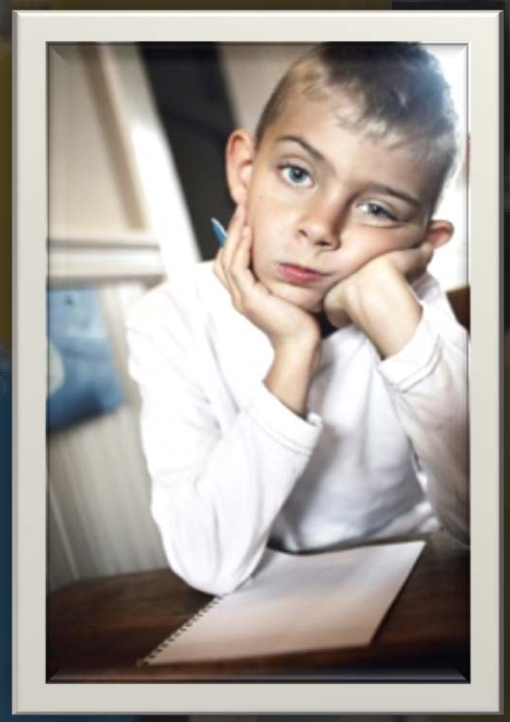
NTER:
National Training and Education Resource

An infrastructure for next generation learning

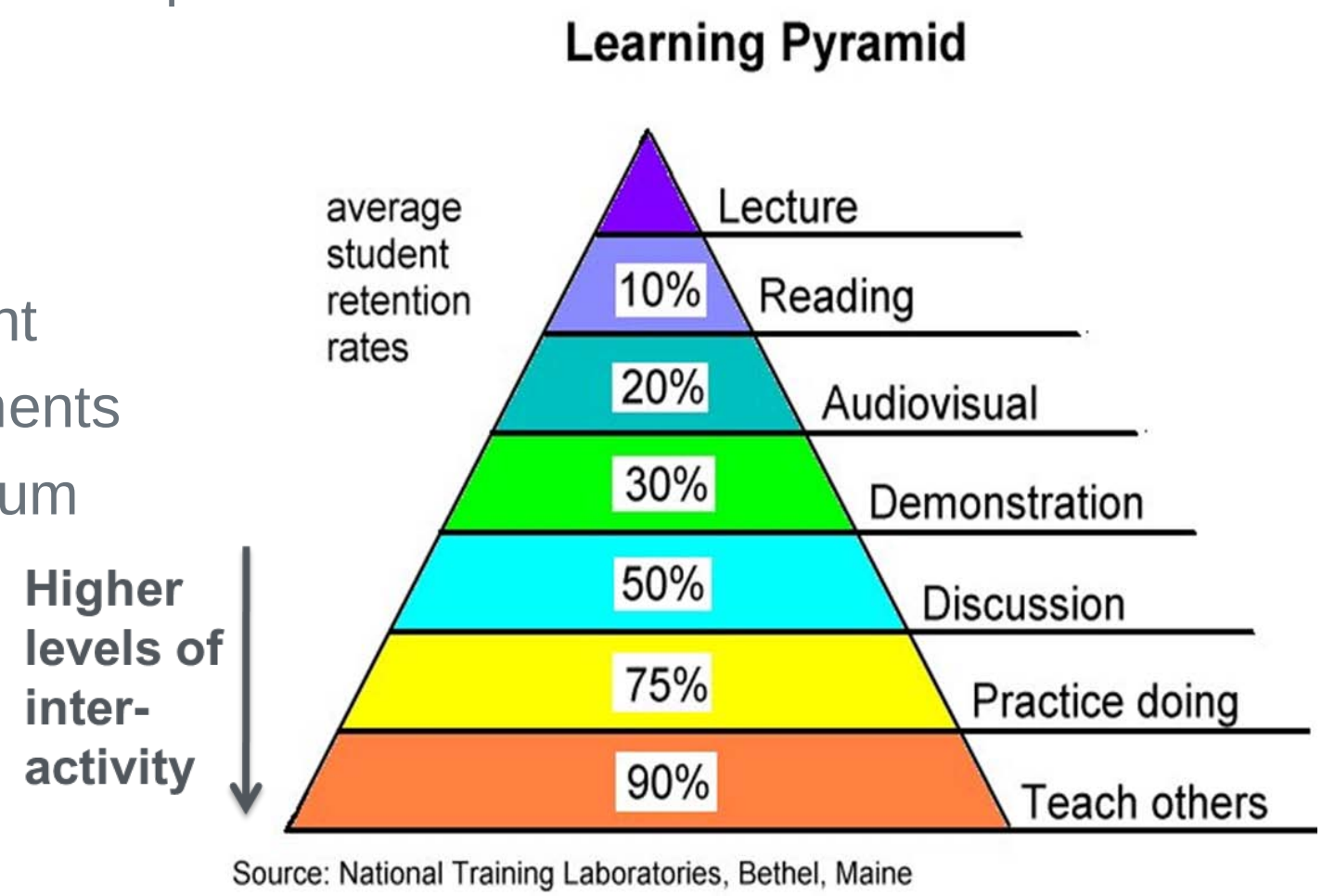
Current State of Classroom Education

- We don't do anything like we did 20 years ago, but we educate our kids the same way we did a century ago
- Lecture format seen as irrelevant for today's students who are plugged in everywhere but when they are at school
- Schools in some large cities have only a 50% high school graduation rate (WH announcement, March, 2010)
- Of all OECD countries, US has the highest non-completion rate (over 50%) for students who start a tertiary education program



We know how to train and educate better!

- New Learning Tools make possible:
  - Highly interactive environments
  - Inquiry-based learning
  - Bridge theory to practice (explore, operate equipment without the consequences of failure)
  - Varied and Contrasting examples
  - Demonstration
  - Access to expertise
  - Feedback
  - Continuous assessment
  - Collaborative environments
  - Endlessly patient medium



Current State of Online Education

- **Just putting the same material online does not solve the problem**
- Current methods to produce online, immersive education:
  - Expensive ($50B per year)
  - Little to no interoperability of online resources
  - Costly to maintain & update
- Platform wars have prevented updating and improvement of online resources
- Metadata wars have not been resolved for cataloging online resources
- Repository wars have not prevented gross duplication of materials
- Firewalls in schools, universities and agencies often prevent access to online resources

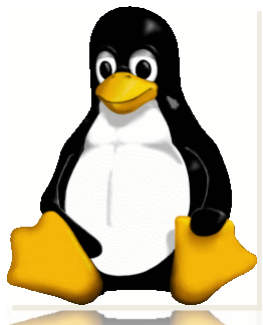
Vision

Support the growth of a capable and flexible workforce by providing quality education and training easily and efficiently through the advances of information technology and recommendations of learning science.

- Create a flourishing ecosystem for next generation learning content
- Develop easy-to-use tools to empower anyone to develop engaging content
- Integrate with existing online projects and standards to amplify individual efforts
- Leverage the power of social media to enable collaboration and improvement of online materials
- Use the flexibility of open source licensing to grow and develop the platform and tools

Advantages of OPEN Source

- ***Enhanced Reliability and Quality*** - open source has been quality assured by a large team of testers on more technical platforms than a commercial vendor could afford or consider
- ***Open Source Communities Find and Fix Bugs More Quickly***
- ***Security Patches are Released More Quickly – often more secure than classic commercial software***
- ***Benefits of a Community of Practitioners*** - the benefits of customers, developers and project team members all working together in a extensive, large community; and
- ***The open source model builds open standards and achieves a high degree of interoperability***
- ***Endorsed by NSA -*** *for ability to deliver security at a lower cost*



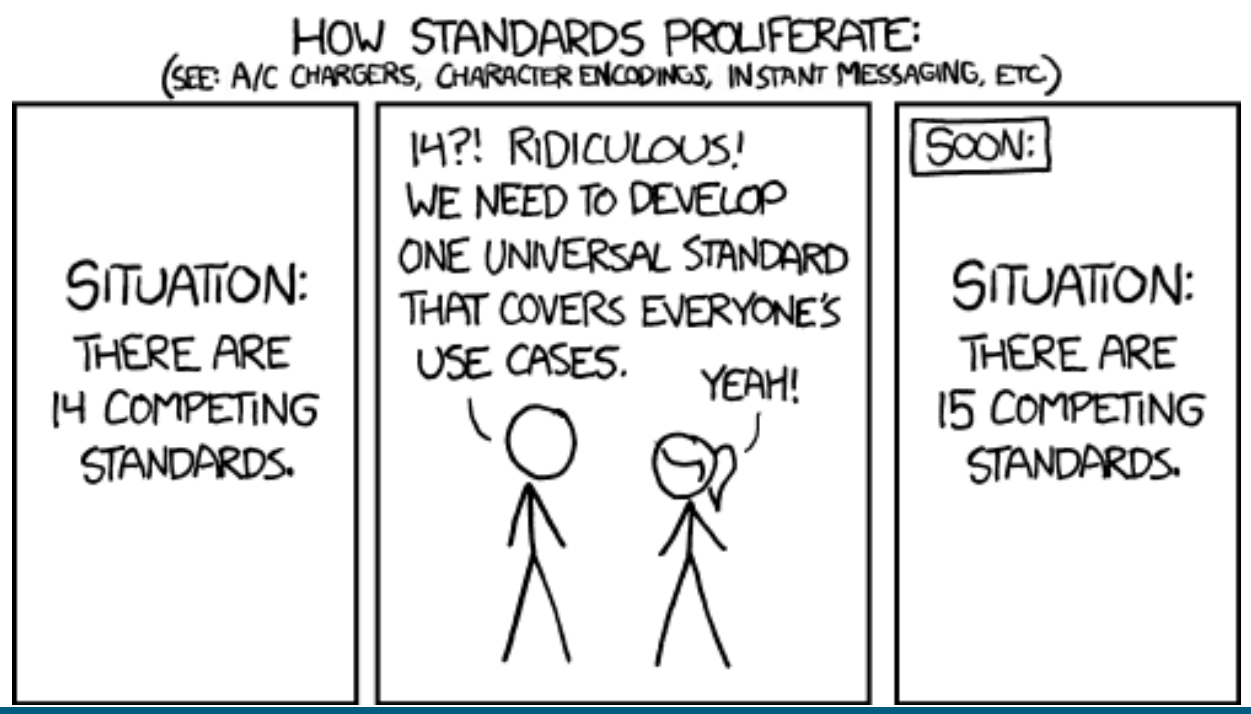
NTER by the Numbers

Subsystem	Function	Lines of Code	Main Sponsor
Ilias	Course Management (LMS)	1,300,000	DOD/NATO
Liferay	Enterprise portal (for displaying and configuring other services)	2,150,000	Cisco
MySQL	Database Management System	1,280,340	Oracle
Jasper	Reporting Engine	228,856	Jasper
Apache	Web Server Software	248,980	Apache
Apache-httpd	More Web Server Software	438,785	Apache
Solr	Full text search & navigation	854,662	Apache
Nutch	Web-search software	82,181	Apache
Hadoop	Support data-intensive distributed applications in the cloud	1,343,735	Yahoo! / Apache
WebGL (deprecated O3D)	Enables browser-based interactive content	34,369	Google
Total		**7,961,908**	

Leveraged code valued at $600M -- $800M

NTER Products and Services

- ***Advanced Authoring Tools*** make it easy, and inexpensive, for organizations to build, and deliver state-of the art learning experiences and continuously improve them
- ***An eLearning Repository with Advanced Search capability*** – gives access to thousands of courses that can be used as is, edited or used as individual searchable content objects to jumpstart course development
- ***A Learning Management System*** for collaborative development, delivery of online & eLearning content



What does NTER do?

Users

Registry

U.S. Department of Energy

NTER

ILIAS

moodle

UMass/Dartmouth

NTER

Bb Blackboard

NRCERT

NTER

ILIAS

U.S. Department of Defense

NTER

ILIAS

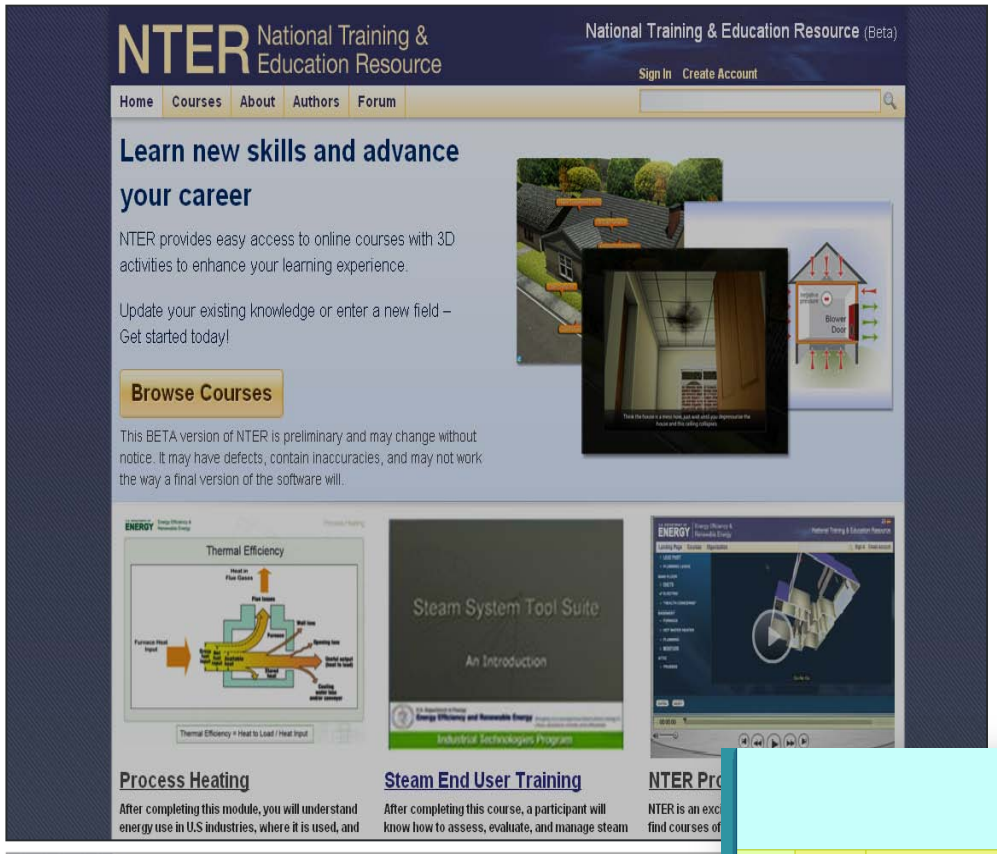
moodle

U.S. Department of Education

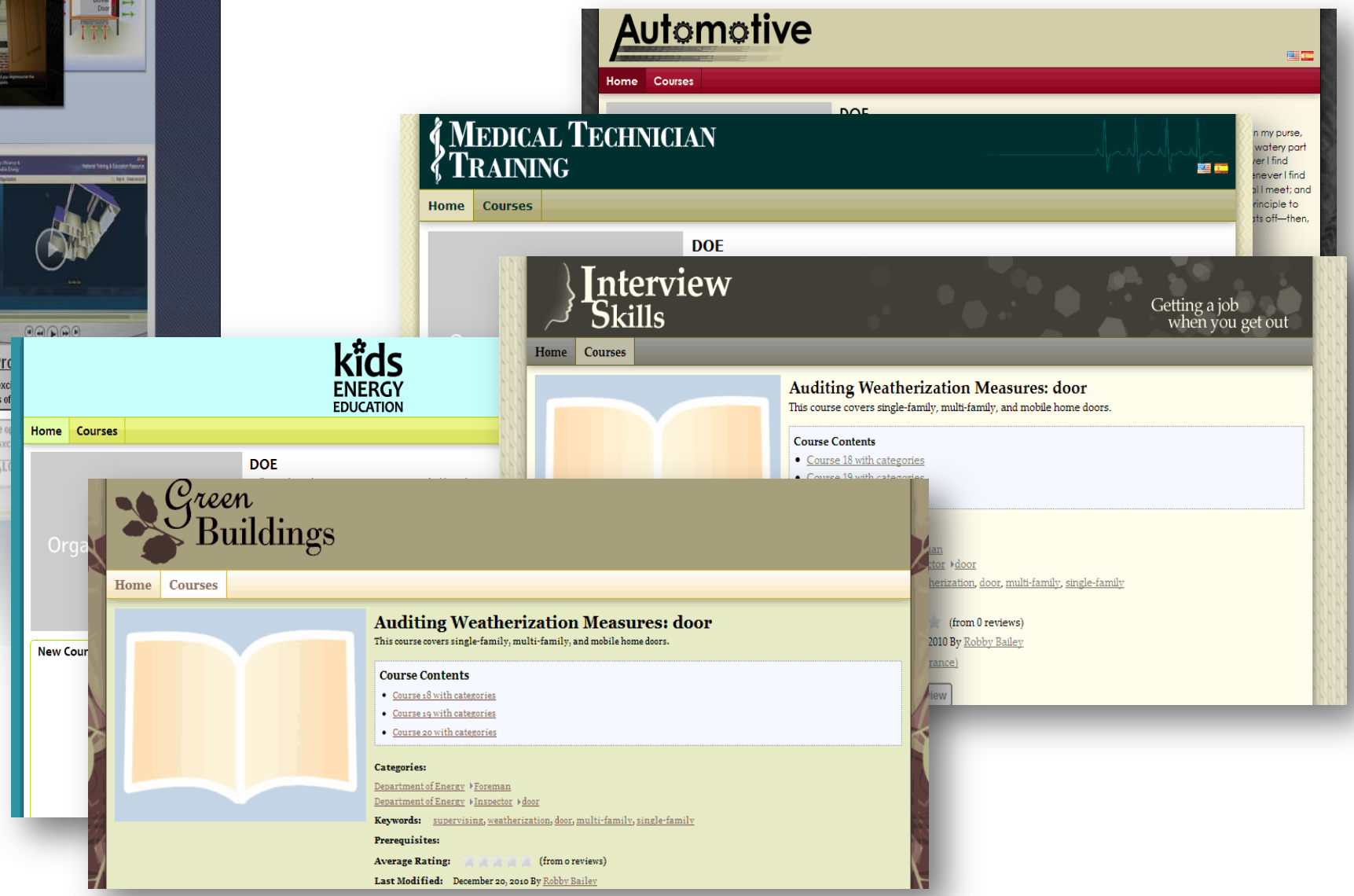
NTER

moodle

NTER Branding Examples



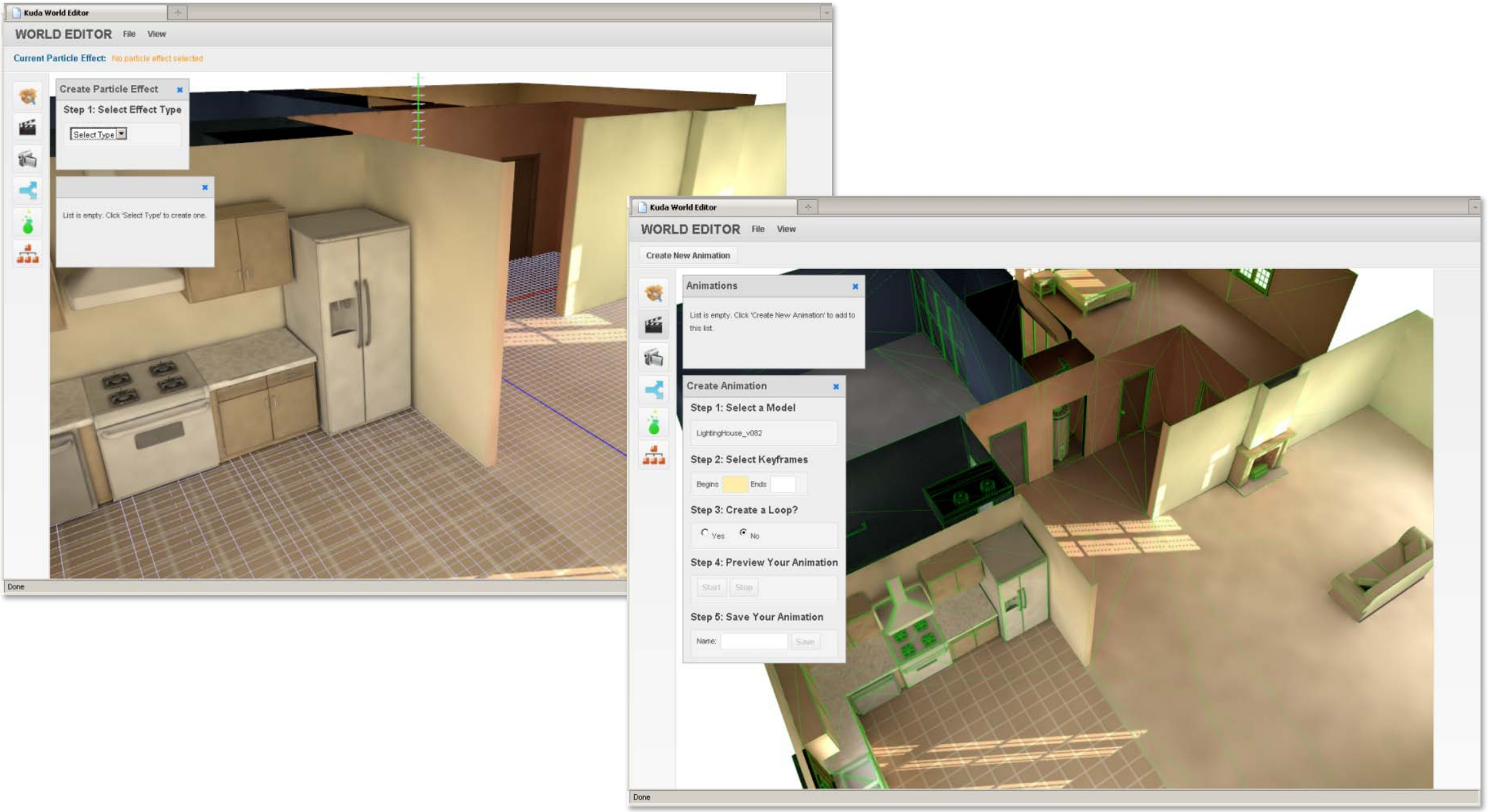
DOE NTER Node



Other NTER Nodes

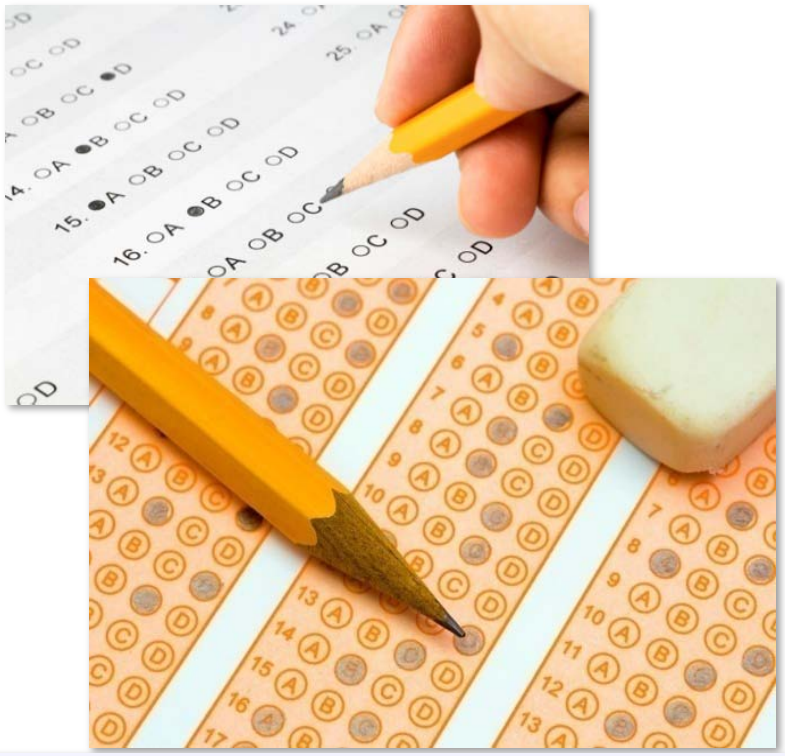
Authoring tool for 3D content creation

- Build 3D simulations without programming
- Runs in browser; no heavy downloads



Performance-based testing

Trading this….



Leaky, recessed light fixtures can cause:

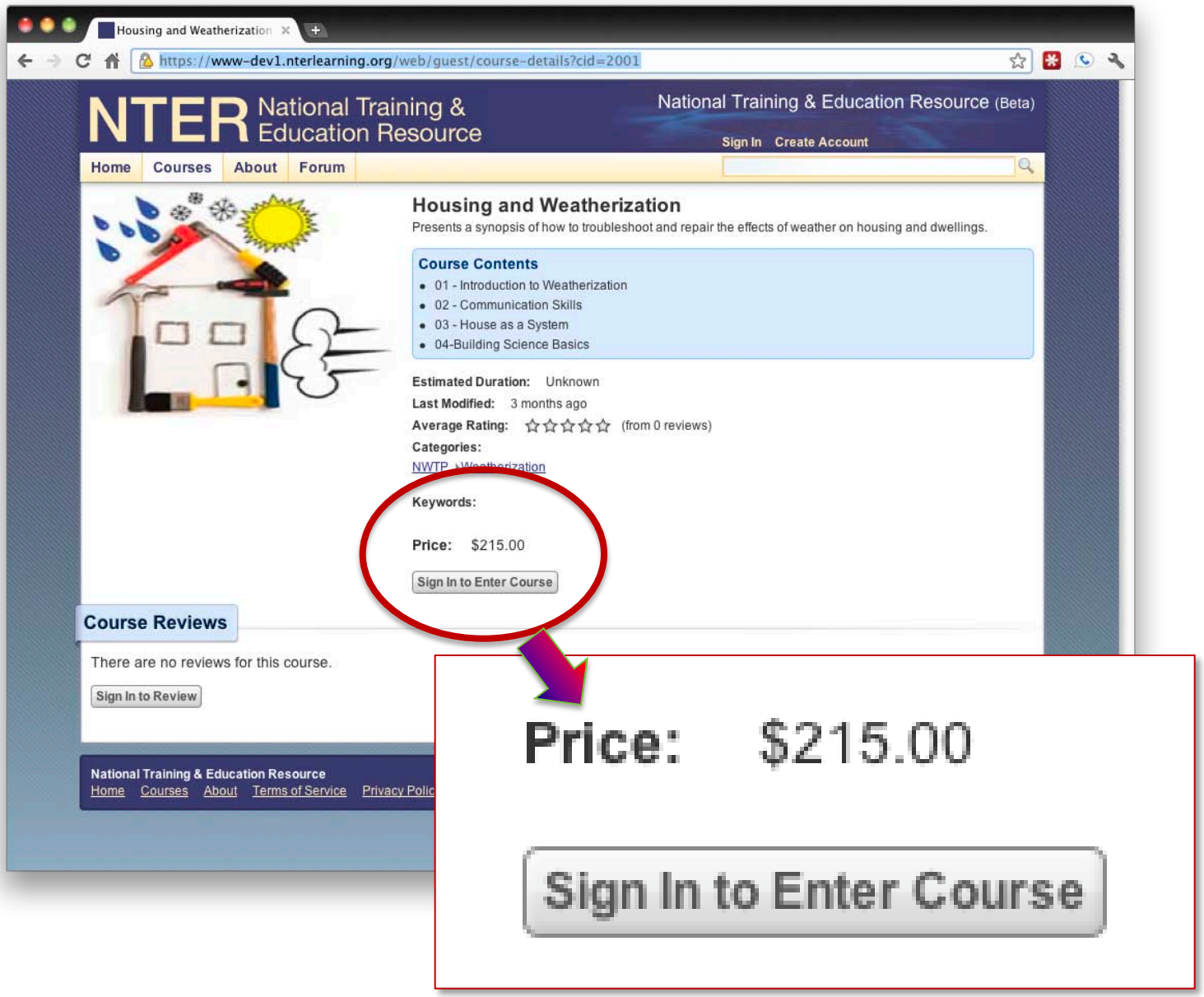
- Electrical problems
- Ice dams
- Furnace malfunction
- All of the above
- Poor light quality

Submit Answers

For meaningful, performance-based assessment

Correctly install the proper type of wall joint to complete the structure.

Commercialization



4 ways to build a market:

1. Courses
2. Instruction (blended)
3. Content
4. Degrees / certificates

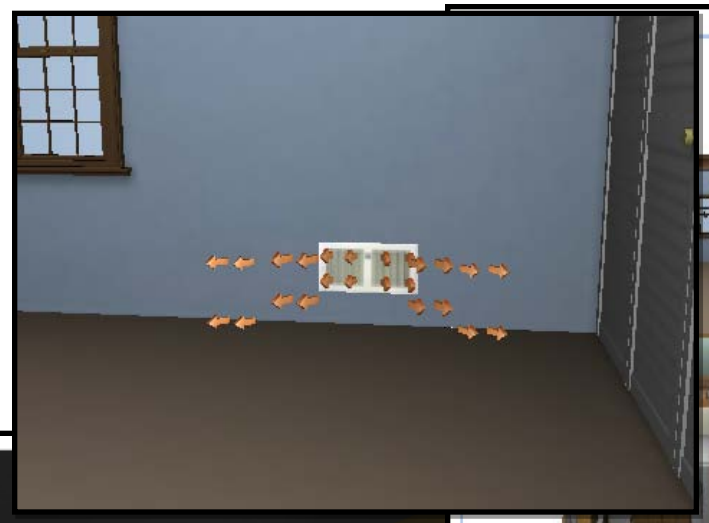
- Icons allow users to identify permissions
- Presents information about source

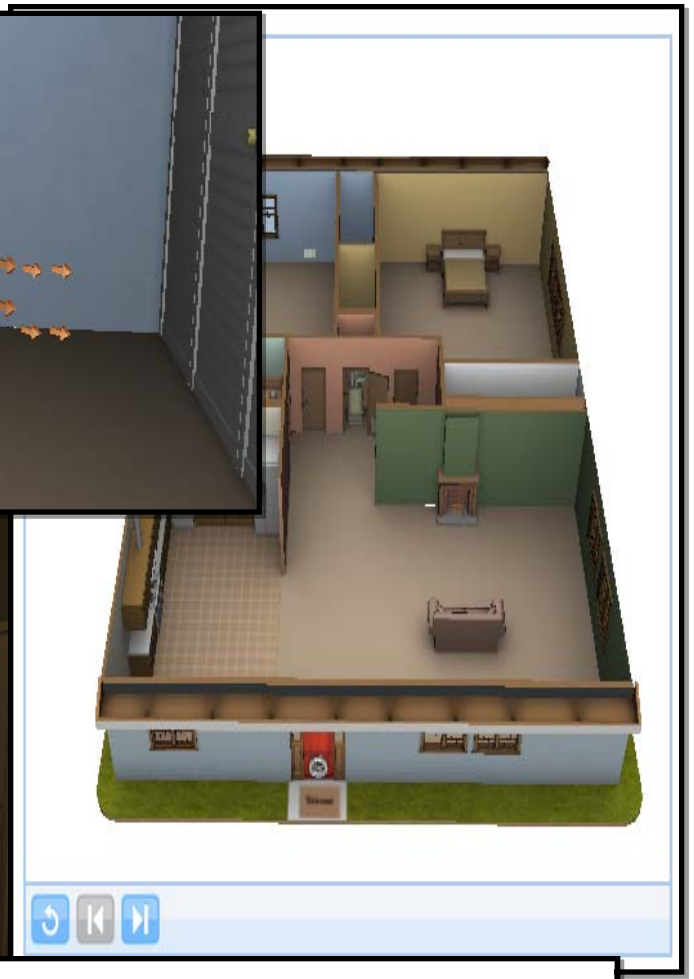
Supports Traditional & Advanced Training Materials

By reviewing this lesson, participants will:

- Know the proper location of thermal and air barriers
- Recognize the driving forces of air leakage
- Understand the connection between air leakage, energy waste, and moisture problems
- Understand how air ducts effect pressure balance within the home
- Understand the principle behind the blower door as a tool for measuring air leakage

Click on the arrow to hear the speaker notes. 00:00 00:00





Particle Control

Show Arrows | Show Spheres | H

Camera Views

ndow | Outside Side | Inside Fireplac

space: Show/hide bounding

ith the mouse to rotate the scene, h

Knowledge Check

Adding insulation to the attic does not affect the heating or cooling system.
- False
- True

Submit Answers

A house is a system of interdependent parts.
- False
- True

Submit Answers

Air sealing and insulating a home reduces the heating and cooling load.
- False
- True

Submit Answers

Leaky, recessed light fixtures can cause:
- All of the above
- Electrical problems
- Poor light quality
- Ice dams
- Furnace malfunction

Submit Answers

Weatherization affects:
- Only certain rooms of the home
- Just the windows and door
- Just the heating equipment
- The entire house as a system

Submit Answers

Sample Screen Shot of Available Courses

Courses - nterlearning.org

https://www.nterlearning.org/courses;jsessionid=DCE0F4BE22792B0F010C30226ECBFF3E

NTER National Training & Education Resource

National Training & Education Resource (Beta)

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All Courses

All Featured New Popular

No Fear Act

☆☆☆☆☆

nwtp.nterlearning.org

Home Energy Scoring Tool - Qualified Assessor Training

☆☆☆☆☆

weatherization-nwtp.nterlearning.org

Steam End User Training

☆☆☆☆☆

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Information Systems Security Awareness Training

☆☆☆☆☆

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Building Science Animations

☆☆☆☆☆

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House as a System Learning Exercise in 3D - Demo

★★★☆☆

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Hazards and Response - Demo

☆☆☆☆☆

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Appropriations Law

★★★★☆

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Drivers Overview Training

☆☆☆☆☆

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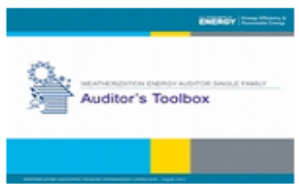
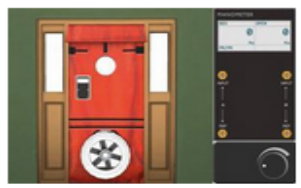


UMass Dartmouth Energy Auditing

☆☆☆☆☆

weatherization-nwtp.nterlearning.org



3D assets for re-use - Blower Door Basics

☆☆☆☆☆

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Blower Door Basics - Beta

★★★☆☆

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NTER Authoring Training

★★★★★

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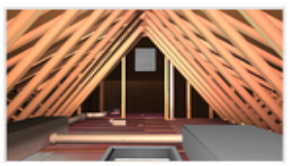

Attic Air Sealing Beta Version Desktop

★★★★☆

weatherization-nwtp.nterlearning.org

Steam Tool Suite Training

☆☆☆☆☆

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Mechanical Insulation Education & Awareness - Alpha

☆☆☆☆☆

weatherization-

Weatherization Courses by Pulaski Technical College

☆☆☆☆☆

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Building Science Basics

☆☆☆☆☆

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Recent NTER Accomplishments…

the WHITE HOUSE PRESIDENT BARACK OBAMA

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The White House

Office of the Press Secretary

For Immediate Release June 24, 2011

President Obama Launches Advanced Manufacturing Partnership

Today, at Carnegie Mellon University, President Obama launched the Advanced Manufacturing Partne
(AMP), a nati vernment to invest i
emerging tec nce our global comp
Investing in t notechnology, will s
creation of g y, and accelerate pr
development

The Presider st more than $500 million to
jumpstart this , we must invest to win the
future. Invest nufacturing capabilities in
critical nation materials used in manufacturing
products; est energy efficiency of
manufacturin reduce the time required to
design, build s will compliment these federal
efforts helpin

Department of Energy

Customer Service Plan

2011
CHIEF LEARNING OFFICER
Learning In Practice Awards
The Innovation Award
Gold, Division I

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

ENERGY EFFICIENCY | RENEWABLE ENERGY | RESEARCH & DEPLOYMENT

NTER

DOE Announces New Partnerships to Support Manufacturing Job Training

U.S. Secretary of Energy Steven Chu announced a series of new manufacturing job training partnerships using the Department of Energy's National Training and Education Resource.

View story.

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DOE Energy Blog ▸
How You Can Save Over 30% on Gas This Summer
July 6, 2011

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GOAL TO CREDENTIAL 500,000 MANUFACTURING WORKERS by 2016

Beginning Shortly
1:30 PM ET
White House Forum on Transforming Federal Technology (IT) Management
THE WHITE HOUSE

ENERGY.G

OLOGY | ENERGY SOURCES | ENERGY EFFICIEN

DOE Digital Archive
RSS Feed
Video Archive

June 29, 2011

Department of En s to Job Training

National Training and Education Resource (NTER) Offers Tools to Train Workers

Washington, D.C. - To complement the Obama Administration's launch last week of the
U.S. Secretary of Energy Steven Chu today announced a series of new manufacturing job t
Department of Energy's National Training and Education Resource (NTER). DOE will be p

DOE/CF-0067

U.S. DEPARTMENT OF ENERGY

STRATEGIC PLAN

MAY 2011

NTER Summary

- ***Searchable Virtual eLearning Content Repository*** – a clearing house for high interest content with advanced search capability
- ***Enterprise eLearning Platform*** – NTER can launch, track record progress and generally manage eLearning content without licensing costs
- ***Agency Customer (External) Training*** - at least 1.3 million external learners need this service
- ***Collaboration Tools*** – Includes, web boards, wikis, blogs, rosters, calendars, and other collaboration and course management system capabilities
- ***Sophisticate 3d Authoring Tools*** – NTER provides sophisticated authoring capability, with a library of 3D content SCOs; and
- ***508 and more*** – Tools are provided to help authors create 508 compliant materials and meet next generation standards for accessibility. Integrated NCAM media player (support for screen readers and Closed captioning)

Thank You

Contacts:

Michelle Fox, Michelle.Fox@ee.doe.gov
Alex Cohen, Alex.Cohen@hq.doe.gov

Early Adopters/Partners

- DOE's Energy Technology Programs (Solar, Vehicles, Advanced Manufacturing,/Industrial Technologies, Federal energy Management Programs)
- Other DOE Offices: Health, Safety and Security, Office of Electricity.
- National Labs: LBL, NREL, PNNL, INL
- Advanced Manufacturing Initiative: National Association of Manufacturer's Manufacturing Institute; Ford's Partnership for Advanced Studies; MAGMA (representing the big 3 automakers); Macomb Community College
- The Center for Energy Workforce Development: Troops to Energy Jobs
- A significant number of the winning applicants in the Department of Labor's Trade Adjustment Act ($500million solicitation)
- Department of Defense
- 6 Weatherization Centers
- Under consideration by 4 other cabinet level agencies and emergency response training center

TECH SPECS

Technical Specifications

- Operating System: Linux (Debian or Ubuntu) or Windows Server
- Nutch: an open source web search engine based on Lucene Java for the search and index component.
- Solr: an open source enterprise search platform from the Apache Lucene project
- Shibboleth: federated identity-based authentication and authorization infrastructure based on SAML
  - Security Assertion Markup Language (SAML): an XML-based open standard for exchanging authentication and authorization data between security domains, that is, between an identity provider (a producer of assertions) and a service provider (a consumer of assertions.) SAML uses a SOAP binding within an HTML message.

Tech Specs (cont'd)

- Database Server software: MYSQL or MSSQL
- MYSQL: relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases under General Public License, as well as under a variety of proprietary agreements.
- MSSQL: a commonly used relational database server, developed by Microsoft

Tech Specs (cont'd)

- Cloud Services:
- Amazon web services
  - Hadoop (software framework that supports data-intensive distributed applications under a free license)

Development technologies:

- Apache-HTTPD (web server software)
- Liferay (Liferay Portal is a free and open source enterprise portal written in Java and distributed under the GNU Lesser General Public License and under proprietary licenses)
- Java and PHP programming languages
- Jasper Reports: JasperReports is an open source Java reporting tool that can write to screen, to a printer or into PDF, HTML, Microsoft Excel, RTF, ODT, Comma-separated values and XML files. Used in Java-enabled applications, including Java EE or Web applications, to generate dynamic content

API

- **RESTful**: a style of software architecture for APIs
- **SOAP APIs**: Simple Object Access Protocol, is a protocol specification for exchanging structured information in the implementation of Web Services in computer networks. It relies on (XML) for its message format, and Hypertext Transfer Protocol (HTTP) or Simple Mail Transfer Protocol (SMTP), for message negotiation and transmission.

3D content development

- **Kuda**: an advanced JavaScript library and World Editor that enables web developers to quickly build interactive 3D web solutions. Allows abstraction of the complexity of 3D behaviors into easy to use building blocks for common functions, allowing developers to create compelling user experiences by setting up a complex sequence of events that respond to user input.
- **WebGL**: a software library that extends the capability of the JavaScript programming language to allow it to generate interactive 3D graphics within any compatible web browser. WebGL code executes on a computer display card's Graphics Processing Unit (GPU), which must support shader rendering
- **three.js**: There are several developer libraries for WebGL development, three.js being another
- **HTML5**: a language for structuring and presenting content for the World Wide Web, and is a core technology of the Internet. An aim of the most recent version 5 has been to improve the language with support for the latest multimedia while keeping it easily readable by humans and consistently understood by computers, devices, and web browsers.

3D content development (cont'd)

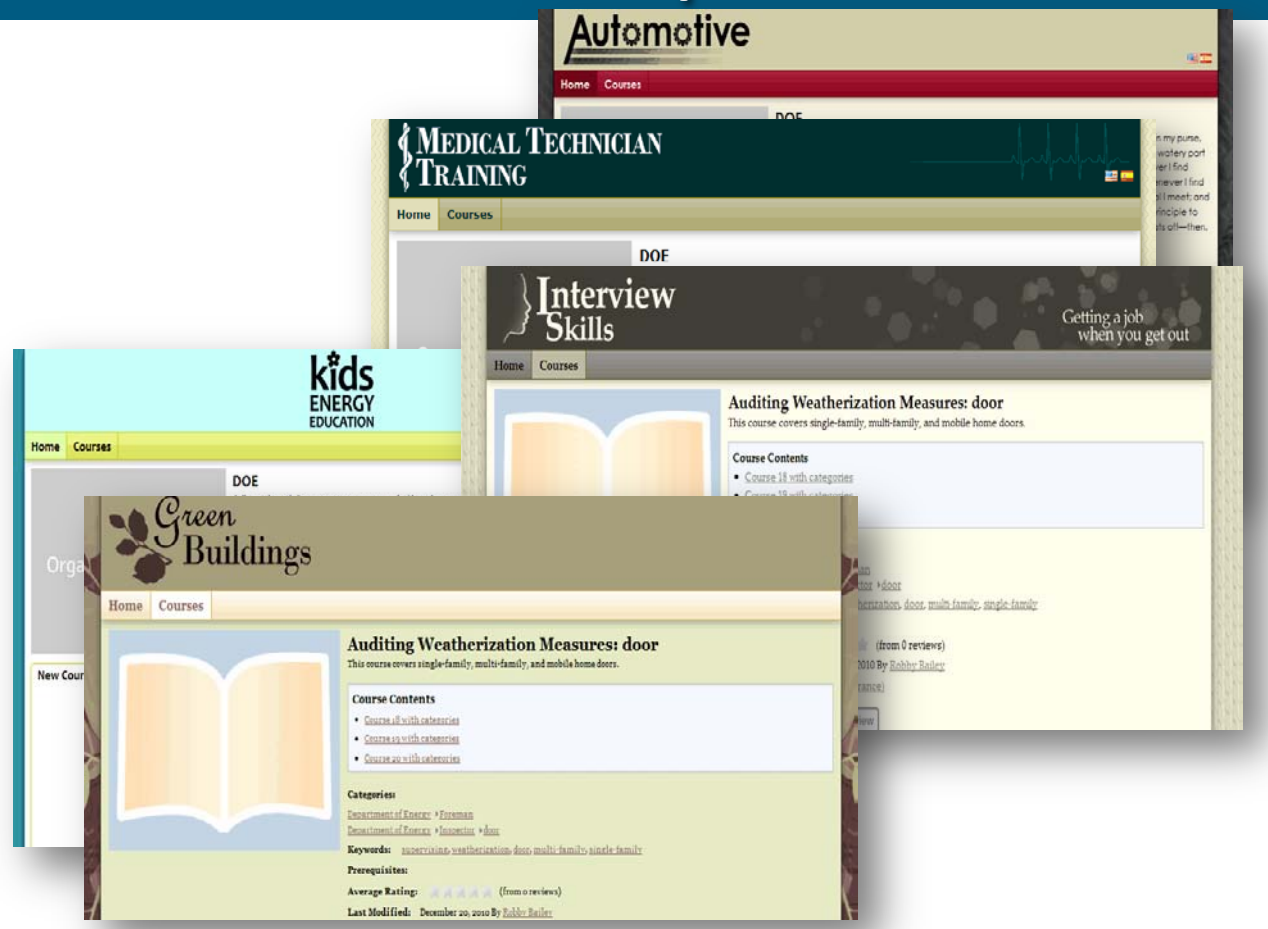
- JavaScript: JavaScript is a prototype-based scripting language, is a multi-paradigm language, supporting object-oriented and functional programming styles.
- 3D modeling / Collada: COLLADA is an open standard (COLLAborative Design Activity) for establishing an interchange file format (via XML schema) for interactive 3D applications. Allows for exchanging digital assets among various graphics software applications that might otherwise store their assets in incompatible file formats.

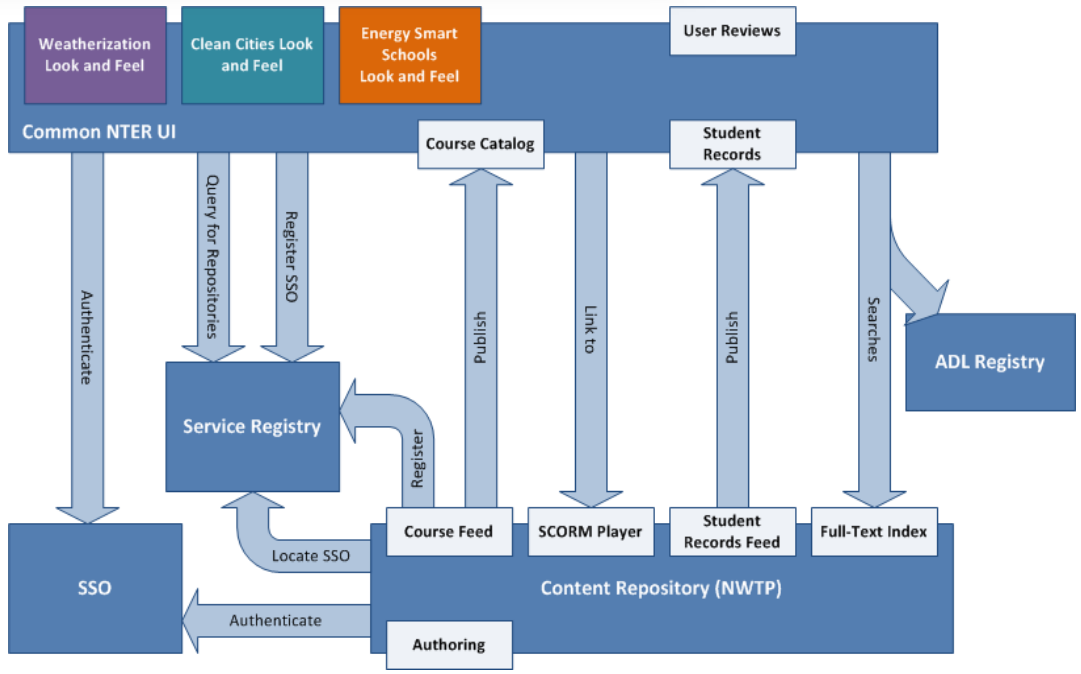
E-commerce:

- NTER supports an e-commerce system if allowable
- PayPal

Future Development Plans

- Currently Planned NTER Enhancements
  - Enhanced SSO
  - Accessibility
  - eCommerce capability
  - Ontology Support
  - Additional LMS Support
- Future NTER Enhancements
  - Enhanced ontology support
  - Enhanced eCommerce
  - Rich Authoring
  - Learning Registry and other system integration
  - Intelligent tutor
  - IP Protection
  - Additional Content Areas
  - Improved Mobil Support





So what's really new?

- Distributed search (end the portal wars: enables customized control and real sharing across institutions)
- Deep content search (end the metadata wars)
- Authoring tools for 3D content creation (the SME can create rich content)
- 3D simulations in browser (no download)
- Integrates with commercial game engines (for deeper immersion)
- Integration platform (to address the fragmented education and training space)
- Assessments in 3D environments (ties to the learning management system—broadens assessment options)
- Portlets (custom tools)
- Skinning (for personalization)
- Social media tools (rate courses to help improve the content)
- Single sign on