Reacting to Errors (for the PLUS app)

Reacting to Errors

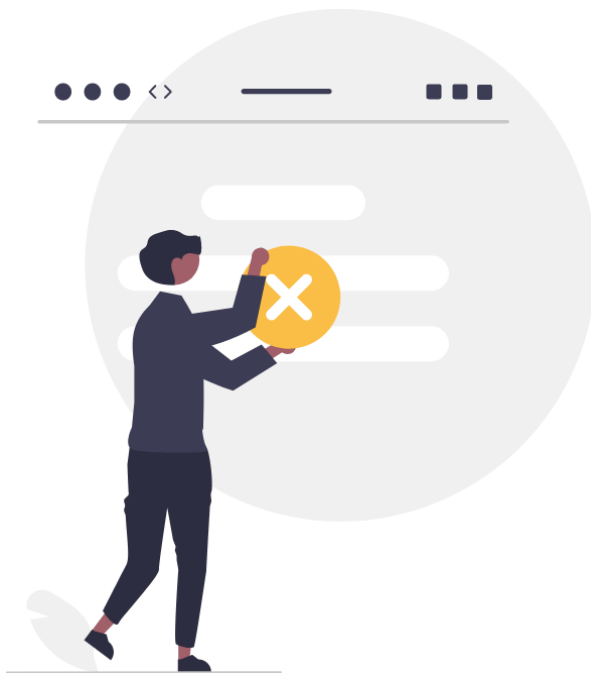Engage and Motivate Students

14

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[Description]

Have you ever found it awkward to tell a student that they've made a mistake? In this lesson, you'll learn how to respond to a student who has recently made an error, in a way that increases student engagement and motivation.

- Explain how to effectively respond to a student who has just made an error.
- Apply recommended strategies, for responding to students when they make an error, that increase motivation and engagement.

Scenario 1
Before we get started, please answer the following questions to help determine what you already know.

Imagine you are a tutor to a student, Aaron, who has a long history of struggling with math. Aaron is not particularly motivated to learn math. He just finished a math problem adding a 3-digit and 2-digit number and has made a common mistake (shown below).

Description: an addition problem displaying the following equation: 118 + 18 = 126

1. What exactly would you say to Aaron regarding his mistake, to effectively respond in a way that increases his motivation to learn?

2. With respect to Aaron's mistake, which of the following tutor's responses below do you think effectively responds to Aaron in a way that increases his motivation to learn?

I would say to the student:

A. "That's not right."
B. **"I appreciate your effort. Let's try solving the problem together. Can you tell me what you did first?**
C. "That is incorrect. You need to make sure you align the columns correctly. What is 8 plus 8?"
D. "You are wrong. Let me show you what you did incorrectly, so next time you get it correct."

3. Why do you think the tutor's response you selected in Question 2 will best support Aaron's motivation to learn and increase engagement?

4. Which of the following statements aligns with the rationale you chose and explained in the previous two questions?

A. Telling a student that their answer is wrong is important. Now they know they need to try again.
B. **Not directly pointing out the error to students encourages students to think critically about their learning. In addition, having a student explain what they did helps them find the error themselves.**
C. A student needs to know when their answer is incorrect. As a coach, it is important to show or explain to students directly what they need to do to get the problem correct.
D. Telling a student that they are wrong is important. As a coach, it is important to always model the correct answer and give the students the answer when they are wrong. This way students will get problems correct.

Research says…

Studies have shown that the way tutors intervene or respond when students make mistakes or show misconceptions in their learning can affect the student's motivation to learn. Asking students to try and correct their own mistakes before you help them is a great practice. For this reason, on Question 2, the most desired response or correct answer is:

"I appreciate your effort. Let's try solving the problem together. Can you tell me what you did first?"

In addition, it is best to respond indirectly and not to explicitly point out the student's mistake by asking leading questions such as, "Can you tell me what you did first?" Having students find their own mistakes is a powerful approach for three reasons:

- It helps students recognize "easy mistakes" on their own, such as making a typo or doing basic math operations incorrectly. Oftentimes, once a student looks at their work again, they will find the obvious error themselves. A student's ability to recognize their own errors increases their motivation to learn.
- It helps students to develop critical thinking skills. The ability to recognize their own errors fosters independent learning skills.
- It involves students in the learning process and gives students ownership of their learning.

(Vega, 2017)

It is important to note that you do not want students to get too frustrated. Sometimes students may not have the prior knowledge or ability to find their own mistakes. When a student tries and fails to find their own mistake, tutors should be more explicit by giving the correct answer and support behind it.

When responding to students making mistakes or errors it is important to praise the student for putting forth the effort, also called praising for effort. Praising for effort gives students positive emotions even after making a mistake or getting a problem wrong. Praising students for effort and encouraging them to continue trying builds resilience and increases their motivation to learn.

(Master, 2015)

[Question - Open Ended]

5. In your own words, please explain why it is important to respond to students when they make an error in a way that doesn't directly call attention to the error?

[Question - Likert]

6. How much do you agree or disagree with this research-recommended approach of not immediately calling attention to the student's error?

1. Strongly disagree
2. Somewhat disagree
3. No opinion
4. Somewhat agree
5. Strongly agree

7. Explain why you agree or disagree.

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8. A tutor is working with a student named Carl. Carl just made a common mistake on the first step of a multi-step algebra problem and does not recognize his error. He continues working on the algebra problem. The tutor stops Carl by stating, "Carl, let's stop here. I see you made a mistake on the first step. Let me show you your mistake."

Which of the following would be a better response to Carl:
   A. "Carl, go ahead and finish working on the problem. When you are done I will show you a small error that you made."
   B. **"Hi Carl, I like how hard and focused you are working on this problem. Please explain to me how you approached the first step."**
   C. "Everyone makes mistakes. You have made an error on the first step."

Research Recommendation
Studies show that asking students to try and correct their own mistakes before you help them is a great practice, as it builds critical thinking skills and increases the student's motivation to learn. Therefore, the correct answer to the above question is:

"Hi Carl, I like how hard and focused you are working on this problem. Please explain to me how you approached the first step."

Scenario 2
You are tutoring a student named Jedidiah. He is having trouble solving a math problem. He just finished adding a 3-digit and 2-digit number and has made a common mistake.

$$213 + 47$$

$$
\begin{array}{r}
213 \\
+ 47 \\
\hline
683
\end{array}
$$

Description: an addition problem displaying the following equation: 213 + 47 = 683

[Question - Open Ended]

9. What exactly would you say to Jedidiah regarding his mistake, to effectively respond in a way that increases his motivation to learn?

[Question - MCQ]

10. With respect to Jedidah's mistake, which of the following tutor's responses below do you think effectively responds to Jedidah in a way that increases his motivation to learn?

I would say to the student:

      A. "Jedidah, it makes me happy to see your effort. Can you show me how you started solving the problem?"
      B. "Jedidah, I appreciate your effort. In the first step, it appears you did not line up the columns correctly. Let's try to solve it now!"
      C. "Jedidah, that is not correct."
      D. "Jedidah, you are wrong. Let me show you the first step, so you do not get the problem incorrect. I want you to do well!"

[Question - Open Ended]

11. Why do you think the tutor's response you selected in Question 10 will best support Jedidah's motivation to learn and increase engagement?

[Question - MCQ]

12. Which of the following statements aligns with the rationale you chose and explained in the previous two questions?

A. When you tell a student their answer is wrong, you are providing valuable feedback for them to correct the problem. Tutors should be sure to correct all of the student's errors.
B. **When asking leading questions and not directly calling attention to the error, you are allowing students to find and correct their own mistakes. This builds motivation to learn.**
C. As a tutor, it is important to model the correct answer and make sure students understand they are wrong. This ensures students will get the correct answer.
D. Giving students praise for working hard on a problem is important, but a tutor needs to then give them the correct answer so they do not struggle in solving the problem.

[Text]
Conclusion & Feedback

Experts believe that the best approach to question 10 is:

> "Jedidah, it makes me happy to see your effort. Can you show me how you started solving the problem?"

This approach entails tutors asking leading questions and not directly calling attention to the error. This encourages students to be critical thinkers and gives them ownership of their learning.

For more information about how to respond to students when they make an error, check out the following resources. They can also be accessed from within the PLUS app.
9 Powerful Ways to Correct Your Student's Mistakes
Praise that Makes Learners More Resilient
The Power of Effective Praise

Feedback
Please provide any feedback or comments related to this training module.

References:

Vega, P. (2017). "9 Powerful Ways to Correct Your Student's Mistakes Without Destroying Their Confidence" December 2, 2017.
https://www.tutorean.co.uk/bettertutor/9-powerful-ways-correct-students-mistakes-without-destroying-confidence/

Master, A. (2015). Praise that makes learners more resilient. Issue brief August 2015.

http://studentexperiencenetwork.org/wp-content/uploads/2015/09/Praise-That-Makes-Learners-More-Reslient.pdf