STEVENSON UNIVERSITY
BEVERLY K. FINE SCHOOL of the SCIENCES
Engineering, Math, and Physics

Maintaining Rigor, Expanding Assessment

Applying UDL in Physics

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What is UDL?

A framework for designing learning experiences that anticipate learner variability.

Multiple Means of Engagement

Why do students learn?

Multiple Means of Representation

How do students access information?

Multiple Means Action and Expression

How do students demonstrate what they know?

But What Does This Mean in Physics?

Multiple options for one assignment

Fair and consistent grading?

More grading time?

Especially challenging in larger classes.

Physics priorities

Quantitative problem solving

Mathematical reasoning

Examinations

Rigor

The question

Can we expand how students demonstrate learning without lowering expectations or replacing rigorous exams?

From Multiple Options → Multiple Assessments

Traditional interpretation

One learning outcome
↓
One assessment
↓
Multiple ways to complete it

My approach

Multiple dimensions of learning
↓
Multiple complementary assessments

Same rigor. More dimensions of learning.

What Changed in My Physics Course?

Original assessment portfolio

Homework (13)
Labs (12)
Unit Exams (3)
Final Exam
Professionalism

Expanded assessment portfolio

Homework (13)
Labs (11)
Unit Exams (3)
Final Exam
Professionalism

+ 1 Lab Skills Test
+ 1 Group Project → Oral Presentation

Example: Assessing Laboratory Skills Directly

PHYS 211 — Circuit Skills

Individual demonstration:

- Build a circuit correctly
- Use a DMM appropriately
- Measure voltage and current
- Collect and interpret measurements

PHYS 210 — Experimental Investigation

A new lab with minimal instructions

Students had to:

- Design/setup the experiment
- Determine how to obtain data
- Collect measurements
- Determine an unknown
- Write a brief report

A direct demonstration of laboratory skills—not simply a written test of lab concepts.

What Did Students Say?

Confidence was closely connected to hands-on participation.

Less confident

"I was doing notes and calculations and not working with the device."

More confident

"I understood all of the labs we performed in class… [including] how to measure voltage and current."

Students also emphasized participation in lab as preparation for the assessment.

A Second Dimension: Collaboration & Communication

Group Physics Project

Physics 2

Hands-on project

Collaborative problem solving

Shared product

Oral presentation

Instructor observation

The project created a different kind of student interaction.

Students worked together toward a shared product and communicated their reasoning and results.

I did not collect formal outcome data, so I present this as an instructor observation. Not a measured effect.

Different Assessments. Different Opportunities to Demonstrate Learning.

Assessment	Primary opportunity
Homework	Practice & feedback
Unit / final exams	Individual quantitative problem solving
Traditional labs	Experimental investigation
Lab skills test	Individual hands-on skills
Group project + presentation	Collaboration & communication

The goal was not more assessments for the sake of more assessments—it was a more intentional assessment portfolio.

Keep the Rigor. Expand the Assessment.

KEEP

Rigorous exams

Quantitative problem solving

Mathematical reasoning

ADD

Direct laboratory skills

Collaborative problem solving

Communication of physics reasoning

ASK

What do I want my students to be able to do?

Does my assessment portfolio allow me to see it?

UDL does not have to mean choosing between rigor and flexibility.

It can mean expanding what we assess while maintaining rigorous expectations.

Thank You

Questions?

Maintaining Rigor, Expanding Assessment: Applying UDL in Physics

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