

## MAE/ECP Communication Initiative Survey Instrument

Construct	Construct Operationalized	Survey Item
General Communicative Self-Efficacy	Confidence Engaging in Effective Communicative Practice	1. I am confident that I can effectively express and represent my expertise in technical and professional communication contexts.
Awareness of Communicative Design	Confidence Understanding the Importance of “Design” in Relation to Communicative Practice	2. I am confident in my ability to choose the best words, select an appropriate sentence structure for communication in technical and professional contexts. 3. I am confident that I can structure well organized communication in technical and professional contexts.
Written Modality	Confidence Preparing and Performing an Effective Technical and Professional Text	4. I am confident preparing a final document and adhering to given conventions, specifications, and/or requirements in technical and professional contexts. 5. I am confident writing a first draft. 6. I am confident revising beyond simple editing. 7. I am confident accurately finding, referencing, and citing sources.
Oral Modality	Confidence Preparing and Performing Technical and Professional Presentations	8. I am confident that I can give technical and professional talks and presentations. 9. I am confident using slideware strategically in order to enhance understanding. 10. I am confident responding to questions, leading discussion, and providing a second closing.
Visual Modality	Confidence Preparing and Performing Data and Non-data Visuals	11. I am confident that I can design data visuals, e.g., charts, tables, graphs in ways that facilitate the understanding and interpretation of technical information. 12. I am confident that I can design non-data visuals, e.g., diagrams, drawings, illustrations, pictures, 3D CAD renditions in ways that facilitate understanding and interpretation of technical information. 13. I am confident creating captions that interpret data and non-data visuals while also following the conventions for labeling, titling and citing. 14. I am confident integrating data and non-data visuals into a text in ways that facilitate the understanding and interpretation of technical information.
<b>Construct</b>	<b>Construct Operationalized</b>	<b>15. Survey Item</b>

Electronic Modality	Confidence Preparing and Performing Communicative Practice Using Electronic Technologies	<p>16. I am confident that I can explore, both as a consumer and as a producer, new media forms or genres, e.g., video (YouTube) and video chat, web pages, podcasts, blogs.</p> <p>17. I am confident that I can use electronic communication such as email, texts and instant messaging along with other forms of social networking media in ways that are appropriate and purposeful in technical and professional contexts.</p>
Awareness of Communicative Practice	Confidence Understanding the “Purposefulness” of Communicative Practice	18. I am confident that I can communicate in ways that “get work done” in both technical and professional contexts.
Awareness of Communicative Context	Confidence Understanding the “Situated Nature” of Communicative Practice	19. I am confident that I can select, adapt and present technical information for multiple audiences, e.g., instructors, colleagues and peers, clients, and supervisors and/or managers.
Concomitant Communicative Practice	Confidence Preparing and Performing in Teams	<p>20. I am confident that I can communicate effectively in teams.</p> <p>21. I am confident communicating in ways that support project aims/goals.</p> <p>22. I am confident communicating in ways that facilitate developing productive relationships with other team members.</p> <p>23. I am confident communicating in ways that allow me to adopt various roles, e.g., follower, leader, expert, facilitator, learner, in team projects</p>
Awareness of Communicative Identity	Confidence Understanding “Persona” in Communicative Practice	24. I am confident I can be perceived as a knowledgeable and capable communicator in technical and professional contexts.

**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)								
	Low	Med	High	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
<b>D1. General Communication Self-Efficacy</b>	1, 17, 18, 23	.87
<b>D2. Writing Self-Efficacy</b>	2, 3, 4, 5, 6, 7	.86
<b>D3. Presenting/Speaking Self-Efficacy</b>	8, 9, 10	.89
<b>D4. Visual Communication Self-Efficacy</b>	11, 12, 13, 14	.88
<b>D5. Electronic Communication Self-Efficacy</b>	15, 16	.64
<b>D6. Self-Efficacy Communicating in Small Groups/Teams</b>	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	Mean	S.D.	n
<b>D1</b>	64.5	17.2	18	73.3	16.6	93	75.7	13.5	83	82.4	12.8	48
<b>D2</b>	63.8	14.4	18	72.0	16.0	93	73.5	16.3	83	81.3	11.2	48
<b>D3</b>	56.3	24.1	18	69.3	17.6	93	67.3	21.0	83	80.3	15.6	48
<b>D4</b>	56.1	22.5	18	73.3	15.1	93	77.5	16.1	83	83.2	12.9	48
<b>D5</b>	64.3	19.3	18	73.6	18.9	93	75.3	17.4	83	80.7	14.4	48
<b>D6</b>	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
<b>D1</b>	-				
<b>D2</b>	.65	-			
<b>D3</b>	.71	.62	-		
<b>D4</b>	.63	.70	.60	-	
<b>D5</b>	.55	.58	.43	.60	-
<b>D6</b>	.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	Low	Med	High
<b>D1</b>	38.9%	44.4%	16.7%	18.3%	45.2%	36.6%	13.1%	45.2%	41.7%	4.2%	31.3%	64.6%
<b>D2</b>	33.3%	55.6%	11.1%	21.5%	41.9%	36.6%	20.2%	41.7%	38.1%	4.2%	35.4%	60.4%
<b>D3</b>	61.1%	16.7%	22.2%	31.2%	39.8%	29.0%	35.7%	33.3%	31.0%	12.5%	31.3%	56.3%
<b>D4</b>	55.6%	27.8%	16.7%	16.0%	55.3%	28.7%	14.3%	35.7%	50.0%	4.2%	35.4%	60.4%
<b>D5</b>	44.4%	33.3%	22.2%	22.6%	38.7%	38.7%	19.0%	33.3%	47.6%	8.3%	35.4%	56.3%
<b>D6</b>	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 $\eta^2$	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 $\eta^2$	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**

<b>Item No.</b>	<b><i>F</i> ratio</b>	<b>Observed <i>p</i></b>	<b>Partial <math>\eta^2</math></b>	<b>Power</b>
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**

<b>Dimension</b>	<b><i>F</i> ratio</b>	<b>Observed <i>p</i></b>	<b>Partial <math>\eta^2</math></b>	<b>Power</b>
<b>General</b>	45.3	<.001	.751	1.0
<b>Written</b>	104.2	<.001	.874	1.0
<b>Oral</b>	60.4	<.001	.801	1.0
<b>Visual</b>	54.6	<.001	.784	1.0
<b>Electronic</b>	26.0	<.001	.634	.997
<b>Group</b>	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 Baseline include valid (i.e., non-missing) responses from the 19 students that completed the survey, whereas percentages at Follow-Up include valid responses from the 16 students that completed the survey. Thus, in some cases, the total of percentages within Baseline or Follow-Up 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
<b>D1</b>	36.8%	47.4%	15.8%	0.0%	18.8%	81.3%
<b>D2</b>	36.8%	52.6%	10.5%	0.0%	18.8%	81.3%
<b>D3</b>	63.2%	15.8%	21.1%	0.0%	6.3%	93.8%
<b>D4</b>	57.9%	26.3%	15.8%	0.0%	12.5%	87.5%
<b>D5</b>	42.1%	36.8%	21.1%	0.0%	18.8%	81.3%
<b>D6</b>	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%.