

**Author(s):** MELO 3D Project Team, 2011

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## Melo3Ds

### Integration (and Creation) of Online Learning Resources. Why and How?

Lynne Crandall, Brenda Gunderson, and Nancy Kerner  
University of Michigan at Ann Arbor

### Learning Resources

- **Learning Resources**  
Any web-based teaching tool (e.g., tutorial, collection, ....)
- **Learning Objects (LOs)**  
Interactive web resources that lead students to learning goals via informed pedagogy

### Selection and Integration of LOs

- **LO course collection**
  - Selection based on course needs and goals
  - Provided within syllabus or on website
- **LOs tagged for course integration**
  - Choice based on **needs vs type** of LO
  - Choice focused on LOs that address **difficult concepts or skills**

### Selection and Integration of LOs (Physics)

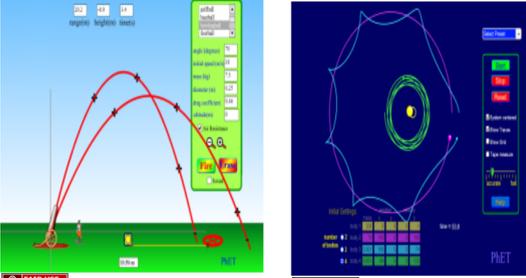
Physics



Games



### Selection of Learning Resources (Physics)



Chosen Java Applets = Games = LOs

### Selection and Integration of LOs (Physics)

Presentation by Anbo

[www-personal.umich.edu/~anbo/presentations/MELO2010physv2.swf](http://www-personal.umich.edu/~anbo/presentations/MELO2010physv2.swf)

- Created Assignments linked to selected LOs with directives on how to interact with the LO
- Visually link abstract homework problems to reality



## Video LO Tutorials (Writing and Math)

Writing presentation by  
Ben Gunsberg

[screencast.com/t/MTE1MGI4MTgt](http://screencast.com/t/MTE1MGI4MTgt)

Mathematics presentation by  
Michelle Lee mishlie@umich.edu

[screencast.com/t/Y2FiNzUxOWlt](http://screencast.com/t/Y2FiNzUxOWlt)

Select one to watch and listen (using your headphones),  
then share with your neighbor ...

## Process of Making YOUR HOUSE

- **Find** the LO
- **Evaluate** it, anything to fix/change, how do you want to make it YOURS?
- **Primary fix** = video (to explain, show, guide)
- What **other components** needed?
  - The roof = objectives
  - The basement = assessment/assignment

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## Some Screen Capture Background



Get free version of Jing from [jingproject.com](http://jingproject.com)

© FAIR USE

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## Jing

### Advantages:

- **Free and Easy to Use**
- Captured Shots or Videos can be saved or automatically uploaded
- Formats great for the web



### Disadvantages:

- Maximum Video Length: 5 minutes
- Can annotate Screen Shot, but no video editing
- Videos are branded
- Video format not always what one would want

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## Using Jing

### Instructions for Use:

1. Choose "Capture" from the Jing Sun.
2. Select the window of area you wish to record.
3. Select *Screenshot* or *Video*. Record.
4. Preview it.
5. Save it locally, or upload it to Screencast.net.



Show a little Jing now!

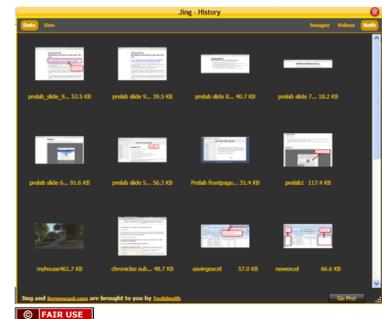
© FAIR USE

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## Using Jing

### History:

- Convenient location to:
- view
  - share
  - delete recent Jings.



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## The Fully Wrapped LO = PreLab 03

**Lesson03:**

In this lesson, you will generate confidence intervals for estimating a population proportion. You will be able to set the value of the (usually unknown) population proportion, the sample size, and the confidence level. You also will be able to decide how many samples will be generated and a confidence interval based on each sample will be computed and displayed. The applet graphs the intervals and those which did contain the true proportion are shown in green, while the intervals that did not contain the true proportion are in red. The true proportion is shown by a blue line on the graph. Trying different settings will allow you to make comparisons and draw some important conclusions about how confidence intervals work.

**Simulation Link:**

The simulation may be found [here](#).

**Assignment:**  
Check Ctools for due date and submission details.

For each of the questions below, use the applet to help you address the question. **Submit your 1-2 sentence summary for each question directly inline to your GST Ctools site Assignment for prelab3 (or as instructed on your class Ctools site).**

- Set the confidence level to 99% and the sample size to 100.
  - What is the long run proportion of confidence intervals that contain the population proportion?
  - Does the long run proportion depend on the sample size  $n$ ? (Try some other sample sizes keeping the confidence level at 99%.)
- What happens to the length of the confidence intervals as the confidence level increases? Compare some intervals at the 90%, the 95%, the 99% confidence levels (keeping the population proportion and the sample size  $n$  the same).
- What happens to the length of the confidence intervals as the sample size increases? Compare some intervals made using samples sizes of  $n = 30$ ,  $n = 50$ , and  $n = 100$  (keeping the population proportion and the confidence level the same).

**Lesson:**

Watch the following video about how to use the confidence interval simulator.



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## Video Wrapped PreLab Part 1

**Introduction:**  
Brief paragraph describes goals of the activity.

**UNIVERSITY OF MICHIGAN**

**Stat 250 Prelab Tutorials**

Tutorials Lesson01

**Lesson03:**

In this lesson, you will generate confidence intervals for estimating a population proportion. You will be able to set the value of the (usually unknown) population proportion, the sample size, and the confidence level. You also are able to decide how many samples will be generated and a confidence interval based on each sample will be computed and displayed. The applet graphs the intervals and those which did contain the true proportion are shown in green, while the intervals that did not contain the true proportion are in red. The true proportion is shown by a blue line on the graph. Trying different settings will allow you to make comparisons and draw some important conclusions about how confidence intervals work.

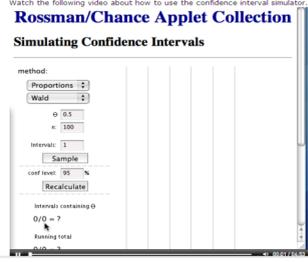
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## Video Wrapped PreLab Part 2

**Lesson:**

Watch the following video about how to use the confidence interval simulator.

**Rossman/Chance Applet Collection Simulating Confidence Intervals**



**Video Wrapper:**  
A narrated screen capture video demonstrates the use of the learning object.

<http://sitemaker.umich.edu/stats350.prelab/lesson03>

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## Video Wrapped PreLab Part 3

**Learning Object:**  
A link to actual online learning object is given.

**Simulation Link:**

The simulation may be found [here](#).

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## Video Wrapped PreLab Part 4

**Assignment:**  
Students complete a short assignment using the Learning Object.

**Assignment:**  
**Due before the start of your lab, Feb. 2-4.**

For each of the questions below, use the applet to help you address the question. **Submit your 1-2 sentence summary for each question directly inline to your GST Ctools site Assignment for prelab3.**

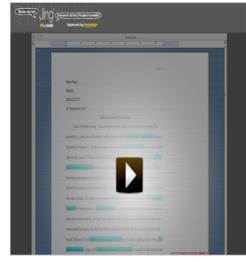
- Set the confidence level to 99% and the sample size to 100.
  - What is the long run proportion of confidence intervals that contain the population proportion?
  - Does this long run proportion depend on the sample size  $n$ ? (Try some other sample sizes keeping the confidence level at 99%.)
- What happens to the length of the confidence intervals as the confidence level increases? Compare some intervals at the 90%, the 95%, the 99% confidence levels (keeping the population proportion and the sample size  $n$  the same).
- What happens to the length of the confidence intervals as the sample size increases? Compare some intervals made using samples sizes of  $n = 30$ ,  $n = 50$ , and  $n = 100$  (keeping the population proportion and the confidence level the same).

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## Video Wrapped Feedback

**Jing**

- Free (with optional upgrade)
- Saved as files or links
- Image or video screencapture
- Documents, webpages, etc.



<http://www.screencast.com/users/cmodey/folders/Jing/media/8bd96754-d693-4b5e-ba59-952afb2f2e4d>

### Advantages of LO?

- Addresses fundamental concept.
- Provides excellent visual demonstration.
- User can adjust controls.

### Disadvantages of LO?

- Learning Objectives?
- Directions?
- Terminology/Notation unknown to our students

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### Initial Assessment of LO

- The “Simulating Confidence Intervals” LO has the **potential** to enhance students’ understanding of an important concept.
- However, the **imperfections** make the LO unsuitable as a standalone resource.

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### A Solution

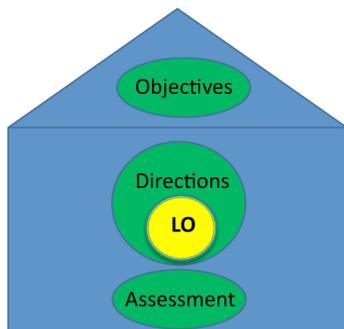
- “**Package**” the LO within the framework of a larger, instructor created lesson.
- **Instructor guidance** using can alleviate the problems caused by LO imperfections.

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### Instead of:



### My students will see:



### Why a video screen capture?

- The **video wrapper** allowed the instructor to:
  - Introduce the LO
  - State the learning objectives
  - Explain inconsistency in notation
  - How it works
- After watching the video, students can use the LO independently.

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## Unique LO Collection Building (Psychology)

### An Innovative End of Term Assignment

- Intro Psych students pick own "muddiest point"
- Student = *para-peer reviewer* **found, reviewed, recommended LO** to address muddiest point
- Students **submitted mini-review** of LO and recommendation for why and how to implement in course

## Unique LO Collection Building (Psychology)

Students recommended many quality LOs **previously overlooked or undiscovered**

### Examples

**Pavlov's Dog**- A classical conditioning simulation  
Categorized in: [Science&Technology/Biology/Zoology](#)



**Mouse Party**- A simulation for examining the effect of common illicit drugs at the synaptic level  
Categorized in: [Science&Technology/Chemistry/Biochemistry](#)



## Unique LO Collection Building (Chemistry)

Presentation by Kevin Hartman,

[screencast.com/t/MTE1MGi4MTgt](http://screencast.com/t/MTE1MGi4MTgt)

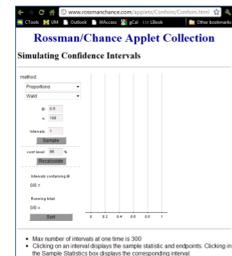
- "LO Scavenger Hunt" to find "best course LO"
- Student submits mini-review and recommendation for why and how to integrate LO in course
- Points awarded based on review, quality of LO, recommendation specifics, and peer feedback

## Overall Outcome: The Big Idea

Move from a model where students are not only engaged learners but also co-teachers.

## (Potentially Useful) LO in Statistics

- Simulating Confidence Intervals
- Authors: Beth Chance, Allan Rossman (CP)



<http://www.rossmanchance.com/applets/Confsim/Confsim.html>

## Interdisciplinary LO Collection

- Undergraduate students have different levels of academic training
- Success in undergraduate education demands a solid foundation in a variety of basic academic skills

Why interdisciplinary?

Examples:

Writing skills  
Working in Groups  
Presentation skills  
Study skills

- How can we work towards leveling the playing field?

## Integrating LOs (Psychology) and Creation of an Interdisciplinary Collection

Presentation by Adena Rottenstein

<http://www.screencast.com/t/ODc1OTU3>

- Unique course specific listings of LO collections
- LOs are video clips with relevant assignments
- Interdisciplinary collection details

## MERLOT

- LO resource collection in MERLOT growing exponentially
- Useful LO evaluation criteria
- Ability to submit LOs and create personal LO collections
- Power of affiliation with a global teaching and learning community

Why MERLOT?

1. Virtual Chemistry Laboratory  
Added: 06/23/2008

2. Acid and Base pH Tutorial  
Added: 06/23/2008

3. Solubility  
Added: 06/23/2008

4. CHEMTUTOR  
Added: 06/23/2008

5. Contemporary Chemistry Multimedia Module  
Added: 06/23/2008

6. Virtual chemistry lab for acid-base titration  
Added: 06/23/2008

7. Virtual Chemistry  
Added: 06/23/2008

8. Periodic Table of the Elements  
Added: 07/02/2008

9. Chembalancer - balancing equations game  
Added: 07/02/2008

10. Bottomless Worksheet of Molarity  
Added: 07/02/2008

11. Computer Animations and Simulations

1. Create a Personal LO Collection on MERLOT

## Creation of an LO collection

- Time to create your own personal collection!
- See *Assignment 1* on page 3 of your workshop handout

<http://www.merlot.org>

2. Make LO collections student accessible. How?