

Appendix B: Data Tables

Table 1. Descriptive Statistics of CSE Items by Academic Level, Early Term Survey

Item No.	ENGR 2250 Course Students (n=18)			Anonymous MAE Students (n=218)								
	Mean	S.D.	n	Sophomores			Juniors			Seniors		
	Mean	S.D.	n	Mean	S.D.	n	Mean	S.D.	n	Mean	S.D.	n
1	62.3	18.5	18	70.1	19.8	90	72.2	17.2	82	78.7	15.5	46
2	63.6	18.4	18	67.5	23.2	93	69.6	19.4	82	77.3	18.4	48
3	59.6	18.7	18	68.3	20.6	93	72.4	17.9	82	79.7	17.1	48
4	61.7	21.9	18	69.4	22.8	93	73.3	22.0	83	84.2	12.2	48
5	73.8	16.4	18	80.3	18.3	93	77.7	18.5	83	86.1	12.5	48
6	65.3	22.9	18	74.7	21.7	93	74.8	21.8	83	82.5	15.2	48
7	59.0	24.7	18	72.1	23.1	93	72.9	22.3	83	77.8	14.8	48
8	55.9	25.0	17	65.3	21.8	93	65.7	21.5	82	78.5	18.1	48
9	59.0	27.5	18	74.1	18.1	93	70.7	22.8	83	84.0	15.3	48
10	59.4	20.4	17	68.5	21.1	93	66.0	24.3	83	78.3	17.5	48
11	58.7	23.1	18	75.3	18.4	93	78.6	18.6	83	83.0	17.2	48
12	53.3	25.4	18	75.0	19.4	94	80.1	19.8	83	82.5	17.6	47
13	58.3	26.1	18	73.4	18.1	93	75.5	20.6	83	84.6	13.7	47
14	54.1	25.1	18	70.7	17.4	93	76.1	17.3	83	83.8	14.1	47
15	63.0	20.6	18	68.8	24.1	93	71.8	20.4	83	77.8	16.4	48
16	65.7	27.1	18	78.4	20.3	93	78.9	20.4	83	83.7	15.7	48
17	71.2	17.0	18	77.0	18.4	93	79.4	16.9	82	84.7	12.6	48
18	58.9	21.2	18	71.4	18.7	93	73.8	18.0	82	83.2	14.0	48
19	74.9	16.8	18	82.3	15.1	93	83.1	13.2	83	88.9	9.8	48
20	75.1	15.4	18	82.7	13.8	93	82.1	13.5	83	87.3	11.0	48
21	77.7	13.1	18	82.1	14.6	93	80.1	16.2	81	86.9	11.7	48
22	76.7	17.5	18	81.6	15.3	93	81.7	15.3	81	87.1	11.7	48
23	65.7	24.6	18	74.6	20.5	93	77.6	16.6	83	82.8	16.3	48

Notes:
 --Values in this table exclude the respondent indicating an academic level of First-Year, the one that did not report an academic level, and the Course student that indicated Junior level.
 -- In order to more easily identify any patterns that emerged, we arbitrarily labelled low CSE as 0-60, medium CSE as 60-80 and high CSE as 80-100. Only course students had a mean below 60 on any of the items, and then it was relatively close to 60.

Table 2. Percentage of Students Indicating Low, Medium, and High CSE for Items by Academic Level, Early Term Survey

Item No.	ENGRC 2250 Course Students (n=18)			Anonymous MAE Students (n=218)								
				Sophomores			Juniors			Seniors		
	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
1	38.9%	50.0%	11.1%	30.0%	40.0%	30.0%	20.5%	47.0%	32.5%	8.7%	37.0%	54.3%
2	44.4%	44.4%	11.1%	36.6%	29.0%	34.4%	31.3%	33.7%	34.9%	16.7%	31.3%	52.1%
3	50.0%	33.3%	16.7%	31.2%	41.9%	26.9%	22.2%	41.0%	36.1%	14.6%	22.9%	62.5%
4	61.1%	22.2%	16.7%	32.3%	26.9%	40.9%	21.4%	34.5%	44.0%	6.3%	27.1%	66.7%
5	22.2%	44.4%	33.3%	11.8%	29.0%	59.1%	15.5%	32.1%	52.4%	4.2%	31.3%	64.6%
6	33.3%	38.9%	27.8%	20.4%	29.0%	50.5%	22.6%	32.1%	45.2%	6.3%	35.4%	58.3%
7	38.9%	44.4%	16.7%	25.8%	30.1%	44.1%	21.4%	33.3%	45.2%	12.5%	50.0%	37.5%
8	52.9%	29.4%	17.6%	39.8%	36.6%	23.7%	37.3%	39.8%	22.9%	18.8%	29.2%	52.1%
9	50.0%	27.8%	22.2%	20.4%	44.1%	35.5%	34.5%	22.6%	42.9%	6.3%	27.1%	66.7%
10	52.9%	29.4%	17.6%	32.3%	36.6%	31.2%	42.9%	23.8%	33.3%	12.5%	37.5%	50.0%
11	50.0%	33.3%	16.7%	19.4%	38.7%	41.9%	16.7%	23.8%	59.5%	8.3%	27.1%	64.6%
12	61.1%	27.8%	11.1%	22.3%	31.9%	45.7%	16.7%	20.2%	63.1%	10.6%	31.9%	57.4%
13	50.0%	27.8%	22.2%	23.7%	38.7%	37.6%	20.2%	32.1%	47.6%	6.4%	27.7%	66.0%
14	61.1%	22.2%	16.7%	22.6%	49.5%	28.0%	15.5%	40.5%	44.0%	6.4%	31.9%	61.7%
15	33.3%	50.0%	16.7%	35.5%	28.0%	36.6%	27.4%	31.0%	41.7%	8.3%	52.1%	39.6%
16	33.3%	33.3%	33.3%	18.3%	31.2%	50.5%	11.9%	28.6%	59.5%	10.4%	25.0%	64.6%
17	27.8%	44.4%	27.8%	17.2%	35.5%	47.3%	8.4%	41.0%	50.6%	6.3%	25.0%	68.8%
18	50.0%	33.3%	16.7%	22.6%	43.0%	34.4%	26.5%	36.1%	37.3%	6.3%	27.1%	66.7%
19	11.1%	50.0%	38.9%	6.5%	34.4%	59.1%	9.5%	22.6%	67.9%	2.1%	20.8%	77.1%
20	16.7%	44.4%	38.9%	5.4%	35.5%	59.1%	8.3%	29.8%	61.9%	2.1%	22.9%	75.0%
21	5.6%	61.1%	33.3%	6.5%	31.2%	62.4%	12.2%	29.3%	58.5%	4.2%	25.0%	70.8%
22	11.1%	38.9%	50.0%	8.6%	34.4%	57.0%	11.0%	28.0%	61.0%	2.1%	29.2%	68.8%
23	33.3%	33.3%	33.3%	2.04%	34.4%	45.2%	14.5%	33.7%	51.8%	12.5%	22.9%	64.6%

Notes: Values in this table exclude one [SD1] respondent indicating an academic level of First-Year, one that did not report an academic level, and one ENGR 2250 Course student that indicated Junior level. Percentages are valid responses; that is, they do not include missing responses as part of the 100%.

Table 3. Question Topics Included and Reliability of Dimensions of CSE

Dimension	Survey Topic Questions	Reliability
D1. General Communication Self-Efficacy	1, 17, 18, 23	.87
D2. Writing Self-Efficacy	2, 3, 4, 5, 6, 7	.86
D3. Presenting/Speaking Self-Efficacy	8, 9, 10	.89
D4. Visual Communication Self-Efficacy	11, 12, 13, 14	.88
D5. Electronic Communication Self-Efficacy	15, 16	.64
D6. Self-Efficacy Communicating in Small Groups/Teams	19, 20, 21, 22	.92

Table 4. Descriptive Statistics of Dimension by Academic Level

Dimension	ENGRC 2250 Course Students (n=18)			Anonymous MAE Students (n=223)								
	Mean	S.D.	n	Sophomores			Juniors			Seniors		
				Mean	S.D.	n	Mean	S.D.	n	Mean	S.D.	n
D1	64.5	17.2	18	73.3	16.6	93	75.7	13.5	83	82.4	12.8	48
D2	63.8	14.4	18	72.0	16.0	93	73.5	16.3	83	81.3	11.2	48
D3	56.3	24.1	18	69.3	17.6	93	67.3	21.0	83	80.3	15.6	48
D4	56.1	22.5	18	73.3	15.1	93	77.5	16.1	83	83.2	12.9	48
D5	64.3	19.3	18	73.6	18.9	93	75.3	17.4	83	80.7	14.4	48
D6	76.1	14.6	18	82.1	13.1	93	81.7	13.0	83	87.6	10.2	48

Note: Values in this table exclude the respondent indicating an academic level of First-Year, the one that did not report an academic level and the Course student that indicated Junior level.

Table 5. Correlations between Dimensions of CSE

Dimension	D1	D2	D3	D4	D5
D1	-				
D2	.65	-			
D3	.71	.62	-		
D4	.63	.70	.60	-	
D5	.55	.58	.43	.60	-
D6	.67	.52	.52	.57	.52

Note: All correlations are statistically significant at the .001 level.

Table 6. Percentage of Students Indicating Low, Medium, and High CSE for Dimensions by Academic Level, Early Term Survey

Item No.	ENGRC 2250 Course Students (n=18)			Anonymous MAE Students (n=223)								
	Low	Med	High	Sophomores			Juniors			Seniors		
				Low	Med	High	Low	Med	High	Low	Med	High
D1	38.9%	44.4%	16.7%	18.3%	45.2%	36.6%	13.1%	45.2%	41.7%	4.2%	31.3%	64.6%
D2	33.3%	55.6%	11.1%	21.5%	41.9%	36.6%	20.2%	41.7%	38.1%	4.2%	35.4%	60.4%
D3	61.1%	16.7%	22.2%	31.2%	39.8%	29.0%	35.7%	33.3%	31.0%	12.5%	31.3%	56.3%
D4	55.6%	27.8%	16.7%	16.0%	55.3%	28.7%	14.3%	35.7%	50.0%	4.2%	35.4%	60.4%
D5	44.4%	33.3%	22.2%	22.6%	38.7%	38.7%	19.0%	33.3%	47.6%	8.3%	35.4%	56.3%
D6	11.1%	44.4%	44.4%	4.3%	34.4%	61.3%	9.5%	26.2%	64.3%	0.0%	27.1%	72.9%

Notes: Values in this table exclude the respondent indicating an academic level of First-Year, the one that did not report an academic level and the Course student that indicated Junior level. Percentages are for valid responses, that is, they do not include missing responses as part of the total 100%.

Table 7. Summary of ANOVAs for Items by Academic Level

Item No.	<i>F</i> ratio	Observed <i>p</i>	Partial η^2	Power
1	4.87	.008	.040	.799
2	4.31	.015	.035	.745
3	7.70	.001	.061	.947
4	9.98	<.001	.077	.984
5	3.80	.024	.031	.688
6	3.51	.031	.028	.651
7	2.21	.112	.018	.449
8	8.37	<.001	.066	.962
9	7.75	.001	.061	.948
10	5.79	.003	.046	.867
11	5.61	.004	.045	.856
12	6.55	.002	.052	.906
13	8.18	<.001	.064	.958
14	13.73	<.001	.103	.998
15	3.68	.027	.030	.673
16	2.22	.111	.018	.449
17	4.50	.012	.036	.765
18	9.75	<.001	.075	.982
19	5.43	.005	.043	.843
20	3.50	.032	.028	.650
21	3.61	.029	.029	.664
22	3.25	.041	.027	.615
23	4.55	.012	.037	.770

Notes: These analyses did not include the respondent indicating an Academic Level of “First-Year” and the one that did not indicate an Academic Level.

Table 8. Summary of ANOVAs for Dimensions by Academic Level

Dimension	<i>F</i> ratio	Observed <i>p</i>	Partial η^2	Power
General	8.34	<.001	.065	.962
Writing	8.02	<.001	.063	.955
Presenting	8.93	<.001	.069	.972
Visual	11.21	<.001	.085	.992
Electronic	4.02	.019	.032	.714
Group	4.67	.010	.037	.782

Notes: These analyses did not include the respondent indicating an Academic Level of “First-Year” and the one that did not indicate an Academic Level.

Table 9. Descriptive Statistics of CSE Items for Early Term Survey and End of Term Survey at Time Points (ENGRC 2250 Students Only)

Item No.	Early Term Survey			End of Term Survey		
	Mean	S.D.	N	Mean	S.D.	N
1	63.2	18.8	19	89.8	7.2	15
2	62.9	18.1	19	85.9	8.8	16
3	59.1	18.3	19	86.8	8.5	16
4	61.2	21.4	19	89.2	9.3	16
5	74.4	16.2	19	94.9	6.5	16
6	63.6	23.5	19	89.4	8.1	16
7	59.3	24.1	19	86.9	11.9	16
8	55.4	24.4	18	91.7	8.0	16
9	58.3	27.0	19	92.4	8.4	16
10	58.1	20.5	18	91.1	8.3	16
11	59.2	22.6	19	85.9	10.4	16
12	53.7	24.8	19	89.1	12.2	16
13	57.6	25.6	19	88.5	9.5	16
14	54.2	24.4	19	90.8	8.6	16
15	62.4	20.2	19	86.9	12.4	16
16	65.9	26.3	19	89.3	11.7	16
17	71.1	16.6	19	90.6	9.1	16
18	59.0	20.6	19	87.7	8.6	16
19	74.7	16.4	19	91.6	9.6	16
20	74.8	15.0	19	91.5	8.7	16
21	77.2	12.9	19	90.4	11.6	16
22	76.6	17.0	19	89.9	12.0	16
23	65.7	24.6	18	90.6	10.0	16

Note: Values in this table include all respondents responding to that item at that time point, hence differing sample sizes at each time point.

Table 10. Descriptive Statistics of CSE Dimensions at Early Term Survey and End of Term Survey Time Points(ENGRC 2250 Students Only)

Item No.	Early Term Survey			End of Term Survey		
	Mean	S.D.	N	Mean	S.D.	N
D1	64.7	16.7	19	89.4	7.5	16
D2	63.4	14.1	19	88.8	6.8	16
D3	55.6	23.6	19	91.7	6.6	16
D4	56.2	21.9	19	88.5	9.2	16
D5	64.1	18.8	19	88.1	10.1	16
D6	75.8	14.3	19	90.8	10.3	16

Table 11. Summary of ANOVAs for Items Across Time Points

Item No.	<i>F</i> ratio	Observed <i>p</i>	Partial η^2	Power
1	34.2	<.001	.710	1.0
2	62.2	<.001	.806	1.0
3	67.2	<.001	.818	1.0
4	24.2	<.001	.618	.996
5	26.8	<.001	.641	.998
6	36.6	<.001	.710	1.0
7	29.1	<.001	.660	.999
8	90.7	<.001	.866	1.0
9	38.2	<.001	.718	1.0
10	63.0	<.001	.818	1.0
11	40.0	<.001	.726	1.0
12	41.5	<.001	.734	1.0
13	32.5	<.001	.684	1.0
14	47.8	<.001	.761	1.0
15	26.2	<.001	.636	.998
16	13.0	.003	.465	.921
17	34.0	<.001	.694	1.0
18	36.8	<.001	.710	1.0
19	26.8	<.001	.641	.998
20	32.8	<.001	.686	1.0
21	28.5	<.001	.655	.999
22	22.4	<.001	.599	.993
23	18.3	.001	.567	.978

Table 12. Summary of ANOVAs for Dimensions Across Time Points

Dimension	<i>F</i> ratio	Observed <i>p</i>	Partial η^2	Power
General	45.3	<.001	.751	1.0
Written	104.2	<.001	.874	1.0
Oral	60.4	<.001	.801	1.0
Visual	54.6	<.001	.784	1.0
Electronic	26.0	<.001	.634	.997
Group	36.9	<.001	.711	1.0

**Table 13. Percentage of Respondents Indicating Levels of CSE for Items at Time Points
(ENGRC 2250 Students Only)**

Item No.	Early Term Survey			End of Term Survey		
	Low	Med	High	Low	Med	High
1	36.8%	52.6%	10.5%	0.0%	12.5%	81.3%
2	47.4%	42.1%	10.5%	0.0%	18.8%	81.3%
3	52.6%	31.6%	15.8%	0.0%	18.8%	81.3%
4	63.2%	21.1%	15.8%	0.0%	12.5%	87.5%
5	21.1%	42.1%	36.8%	0.0%	6.3%	93.8%
6	36.8%	36.8%	26.3%	0.0%	18.8%	81.3%
7	36.8%	47.4%	15.8%	0.0%	37.5%	62.5%
8	52.6%	26.3%	15.8%	0.0%	12.5%	87.5%
9	52.6%	26.3%	21.1%	0.0%	12.5%	87.5%
10	52.6%	26.3%	15.8%	0.0%	6.3%	93.8%
11	47.4%	36.8%	15.8%	0.0%	25.0%	75.0%
12	57.9%	31.6%	10.5%	0.0%	18.8%	81.3%
13	52.6%	26.3%	21.1%	0.0%	18.8%	81.3%
14	63.2%	21.1%	15.8%	0.0%	18.8%	81.3%
15	36.8%	47.4%	15.8%	0.0%	31.3%	68.8%
16	31.6%	36.8%	31.6%	0.0%	25.0%	75.0%
17	26.3%	47.4%	26.3%	0.0%	25.0%	75.0%
18	52.6%	31.6%	15.8%	0.0%	25.0%	75.0%
19	10.5%	52.6%	36.8%	0.0%	6.3%	93.8%
20	15.8%	47.4%	36.8%	0.0%	18.8%	81.3%
21	5.3%	63.2%	31.6%	6.3%	12.5%	81.3%
22	10.5%	42.1%	47.4%	6.3%	12.5%	81.3%
23	31.6%	31.6%	31.6%	0.0%	18.8%	81.3%

Notes: Percentages at Early Term include valid (i.e., non-missing) responses from the 19 students that completed the survey, whereas percentages at End of Term include valid responses from the 16 students that completed the survey. Thus, in some cases, the total of percentages within Early or End may not sum to 100%.

Table 14. Percentage of Respondents Indicating Levels of CSE for Dimensions at Time Points (ENGRC 2250 Students Only)

Dimension No.	Early Term Survey			End of Term Survey		
	Low	Med	High	Low	Med	High
D1	36.8%	47.4%	15.8%	0.0%	18.8%	81.3%
D2	36.8%	52.6%	10.5%	0.0%	18.8%	81.3%
D3	63.2%	15.8%	21.1%	0.0%	6.3%	93.8%
D4	57.9%	26.3%	15.8%	0.0%	12.5%	87.5%
D5	42.1%	36.8%	21.1%	0.0%	18.8%	81.3%
D6	10.5%	47.4%	42.1%	0.0%	18.8%	81.3%

Notes: Percentages at Early Term Survey include dimension scores for the 19 students that completed the survey, whereas percentages at End of Term Survey include dimension scores for the 16 students that completed the survey. Due to rounding, the total of percentages within Early Term or End of Term may not sum to 100%.