



The CAPA Project

Presented by:

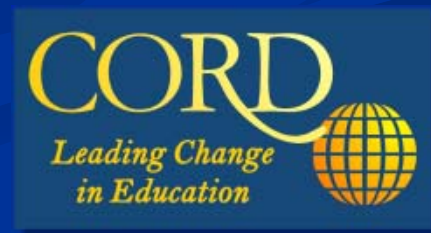
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— *The Concord Consortium* —


and

John Chamberlain, *CORD*

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Introduction

- 
- Consider various performance-related skills:
 - **Trade skills** (welding, construction,...)
 - **High-risk** (lasers, nuclear, bio-hazards,...)
 - **High-cost** (space program, surgery,...)
 - **Rare/Controversial** (procedures, research,...)
 - **Troubleshooting** (complex devices/situations)
 - **Difficult** (research, destructive testing, tools,...)

Performance Assessments

- Students, employees (hiring, promotion)
- How can we assess desired skills?

- **Worst-case:** paper/pencil test

- Poorly represent performance
- Generally indicates only head-knowledge
- Requires well-designed test instrument





- **Best-case:** hands-on test

- Excellent measure of performance
- Requires real-world equipment/conditions
- Requires real-time proctor involvement

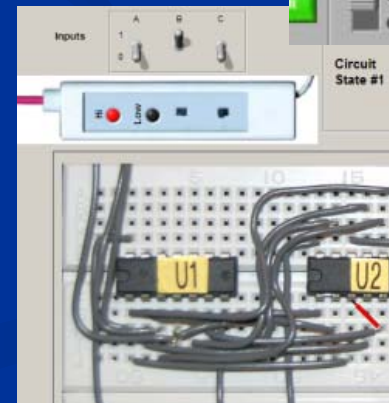
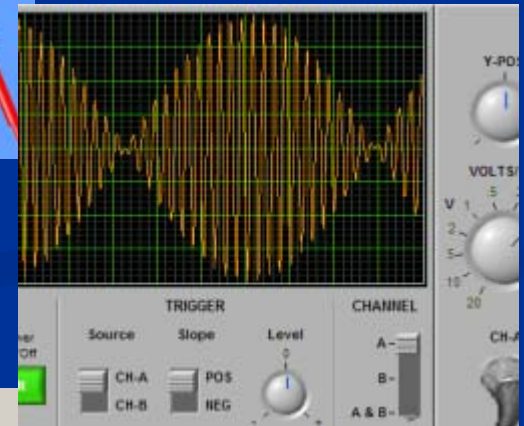


Research Goals

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- **Create** assessments in the “middle ground”
 - Realistically **simulate** the performance tasks
(Univ of CO: *PhET*; Nat’l Instruments: *LabVIEW*)
 - **Capture data** and score with objective rubric
(Concord: *SAIL/OTrunk*)
 - **Compare** scores with other tests
- 
- Evaluate the “middle-ground” results
 - What have we learned (in this project)?

Computer-Assisted Performance Assessments

- Digital Multimeter
 - Using a DMM
 - Ohm's Law
- Oscilloscope
 - Freq and amplitude
 - Amplitude modulation
- Circuit troubleshooting
 - Logic gates (digital)
 - Amplifier (analog)



Our Software

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- System requirements include:
 - MS Windows 2000 or later
 - Java Runtime Environment (1.5 or later) with Web Start
 - LabVIEW 8.5 Runtime Engine
 - Adobe Flash Player
 - Adobe Reader
 - User privileges to install to **C:\Program Files**
 - Details are available at:

<http://capa.concord.org>

Hands-On Demo!



- Go to:

<http://capa.portal.concord.org>

- Register as a teacher to access full portal functionality
 - Add classes and students
 - Select assessments for your students
 - View student reports
- Choose an assessment (click arrow: ➡) and follow instructions
- Have fun!

Reporting and Rubrics

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- The CAPA Portal currently provides:
 - Class and student management
 - Student progress report
 - Automatic scoring of assessments
 - Detailed reports for each student
 - Aggregated class report for each assessment
 - Future functionality
 - Teacher-editable rubric for each assessment

Student Reports

CAPA

File

Measuring Resistance 3.0

Time: 07/28/2008 13:17:06 CDT
Student: Thomas Edison

Summary

	Time (s)	Value	Unit	# Measurements	Voltage measure
resistance	504.6	(0) Bad	(0) Ok	(5) 4	(9) Good (15)

Final Grade: 44 / 100 (44.0 %)

Answer submitted: 60 mOhms. Correct Answer: 65 Ohms

resistance

Summary of points taken out:

Time (s)	More than 5 minutes completing assessment	(-5)
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Aggregated Reports

[CAPA: http://capa.diy.concord.org/reports/2/otml?users=239,240,241,242,243,244,245,246,247](http://capa.diy.concord.org/reports/2/otml?users=239,240,241,242,243,244,245,246,247)

File

Using Digital Multimeter

Teacher: [Positive Charge](#)

Class: [Electronics 101](#)

	Voltage			Current			Resistance			Final Grade (out of 100)
	Leads	Circuit	Score	Leads	Circuit	Score	Leads	Circuit	Score	
Thomas Edison	Good	Correct	100	Good	Correct	100	Good	Correct	100	100
Capa Student1	N/A	N/A	0	N/A	N/A	0	N/A	N/A	5	1
Capa Student2	Good	Correct	95	Good	Correct	98	Good	Correct	98	97
Capa Student3	Good	Correct	100	Bad	Incorrect	8	N/A	N/A	0	36

Customizing the Rubric



Indicator	Description	Points	Percent
<input checked="" type="checkbox"/> Time (s)	Time the student took to complete the step (in seconds)	5	5.0 %
<input checked="" type="checkbox"/> Value	Whether the value submitted is correct or not	40	40.0 %
<input checked="" type="checkbox"/> Unit	Whether the value submitted is correct or not	15	15.0 %
<input checked="" type="checkbox"/> # Measurements	Number of measurements the student made in this step	0	0.0 %
<input checked="" type="checkbox"/> Answer was measurement?	Whether the value submitted was taken from a measurement or not	5	5.0 %
<input checked="" type="checkbox"/> Correct DMM Setting?	Whether the student had the multimeter in the correct setting or not	15	15.0 %
<input checked="" type="checkbox"/> Lead Placement?	Whether the multimeter leads are placed in the right place	10	10.0 %
<input checked="" type="checkbox"/> Circuit Setting	Whether the circuit set up was correct	10	10.0 %
<input checked="" type="checkbox"/> DMM overloaded?	Whether the multimeter was ever overloaded during the assessment	0	0.0 %
<input type="checkbox"/> TOTAL		100.0	100 %

DMM overloaded?		Points
Whether the multimeter was ever overloaded during the assessment		
No	The DMM was never overloaded	0
Yes	The DMM was overloaded at least once	-20

How You Can Help

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- We need you!
 - Seeking 20 professors and teachers from around the country
 - Run trials 2008-2009 school year
 - Interested?
 - Submit form with your contact info at the end of this session
 - Participants will receive small stipend

The End!

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- Thank you for participating in this session!
For more information, please go to:

<http://capa.concord.org>

- To contact us, send email to:

capa@concord.org