Maximizing Engagement and Content Understanding during Flipped Classroom Experiences in an Honors Physics Classroom

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Background

- Honors Physics students often struggle to complete advanced problem solving and lab analysis independently during homework.
- Flipped Classrooms use video as homework to introduce concepts before class time.
- Flipped Classroom Experiences allow introductory intuitive information to shift to homework time which frees up class time to tackle more nuanced work.
- This shift is only effective if students are <u>engaged</u> and <u>understand the content</u> presented during the Flip.

Research Questions

Focus Question: "How are engagement and content understanding best maximized during the flipped portion of a flipped Honors Physics Course?"

Sub-Question 1: To what degree is there a correlation between type of integrated prompt and engagement?

Sub-Question 2: What if any correlation exists between type of integrated prompt and content understanding?

Sub-Question 3: In what ways does this process affect me as a teacher?

Methodology

Treatment: Variation of Integrated Prompt Type while completing Flipped Video Experiences.

Phase 1
- Students trained in flipped process
- Basic prompt at beginning and end of video

Phase 2
- Groups X and Y
- Varying Integrated Prompts alternate between Generic and Specific
- Student survey and Interviews

Results

Engagement

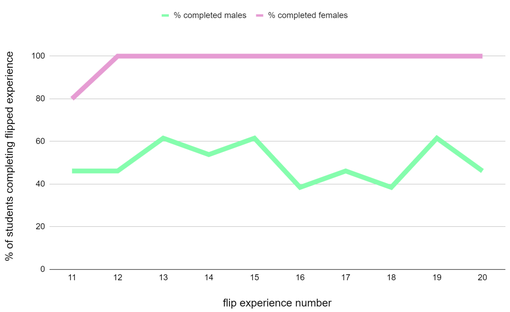

Figure 1. Student completion of flipped experience by gender, (*N*=18)

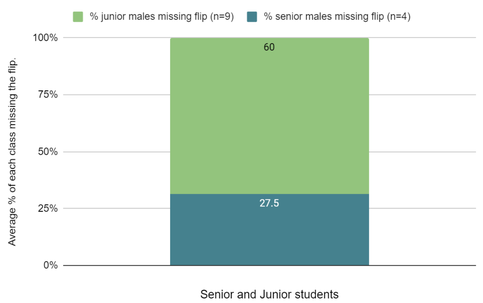

Figure 2. Missing flipped experiences of junior and senior males, (*n*=13)

- There was no correlation between Type of Integrated Prompt and Engagement for students who started the flipped experience.
- Females had a better overall engagement
- Junior males were less likely to complete the flipped experience.

Content Understanding

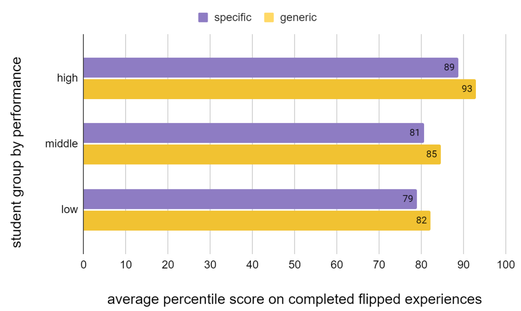

Figure 3. Performance by student group with specific and generic prompts, (*N*=18)

- Generic Prompts result in higher content understanding for all student groups.
- Generic prompts provided a "broad idea of what to answer or do, rather than a specific question".

Next Steps

- Is there a relationship between note taking style and content understanding?
- Are there effective motivators for flip-resistant students?
- Does training students on extending their thinking correlate with greater content understanding?
- Does this result scale to other learners?