

Structuring classroom discourse using formative assessment rubrics

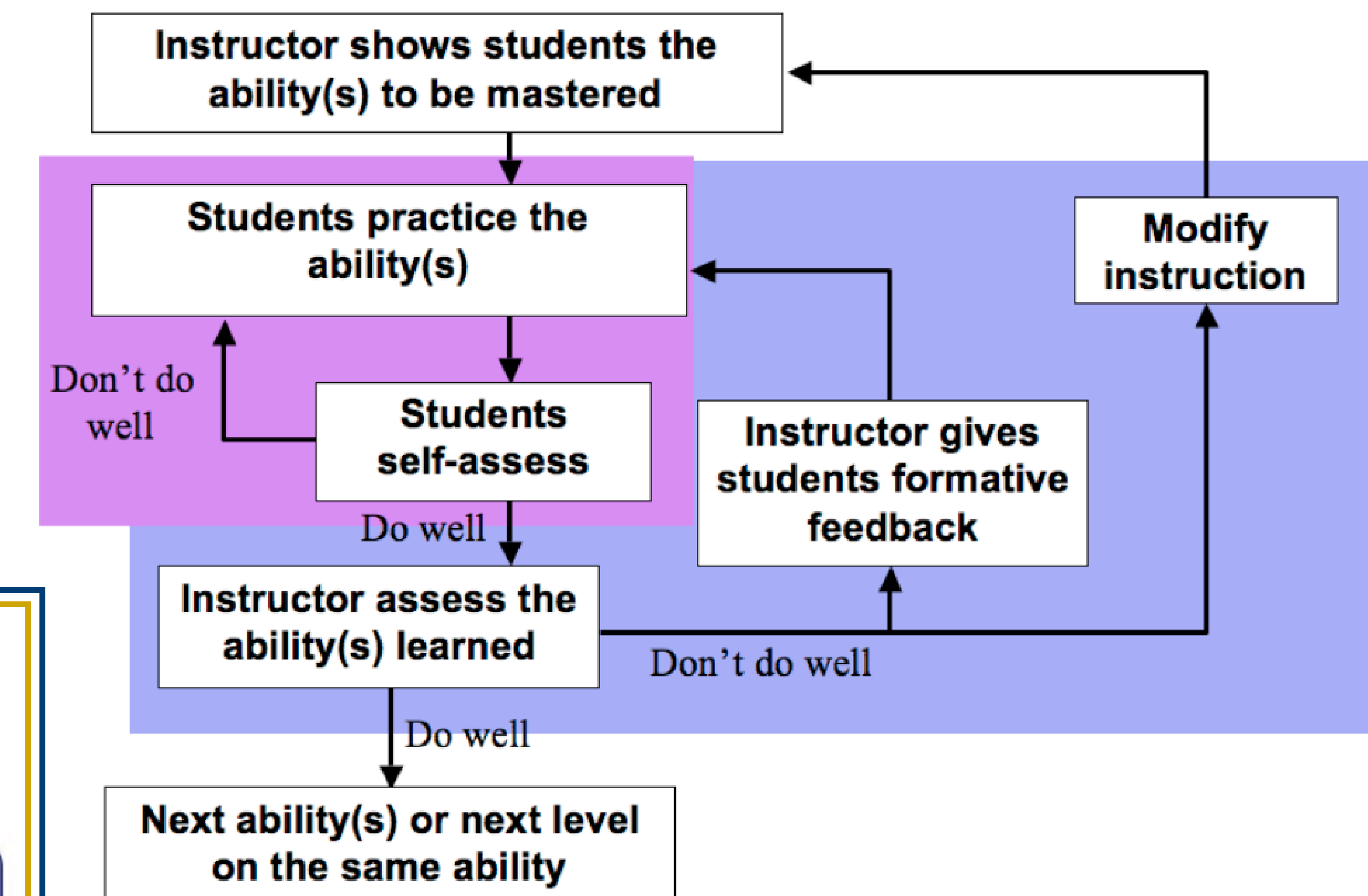
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Examples of rubric sub-abilities

Sub-ability	Missing	Inadequate	Needs Improvement	Adequate
C4 Is able to make a reasonable prediction based on a hypothesis	No attempt to make a prediction is made.	A prediction is made that is distinct from the hypothesis but is not based on it.	A prediction is made that follows from the hypothesis but does not incorporate assumptions	A correct prediction is made that follows from the hypothesis and incorporates assumptions.
D8 Is able to identify the assumptions made in using the mathematical procedure	No attempt is made to identify any assumptions.	An attempt is made to identify assumptions, but the assumptions are irrelevant or incorrect for the situation.	Relevant assumptions are identified but are not significant for solving the problem.	All relevant assumptions are correctly identified.

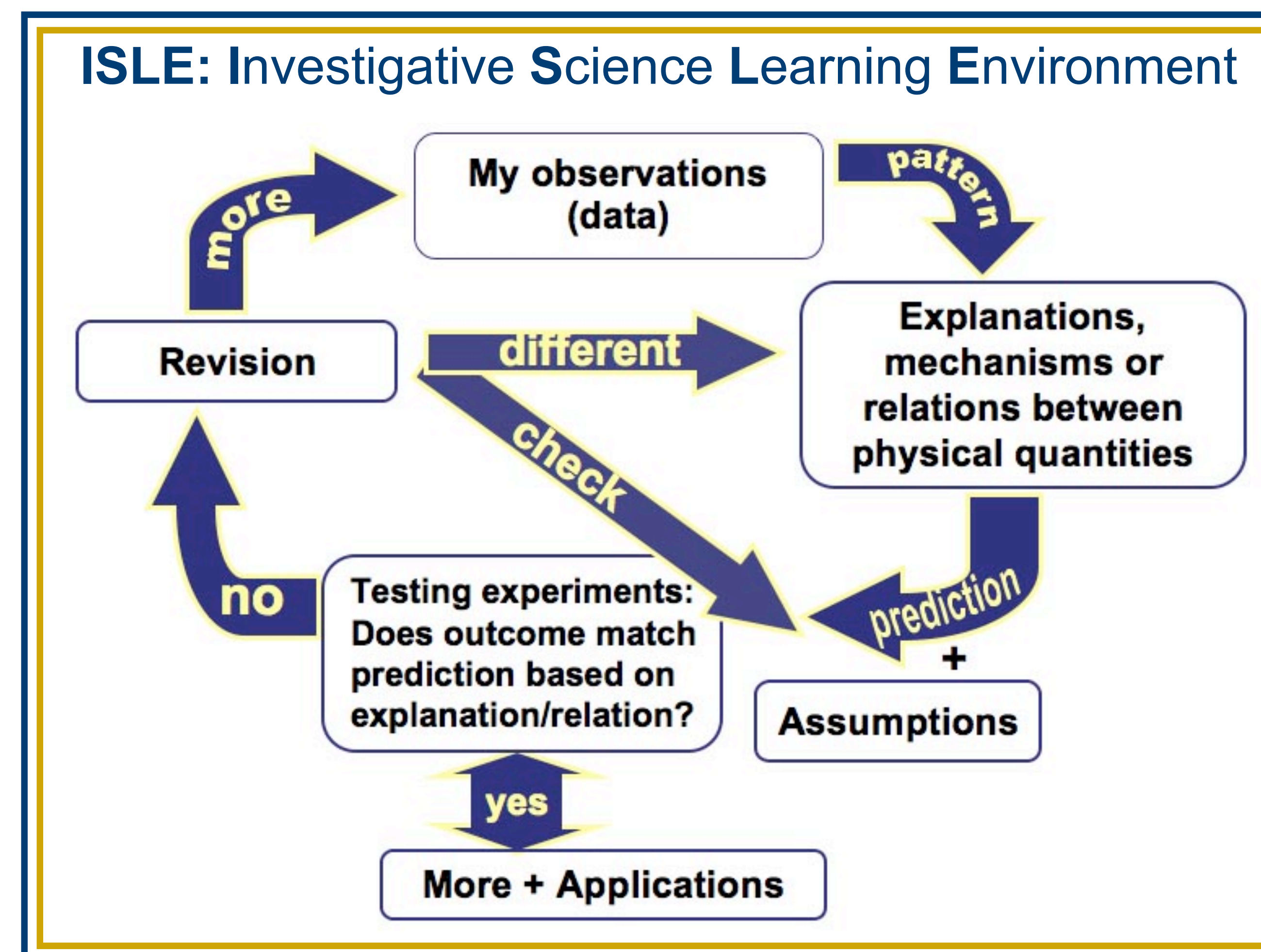
Incorporating Formative Assessment in Student-Centered Classroom



What is critical thinking in physics?

What counts as a scientific argument?

What are the “rules” of the “game” of physics?



Example of epistemological sophistication

“We have to come up with the best model we can based on the equipment we have available to test the model, or just the ideas that come to mind at the time, and make sure everything is consistent with it. We still have to accept that fundamentally our models might be just wrong.”

Best evidence of success (see James Zull, “The Art of Changing the Brain”)

“I feel I gained a lot from the class, but I put in a lot of effort. I would find myself, even when I was driving home or walking in between classes thinking about things we’d done [in class].”

Sense of community

“So one interesting thing about the class is that it did create a sense of community, even among the students I didn’t really interact with very much, like Bob, I never spoke to him at all during the class, but I ran into him at Biscayne bay and we talked for a couple of minutes. Bill, the same thing. So the class established a sense of community. It was a different experience (as compared to other classes).”

