

Appendix B

Survey Items Analyzed by Research Question

Question (abbreviated)	PST/TE	Survey(s)	Response Type	Codebook	Total Responses	No. of Responses Group Coded	No. of Responses Double Coded	Agreement for Double Coded Responses [a]
RQ1 (Perceptions)								
Describe your main takeaway/learning from the simulation cycle.	PST	TM, ABS	Open	Adapted	77 ^b	11 (14%)	16 (21%)	92% (0.734)
What did your PSTs learn from participating in the simulation cycle?	TE	TM, ABS	Open	Adapted	12 ^d	0 (0%)	12 (100%)	87% (0.696)
How appropriate do you believe a TM/ABS activity would be as a component of a teacher preparation methods course?	PST, TE	TM, ABS	Likert	n/a	77[b], 12[d]	--	--	--
Would you recommend including TM/ABS discussions in future courses?	PST	TM, ABS	Likert	n/a	77[b]	--	--	--
In your view, in what ways did the simulation experience support you in your role as a math/science teacher?	PST	TM, ABS	Open	New	77[b]	11 (14%)	16 (21%)	93% (0.707)
RQ2 (Understanding)								
In your view, what are the characteristics of high-quality discussions focused on argumentation in a math/science classroom?	PST	Pre, Post	Open	Adapted	77[c]	8 (11%)	16 (21%)	94% (0.864)
Has your view of high-quality discussion focused on argumentation in a math/science classroom changed over the course of the semester?	PST	Post	Likert	n/a	38	--	--	--
Describe how your view of high-quality discussions focused on argumentation has changed over the course of the semester.	PST	Post	Open	New	20 ^e	0 (0%)	20 (100%)	97% (0.949)
What activities or experiences, inside or outside of class, do you feel contributed to that change, and how?	PST	Post	Open	New	20	0 (0%)	20 (100%)	98% (0.981)
RQ3 (Beliefs)								
How important do you feel it is for secondary students to have opportunities to engage in argumentation in math/science?	PST	Pre, TM, ABS, Post	Likert	n/a	154[f]	--	--	--
Explain why you think it is or is not important for secondary students to have opportunities to engage in argumentation in science/math.	PST	Pre, TM, ABS, Post	Open	Adapted	154[f]	24 (16%)	26 (17%)	92% (0.780)
Have your perspectives about the importance of argumentation for secondary students changed over the course of the semester?	PST	Post	Likert	n/a	38	--	--	--
Please describe in your own words how your perspectives of the importance of argumentation for secondary students has changed.	PST	Post	Open	New	18[g]	0 (0%)	18 (100%)	94% (0.899)
What experiences inside or outside of class contributed to that change?	PST	Post	Open	New	18[g]	0 (0%)	18 (100%)	87% (0.840)
RQ4 (Skill)								
How did your level of preparedness to implement each element of AFD change over the course of the semester?	PST	Post	Likert	n/a	190[h]	--	--	--
Explain what supports helped you to be more prepared with respect to the following elements of argumentation-focused discussion.	PST	Post	Open	New	167	17 (10%)	34 (20%)	90% (0.879)

Question (abbreviated)	PST/TE	Survey(s)	Response Type	Codebook	Total Responses	No. of Responses Group Coded	No. of Responses Double Coded	Agreement for Double Coded Responses [a]
To what extent have your PSTs shown progress in developing their skills in elements of AFD from the beginning to the end of the semester?	TE	ABS	Likert	n/a	30[i]	--	--	--

[a] Percent Agreement (One-way random Average Measures ICC)

[b] This question was asked on both the TM survey and the ABS survey. All 39 PSTs responded to the ABS survey; however, one PST did not complete the TM survey, resulting in 38 responses for the TM survey, and a total of 77 responses overall.

[c] This question was asked on both the presurvey and postsurvey. All 39 PSTs responded to the presurvey. However, one PST did not complete the postsurvey, resulting in 38 responses for the postsurvey and a total of 77 responses overall.

[d] This question was asked on both the presurvey and postsurvey. All six TEs responded to both the presurvey and postsurvey, resulting in a total of 12 responses overall.

[e] Only 20 of the 38 PSTs who completed the postsurvey responded “yes” to the question “Has your view of the high-quality discussion focused on argumentation in a math/science classroom changed over the course of the semester?” on the postsurvey. Therefore, only 20 PSTs were given the follow-up prompt.

[f] This question was asked on the presurvey, TM survey, ABS survey, and postsurvey. All 39 PSTs responded to the presurvey and ABS survey; however, one PST did not complete the TM survey and postsurvey, resulting in 38 responses for the TM survey and postsurvey and a total of 154 responses.

[g] Only 18 of the 38 PSTs who completed the postsurvey responded “yes” to the question “Have your perspectives about the importance of argumentation for secondary students changed over the course of the semester?” on the postsurvey; therefore, only 18 PSTs were given the follow up prompt to describe how their perspectives changed.

[h] This question was asked on the postsurvey. However, only 38 PSTs completed the postsurvey. There were a total of 190 data points for this question, as the 38 PSTs responded across each of the five elements of high-quality discussion focused on argumentation.

[i] This question was asked on the postsurvey. which was completed by all six TEs. There were a total of 30 data points for this question, as the 6 TEs responded across each of the five elements of high-quality discussion focused on argumentation.

Note. PST = preservice teacher; TE = teacher educator; TM = Teacher Moments; ABS = Avatar-Based Simulation; RQ = Research Question