ENGAGING STUDENTS DURING A HELP SESSION

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When many undergraduates come to TA sessions, they are tired. Their homework is due tomorrow morning. They have slept only 10 hours in the past three days. They have barely looked at their homework. After you kick them out at 9pm they face heading back to their dorm room to write a draft of a 40 page research paper about how Gillman’s woman in “The Yellow Wallpaper” was bridled so severely by an androcentric hegemony, that her only escape was psychosis. Also, their anthropology-major-significant-other has been nagging for a week that they never spend any time together, and their Mom just called and told them their dog has congestive heart failure.

The last thing they want to hear is you telling them “Well, how do you think you should start the problem?” They are probably thinking, “Moron! If I knew that, I wouldn’t be here! I want to punch you in the face!” So, how does one avoid getting a black eye?

Self-concept for mathematics is (apparently) an extremely important factor in ability/willingness to engage with the material [1]. There is a particularly nice anecdote on page 1412 of the article cited. This article made me realize that the more I can tread on material for which their self-concept is high, the more engaged they will be. How does one leave such a trail of “success-breadcrumbs” to lead the students to victory: a sense of importance, fulfillment of their personal values and goals, and a completed homework assignment?

The following scenarios are categorized and pasted together from ones I have had with students. The TA’s responses are similar to ones that I have given, and are not necessarily the responses likely to elicit student enthusiasm. What do the students value? How can we deduce the material for which their self-concept is highest? Are their any responses that could effectively kindle an intrinsic motivation for their homework and mathematics in general? How could we modify our approach when the session has 30 students instead of just 2 or 3?

1. THE BLANK-STARE STUDENT

TA: So do you need any help?

BS: *Turns paper towards you. Stares blankly. The questions reads:* Evaluate \( \int_C 4x^3 ds \) where \( C \) is the line segment from \((-2, -1)\) to \((1, 2)\).

TA: So, do you understand what the question is asking?

BS: *Student shakes head. Crickets chirp.*

TA: Let’s break down each part of what the question is asking. What if instead of \( ds \) that was \( dx \)? We know how to do that indefinite integral, right?

BS: *Nods.*

TA: Ok, so why don’t we figure out what \( ds \) means...

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2. The Clingy Student

TA: So do you need any help?
CS: So I was doing problem 1...takes out a sheet of paper with an integral and a u-substitution on it. So I guess, I was thinking u-substitution?
TA: That sounds good to me! Why don’t you give it a shot? Starts moving to the next student.
CS: Well, but...wait, so is this the right substitution?
TA: Well, why don’t you try it?
CS: Well, so...wait, so I just plug this in for $e^{2x}$? Then, well, so I’ll integrate it, and then oh but then I’ll have to use this other $du$?
TA: Would you like to go over u-substitution on an example problem?
CS: Well, I mean, I think I get how to do u-substitution, it is just that when I integrate this, I’m not sure it will work out.

3. The Is-This-Right Student

TA: So do you need any help?
ITR: Ok so for problem 10, I get 50.01563829502948 $m^2$. Is this right?
TA: Well, I don’t know the answers off-hand. Do you want to talk about how you arrived at that answer?
ITR: Well, so I took this function, and then I found this outward pointing normalized vector and then...
TA: Ah, I see, so you found the outward pointing normal, and then you...That work looks right to me! Have you crossed-checked that answer with another student in your section?

4. The Chatterbox

TA: So do you need any help?
CB: OMG I am obsessed with gargoyles! Have you ever noticed how Dr. Spock kind of looks like a gargoyle?? All Vulcans do, except they don’t have wings. They should really have wings.
TA: How’s the homework going?...

References