Comparison of student comments on IVETs at RIT and UC

The IVETs assigned at RIT and UC during the research phase of the project were hosted on an RIT server. The research IVETs were programmed to send information back to the server for storage in a database each time a student navigated from one page to another. The information included such things as whether the student had chosen the Video or Text option, how long the student remained on a given page, what answer(s) were chosen for the questions, and so on. In particular, at the end of each IVET was a page where the student was asked two questions, with text boxes for open-ended responses.

The first open-ended question asked what the student had learned in the IVET. We included this primarily because there is research indicating that students who summarize a lesson in writing are more likely to learn from it. However, we also wanted formative data to use for improving future IVETs, so the instructions told the student that the response could also be feedback about the IVET (Figure 1). An answer was required, but students could circumvent that by entering a few random characters in the textbox.

The second open-ended question asked for feedback about the affect question that was in the IVET. This question was optional.

![Figure 1. The What-Did-I-Learn page of a typical research IVET.](image)

The responses were coded, and the numbers of responses for each code are shown in Table 1 for two IVETs assigned in the fall semester of 2022 to both UC and RIT students: Linear Momentum and Angular Momentum. The percentages shown were obtained by dividing the number of responses by the number of students who completed the IVET at that institution. The total numbers of responses do not add up to the number of students because each student's response could fall into several categories, and some students gave irrelevant responses (comments about software issues, etc.).

Figures 2 and 3 express the percentages from Table 1 graphically.
The only large difference in the student response data is that the RIT students were more likely to answer the question about how much they learned. Otherwise, the results indicate very similar patterns for both cohorts, which is what we expected. Because of the small sample sizes, the differences between the institutions are probably not significant.

Students at both institutions gave overwhelmingly positive comments about the IVETs with very few students complaining about them. Likewise, students were much more likely to indicate that the affect question was useful compared to students who indicated that they did not like it.

The following are sample responses for each category.

**Category – Thoughtful comments about what they learned from the tutorial**

*I learned how to use conservation of linear momentum in tandem with conservation of mechanical energy.*

*I learned how to combine conservation of energy and conservation of momentum to solve a complex physics problem.*

*I learned how to use moment of inertia and angular momentum to solve for final angular speed.*

*I learned that objects moving in a straight line still have angular momentum.*
Category – IVET: Positive comments

The activity functioned well and helped me learn.

The explanation and everything was very well done

I thought it was really helpful that she explained why each answer choice was wrong and which was right.

I liked how this video made it more clear to me how to use the different types of equations with each other and clearly explained to me what the scenario was and why we were using the equation in that scenario.

The activity broke a big problem down into simpler down into simpler blocks, and what cues to look out for (i.e. use CoLM for collisions), so it worked fine

It was pretty good.

Category – IVET: Negative comments

It was too long. Why does it show me how to do it correctly if I got the right answer?

I didn't learn anything

This is an inefficient way of learning. I can't answer questions on things I literally did/learn 3 seconds ago.

Category – Affect: Positive comments

I think being asked that question allowed me to take in what I had learned so far. That way I can break down how much I have learned and what I am confused about.

I felt loved

I liked it, it made me do a small reflection to make sure I was truly keeping up.

I felt like being asked that question half way through the tutorial was a great way to see if you actually believed that you knew what was going on. That question gives me a chance to go back and try to learn again what they are asking.

I appreciate that someone cared to check to make sure I was understanding the material, even though I was understanding it just fine.

I think it is great. I wasn't struggling with the solution but if I was I would definitely have found the help useful.
I honestly enjoyed the response to my answer. It reminded me that this video was not just about one problem, it was about problem solving in general and reminded me that I was not the only one struggling and that I am still able to get help.

**Category – Affect: Neutral comments**

I felt it was a bit of an unnecessary question but I didn't mind it.

I didn't mind being asked.

I feel fine using this tutorial

I was fine answering the question, no other emotions were felt.

**Category – Affect: Negative comments**

Felt kinda unnecessary, I'd rather get on with it

I didn't like being asked how I feel

I didn't need this video