Guided Experiential Learning: Training Design and Evaluation

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Overview:

  This workshop is designed to provide an "educational" experience and is not intended to provide "training". The difference, in my view, is that in education, the goal is to gain conceptual knowledge about any topic. In training, the goal is to learn how to do something. Conceptual knowledge attempts to answer questions such as "What is it?" and "How does it work?" and "Why should I care about it?" and so on. Training attempts to answer the questions "How (when, where) do I do it?". It is impossible to train anyone to apply an entire training design system in three to four hours. It is however very possible in that time frame to provide a conceptual overview of a design system along with an argument for why it might be useful, some examples of the design strategies it contains and an opportunity for questions and discussion.

  The workshop is focused on training "design". Design is defined as the study of "plans that describe for how to arrange external instructional events so that they effectively influence internal learning processes for learners who can't or won't learn for themselves". Design is the "blueprint" stage in the production of training. Development is defined as the implementation of a design to produce the materials and media needed for a training course.

  During the workshop I'll try to give some examples and make some general suggestions about "how to" but it is important that the workshop begin with the understanding that it would take longer to learn what anyone needed to know about how to design training using the GEL approach.

    -Dick Clark

When asked about experiential training design you will be able to:

1. Explain 4 design misconceptions
2. Explain 4 principles about our mental architecture for learning
3. Describe GEL design stages and their use with immersive simulations and games

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Note that the goals for the workshop are focused on being able to explain why GEL training design is needed and what happens at its various stages.

This workshop describes some of the most recent developments in research on the structure of our mind, the mental process that aid learning and performance and ways to blend that knowledge into the development of the next generation of training design models.

One thing we've learned in the past decade from research is that some of our intuitive beliefs about learning and training are wrong. These misconceptions bout how adults learn and the training strategies that help them learn, have to be overcome before we can advance in a positive direction. The workshop begins with a discussion of five training misconceptions.

4 Training Misconceptions

1. Use of Multimedia and Games increase learning and motivation
   - Training methods influence learning, NOT media
   - Motivation caused by beliefs NOT media
2. SME's give accurate information that is useful to trainees
   - SME's describe "what" not "how"
   - Leave out about 80 percent of "decisions"

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Evidence for these two misconceptions can be found by reading:

1. Media does not influence learning or motivation

   Read: Clark, R. E. (2001). *Learning from Media: Arguments, Analysis and Evidence.* Greenwich, Conn: Information Age Publishers. ISBN 1-930608-77-2

2. SME's do not give accurate information during training even when they are highly effective experts and want to be helpful to trainees:

   Read: Clark, R. E. and Estes, F. (2002). *Turning Research into Results: A guide to selecting the right performance Solutions*. Atlanta: CEP Press.

4 Training Misconceptions

3. Behavioral task analysis will capture the way experts make decisions and solve problems
   - Cognitive task analysis captures complex decision-making knowledge of all types
   - Can be used to provide complete learning guidance
4. Learning Styles help us shape different training for different trainees
   - Meyer's Briggs and visual/verbal learner measures do not work
   - Only trainees with different levels of prior knowledge and motivation need different types of instruction

Evidence for these two misconceptions can be found by reading:

3. Cognitive task analysis and strongly guided training works:

   Read: Scharaagen et al. (2000) Cognitive task analysis. Lawrence Erlbaum Associates Publisher.

   Kirschner, P., Sweller, J. and Clark, R. E. (In Press for June 2006). Why minimally guided learning does not work: An analysis of the failure of discovery learning, problem-based learning, experiential learning and inquiry-based learning. *Educational Psychologist*. *41* (2).

   Note: Copy available at GEL website: www.ict.usc.edu/~itw/gel

4. Learning Styles do not help us train diverse groups of learners:

   Read: Stahl, S. A. (Fall 1999) Different Strokes for Different Folks? *American Educator*. 1-5.

   Note: Copy available at GEL website: www.ict.usc.edu/~itw/gel

Design Models Must Be
Based on Our Mental Architecture

Components of
Instructional Design Process
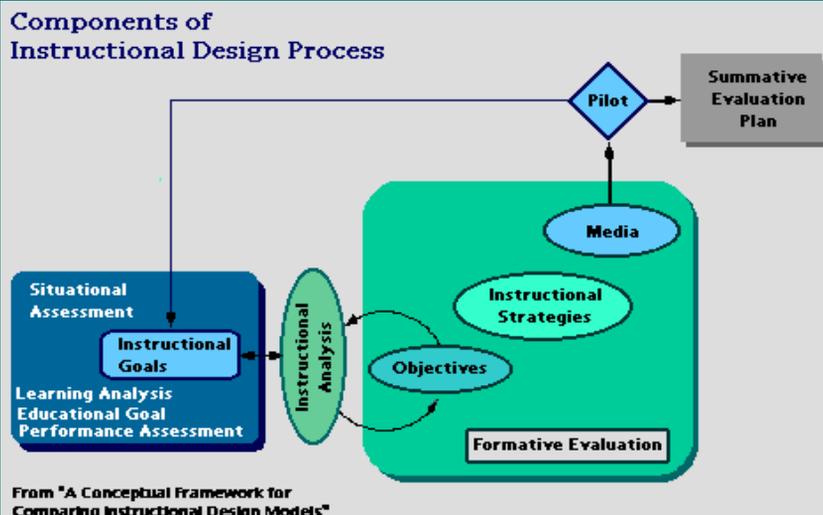
A huge variety of design models are available to support training. Which one is best? Most have the features depicted on this slide. Yet these "features" only tell a training developer "what to do" not "how to do it" or "why".

To get a sense of how many instructional design models exist check out this URL maintained by Martin Ryder at the University of Colorado at Denver:

http://carbon.cudenver.edu/~mryder/itc_data/idmodels.html#isd

In the past, many design models have been developed without any reference to our understanding about how people learn. Many of the ISD models that have attempted to include current information on learning are now seriously out of date because the have not been upgraded.

As we are building the next generation of training design systems, we must take into account what we've learned in the past decade about the way the mind is structured and how it functions to support (or fail to support) learning. We turn next to a discussion of mental or cognitive "architecture" and what we now know about learning processes.

Mental Architecture for Learning
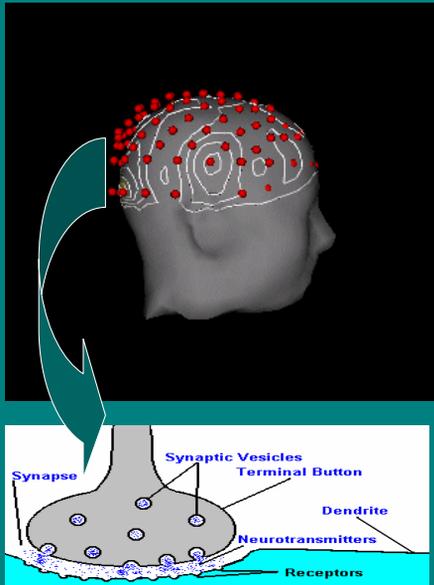
The mind is structured to protect existing knowledge and to learn new information.

Training must overcome the protective devices and support mental strategies that aid learning

Those who study the transfer of knowledge from research to application say that in the past, it has taken roughly 20 years (a generation) for an insight gained in research to be used in general practice. Through technology we now have the opportunity to cut that cycle time down to a more realistic frame.

One vital thing we've learned about the mind is that it has many built in systems to protect us from "scrambling" our memories and erasing vital experience. Those systems protect us by making it very difficult for us to learn something new – Most importantly if the new thing we are learning replaces or changes something we already know the barriers our mind imposes are very difficult to circumvent.

What we take away from the fact is that our mental architecture makes learning difficult to protect us is that we must provide very strong guidance to trainees who are learning something they are expected to apply later. The following five principles reflect these self-protective mechanisms and ways we can overcome them in training. Evidence for these principles and a more careful discussion of them can be found in: Clark, R. E. and Estes, F. (2002). *Turning Research into Results: A guide to selecting the right performance Solutions*. Atlanta: CEP Press

You will also find a related discussion of "cognitive load theory" in this paper by Dr. Graham Cooper in Australia: URL:

http://education.arts.unsw.edu.au/CLT_NET_Aug_97.HTML

Four principles about how our mental architecture influences learning

1. **We have a very limited thinking space, easily overloaded to protect us from scrambling our brain**

   (ONLY 3 +/- 2 "chunks"/or ideas at one time)

   – When overloaded, our brain "short circuits" and stops learning

   – Overload is not noticed – may be enjoyable

   – To overcome this limit we have two different but interacting knowledge systems

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One of the main functions of our mind is to provide us with the private, conscious activity we call "thinking" or "consciousness". This active space in our minds is what separates human beings (and perhaps some other mammals) from lower forms of life. Consciousness where we become aware of our surroundings, make and execute plans and solve problems. Yet the architecture of our consciousness imposes very severe limits on the number (size, amount) of things we can consider at any one time when we are thinking. We know from 50 years of research that the approximate number is three different ideas (plus or minus one idea). If we try to go beyond this number, our mind appears to 'short circuit' by switching our attention to something simpler and more mentally manageable. This limitation protects us from grasping so many new ideas at once and storing them in our experience in a way that radically changes our understanding of our world – before we have an opportunity to check out the new ideas and see if they work for us.

Another way our mind helps to protect us is to format all experience into two very different types of knowledge:

1. Declarative – used for all conscious thinking and stored in a separate memory and subject to the 3 + or – 1 chunk limit.

2. Procedural – how to information that is not conscious, not subject to the chunk limit and stored in a separate memory.

Read a more detailed description of these two kinds of knowledge and their function in learning, training and performance – the following article can be found on the ICT web page for this workshop (see final slide for address) **Training in the 21st century: Some lessons from the last one**. Haccoun, R. R.; Saks, A. M. *Canadian Psychology*. 39(1-2), Feb-May 1998, 33-51.

Mental Architecture

2. Two types of knowledge systems compensate for limited "thinking" space

A) Declarative (What and Why)
- Conscious, easily learned and changed, can be wrong – designed to handle novelty, uncertainty

B) Procedural (When and How)
- Unconscious, difficult to learn and change, can't be wrong – designed to circumvent limits on consciousness

Knowledge is learned in a conscious, declarative form but if it is correctly formatted during training and practice, the mind changes it to an unconscious procedural form. This change only happens during practice when it is applied and when the trainee is successful at achieving learning goals – for example, solving relevant problems. In its procedural form it does not overload the mind and can be applied successfully after training.

There are various types of declarative knowledge including concepts (anything with a definition and example), processes (how something works), and principles (cause and effect). Declarative knowledge comes in a variety of formats including sensory based depictions (e.g. visual images) and "notational" (e.g. verbal descriptions).

Procedures are not only tasks that we do with our hands, we must also learn and use "mental procedures" – we call them "decisions". Almost all tasks require decisions. To make a decision successfully, trainees need to be taught when a decision is required, what alternatives must be considered, and what criteria they should use to select among those alternatives. This workshop will argue that: A) we must show trainees exactly when and how to make decisions; and B) training on how to make decisions must be focused on authentic and typical problems that represent what the trainee needs to be doing in the field after training.

Since all experienced SME's are expert at making decisions, and since the unconscious nature of their expertise makes it difficult for them to explain to trainees (or training designers) exactly how they make decisions – the design of training on decision making poses some unique problems. In the GEL System, we strongly advise the use of an interview technique during design called "Cognitive Task Analysis" – described later in the workshop. This technique captures the unconscious knowledge about how SME's make decisions in a form that can be used in training.

When tasks require a mixture of declarative and procedural knowledge to complete, they are considered to be "complex". Since we almost never teach decision making and since complexity is a part of nearly every job and task in the military, GEL Training is one way to close the gap between what we know people need to know, and the design process we use to support their training.

3. Once we accept a new goal, our "learning system" architecture is structured to select and/or develop a procedure for achieving it.

   - General learning procedures include:
     - <u>Plans</u> to achieve the goal
     - <u>Connections</u> to relevant prior knowledge,
     - Ways to <u>select the important</u> and ignore the rest
     - <u>Self monitoring</u> for accuracy and <u>results feedback</u>
     - Procedures for using feedback to <u>tune</u> the plan

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Everyone is born with a mind that is "wired to learn". While everyone is born with their own unique amount of each specific learning processes, most of us have the same type of processes such as planning, connecting to prior knowledge, self monitoring and so on. The problem is that these processes tend not to be very efficient or effective when they are applied to novel problems.

When people gain expertise in a particular area, the expertise includes much more specific and powerful learning processes such as specific learning plans that can be applied to tasks and problems within the field of expertise. Yet these specific learning processes do not generalize outside of a field of expertise. So when trainees are confronting something new (to them), their learning processes need strong support or guidance in the form of specific learning plans, examples and analogies that connect to their prior knowledge and external monitoring of their learning progress. The exact form of the guidance we give them should mirror and support the minds' learning processes. All training is an attempt to help people learn how to achieve performance goals by guiding their planning, connecting, selecting, monitoring of practice, feedback and adjusting their knowledge to reflect feedback.

The GEL Design model provides strong guidance that is formatted to support these learning processes for all trainees.

Mental Architecture

4. Successful training provides clear goals and supports the learning strategies that trainees can't or won't provide for themselves.
   - Provide a clear "3C" goal (concrete, current, challenging),
   - Motivate them to accept and persist at achieving it
   - Show how with "worked example" including decisions
   - Immerse in a variety of realistic examples – starting simple and gradually becoming realistic
   - Support their learning strategies as they develop their own version of a procedure

All human performance requires a goal. Many goals we pursue are unconscious because we've done something so often, we are no longer aware of what goal was responsible for our behavior. In training, we must communicate very clearly about the goals of each lesson. This was one of the reasons why early work on "learning objectives" had such a positive impact on training design. Vague goals cause trainees to substitute their own goals and/or encourage misunderstanding. Great training courses have failed because trainees did not understand clearly what they were being asked to do with what they were learning. Most of the current research on goals (described in the Clark & Estes book cited earlier) leads to our support of the three qualities described in the slide above.

Training Design Reflecting Mental Architecture

- Cognitive Task Analysis gives accurate and complete information on all actions and decisions needed
- Complete information must be embedded in learning plans with demonstrations, practice and feedback
- Think of immersive simulations and games as a basis for demonstrations and practice of skills until they automate

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These three points are an attempt to connect the takeaway points in what we've discussed so far. We need accurate information about both actions and decisions to provide to trainees who also need to have their learning processes supported. Training and trainers will be more successful if they give strong guidance to trainees when they are in the early stages of learning in a new area of practice. They also need a very long period of application practice so that they can tune and correct their knowledge. This is true of both "hard" and "soft" skills.

The topic turns next to immersive training – an approach to simulations and games that provide an excellent opportunity for flexible demonstration (during training) and practice (by trainees after training) of complex skills – and many of these immersive multi media programs do it in an exciting gaming environment.

A New ICT Example

Slim ES3 (Every Soldier a Sensor) – PC Platform

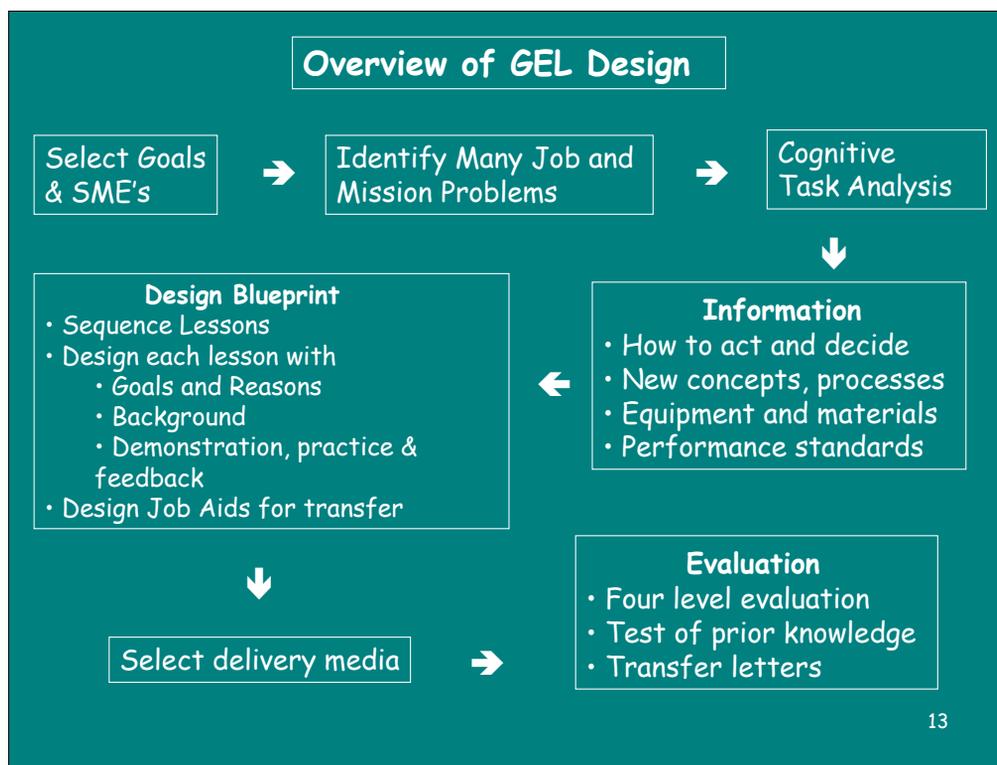**Active Surveillance and Threat Identification**

- Imagine that lessons have provided complete information about how to observe in lessons containing goals, reasons, what they need to know (concepts, processes) and procedures

- ES3 is not "stand alone" training (except for experts) - can be used for demonstration, practice and feedback once lesson reaches demo and practice

START ES3 MOVIE HERE

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Developed in only 90 days, Every Solder a Sensor Simulation (Es3) responds to the need for a Presence Patrol training tool for U.S. ground forces in current or upcoming deployment in Iraq . Providing practice in Active Surveillance and Threat Indicator Identification, players are on point in an environment modeled on a southwest Asian urban setting. The application was developed with the close cooperation of the U.S. Army's Office of the Deputy Chief of Staff, Intelligence – G2. At approximately 40 megabytes, the application is intended to be delivered over the internet. The player self-navigates urban terrain populated with civilians, security personnel, NGO's and insurgents seeking to detect threats of varying significance while attempting appropriate interaction with those he encounters. Players work from a menu of actions, recording their observations, checking maps, taking GPS readings and even taking digital "photographs". Play is time-limited: each action has a time cost. Skillful players will commit more objects to memory as the "cost" of investigating or recording observations runs the clock out rapidly. Following the patrol, the player prepares a report, working from recorded objects and recalling items observed. Scoring takes into account objects reported and an Information Operations indicator reflecting success in civilian interactions. The After Action Review allows study of objects observed and missed along with current doctrinal information about the category of threat which the object represents.

Overview of GEL Design

```
Select Goals      →   Identify Many Job and   →   Cognitive
& SME's               Mission Problems            Task Analysis
                                                      ↓
Design Blueprint                              Information
• Sequence Lessons                            • How to act and decide
• Design each lesson with        ←            • New concepts, processes
   • Goals and Reasons                        • Equipment and materials
   • Background                               • Performance standards
   • Demonstration, practice &
     feedback
• Design Job Aids for transfer

         ↓
                                             Evaluation
Select delivery media        →               • Four level evaluation
                                             • Test of prior knowledge
                                             • Transfer letters
                                                            13
```

The boxes in this figure are sequenced in the same order that GEL Design is practiced. It begins after needs analysis has indicated a need for a course and the general performance goals have been established for the trainees. The first stage requires the identification of highly experienced SME's (a key element in the success or failure of the approach – we have to go beyond MOS designations and only choose SME's who have extensive, successful experience doing what the trainees will learn to do).

For this workshop, we are going to give an example based on a recent immersive simulation developed at USC by the Institute for Creative Technology. The "SLIM ES3" simulation is designed to teach soldiers to be observant and aware of their surroundings when they are potentially in harms way. In selecting this expensive simulation as an example, we do not want to imply that GEL design requires expensive media. GEL can be used with any delivery medium, including live trainers.

A much more extensive description of the GEL design system is available at the URL listed on the final page of this manual

Using Guided Experience to Design Courses

| Select Course & SME's | → | Identify Many Job and Mission Problems | → | Cognitive Task Analysis |

Problem Selection and Examples

- Identify goals and experience level of trainees
- Work with 2 experienced SME (beyond MOS)
- Identify six large, authentic field problems
    - From Easy to Moderate to Difficult
- Create "worked examples" of the problems
    - Use cognitive task analysis information
    - Starting conditions, procedure and output?
    - Solutions must be understood by trainees

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Lets assume that we are designing a course that will be titled: "Every Soldier a Sensory on Presence Patrol" The general goal of the course is to increase the observation skills of all Soldiers when they are on patrol.

We start by locating 2 to 3 expert SME's, and interview them separately to ask for many different field problems that relate to observational awareness when Soldiers are on patrol. We use "cognitive task analysis" (CTA) as an interview strategy. Find information about CTA Resources given for CTA at http://www.ctaresource.com/ in a book: Schraagen, J. M. et al. (2000) Cognitive Task Analysis and from Klein Associates located at:http://www.decisionmaking.com

Some of an expert's list is depicted below. In addition, we ask each expert for a large number of typical situational problems or challenges (from simple to very complex) associated with each item on the list:

_____

Design Notes: Interview with SME Alpha

Preparing for presence patrol

On patrol: recognizing changes in the environment; engaging in active observation

      Interacting with locals

      Finding and identifying objects of significance and high-value

      Recognizing and detaining individuals of significance

      Recognizing the risk of a potential attack or ambush

      Prioritizing and reporting information during Presence Patrol

Preparing the patrol debrief

The equipment that should be available to soldiers during the presence patrol is:

Map, Pencil and notebook, Digital camera, GPS, Weapon

Using Guided Experience to Design Courses

| Select Course & SME's | → | Identify Many Job and Mission Problems | → | Cognitive Task Analysis |

Cognitive task analysis

- Interview expert and ask:
  - Outline tasks in order performed in field
  - For each task:
    - What must happen for task to begin?
    - List actions and decisions for every team member
    - Capture new concepts and "how it works" processes
    - List necessary equipment/material
    - List performance standards (speed, accuracy)
    - Review analysis for accuracy and revise

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Below is part of the interview results for one part of the task:

Outline of one set of tasks:

Orientation at the drop-off point: The moment you are dropped off - Stop, Look, & Listen

All team members should recall the condition of the environment on the previous patrol, using the following criteria:

The time of day; position of sun or moon; temperature

Observe situation today and note condition of buildings. streets and other structures

New graffiti?. If observed Translate and Write down translation and location

Windows and doors (open or closed; boarded up)

Roofs, balconies, and other building-related objects

Note absence or presence of people: number, type, and behavior

Children playing and approaching for candy and other favors

Women engaged in normal activities (shopping, etc)

Men individually and in groups (uniformed and non-uniformed

Note that the Expert has Indicated an important decision That trainees must Learn to make
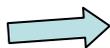
Decide whether each observation meets one of the following threat ratings:

I – Immediate Threat

II – Near Threat

III- Possible Threat

IV – Of Interest

V – No Threat

Cognitive Task Analysis – Second SME

- Interview second SME and ask them
    - Can you suggest better problems?
    - Review for accuracy (Can it be done this way?)
    - Review for efficiency (Is there a quicker way?)
    - What has been forgotten?
- Repeat with third SME if possible
- Produce printed copy of all procedures for each task with related starting conditions, steps, equipment & standards

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After we have finished the cognitive task analysis with each expert and have asked them to review and correct their own list for accuracy and efficiency (e.g. can they drop steps and still achieve the task goals) we give each SME the work of another SME and ask them to correct it for 1) accuracy and 2) efficiency.

One of the SME's recommends a number of changes including:

1. The first SME did not include the criteria for deciding which of the threat levels to assign to any incident noticed.

2. The need to specify the use of the digital camera to record the condition of streets and buildings so that an exact record of their previous condition can be checked by each new patrol

3. The need to be much more specific about the different types of behavior by children and adults in the neighborhoods that lead to alerts.

4. Etc.

Once all steps in every procedure have been listed, reviewed and corrected for accuracy and efficiency, and all reasons for implementing each of the procedures have been captured along with lists of equipment and materials – and the information has been approved by SME's and supervisors – the design moves to the next stage – the outline of the course and the design of each lesson.

Design
- Sequence Lessons
- Design each lesson with
  - Goals and Reasons
  - Background
  - Demonstration, practice & feedback
- Design Job Aids for transfer

Design Lessons

- Sequence groups of problems/tasks into lessons
  - First performed in field are first taught
  - If no fixed sequence, easy before difficult
- Develop goals for each lesson
  - Remember concepts, processes
  - Remember conditions and consequences
  - Perform procedure in the field
- Design job aid's based on procedure

To design a course, start by outlining the sequence and content of lessons:

1. We <u>train in the same sequence as the trainee is expected to perform</u> what they have learned. Whatever is done first, is taught first. So the SLIM ES3 course would have to begin with lessons on preparing for patrol, then lessons connected with what happens on patrol and then "after" the patrol.

2. Whenever there is no necessary sequence in the field, then teach less <u>complex knowledge</u> before things that are more complex. So teaching soldiers what to carry and how take digital pictures of a neighborhood might be taught before how to make a decision about the threat level of things that are observed.

3. New <u>concepts</u> that must be learned in order for the procedures to be learned should be taught just before the procedure where the new concept is required. For example, in different cultures, people communicate common ideas or emotions such as fear in different ways. It might be necessary in this course to teach soldiers how to recognize the way that the people they encounter have learned to communicate fear before teaching them how to recognize threat levels.

4. Once accurate procedures for each lesson have been developed, they can be abbreviated and placed on <u>job aid</u> cards that soldiers can use until they become familiar with each procedure during practice.

5. Lessons are designed with similar outlines – starting first with goals, then reasons (motivation), then background (new concepts and reminders about prior knowledge), demonstration (of the procedure), practice and feedback.

Job Aids

- Where possible, summarize all key procedures for trainees to use while learning
- Job aids are not "cheating" they are "training wheels" that help trainees during practice
- Remove the job aids as they succeed at practice

Before Patrol	*On Patrol*	*After Patrol*

1.Commit CCIR to memory.
2.Check for pencil & paper
3.Check map
4.Check camera
5.Check GPS
6.Check personal equipment
7.Check weapon
	1.STOP, LOOK & LISTEN
	2.Note changes in buildings
	3.Note changes in people
	4.Note changes in sounds
	5.Interact with locals
	    a.Be culture aware!
	    b.Be an active listener
	6.Report changes in environment
	7.Report object of significance
	8.Report threats
	9.Use your experience, intuition, and judgment
		1.Review logged observations
		2.Recall observations no logged
		3.Prioritize all observations and assign threat level
		4.Submit Patrol Report

Suspect, do not ignore 	**Always be aware of the possibility of secondary devices** **Always be aware of "come-on" or "false" IED's used in an attempt to channel you to an area that may have an actual device** **Roadside IEDs** 	Suspect: Do not ignore Links to buried explosives

Example of Job Aid

Instructional <u>Methods</u> for Each Lesson

Design
- Sequence Lessons
- Design each lesson with
    - Goals and Reasons
    - Background
    - Demonstration, practice & feedback
- Design Job Aids for transfer

Lesson Sequence:

1. Goals –
- You will learn how to (REMEMBER, DO, APPLY…)

2. Reasons
- Value of learning - consequences of not learning
- What you already know that you should use

3. What You Need to Know to Perform
- Teach new concepts and processes needed to learn procedure
- Give job aid's based on CTA procedure

Example of a design for one section of a course containing three lessons
_____

Goals

In this section of the course, you will learn how to:

1. Identify objects during presence patrol that are specified by the CCIR
2. Decide on the correct threat level for the objects you identify
3. Take the correct action in reporting the identified objects and threat level

Reasons

Human Intelligence is vital, as it has the capability to confirm existing reports (such as locations of vehicles, IEDs, etc). It also has the unique ability to give the commander information on what the enemy intends to do and an idea of what we can expect. This is critical information, in part because it may help save your life and the lives of other soldiers. The skills you will learn are based on the experience and suggestions of the most effective urban warfare observers.

Background: What You Need to Know to Learn the observation techniques

Concepts (need definitions and examples)

IEDs

Weapon caches

Vehicles with explosives

Individuals of significance

Processes (insert graphic of intelligence gathering and processing)

Lesson Sequence:

Design
• Sequence Lessons
• Design each lesson with
   • Goals and Reasons
   • Background
   • Demonstration, practice & feedback
• Design Job Aids for transfer

4. **Demonstrate** procedure
   • Worked examples of problems using CTA procedure
   • Use integrated visuals and sound (narration)
   • Instructor or Model should be credible, similar

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Perhaps the most critical part of any training design is the demonstration and practice stage. The demonstration must accurately and completely depict the action and decision <u>procedures</u> trainees must learn. If the demonstrations of the procedures are incomplete or if some of the steps are wrong, many trainees will go away from the training with incomplete or incorrect knowledge.

Many developers and media producers want to introduce some drama into a demonstration. This device can be helpful provided that the drama does not detract from learning the procedure. If an actor or animated figure is chosen to demonstrate the procedure they are most effective if the trainees view them as having three qualities: 1. credible (the figure demonstrating is perceived as having "walked the talk" or that they have "been there"; 2) similarity (like the trainees in some essential ways); and positive or enthusiastic (negative or pessimistic models do not appear to aid learning).

Initial demonstrations of skills should focus primarily on the steps and not on extraneous background, flashy visuals, music or even unnecessary sounds. As trainees become more expert, the depictions of the surroundings for the procedure (e.g. street scenes, sounds, events) can become more realistic and authentic.

Lesson Sequence:

> **Design**
> • Sequence Lessons
> • Design each lesson with
>   • Goals and Reasons
>   • Background
>   • Demonstration, practice & feedback
> • Design Job Aids for transfer

5. Practice & Feedback –

First show easy problem <u>and</u> solution – ask for questions
   • Second, next easy problem and half of solution
            Ask trainees to complete it for practice
            Focus them on job aid for reminders
      • Third, give moderate problem and ¼ solution
      • Fourth, moderate then complex and ask them to solve

   • Gradually fade support – training wheels come off!

Scenario for a first demonstration of one of the skills being taught
Demonstrations do not have to be expensive – but they must accurately reflect the procedures being learned

ES3 Screen Image	Dramatization
Mission Brief with picture of IED	This IED is on the CCIR for today's presence patrol
Street scene in a neighborhood	We are on patrol in a Middle-eastern city during the day
Children in street playing soccer	Patrol approaches children and one soldier asks them about why they are playing soccer in the street rather than on the nearby soccer field. They respond: "We can't play on the soccer field"
A woman on the street watching the children	Soldier talks to a nearby woman and asks her why children are not playing on the soccer field. She replies "Field is not safe."
Patrol approach soccer field, checks digital record of condition of field days ago	There appears to be a new area of loose dirt at the side of the field and new piles of trash
Patrol huddles	Patrol analyzes the potential threat level of the loose dirt and trash piles using the decision procedure
Patrol making report	Patrol makes a report on the threat level they've determined for the soccer field

Media Selection, Evaluation and Transfer

Select delivery media →

Evaluation
- Four level evaluation
- Test of prior knowledge
- Transfer letters

- Select media based on context, practice and cost
- Evaluate on four levels
  1. **Reactions** (motivation - confidence, value)
  2. **Learning** (use practice exercises to evaluate)
  3. **Transfer** (check with supervisor/commander)
  4. **Impact** (did it make a difference to bottom line?)
- Send letter to commander asking for transfer help

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Don Kirkpatrick's Four Level Evaluation model may be the most popular in the world (see: http://coe.sdsu.edu/eet/Articles/k4levels/) and is very useful for evaluating a training design before development takes place.

In the GEL design system, designers are urged to create a draft or storyboard version of training and walk a small group of trainees through the mock up and evaluate the results – then use the evaluation results to modify the design before development begins. The four levels of evaluation are:

Level 1: Reactions – Mix closed ended questions about the perceived quality and utility of the training (on a five or seven point scale) with open ended questions that allow the trainee to (anonymously) tell you how to improve it. Keep in mind that people can like training and feel confident that they can use what they learned – even when they have learned very little – so we must measure level 2 and 3 also.

Level 2: Learning – Collect data from practice exercises as trainees attempt to solve the GEL problems. Note the mistakes they make and how quickly they recover from them. Keep in mind that people can learn during training and not transfer what they learn to the field – so we must go on to level 3.

Level 3: Transfer – Two kinds of information help you check to see if they have transferred what they learned to training. Ask their supervisors and check on any performance records associated with the training that are naturally collected (for example, frequency and types of injuries)

Level 4: Results – People can learn, transfer what they learn to the field successful and their new skills can fail to make any difference. This level is a check on whether the training was needed to solve a problem. Level 4 results are measured by checking to see if the problem that led to the request for training is solved or helped by the use of the new skills in the field.

Example from ICT

Full Spectrum Warrior – X Box Platform

- Squad leader planning and decisions
- Imagine that lessons have provided goals, reasons, what they need to know (concepts, processes) and procedures
- FSW is not "stand alone" training (except for experts) - can be used for demonstration, practice and feedback once lesson reaches demo and practice

FSW MOVIE HERE

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Full Spectrum Warrior is a squad-based, tactical-action game that places you, the player, into 21st Century MOUT urban operations situations. In Full Spectrum Warrior, you are a squad leader, in command of a squad of two fire teams of U.S. army infantry soldiers. It is the trainees responsibility to achieve specific objectives through the skillful deployment and use of the men under their command. It is the combination of tactical planning and guided execution on modern, asymmetrical battlefield that is the foundation of Full Spectrum Warrior. Full Spectrum Warrior was developed with close support from the Army Infantry School at Fort Benning to ensure content fidelity. Motion capture production of actual soldiers is used for computer character animations.

This game has an X box platform which may not be appropriate for most training contexts. Yet it could serve as a demonstration of various procedures that must be learned for urban warfare scenarios.

Summary

Despite <u>more up front time and effort</u> required for Guided Experiential Design and delivery:

- Amount learned increases
- Learning time decreases
- Learners like it as well as pure immersion
- Involves "authentic" settings and tasks
- Transfers to the field and reduces application errors

  What is not to like?

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Guided Experiential Learning: Training Design and Evaluation

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