

**Secondary Science Core Teaching Practices
 Delphi Study Round 3 Summary**

Round 3 ratings for given core science teaching practices.

Mean participant ratings (n=24) based on a 5-point Likert scale:

(1 = Strongly Disagree...5 = Strongly Agree) for whether the given practice should be considered a core science teaching practice.

Science Teaching Practice Short Title	Mean	Mode	S.D.	Mean Δ from Top Practice	Mean Δ from Round 2
1. Engaging Students in Investigations ^a	4.75	5	0.53	0.00	+0.21
2. Facilitating Classroom Discourse	4.71	5	0.46	0.04	- 0.04
3. Eliciting, Assessing, & Using Student Thinking about Science	4.67	5	0.56	0.08	+0.21
4. Providing Feedback	4.58 ^b	5	0.50	0.17	+0.41
5. Constructing and Interpreting Models	4.58	5	0.78	0.17	+0.16
6. Connecting Science Concepts to Applications ^c	4.54	5	0.72	0.21	+0.50
7. Linking Science Concepts to Phenomena	4.50	5	0.78	0.25	+0.25
8. Focusing on Core Science Ideas and Practices	4.50	5	0.88	0.25	- 0.04
9. Building Classroom Community	4.46	4	0.66	0.29	- 0.12
10. Managing Materials and Lab Equipment	3.67	4	1.01	1.08	- 0.33

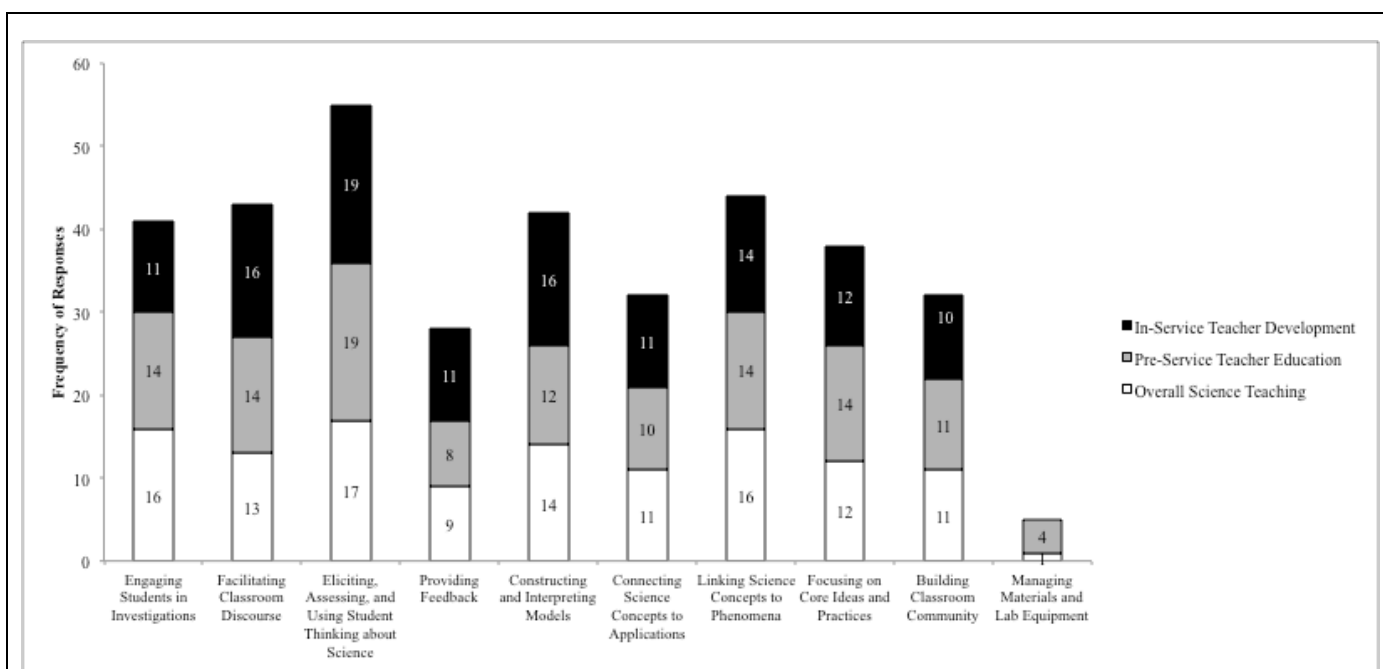
^a Some practice titles were changed based on Round 2 participant feedback.

^b Practices with equal means were ordered beginning with the smallest standard deviation.

ANOVA results indicated only one statistical difference between master teachers' and university faculty members' ratings. Faculty members rated Building Classroom Community significantly higher than teachers, $F(1, 23) = 6.243, p < .05$, but both groups agreed that the practice should be core, ($M_f = 4.71, S.D. = .469$); ($M_t = 4.10, S.D. = .738$).

Priority of Practices in Specific Contexts

In Round 3, panelists were asked to choose the five core science teaching practices (unordered) from the existing list that they believed were most important to focus on in three particular contexts – general effective science teaching, pre-service teacher education, and in-service teacher professional development. These questions highlighted the priorities of the panel given the limited time and resources that are available for preparing and further developing science teachers. Results are shown in the figure below.



Prioritization of core science teaching practices for three different contexts.

Participants chose five science teaching practices that they deemed most important for a) overall science teaching; b) pre-service science teacher education; c) in-service science teacher development.

Practices are ordered from left to right based on their rank order from Round 3 rating.

Participant Selection and Demographics

Participant selection is the most important methodological step for a Delphi panel (Gordon, 1994). Participants were selected for this study to both maximize expertise and represent a broad range of stakeholders that included science education researchers, science teacher educators, scientists, and science teachers. Strict criteria were established for participant recruitment and selection (Clayton, 1997; Gordon, 1994). High school science teachers were recruited from different regions of the country with no more than two participating teachers coming from the same state. All invited teachers received either national or state science teacher of the year honors within the past five years. Representation was also sought from across the physical, life, and earth sciences. Eleven teachers were initially contacted and ten teachers agreed to participate in and completed the study.

Key demographics of Delphi panel science teacher participants.

Gender		Mean Years H.S. Teaching	Number of Teachers Having Taught Each Discipline					Adjunct University Status	Highest Degree Awarded in a Science Discipline			States Represented
M	F		Bio	Chem	Phys	Earth	Math		B.A.	M.S.	Ph.D.	
5	5	22.70 (6.46)	7	7	5	5	3	6	2	7	1	9*

* States include: California (2 participants), Florida, Kentucky, Missouri, Ohio, Oklahoma, Pennsylvania, Virginia, and Washington.

Key demographics of Delphi science teacher participants' student population.

Mean % EL	Mean % Special Education	Mean % Free/Reduced Lunch	Mean % Ethnicity				
			Asian	Black	Hispanic	White	Other
18.90 (29.06)	9.60 (5.31)	45.40 (18.25)	7.20 (15.28)	14.00 (15.36)	9.20 (9.11)	60.60 (22.53)	9.00 (12.58)

University faculty representing different areas of expertise comprised the remainder of this Delphi panel. Full professors were given priority on this panel, although five of the fifteen spots were reserved for assistant and associate professors. Criteria were established for recruiting participants from Research 1 universities with no more than two professors coming from the same institution. University faculty were recruited for their expertise in one or more of the following categories: bench science, science education research, and science teacher education. Given the focus on science core teaching practices, priority was given to science education researchers with a strong publication record who also had experience as science teacher educators. Fourteen of the sixteen invitees participated in all three rounds of the study.

Key demographics for participating university faculty.

Gender		Mean Years H.S. Teaching	Mean Years Science Teacher Education	Mean Years University Faculty	Highest University Rank		
M	F				Asst. Prof.	Assoc. Prof.	Full and/or Chaired Prof.
6	8	6.00 (4.40)	19.07 (9.43)	20.29 (9.13)	1	4	9