

Student perspective of GTA strategies to reduce feelings of anxiousness with cold-calling



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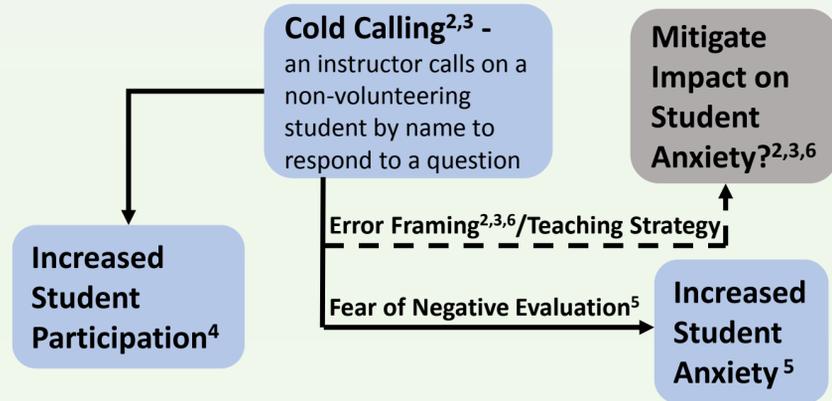
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Motivation

While evaluation of GTA professional development often focuses on changing GTA beliefs about teaching and learning, it is also important to explore changes to GTAs' teaching actions and impacts on their students¹.



What is the impact of cold calling on students, and what do their GTAs do to help alleviate feelings of anxiousness when they cold call?

Context

Graduate teaching assistants (GTA) practiced cold calling and error framing in a mixed-reality simulator with avatar-students in the first week of the semester as a new part of their training.



Participants

We recruited 11 undergraduate students from lab sections where the GTA was observed to use cold calling and error framing in more than one classroom observation.

Target Courses

- Introductory inquiry-based chemistry lab
- Introductory physics "mini-studio" (combined recitation and lab)

Methods

- Semi-structured interviews about the impact of cold calling on their feelings of anxiousness and strategies their GTA used to reduce those feelings associated with cold calling
- Constant comparative method to find emergent themes⁷
- Inter-rater reliability: Gwet's AC1 value for all 7 teaching strategies ranged from 0.89 to 0.94 (>0.81 means near perfect agreement)⁸

Student Perceived Teaching Strategies Their GTA Paired with Cold Calling to Help Them Feel Comfortable with Cold Calling

Teaching Strategy	Description	Student Quote	Students	GTAs
Error Framing	GTA used an error framing-type statement in response to student answers or an overall feeling of not being afraid to share an incorrect answer in front of the class.	Error framing-type statements: Brocky: ...he'll [P1] say 'I know this is really hard so don't worry if you answer it wrong'. (P1)	Total: 3 Individual: 1 Focus Group: 2	P1 C2
		Error-friendly environment: Val: ... he makes it known that you don't need to have a correct answer. Any answer is a good answer as long as you are participating... (C1)	Total: 5 Individual: 5 Focus Group: 0	C1, C2, C3
Allowing Other Students to Assist	GTA gave them the option to say, "I don't know" and allowed their peers to help with the cold-call question.	Quinn: But if you didn't know what was going on, he would just say, 'Oh, that's okay. Let's get someone else to help you,' and then other people would raise their hand and we would answer. (C1)	Total: 8 Individual: 5 Focus Group: 3	P1, C1, C3 C1, C2
Building Off of What Students Know	GTA encouraged students to say what they did know or asked questions about content students already knew.	Amari: So, if he called on you and you didn't know, he would encourage you to say something that you did know, and then he would build off of that. (C2)	Total: 6 Individual: 3 Focus Group: 3	C2, C3 C1, C2
Providing Neutral Responses with Explanations	GTA responded to student answers the same way and gave an explanation.	Marley: I think that whether you were right or wrong like there was always an explanation. So, I mean, it's like when I was wrong like you didn't feel like it. (C3)	Total: 5 Individual: 4 Focus Group: 1	C1, C3 C2
Using Student Names	GTAs learned their names and used them as part of the cold call.	Val: Because he knows my name, because it's more like I know everybody in the class, it's such a small class, I feel better about answering and being called on. (C1)	Total: 4 Individual: 3 Focus Group: 1	C1, C2, C3 C2
Calling on Student Groups	GTA cold calls on student groups during whole class discussions.	Quinn: ...within our groups we have multiple brains, and we were all thinking together, and then we would share as a group. So that's good at making people comfortable because it's not just yourself talking. (C1)	Total: 4 Individual: 3 Focus Group: 1	P1, C1, C2 C2
Providing Thinking Time Before Cold Calling	GTA provided thinking time before they called on students or expected a student response.	Bo: ...he'd ask you a question, and we would've already written it down. So, I don't really have to worry about what I'm going to say because I've already written it down... (C1)	Total: 2 Individual: 1 Focus Group: 1	C2 C1

In the table, P (physics) and C (chemistry) indicates the discipline of the GTA and the number next to P or C indicates a different GTA in the same discipline.

Possible Connection to Facework

We found 9 out of 11 students perceived their GTA to be helpful, personable, and relatable when their GTA used one of the above teaching strategies, creating a welcoming environment for students. Using student names and providing thinking time before cold calling are two example of teaching strategies which align with core constructs of *facework*⁹ (actions taken to prevent threats to and to maintain students' self-image). Future investigations of how to mitigate student anxiety related to cold calling and other active learning strategies could be guided by facework.

Takeaways

- Students perceived their GTA to pair a variety of teaching strategies with cold calling.
- Students reported either error framing-type statements or an error-friendly environment, implying a connection between the training and GTA behavior.

[1] T. D. Reeves et al., CBE Life Sci. Educ., **15**(2), es2 (2016).

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[3] D. Lemov, (2010). *Teach like a champion: 49 techniques that put students on the path to college (K-12)* revolution, edited by D. M. Fetterman (Praeger Publishers, 1988), Vol. 1, p. 212-213.

[4] E. J. Dallimore, J. H. Hertenstein, M. B. Platt, J. Manag. Educ., **37**(3), 305-341 (2013).

[5] K. M. Cooper, V. R. Downing, and S. E. Brownell, Int. J. STEM Educ., **5**(1), 23 (2018).

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[8] K. L. Gwet, *Handbook of Inter-Rater Reliability: The Definitive Guide to Measuring the Extent of Agreement Among Raters* 4th ed. (Advanced Analytics, Gaithersburg, 2014), Vol. 1. p. 104 - 107.

[9] J. Kerssen-Griep, Commun. Educ., **50** (3), 256-273 (2001).

