Transforming Small Arms Maintenance Training Through Virtual Task Trainers

Troy J. Welch
Business Development Manager
NGRAIN Corporation
twelch@ngrain.com

May 9, 2007

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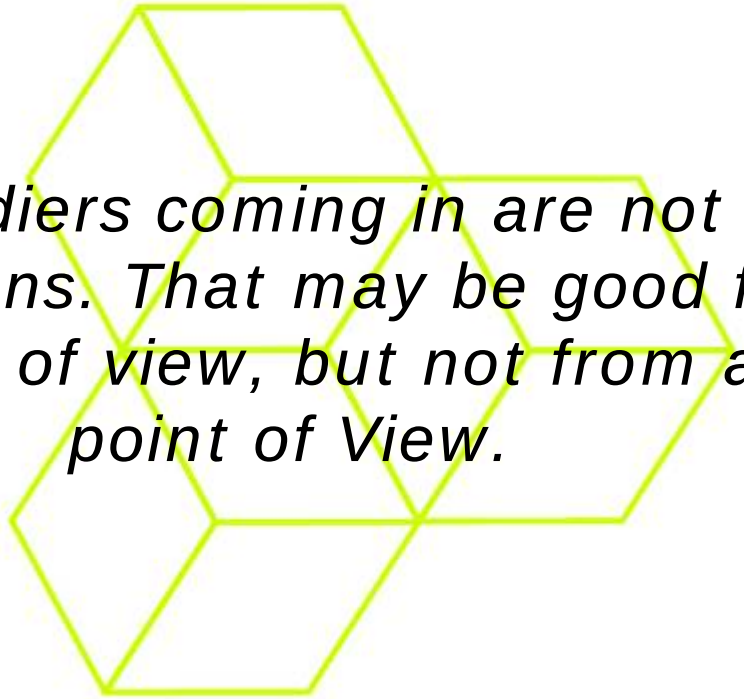

Our new soldiers coming in are not familiar with weapons. That may be good from a society point of view, but not from an Army point of View.

General William S. Wallace,
Commanding General US Army Training and Doctrine Command

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Agenda

- Environment
- Current Methods of Training
- Virtual Task Trainers
- Case Studies
- Summary

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Environmental Factors

- High Operational Tempo
- Immediate Fielding of Equipment
- Reduced Residency Time
- Soldiers Tasked with New Duties
- Systems & Weapons used in harsh environments beyond their planned retirement

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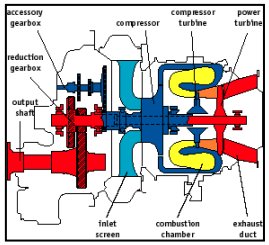
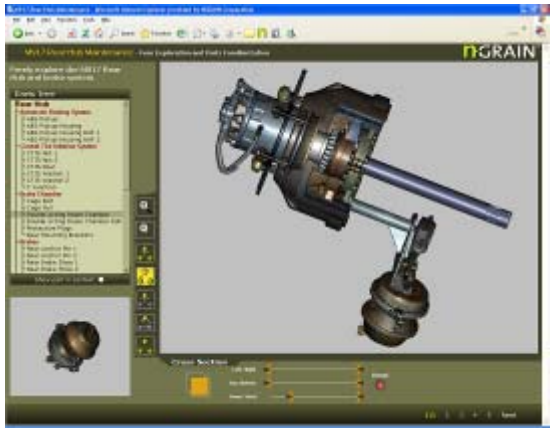
Methods of Hard Skills Training

Text



Multimedia



Interactive 3D Simulations

Hard Trainers

Live Equipment

Text	Interactive 3D Simulations	Hard Trainers	Live Equipment
✓Low cost	✓Low cost	×High cost	
✓Easy to create and update	✓Easy to create and update	×Difficult to create and update	
✓Anytime, anywhere access	✓Anytime, anywhere access	×Limited access	
×Low learning effectiveness	✓High learning effectiveness	✓High learning effectiveness	

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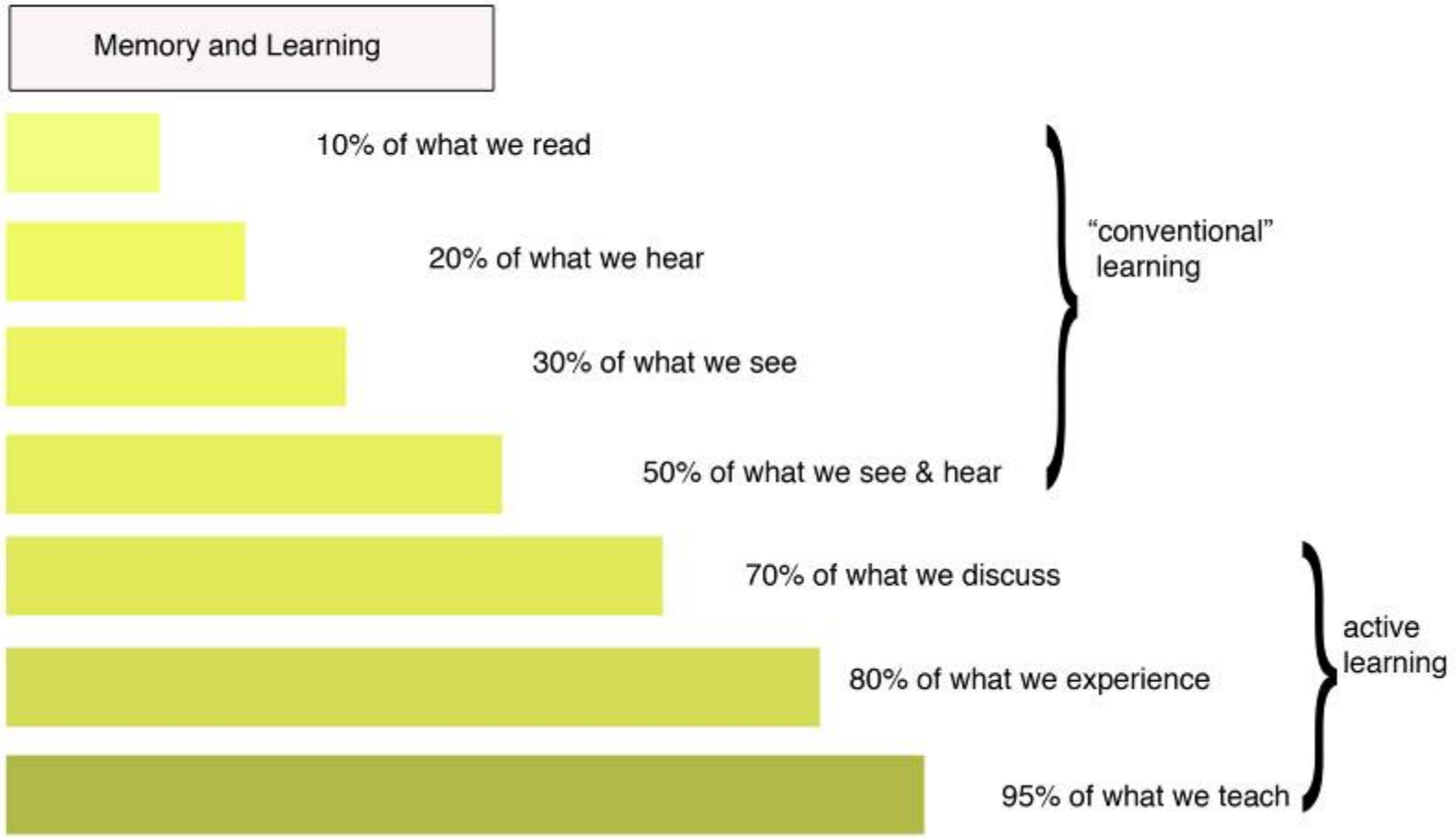
Learning Theory

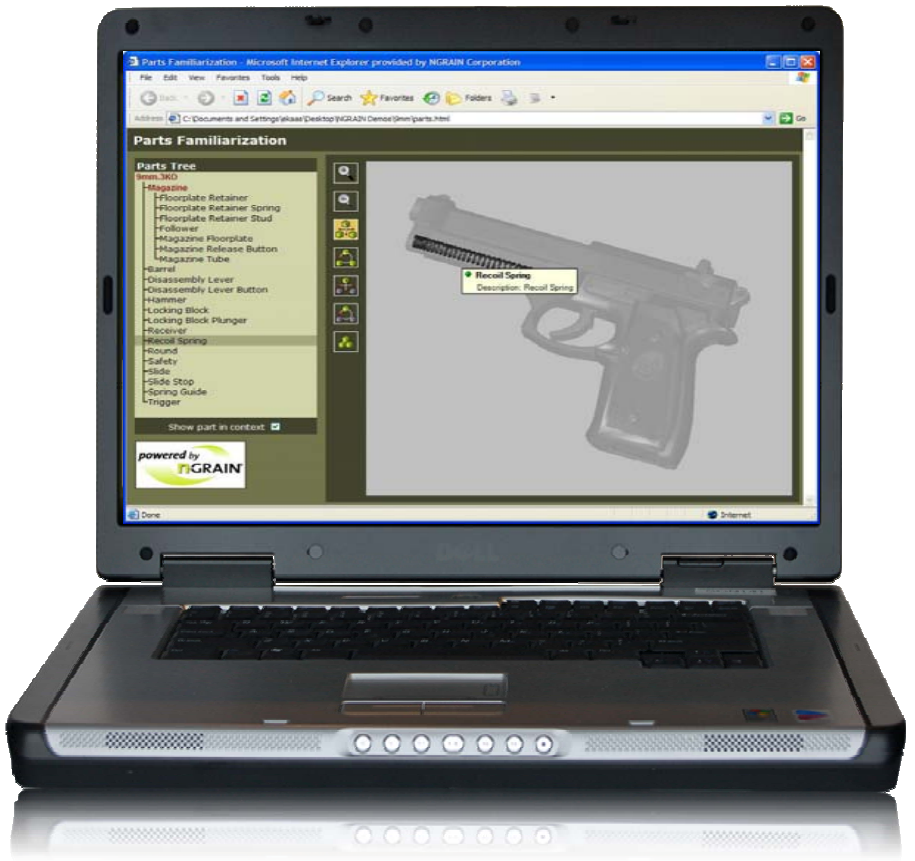


Source: Airbus / Journal for Civil Aviation Training (Issue 1 / 2006)

Virtual Task Trainer

- Virtual 3D equipment simulations to:
  - *Familiarize*
  - *Acquire*
  - *Practice*
  - *Test and Validate*

- **ROI: Train 60% Faster**



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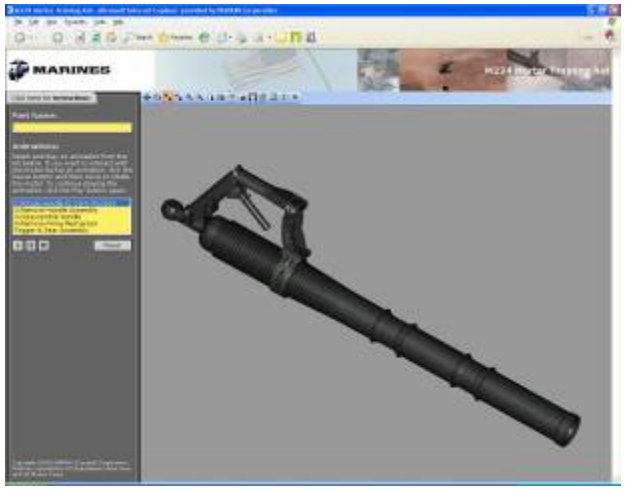
Benefits of Virtual Task Trainers

- ✓ Let students learn from their mistakes, **safely**
- ✓ Let training take place **without the expense** of equipment
- ✓ Train **more efficiently**
- ✓ **Reduce wear and tear** on equipment
- ✓ Enable **task-based, on-the-job training**



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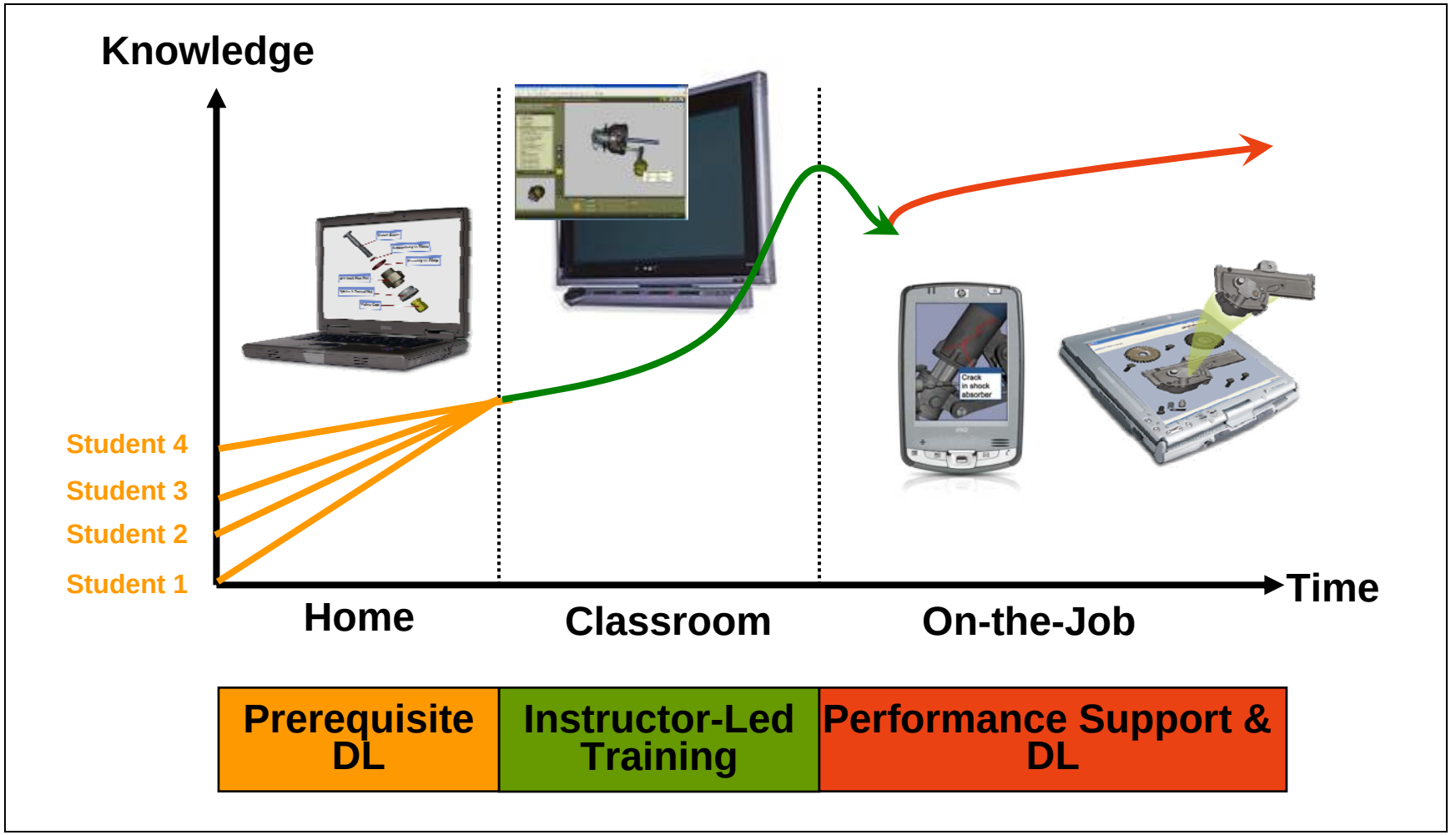
Supporting the Lifelong Learning Continuum



Source: VERTEX Solutions, Inc. 2002

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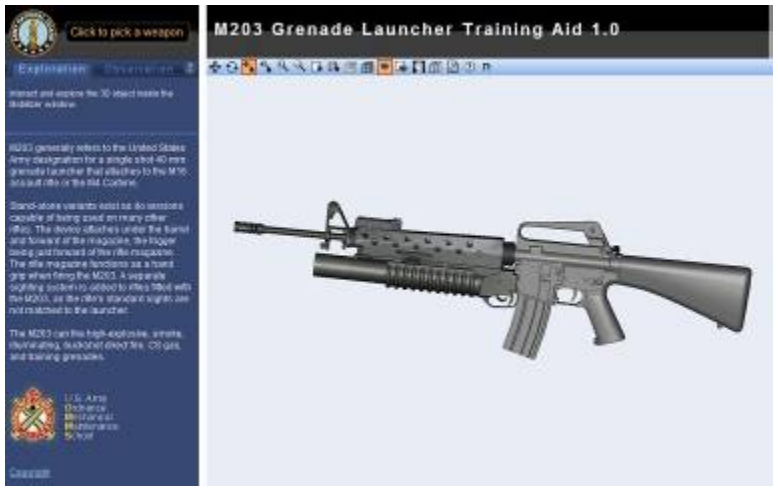
Weapons Virtual Task Trainer for the US Army National Guard

- **Challenge:**
  - Difficult for instructors to demonstrate assembly and disassembly procedures
- **Objective:**
  - Improve classroom and self-paced study of individual arms
- **Results**:
  - Increased knowledge of maintenance and assembly/disassembly procedures of small arms



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ARNG Weapons Training Aid 1.0

M240 Machine Gun

explore weapon | view animations

M249 Squad Automatic Weapon

explore weapon | view animations

M240B Machine Gun

explore weapon | view animations

M2 Machine Gun

explore weapon | view animations

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M107 Sniper Rifle

explore weapon | view animations

M203 Grenade Launcher

explore weapon | view animations

M590 Shotgun

explore weapon | view animations

MK19 Grenade Launcher

explore weapon | view animations

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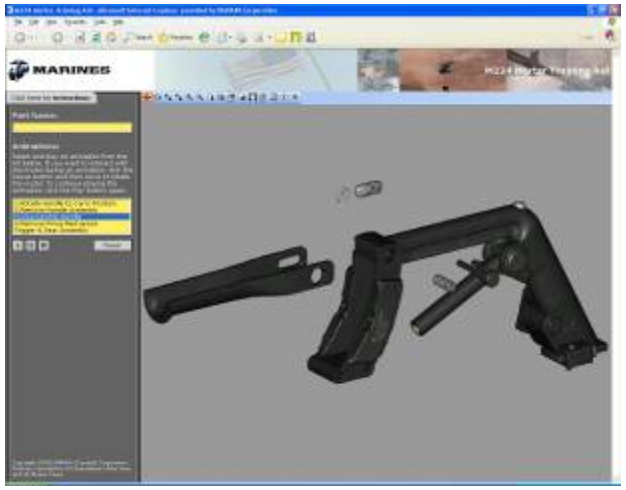
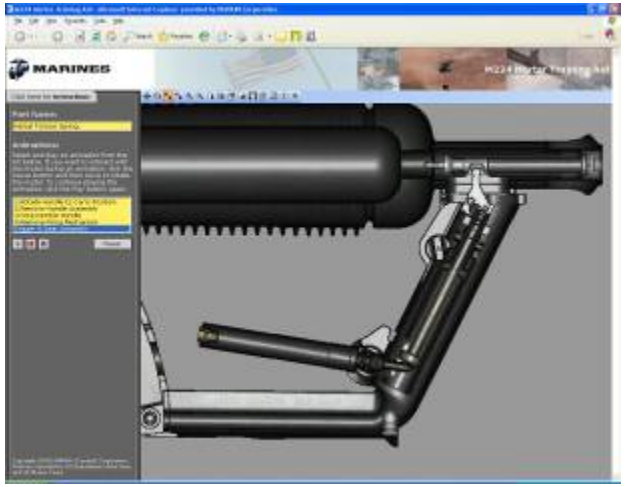
M224 Mortar Virtual Task Trainer for the US Marine Corps

- **Challenge:**
  - Inability for “dummy” weapon trainers to show operation of internal parts
  - High breakage rates
- **Objective:**
  - Effectively train students on equipment internals and interactions
  - Reduce breakage and associated costs
- **Results**:
  - Improved training, including internals
  - Reduced equipment replacement costs





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Summary

- Virtual task trainers offer numerous benefits:
  - Lets training take place even if there is no equipment available
  - More effective for task-based learning objectives
  - Operationally deployable
  - Very suitable for training on internal components

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Thank You. Questions?

- For more information:
  - Email Troy Welch: twelch@ngrain.com
  - Go to www.ngrain.com for case studies