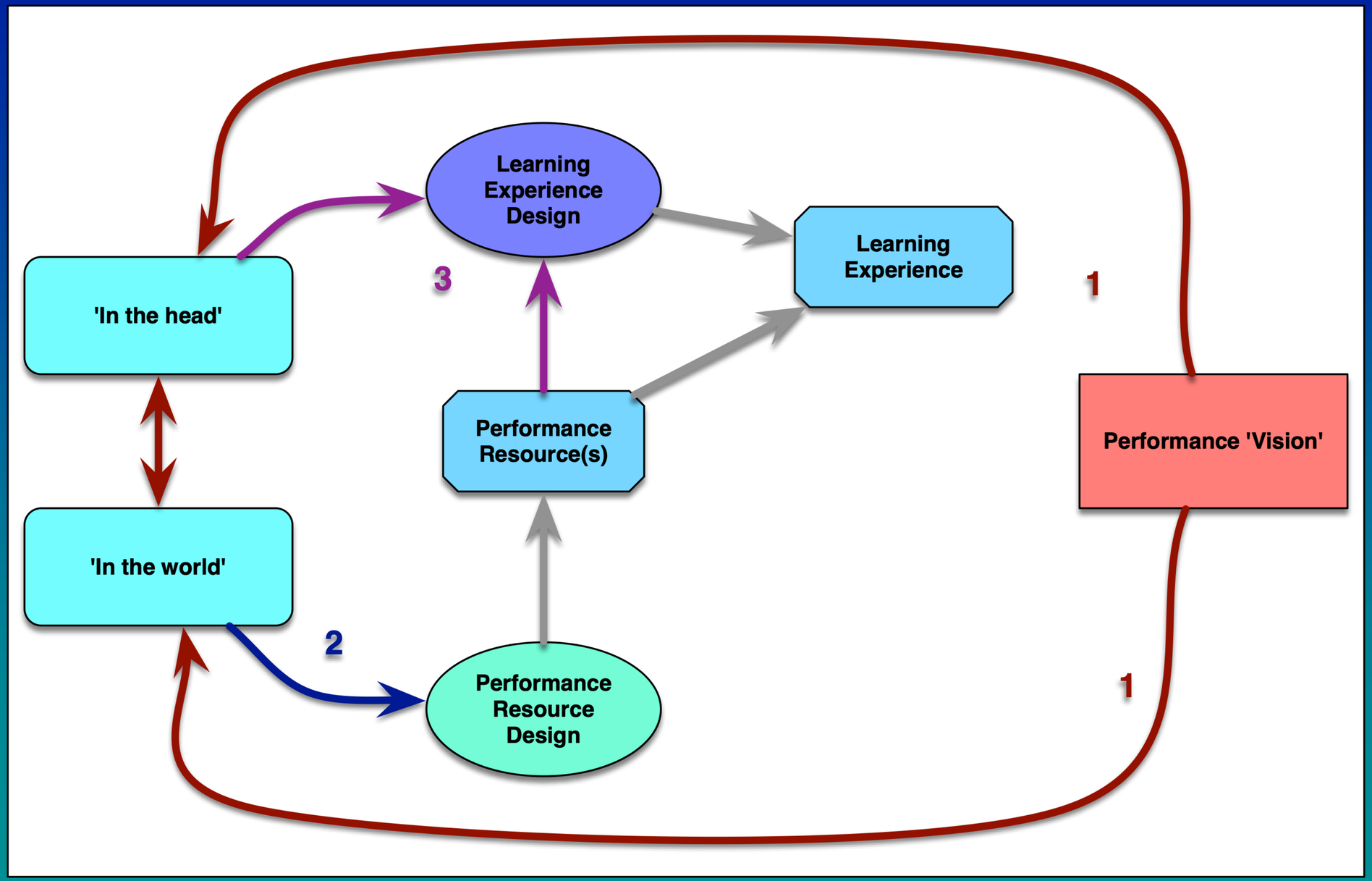
Human

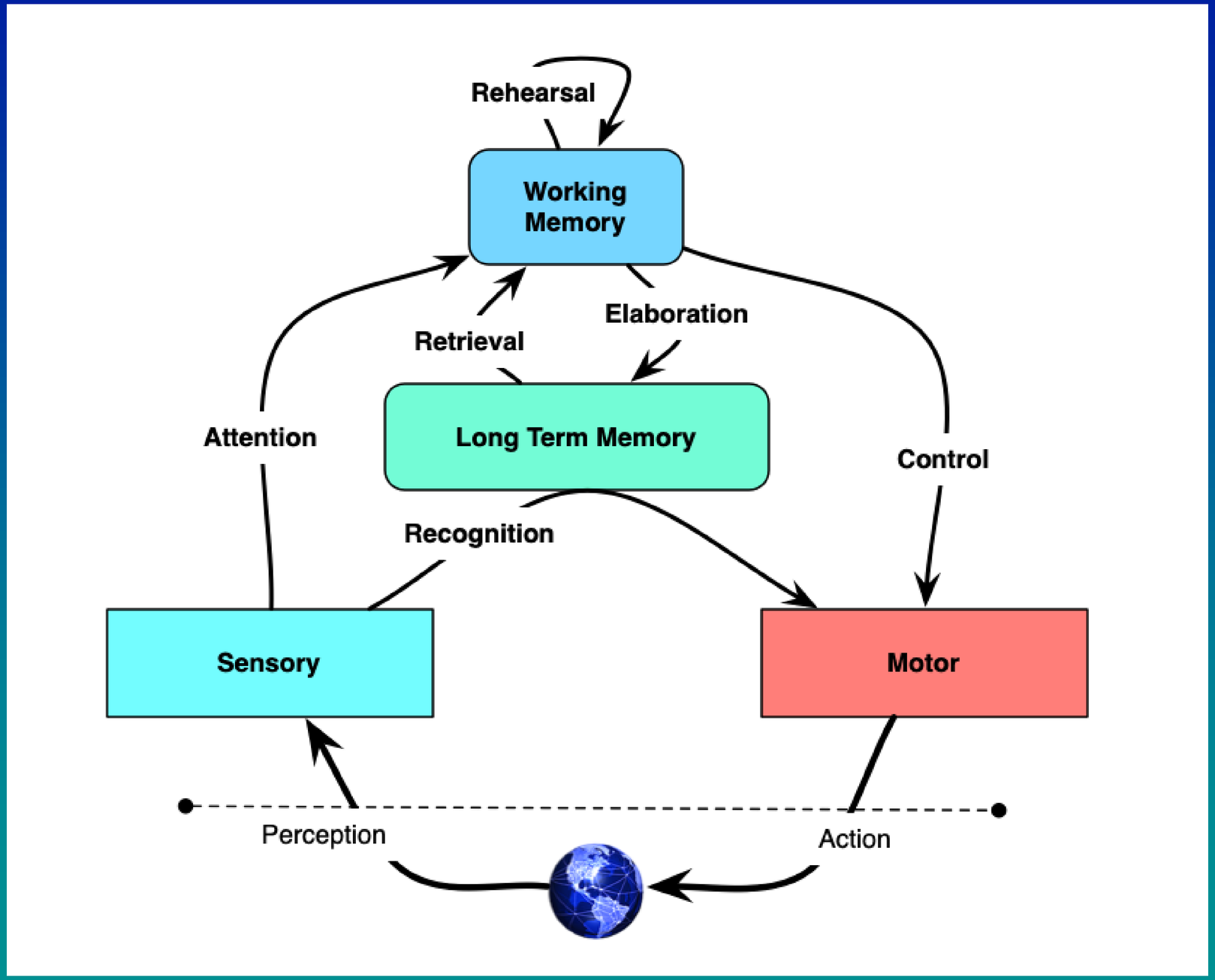

Executive Function
Pattern-matching
Rote Processing
Augmented Human
Problem
Executive Function
Pattern-matching
Human

Performance 'Vision'


'In the head'
'In the world'
Performance 'Vision'
1
1


'In the head'
'In the world'
Performance Resource(s)
Performance Resource Design
Performance 'Vision'
1
2
1


Learning Experience Design
Learning Experience
'In the head'
3
1
Performance Resource(s)
Performance 'Vision'
'In the world'
2
Performance Resource Design
1


Rehearsal
Working Memory
Elaboration
Retrieval
Attention
Long Term Memory
Control
Recognition
Sensory
Motor
Perception
Action

Clark N. Quinn

Learning Science

for Instructional Designers

From Cognition to Application

Thanks!

Clark Quinn
clark@quinnovation.com
+1-925-200-0881
site: quinnovation.com
blog: learnlets.com
twitter: @quinnovator
books: quinnovation.com/books.html

QUINNOVATION

Internet Time Alliance

SERIOUS eLEARNING