Successes and Challenges in implementing the ISLE approach

Please rename yourself

First name

Where you teach- high school or college

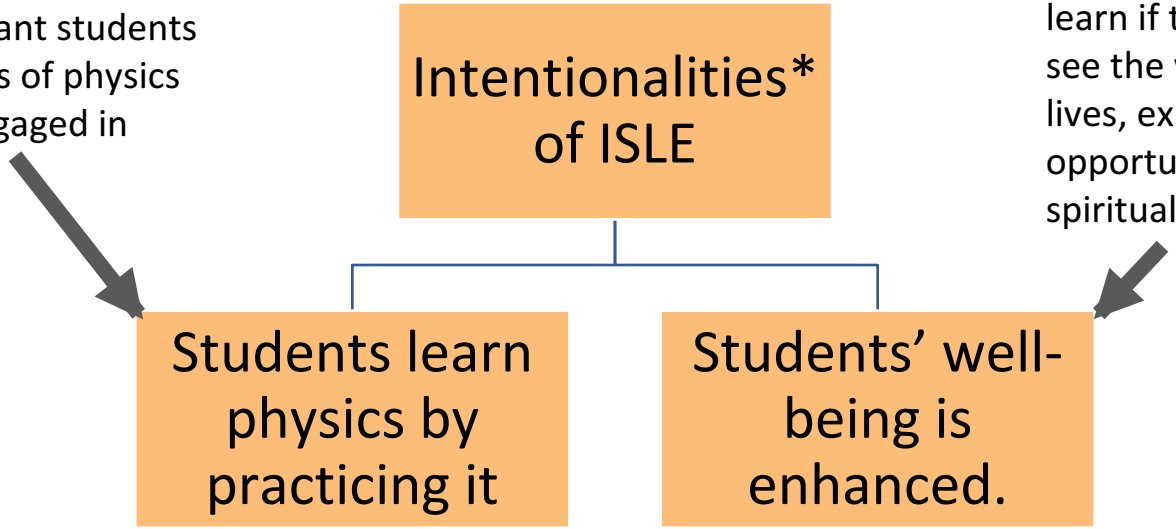
Country

Eugenia University USA

The ISLE approach– an intentional approach to curriculum design and learning

Based on: "the medium is the message" - If we want students to learn the process of physics they have to be engaged in that process.

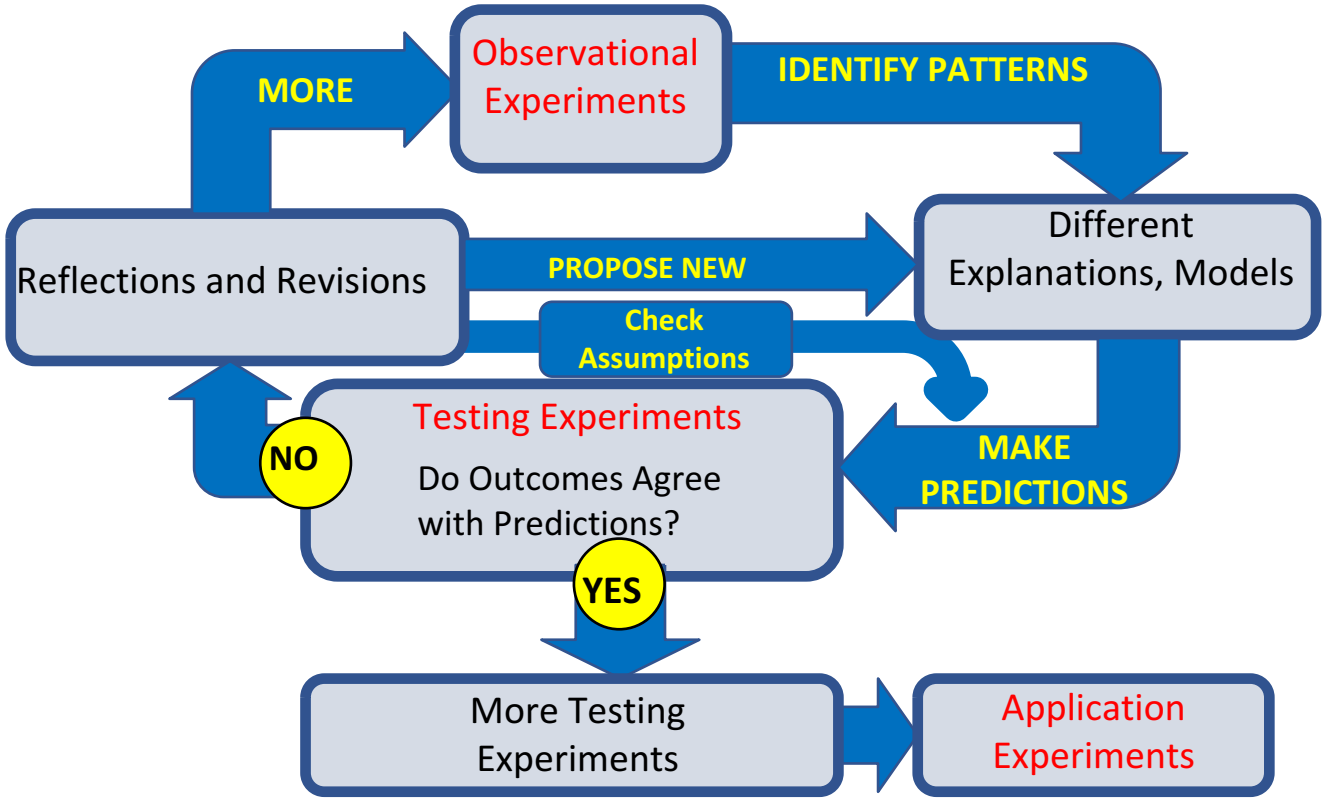
Based on: Theories of human motivation: People will only learn if they enjoy it (c.f. Flow), see the value in their personal lives, experience learning as an opportunity for mental and spiritual growth.



*Intentionality = a purposeful mental state that guides all of our decisions about assessment, activity design, course goals, classroom set-up and even how we interact with students in the classroom on a minute-by-minute basis.

Brookes, D. T., Etkina, E., & Planinsic, G. (2020). Implementing an epistemologically authentic approach to student-centered inquiry learning. Physical Review Physics Education Research, 16(2), 020148.

The Investigative Science Learning Environment (ISLE) approach



Etkina and Van Heuvelen, 2001, 2007; Etkina, 2015

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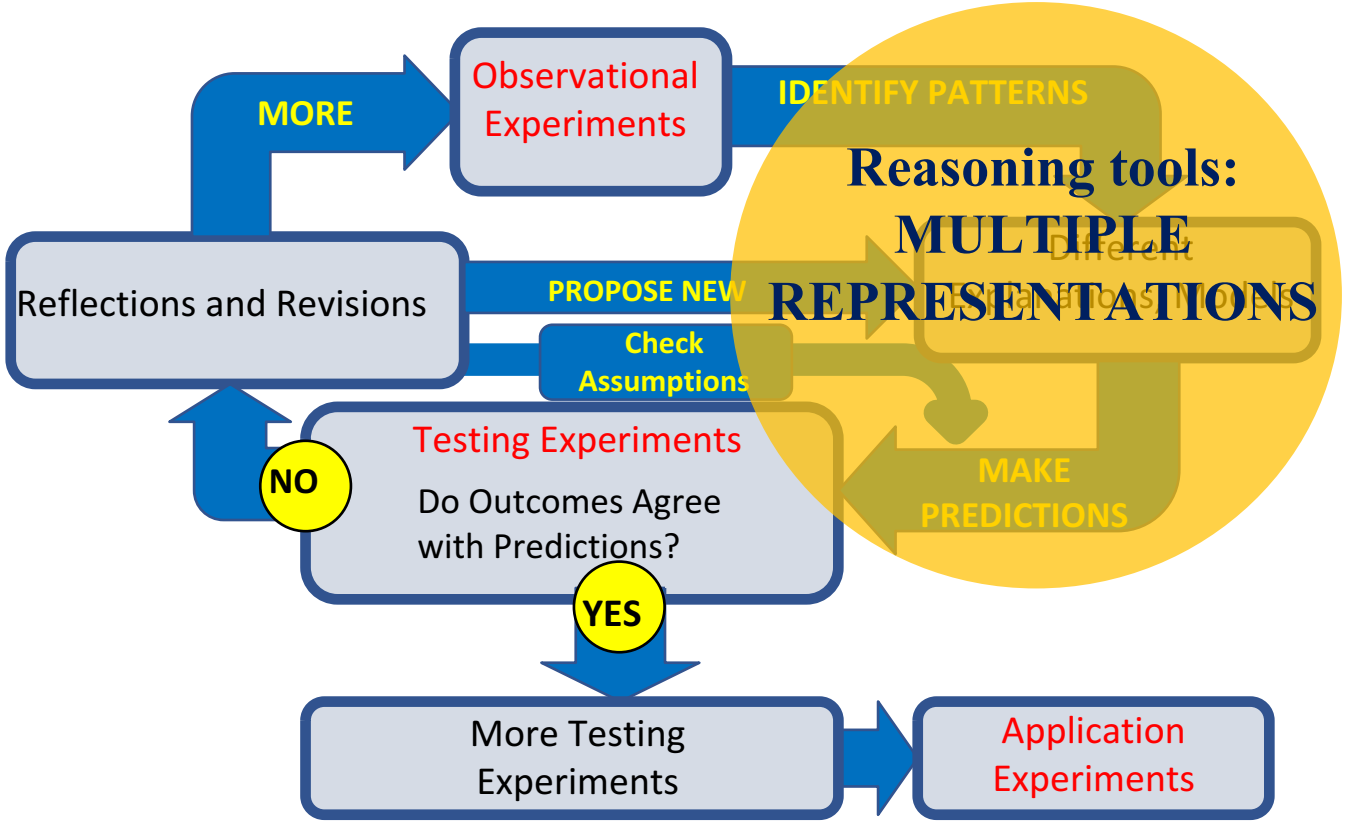

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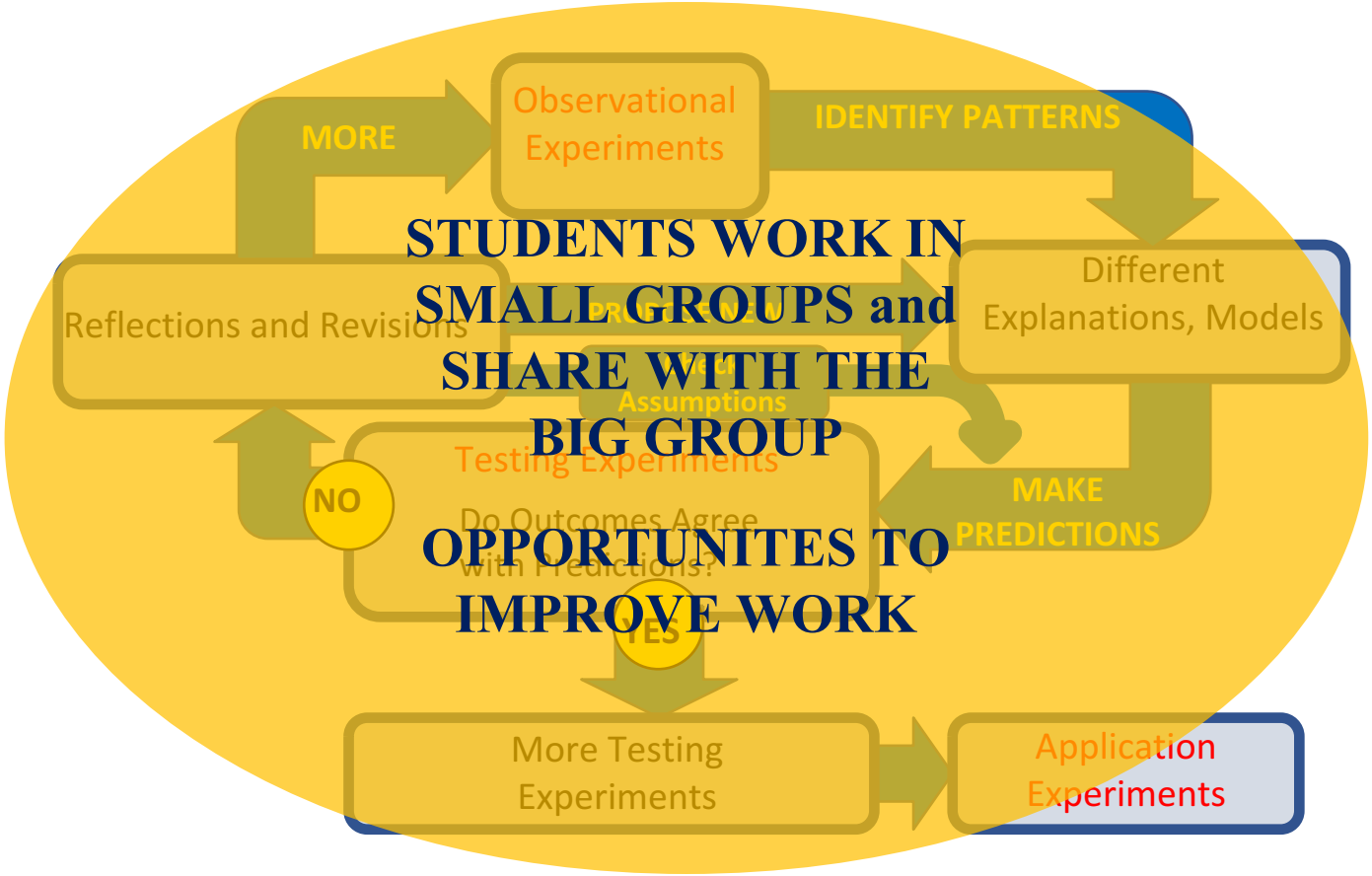

Etkina and Van Heuvelen, 2001, 2007; Etkina, 2015;
https://docs.google.com/document/d/1EGJAPCHBIJGLLt7NS0B0WkimPbbFyf5225vFss1567s/edit?usp=sharing

Folder with the expertise activity

October 2024 Successes and Challenges in implementing the ISLE approach

Video of ISLE in action

- Watch the following video. How does this video represent learning physics through the ISLE approach?

  https://youtu.be/RMyQD27t0oY

Team 1 Successes

Expertise activity and Equation Jeopardy and some group lab reports; bean bags

Getting better at transitioning, whiteboard activities

Group exams participation and engagement

Reference activity (“remember we use the arrow…”, “bowling ball” “bean bag”)

ISLE for AP preparation, for students with limited math

Make connections well beyond lectures can offer

“Co pilot” method

Team 2 Successes

- Strong Conceptual Understanding
- Need to know drives the unit
- Success engaging students who are weaker in mathematics
- Having students use real equipment to do the labs, not just videos really helps with understanding and changes the mood in the class
- Students appreciate the resubmission policy and recognize that it is a great learning opportunity
- Using equipment are so important. They should touch equipment
- Group working and using different marker colors for each student as a signature
- Trying multiple submission and revising increase their self confidence specifically for underrepresented students
- They learn how to use different representations
- ISLE creates a different outlook for labs
- Looking at the experiments as an observational, testing or application experiments helped me get more learning out of the experiments.

Team 3 Successes

The collaboration of the students in small groups.

The students learning to ask each other how to solve problems.

Students are discovering the physics “on their own”

Students able to learn from other groups - most of the knowledge is in the class. They come to rely on each other.

They get better at making their own testing experiments and realizing that they can figure it out on their own.

Promotes scientific thinking and how to be a scientist.

They are getting at being “wrong” and learning from it. Focus on continuous improvement rather than being correct on the first attempt.

Students feel more in charge of their learning

Stressing the importance of non-mathematical representations in problem solving rather than just math.

Team 1 Challenges

Scared to make big changes, fear of not covering everything

Lack of support from admins, students report faculty for complains

The only physics teacher at school, students vary from year-to-year, some year students couldn’t do the same activities as well as they should (especially in the assessment)

Haven’t taken the intro-sessions yet from the “experts”.

Priorities are different from some of the ISLE process components

Team 2 Challenges

- Grading, grading, and more grading
  - Hardware challenges with regrading
- For resubmissions in hs, no office hours to talk to students
- Students used to having high grades find it difficult and can become discouraged
- How to deal with students with low motivation or who are disinterested and how to not take it personally
- Students who refuse to work in a group
- How to deal with students who bounce off of isle method

Team 3 Challenges

Low percentage of girls in class (less than 10%). How do we form effective groups with so few girls?

- Get to know your students

Differences in language from using a different textbook other than College Physics: Explore and Apply, but still using ISLE language and activities in class.

Getting students to work in their groups outside of class time.

Getting students to take notes that are meaningful to them.

Having students be comfortable working with a variety of students when changing groups on a regular basis.

Working with colleagues who may be interested in teaching with a more traditional method (or is resistant to ISLE).

There are so many activities. How do we know which ones to choose? What is enough? What is too much? Timing?

What will I take away from today?

The challenges of today can become the successes of tomorrow.

Back to basics: Focus on need to know, equation jeopardy, expertise activity, etc.

The support from this group/community itself can carry us in a long way. Don't be afraid to reach out.

Reminding students of their progress

I am going to try the idea of having students write there assessment questions and also giving them rubrics before the grading happens (and also the decision making compass made a big impression)

We are students in ISLE, we are learning for ever.

various levels of "need to know"

Decision making compass. Will it lead to more learning or less? Worse wellbeing or better well being?

I need to re-plan how much time I am going to put on kinematics, I need to think about re-arranging my whiteboard positioning and how to work on digital tools to share it. Put more emphasis on obs vs test exp.