

# Game On!

## Optimizing Training for Today's Workforce

Kimberly Himmer

Commander, U.S. Navy (Ret.)

Articulated Python Inc.

Kimberly.Himmer@ArticulatedPython.com

 @RticulatdPython

# Introduction

- Background research on the limitations of some training mediums
- Principles of Andragogy
- Games as a training system
- Games as an effective training medium for the adult learner

**Games are not child's play.**

# Ineffectiveness of CBT (Computer-Based Training)

- 90% of online learners fail to complete a class in which they've enrolled
- U.S. Navy no longer requires sailors to use CBT for General Military Training
- U.S. Navy study found that participants in professional Surface Warfare Officer said CBT training was ineffective and likened it to, "Death by PowerPoint."

# Ineffectiveness of CBT

- According to a Norwegian Military study:
  - Students come to CBT ready to learn
  - Poor Instruction/Instructional Design quickly demotivates the learner
  - Learners are turned-off by bad learning platforms



# Ineffectiveness of CBT

- According to a Norwegian Military study:
  - “How you present content affects learner motivation”
  - “Motivation influences engagement and cognitive efforts, and thereby affects the ability to process information and construct knowledge”
  - Learning “should be designed and developed to maintain the learner’s attention by stimulating their curiosity and desire to actively take part in the learning process”

# Pedagogy Vs. Andragogy

- Pedagogy:
  - Dissemination of basic skills and declarative knowledge
  - Teacher is in control of the evolution and evaluation
- Andragogy:
  - Theory of life-long learning
  - Vocational learning of particular importance



# How Adults Learn

- According to Malcolm Knowles, the adult learner:
  - Is self-directed
  - Has a reservoir of prior knowledge and experience with which to relate new learning
  - Is motivated to learn out of responsibility for social roles, as opposed to academic pressure
  - Wants to learn new things that are immediately applicable to his current situation
- Adults feel utterly patronized when taught using pedagogical principles

# CBT

Main Menu

Take the Test

Print your certificate

Save/Quit

Introduction

**Types of  
ransomware**

Delivery methods

Protecting against  
attack

Case Study

Conclusion



There are two types of ransomware:

- Locker
- Crypto



# CBT

Main Menu

Take the Test

Print your certificate

Save/Quit

Introduction

**Types of  
ransomware**

Delivery methods

Protecting against  
attack

Case Study

Conclusion



What are the two types of  
Ransomware?

- A. Spike and Blitz
- B. Steve and Swift
- C. Locker and Crypto

# CBT: Pedagogy or Andragogy?

	PEDAGOGY	ANDRAGOGY
LEARNER:	Dependent on Instructor	<del>Self-directed</del>
METHOD:	Didactic	<del>Experiential learning</del>
PROCESS:	Subject-material-based	<del>Problem solving and performance of tasks</del>
ASSESSMENT:	Instructor evaluates learning	<del>Learner self-evaluates progress and growth</del>
MOTIVATION:	External	<del>Internal</del>

# What About Simulators?



**“I suppose I’ll be the one  
to mention the elephant in the room.”**

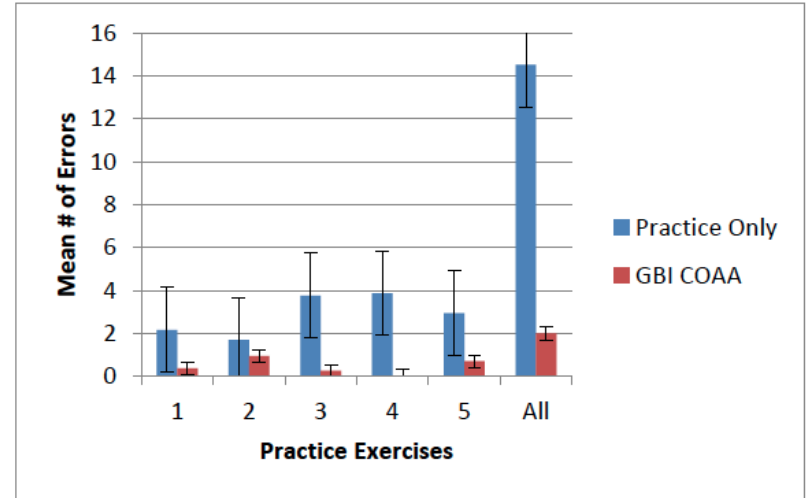
# What About Simulators?

- A practice platform for knowledge acquired through other means (typically a classroom)
- Representation of reality
- Judged by its correspondence to the system
- Not necessarily a conflict or competition; not looking for a WIN
- Purpose is to show mastery of a skill set; teleological completion of tasks



# Results of 2014 Research by U.S. NAWC & U.S. ARI

- Simulator practice group unable to self-diagnose errors
- Average of:
  - 14 errors for practice group
  - 2 errors for GBL group
- GBL group performed significantly better on more complex scenarios that were not practiced/ taught



(Source: Walker, H. & Wray, R. 2014)

# Simulators: Pedagogy or Andragogy?

	PEDAGOGY	ANDRAGOGY
LEARNER:	Dependent on Instructor	<del>Self-directed</del>
METHOD:	Didactic <b>ACQUISITION</b> of knowledge	Experiential <b>PRACTICE</b>
PROCESS:	Subject-material-based	Problem-solving and performance of tasks
ASSESSMENT:	Instructor evaluates learning	<del>Learner self-evaluates progress and growth</del>
MOTIVATION:	External	<del>Internal</del>

# Harnessing Andragogy for Training

	PEDAGOGY	ANDRAGOGY
LEARNER:	<del>Dependent on Instructor</del>	Self-directed
METHOD:	<del>Didactic</del>	Experiential learning
PROCESS:	<del>Subject material based</del>	Problem-solving and performance of tasks
ASSESSMENT:	<del>Instructor evaluates learning</del>	Learner self-evaluates progress and growth
MOTIVATION:	<del>External</del>	Internal

# Harnessing Andragogy for Training...

**Self-directed**

**Experiential learning**

**Problem-solving and  
performance of tasks**

**Learner self-evaluates  
progress and growth**

**Internal**



... Through Games



**What is a game?**



# Games are Systems

“A *system* is a set of things that affect one another within an environment to form a larger pattern that is different from any of the individual parts.”

- Systems have 4 main elements:
  - Objects
  - Attributes
  - Internal relationships
  - Environment

# Games are Complex, *Emergent* Systems



- Product of coupled, context-dependent interactions
- Can describe all of the rules, but cannot describe all of the products of those rules
- Behavior of the system cannot be summed up by the behaviors of its constituent parts
- The resulting system is nonlinear

# Soccer as a system

- Objects:
  - Ball, goals, players, field
- Attributes:
  - Positions, teams, rules
- Internal relationships:
  - Between teams, players
- Environment:
  - The game itself, the conditions that allow the game to exist



# Soccer as a system



## Complexity and Emergence:

- No two soccer games are the same, even between the same teams
- The system evolves according to the context-dependent interactions
- Results in **meaningful play**

# Games as Andragogy

**Self-directed**

**Experiential learning**

**Problem-solving and  
performance of tasks**

**Learner self-evaluates  
progress and growth**

**Internal**

# Self-directed

- Games

- Fictionality imparts ambiguity into the system
- Allows for a productive learning environment: no assumptions
- Exploratory spaces
- Player has:
  - Volition
  - Agency



- Andragogy

- Adult learner does not want to be spoon-fed
- As Knowles put it, "he can explore a topic in a way that makes sense to him."
- Learner has control over his learning experience





# Experiential learning

- Through gameplay, you learn how the system works
- Therefore, the learning objectives **MUST** be intrinsic to the system of the game
- Do not “TELL” the player; let them “DO”



# Problem-solving and performance of tasks



# Learner Self-Evaluates Progress and Growth



- Feedback is critical to the adult learner, like a “guided missile”
- Learner wants a mechanism to self-evaluate progress and growth
- Good games provide constant feedback to the player

# Internal

- Play serves as an organizing function on both a cultural and individual level
- “Humans are the biggest players of all. We are built to play, and built through play”



# Internal

- Motivation comes from the well-functioning system of the game
  - Volition and agency
  - Learning experientially, through “DOING”
  - Solving problems and overcoming challenges
- Motivation is intrinsic, if the system is designed for the player-learner
- Motivation is also autotelic to the game

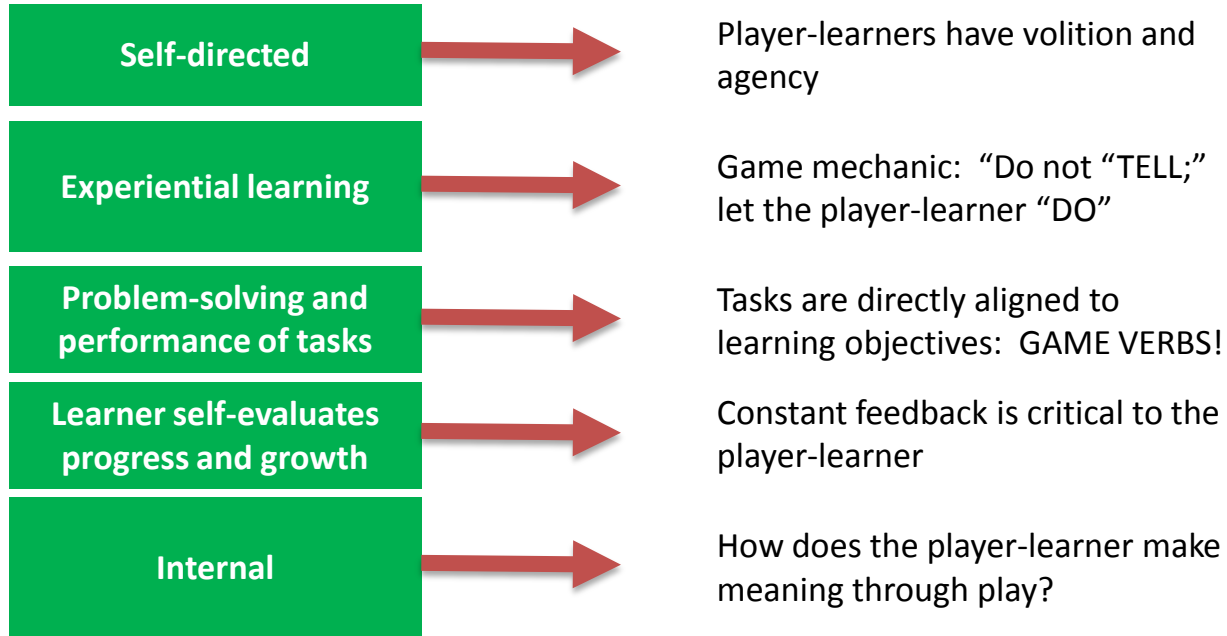
# Internal

## Rhetorics of Play

- **Progress**
- **Fate**
- **Power**
- **Identity**
- **Imaginary**
- **Self**
- **Frivolous**

## Layman's Terms

# Harnessing Andragogy through Game-Based Training



“Leadership: the art of getting someone else to do something you want done because he wants to do it.”

-- Dwight D. Eisenhower



# Game On!


## Optimizing Training for Today's Workforce

Kimberly Himmer

Commander, U.S. Navy (Ret.)

Articulated Python Inc.

Kimberly.Himmer@ArticulatedPython.com

 @RticulatdPython

# Sources

- Bowman, W., Crawford, A., & Mehay, S. (2008). An Assessment of the Effectiveness of Computer-based Training for Newly Commissioned Surface Warfare Division Officers. (Report No. NPS-HR-08-140). Naval Postgraduate School. Retrieved from <http://www.dtic.mil>.
- Brown, S. (2009). *Play: How it Shapes the Brain, Opens the imagination, and Invigorates the Soul*. New York, NY: Penguin.
- Faram, M. (2017, March 27). Navy eliminates online GMT—mandatory training shakeup puts commands in charge. *Navy Times Online*. Retrieved from <http://www.navytimes.com>.
- Huizinga, J. (1944). *Homo Ludens*. London, UK: Routledge, & Kegan Paul Ltd.

# Sources

- Isaksen, G. (2014). Hey, Your e-learning courses are giving me a cognitive overload. Interservice/Industry Training, Simulation, and Education Conference; Orlando, FL; December 2014. Retrieved from <http://www.iitsecdocs.com>.
- Isaksen, G. & Hole, S. (2016). How to evaluate student motivation and engagement in e-learning. Interservice/Industry Training, Simulation, and Education Conference; Orlando, FL; December 2016. Retrieved from <http://www.iitsecdocs.com>.
- Knowles, M. (1973) *The Adult Learner: A Neglected Species*. Houston, TX: Gulf Publishing Company
- Knowles, M., Holton, E., & Swanson, R. (2005). *The Adult Learner: The Definitive Classic in Adult Education and Human Resource Development*. Burlington, MA: Elsevier.

# Sources

- McGonigal, J. (2011). *Reality is Broken*. New York, NY: Penguin.
- Salen, K. & Zimmerman, E. (2004). *Rules of Play: Game Design Fundamentals*. Cambridge, MA: MIT Press.
- Sutton-Smith, B. (1997). *The Ambiguity of Play*. Cambridge, MA: Harvard UP.
- Tauber, T. (2013, March 21). The dirty little secret of online learning: Students are bored and dropping out. Quartz. Retrieved from <http://www.qz.com>.
- Walker, H. & Wray, R. (2014). Effectiveness of Embedded Game-Based Instruction: A Guided Experiential Approach to Technology Based Training. Interservice/Industry Training, Simulation and Education Conference; Orlando, FL; 2014. Retrieved from <http://www.iitsecdocs.com>.