F02
Strategies for Supporting Complex Skill Development

Julie Dirksen
Usable Learning
The main question:

Is it reasonable to think that somebody can be proficient without practice?
**LET'S PLAY**
**SKILL / NOT A SKILL!**

<table>
<thead>
<tr>
<th>Action</th>
<th>Skill?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saving a file in MS Word</td>
<td>Yes</td>
</tr>
<tr>
<td>Playing Skeeball</td>
<td>Yes</td>
</tr>
<tr>
<td>Giving performance reviews</td>
<td>Yes</td>
</tr>
<tr>
<td>Filling out a timesheet</td>
<td>Yes</td>
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<tr>
<td>Calming an irate customer</td>
<td>Yes</td>
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<tr>
<td>Building a database</td>
<td>Yes</td>
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<tr>
<td>Designing a brochure</td>
<td>Yes</td>
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<tr>
<td>Making mac &amp; cheese from the box</td>
<td>Yes</td>
</tr>
<tr>
<td>Problem-solving a missing supply order</td>
<td>Yes</td>
</tr>
<tr>
<td>Programming the shopping cart widget for a website</td>
<td>Yes</td>
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</table>
Skill: It is not reasonable to think that somebody can be proficient without practice.
I CALL THIS THE...

...sports and things-where-you-can-kill-people conundrum:
COMPLEX SKILLS

Substance Abuse Therapist

Project Management Budgeting

Six Sigma Statistical Process Control
SLEEPING, EATING AND BONDING (CHRIS DEDE)

- Sleeping problems...
- Eating problems...
- Bonding Problems

Dependence on Context
CYNEFIN
(DAVE SNOWDEN)
SIMPLE/OBVIOUS PROBLEMS

- Have known solutions
- Well-defined problems
- Clear relationship between cause and effect

- Procedures
- Compliance
- Straightforward Tasks
SIMPLE/OBVIOUS PROBLEMS

Updating a Medical Record

Running hotel breakfast service

Daily plant operations
COMPLICATED PROBLEMS

Have solutions, but often require expertise or analysis to identify.

Expertise is gained through repeated exposure and practice.

Cause and effect can be recognized through expert experience.

• Management
• Analysis
• Expert Performance
COMPLICATED PROBLEMS

Playing Chess

Medical Research

Business Consulting
MOVING COMPLICATED TO SIMPLE
COMPLEX PROBLEMS

No right answers
Patterns emerge
Cause and effect can only be deduced in retrospect
Changing/unstable circumstances

• Innovation
• Unforeseen events
• Responding to volatility
COMPLEX PROBLEMS

Design
Innovation

Product
Pricing

Executive
Leadership

probe–sense–respond
CHAOTIC PROBLEMS

Cause and effect are unclear
Triage and act to establish order
Try to pull things back to a more stable situation

• Disaster management
• Collapse of a business
CHAOTIC PROBLEMS

Disaster Response

act–sense–respond
IMPACT ON LEARNING

- Complex
  - Probe
  - Sense
  - Respond
  - Emergent

- Complicated
  - Sense
  - Analyze
  - Respond
  - Good Practice

- Chaotic
  - Act
  - Sense
  - Respond
  - Novel

- Simple
  - Sense
  - Categorize
  - Respond
  - Best Practice
SIMPLE - IMPLICATIONS FOR LEARNING?

Simple Tasks

- Well-suited to elearning self study
- Can be tested with recognition-based tasks
- Can be evaluated by computer
Complicated Tasks

- Require multiple cases/scenarios
- Can be tested with performance tasks
- Can be evaluated by an expert reviewer
- Other possibilities include self-assessment or peer-assessment

http://www.rehearsal.com/
SELF ASSESSMENT — ELEARNING EXAMPLE
They just won't leave me alone. What should I do?

What should you tell Alex?

<user types their response here>

Submit
Scenario: Teacher Response to Bullying

Did you (self-assess):

- Pay attention
- Affirm that it was a good choice to come talk to you
- Something else

What should you tell Alex?

- They just won’t leave me alone. What should I do?
- Something else

I would tell him…

Revise my answer

Continue
What should you tell Alex?

I would first let him know that he’s safe, and then…

They just won’t leave me alone. What should I do?

So, I would say…

Click an expert teacher to see what they’d say:
COMPLEX - IMPLICATIONS FOR LEARNING?

Complex Tasks

- Learn a method of inquiry
- Requires real-world practice
- Online workshop format

http://support.citrixonline.com
Social learning for complex problems.

Figure 5  Organizing Characteristics

<table>
<thead>
<tr>
<th>Domain (Cynefin)</th>
<th>Society (TIMN)</th>
<th>Communication Medium</th>
<th>Practice (Cynefin)</th>
<th>Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chaotic</td>
<td>Tribal</td>
<td>Oral</td>
<td>Novel Practices</td>
<td>Action</td>
</tr>
<tr>
<td>Simple</td>
<td>+Institutions</td>
<td>Written</td>
<td>Best Practices</td>
<td>Coordination</td>
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<tr>
<td>Complicated</td>
<td>+Markets</td>
<td>Print</td>
<td>Good Practices</td>
<td>Collaboration</td>
</tr>
<tr>
<td>Complex</td>
<td>+Networks</td>
<td>Digital</td>
<td>Emergent Practices</td>
<td>Cooperation</td>
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CHAOTIC — IMPLICATIONS FOR LEARNING?

- Practice around managing stress reactions which requires visceral experience
- Procedures to triage and bring back order
ANALYZING A SKILL

1. Time to Acquire
2. Tacit/Explicit
3. Variability of Performance
4. Variability of Outcomes
5. Error Tolerance
6. Frequency of Use
7. Immediacy of Use
8. Availability of Support
1. TIME TO ACQUIRE

How long does it take?
EVER TAKEN THE GMAT?
FAST OR SLOW

Developing Problem-Solving Skills

What can be accomplished in a single e-learning course
PACE LAYERING

Stewart Brand, How Buildings Learn
PEOPLE — FAST AND SLOW

Knowledge
(specific tools, techniques, concepts & principles)

Skills & Attitudes

Foundation
(cultural, core values & personality traits)

Faster

Slower
FAST OR SLOW?

- How to fill out your time sheet
- Managing a software development project
- Coaching employees
- Using Photoshop to crop a picture
- Using Photoshop to repair an old photo
- Querying a database
- Designing a database
- Playing chess
IMPLICATION FOR LEARNING?

- Fast
- Medium
- Slow
2. TACIT / EXPLICIT

How do they learn it?
TACIT / EXPLICIT

- Understanding cultural differences
- Preventing accidents in the workplace
- SOPs for immunization
- Getting to the actual Root Cause of a problem
CHICK SEXING

How do you know if it’s male or female?
PATTERN RECOGNITION

IMPLICATION FOR LEARNING?

EXPLICIT

TACIT
3. VARIABILITY OF PERFORMANCE

How big is the gap between okay and great?
HOW BIG IS THE DIFFERENCE BETWEEN LEAST AND BEST?

A new competent waitperson

Your best waitperson

2x

5x

10x
WHICH DO YOU THINK HAS BIGGER VARIABILITY OF PERFORMANCE?

Assembly line work?

Computer programming
IMPLICATIONS FOR LEARNING?
4. VARIABILITY OF OUTCOMES

How many right answers are there?
VARIABILITY OF PERFORMANCE

Which has more variability (# of right answers) in correct performance?

Checking blood pressure

Designing a website
HOW MANY DIFFERENT RIGHT ANSWERS?

Ways to talk to patients about managing blood pressure.

Ways to motivate students.
IMPLICATION FOR LEARNING?

Not:

Instead:
5. ERROR TOLERANCE

How much error is acceptable?
ERROR TOLERANCE

Which (usually) has a lower error tolerance?

Designing a website

Checking blood pressure
HOW ABOUT HERE?

Flight attendant safety training

Flight attendant drink service training
IMPLICATION FOR LEARNING?

75%  60%  95%
6. FREQUENCY OF USE

How often will they use the skill?

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VARIABLE 5 - HOW FREQUENTLY WILL YOU USE IT?

What is the frequency of use?
- Tax information
- Making coffee
- CPR
- Sanitary food handling
- Identifying money-laundering
HOW MUCH DO PEOPLE REMEMBER?

FORGETTING CURVES

SPACING

12 hours of intensive studying for a French final exam

- or -

12 one-hour sessions of studying for a French final exam
IMPLICATIONS FOR LEARNING?
7 & 8. IMMEDIACY OF ACCESS AND AVAILABILITY OF SUPPORT

How quickly will they need to use the skill?
HOW IMMEDIATE IS ACCESS?

How immediate is access?

Tax information

Making coffee

CPR

Sanitary food handling

Identifying money-laundering
HOW EASILY CAN THEY ACCESS PERFORMANCE SUPPORT?

How immediate is access?
Tax information
Making coffee
CPR
Sanitary food handling
Identifying money-laundering
TRAINING FOR FAST FOOD CLERKS:

What is the ability to access performance support materials?

While the store is being robbed? 

After the robbery is done?
IMPLICATIONS FOR LEARNING

Immediacy of Use

Job Aid

Access of support materials
How can you structure skill practiced?
Accuracy – complete the task with 100% accuracy
Speed – practice until desired speed is reached
Integration – integrate with real-world context
POSSIBLE STEPS IN SKILL DEVELOPMENT

- Examples/Non-examples
- Critiquing an Example
- Generalizing Principles
- Generating Examples
EXAMPLES / NON-EXAMPLES

Is this an example of quid pro quo harassment?

- **Yes**
  - Suggesting that “you make it worth their while” to raise your pay

- **No**
  - Offering to discuss a promotion opportunity
  - Offering to buy someone a drink at an office happy hour
Which is a better value statement for Jeanette’s resume?

I need a fulfilling position that allows me to grow, and provides good work/life balance.

I can offer a dedication to detail, and a passionate desire to learn more and improve to my next organization.
CRITIQUING AN EXAMPLE

Use the checklist to evaluate the value statement for Jeanette’s resume:

I need a fulfilling position that allows me to grow, and provides good work/life balance.

- Tied to organizational goals
- Specific
- Jargon-free
- Doesn’t include non-relevant info
- Distinguishes candidate from others
You identified these areas as problems in Carl's cover letter. In the forum below, suggest principles for writing a better cover letter:
DESIGN FOR SKILLS
WE DEVELOP UNCONSCIOUS COMPETENCE

- Familiarization
- Comprehension
- Conscious Effort
- Conscious Action
- Proficiency
- Unconscious Competence
WHAT HAPPENS WHEN YOU ARE LEARNING SOMETHING NEW?

Your brain gets busy. it starts burning a lot of fuel....
WHAT ABOUT WHEN YOU ARE USING SOMETHING YOU ALREADY KNOW?

Familiar skills don’t require nearly as much conscious attention.
Most learning is structured like this:

- **Module 1**: Intro
- **Module 2**: New info
- **Module 3**: More new info
- **Module 4**: Even more new info
- **Module 5**: Yet again, with the new info
- **Module 6**: Summary
BUT WHAT ABOUT THIS STRUCTURE?

**Level 1**
Some new stuff, pretty easy, though

**Level 2**
Stuff you know plus a bit more

**Level 3**
Stuff you know, maybe a little faster

**Level 4**
Stuff you know plus a bit more

**Level 5**
Stuff you know, kicked up a notch

**Level 6**
Boss Fight!
WHAT DOES YOUR LEARNING LOOK LIKE?
HOW CAN THIS WORK?

- Enough initial exposure to execute
- Initial practice on simple problems in a safe way
- Safe practice on harder problems
- Heavily coached real example
- Real world mentoring
THE FLOW CHANNEL

- Flow: The Psychology of Optimal Experience by Mihaly Csikszentmihalyi
WOULD YOU EVER STRUCTURE A BASKETBALL CAMP THIS WAY?

Day 1: Dribbling only
Day 2: Passing only
Day 3: Just free-throws
Day 4: Guarding
Day 5: Jumping all day long
SO WHY DO WE STRUCTURE SKILLS CURRICULUM LIKE THIS?

Day 1  Day 2  Day 3  Day 4  Day 5

Food Safety  Customer Service  Managing Employees  Ordering and Inventory  Accounting and Financials
SO WHY DO WE STRUCTURE SKILLS CURRICULUM LIKE THIS?

Day 1

Day 2

Day 3

Day 4

Day 5

Managing a Shift

Managing a Week

Managing a Quarter

Food Safety

Customer Service

Managing Employees

Ordering and Inventory

Accounting and Financials
GAME DESIGN CAN HELP INFORM STRUCTURE

Cycles of Expertise
SKILL EXAMPLE: PROJECT MANAGEMENT — CREATING A BUDGET

Pre-work

Class

Coaching and Mentoring

After class

Elearning

Classroom

Coaching

Webinar Series

How to use MS project to estimate time and create Gantt Charts

Case Studies. How to think about the process of creating budgets, practice creating budgets

A structured coaching plan that a manager can use.

Experience project managers share budget case studies (war stories) — once a month
QUESTIONS

Julie Dirksen
Julie@usablelearning.com
Twitter: usablelearning

Facebook group:
https://www.facebook.com/groups/designforhowpeoplelearn/
REFERENCES


Ebbinghaus https://en.wikipedia.org/wiki/Hermann_Ebbinghaus

Forgetting curve https://en.wikipedia.org/wiki/Forgetting_curve


Uncredited images: www.pixabay.com