Supplemental Material

CBE—Life Sciences Education

Lo *et al.*

Prevailing questions and methodologies in biology education research: A longitudinal analysis of research in *CBE-Life Sciences Education* and at the Society for the Advancement of Biology Education Research

Supplemental Figures and Tables

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Figure S1. Study contexts of *LSE* articles. Specific contexts found in *LSE* articles were coded as classroom interventions in a specific content area, course-wide classroom interventions, interventions lasting one or more years, week-long workshops (ws), multi-week workshops, or not reported. The ring on the left represents the complete *LSE* data from 2002-2015. The graph on the right illustrates the percentage of research questions found in *LSE* articles on an annual basis.

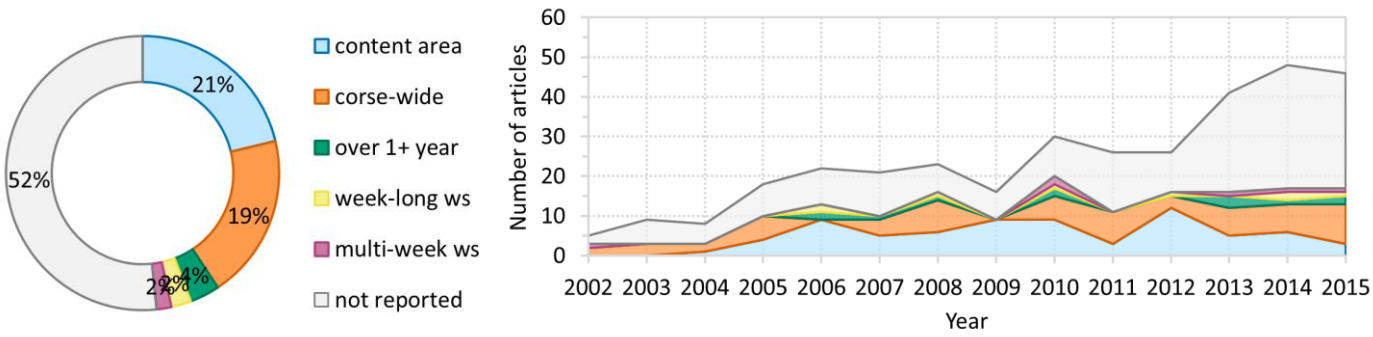


Figure S2. Correlation between SABER presentation format and research methodologies. Correspondence analysis (scatter plot) and hierarchical clustering (dashed circles) of data reveal three predominant combinations of presentation formats and methodologies at SABER: talks with quantitative or both methods, posters with qualitative methods, and roundtables with no methods reported.

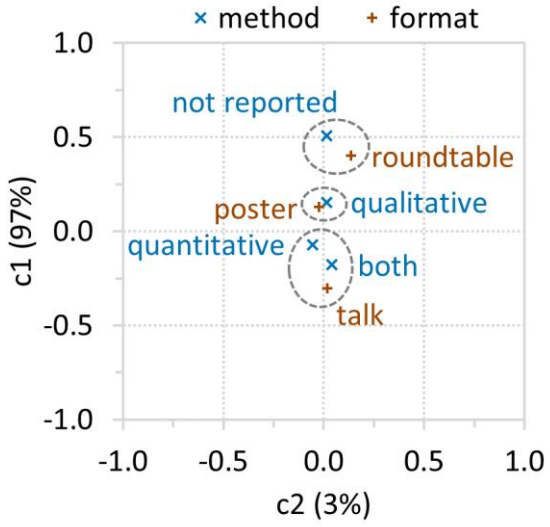
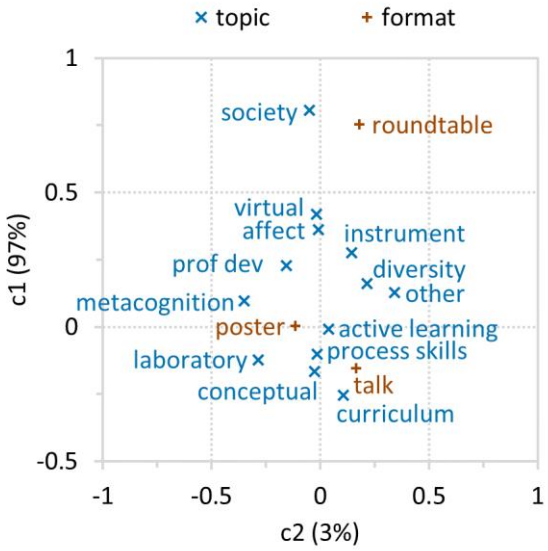


Figure S3. Correlation between SABER presentation format and research topic. Correspondence analysis (top) and hierarchical clustering (bottom) of data reveal four predominant combinations of presentation formats and research topic at SABER: talks on curriculum, active learning, conceptual understanding, and process skills; roundtable presentations on science and society, affect, and virtual learning; posters on professional development, laboratory education, and metacognition; and diversity and instrument development as related topics.



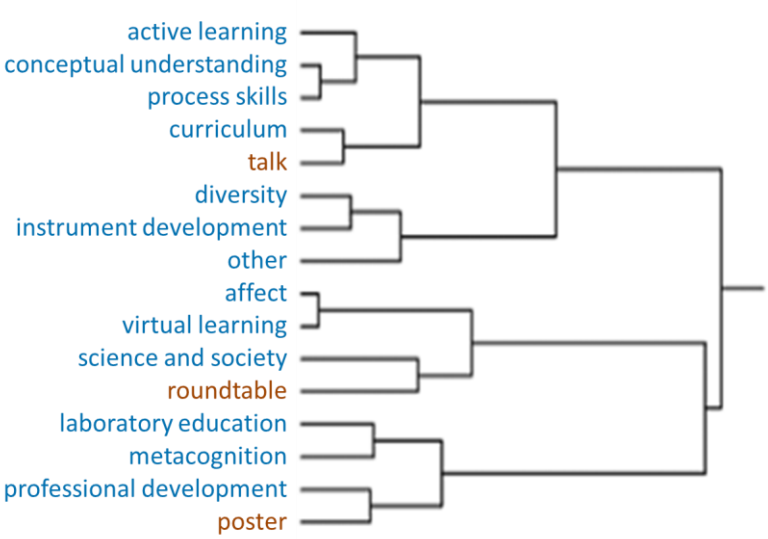


Table S1-S10. *LSE* article or SABER abstract data per year(s) indicated. Tables provide the specified data (number of articles or abstracts in each category) and the percentage of the total articles found in those categories.

Table S1. Research questions in *LSE* articles

Year	Causal	Descriptive	Mechanistic	Total
2002-06	27 (42%)	38 (58%)	0 (0%)	65
2007-11	49 (51%)	43 (44%)	5 (5%)	97
2012-15	61 (31%)	112 (56%)	27 (14%)	55
Total	137 (38%)	193 (53%)	32 (9%)	362

Table S2. Research questions in SABER articles

Year	Causal	Descriptive	Mechanistic	Not reported	Total
2011	61 (69%)	27 (30%)	1 (1%)	0 (0%)	89
2012	59 (62%)	33 (35%)	2 (2%)	1 (1%)	95
2013	96 (56%)	42 (31%)	4 (3%)	0 (0%)	142
2014	86 (34%)	55 (37%)	5 (3%)	1 (1%)	147
2015	120 (68%)	51 (29%)	4 (2%)	1 (1%)	177
Total	422 (65%)	208 (32%)	16 (2%)	4 (1%)	650

Table S3. Study populations in *LSE* articles

Year	Undergrad	K-12	Grad or postdoc	Faculty	Comm College	Total
2002-06	46 (74%)	12 (19%)	0 (0%)	4 (6%)	0 (0%)	62
2007-11	100 (86%)	3 (3%)	4 (3%)	2 (2%)	7 (6%)	116
2012-15	109 (56%)	14 (9%)	17 (11%)	9 (6%)	12 (7%)	161
Total	255 (75%)	29 (9%)	21 (6%)	15 (4%)	19 (6%)	339

Table S4. Study populations in SABER abstracts

Year	Undergrad	K-12	Grad or postdoc	Faculty	Comm College	Not reported	Total
2011	69 (78%)	5 (5%)	4 (4%)	5 (5%)	1 (1%)	6 (6%)	88
2012	71 (69%)	3 (3%)	7 (7%)	10 (10%)	0 (0%)	11 (11%)	102
2013	98 (66%)	4 (2%)	15 (10%)	22 (15%)	0 (0%)	11 (7%)	150
2014	107 (70%)	6 (4%)	13 (8%)	18 (12%)	3 (2%)	7 (5%)	154
2015	130 (67%)	7 (4%)	15 (8%)	23 (12%)	2 (1%)	17 (9%)	194
Total	475 (69%)	24 (4%)	53 (8%)	78 (11%)	6 (1%)	52 (8%)	688

Table S5. At-risk demographics reported in *LSE* articles

Year	Gender	Race	SES	Total
2002-06	16 (26%)	16 (26%)	5 (8%)	37
2007-11	38 (33%)	22 (19%)	5 (4%)	65
2012-15	71 (44%)	41 (25%)	6 (4%)	118
Total	125 (37%)	79 (23%)	16 (5%)	220

Table S6. At-risk demographics reported in SABER abstracts

Year	Gender	Race	SES	Total
2011	7 (7%)	3 (3%)	0 (0%)	10
2012	2 (2%)	2 (2%)	0 (0%)	4
2013	4 (3%)	7 (5%)	1 (1%)	12
2014	8 (5%)	5 (3%)	1 (1%)	14
2015	18 (9%)	14 (7%)	1 (1%)	33
Total	39 (53%)	31 (42%)	3 (4%)	73

Table S7. Research methodologies in *LSE* articles

Year	Qualitative	Quantitative	Both	Total
2002-06	7 (11%)	22 (35%)	33 (53%)	62
2007-11	18 (17%)	44 (40%)	47 (43%)	109
2012-15	14 (9%)	62 (39%)	84 (53%)	160
Total	39 (12%)	128 (39%)	164 (50%)	331

Table S8. Research methodologies in SABER abstracts

Year	Qualitative	Quantitative	Both	Not reported	Total
2011	8 (9%)	40 (43%)	30 (32%)	16 (17%)	94
2012	19 (19%)	25 (25%)	37 (37%)	19 (19%)	100
2013	23 (15%)	52 (34%)	52 (34%)	23 (15%)	151
2014	28 (19%)	37 (25%)	59 (39%)	27 (18%)	151
2015	28 (15%)	59 (31%)	70 (36%)	59 (17%)	192
Total	106 (15%)	213 (31%)	248 (36%)	118 (17%)	688

Table S9. Data collection in *LSE* articles

Year	Instrument -New -Existing	Interview -New -Existing	Observe -New -Existing	Artifacts	Other data	Total
2002-06	41 (53%) 4 (5%)	6 (8%) 0 (0%)	2 (3%) 0 (0%)	13 (17%)	11 (14%)	77
2007-11	48 (47%) 14 (14%)	7 (7%) 0 (0%)	1 (1%) 1 (1%)	27 (26%)	4 (4%)	102
2012-15	99 (47%) 39 (19%)	20 (10%) 3 (1%)	7 (3%) 1 (0%)	28 (13%)	13 (6%)	210
Total	188 (48%) 57 (15%)	33 (8%) 3 (1%)	10 (3%) 2 (1%)	255 (17%)	28 (7%)	389

Table S10. Validity, reliability, and effect size reported in *LSE* articles

Year	Validity	Reliability	Effect Size	Total
2002-06	16 (26%)	15 (24%)	2 (3%)	37
2007-11	43 (37%)	32 (28%)	3 (3%)	65
2012-15	105 (65%)	97 (60%)	32 (19%)	118
Total	164 (48%)	144 (42%)	37 (11%)	220