Electronic Supplementary Material (ESI) for Chemistry Education Research and Practice. This journal is © The Royal Society of Chemistry 2016

Appendix 1

Tables 1 and 2 list some information about the schools and teachers involved in the study. All schools in the study are located in southwestern Ohio. The school demographics given are number of students and the percent of the student body that is non-white. For the teachers, their schools, gender, years of experience, and courses taught are included.

	School W	School X	School Y	School Z
Student Population	1138	1859	2495	2034
% Non-white	8	22	17	27

Table A1.1 School Demographics

Teacher	School	Gender	Years of	Chemistry
			Experience	Courses Taught
Quinn	W	Male	18	Honors, College
				Prep
Harrison	W	Male	5	College Prep
Marguerite	Х	Female	18	Advanced
				Placement,
				Honors, College
				Prep
Jacqueline	Х	Female	3	College Prep,
				Chemistry in the
				Community
Sophia	Y	Female	20	Honors, College
				Prep
Eleanor	Ζ	Female	28	Honors
Han	Ζ	Male	17	Advanced
				Placement,
				College Prep
Charlotte	Z	Female	3	College Prep

Table A1.2 Teacher Characteristics

The last 10 rows of the agglomeration schedule are shown below. The step at which the cut was made is in bold. As the change in the coefficients was much larger at stage 427 than at stage 426, we retained 5 clusters.

Clusters Combined			Appears		Next	Change in	
Stage	Cluster 1	Cluster 2	Coefficients	Cluster 1	Cluster 2	Stage	Coefficients
421	12	15	214.307	405	411	422	22.058
422	11	12	238.871	410	421	427	24.565
423	4	21	265.635	414	420	428	26.763
424	3	30	295.764	419	397	429	30.130
425	1	2	330.739	412	413	427	34.974
426	5	34	378.450	418	417	428	47.711
427	1	11	488.246	425	422	429	109.796
428	4	5	654.495	423	426	430	166.249
429	1	3	961.647	427	424	430	307.152
430	1	4	1542.976	429	428	430	581.329

Table A1.3 Agglomeration Schedule for Cluster Analysis

The dendrogram for the cluster analysis is shown below.



Figure A1.1 Dendrogram for Cluster Analysis

The following "heat" maps show the average chemistry self-concept score for the students in each node at six time points throughout the academic year. Round 0 corresponds to the beginning of the academic year and Round 5 corresponds to the end of the academic year. Most nodes, or groups of students, show little to no change in chemistry self-concept score from the beginning to the end of the academic year. A few nodes, however, do show shifts in chemistry self-concept.



Figure A1.2 Self-Organizing "Heat" Map Displaying Students' Chemistry Self-Concept Scores at the Beginning of the First Semester



Figure A1.3 Self-Organizing "Heat" Map Displaying Students' Chemistry Self-Concept Scores in the Middle of the First Semester



Figure A1.4 Self-Organizing "Heat" Map Displaying Students' Chemistry Self-Concept Scores at the End of the First Semester



Figure A1.5 Self-Organizing "Heat" Map Displaying Students' Chemistry Self-Concept Scores at the Beginning of the Second Semester



Figure A1.6 Self-Organizing "Heat" Map Displaying Students' Chemistry Self-Concept Scores in the Middle of the Second Semester



Figure A1.7 Self-Organizing "Heat" Map Displaying Students' Chemistry Self-Concept Scores at the End of the Second Semester