

Annual Program Assessment Report

Academic Years Assessed: 2020-2021; 2022-2022

College: Letters & Science

Program: Master of Science in Science Education

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Program Assessment Plan

Program Learner Outcome	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	Data Source
Science Education as Art/Discipline				X		
Written Communication			X			2 & 3
Oral Communication		X				1
Science Content					X	
Research	X					

Data Sources

1. Fifteen randomly chosen student oral Capstone presentation artifacts were assessed by five MSSE graduates using a rubric created to evaluate the learning outcome of “communicating information orally in an organized and effective manner by sharing the results of their Capstone research projects.”
2. Fifteen randomly chosen student writing artifacts from MSSE education and science courses were assessed by five MSSE graduates using a rubric created to evaluate the learning outcome of “communicating in writing in an organized and effective manner.”
3. Twenty-two MSSE 575 Capstone papers were assessed using the MSSE 575 writing rubric.

Threshold Values

Program Learning Outcome	Threshold Value	Data Source
MSSE students will communicate orally in an organized and effective manner by sharing the results of their Capstone research projects.	The threshold value for this outcome is for 75% of the assessed students to score 3 or above on a 1-4 scoring rubric.	1. Oral Communication Rubric
MSSE students will communicate in writing in an organized and effective manner.	<p>The threshold value for this outcome is for 75% of the assessed students to score 3 or above on 1-4 scoring rubric.</p> <p>The threshold value for the outcome of the MSSE 575 Writing Component Rubric is 75% of the assessed students to score 28 or above on a 31 point scoring rubric.</p>	<p>2. Written Communication Rubric</p> <p>3. MSSE 575 Writing Component Rubric</p>

The completed assessments were consistent with the program’s assessment plan and were updated based on the feedback from the 2020 MSSE Program Assessment.

Data Collection & Analysis Methods

The data collected and analyzed spanned the 2020-2022 academic school years. Two Program Learner Outcomes were assessed:

- MSSE students will communicate orally in an organized and effective manner by sharing the results of their Capstone research projects.
- MSSE students will communicate in writing in an organized and effective manner.

Rubrics were created to assess each of the two learner outcomes. Each rubric was based on a 1-4 scoring scale with 4 being the top score. Artifacts in each of the three areas of assessment were randomly selected as follows:

- Oral Communication. Random samples of Capstone Presentation recordings.
- Written Communication. Random writing samples from three education and one science content course. The Capstone Writing Rubrics of 22 Capstone papers were also assessed.

Learner Outcome	Sample and Sample Size	Rubric	Example
Oral Communication	MSSE Capstone Presentations (<i>N</i> =15)	Data Source 1	Example Presentation Link
Written Communication	MSSE Writing Samples (<i>N</i> =22)	Data Source 3	Example Paper Link

Five graduates of the MSSE Program were recruited to serve as evaluators. Each evaluator was assigned five artifacts in each assessed category. As a result, each artifact was evaluated by two separate evaluators and the two scores were averaged for each artifact. Then the scores for each of the artifacts in each category were averaged and reported as the percentage of students scoring in each of the rubric descriptors.

Learner Outcome Rubrics

Data Source 1: Oral Communication Rubric

Key Question: Has the student communicated orally in an organized and effective manner?

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- 1 Communicated using a rehearsed, clear, pleasant voice at an appropriate volume. Smooth transitions. Relatively flawless grammar and mechanics.
- Between option 1 & 2
- 2 Communicated using a moderately well rehearsed manner. Clear, pleasant voice at an appropriate volume with some exceptions. Mostly smooth transitions. Relatively flawless grammar and mechanics.
- Between options 2 & 3
- 3 Struggled communicating in a moderately well rehearsed manner. Struggled with clear, pleasant voice at an appropriate volume. Rough/awkward transitions. Errors in grammar and mechanics.
- Between options 3 & 4
- 4 Did not communicate effectively. Did not use a clear, pleasant voice at an appropriate volume. Extremely rough/awkward transitions. Numerous errors in grammar and mechanics.

Data Source 2: Written Communication Rubric

Key Question: Has the student communicated in writing in an organized and effective manner?

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- 1 Written communication is clear, organized and contributes to a sense of wholeness. Relatively flawless grammar and mechanics.
- Between options 1 & 2
- 2 Written communication is mostly clear, organized and contributes to a sense of wholeness. Few grammatical and mechanical errors.
- Between options 2 & 3
- 3 Written communication is not clear, not organized and/or does not contribute to a sense of wholeness. Contains grammatical and mechanical errors.
- Between options 3 & 4
- 4 Fails to meet writing standards.

Data Source 3: MSSE 575 Capstone Paper Rubric

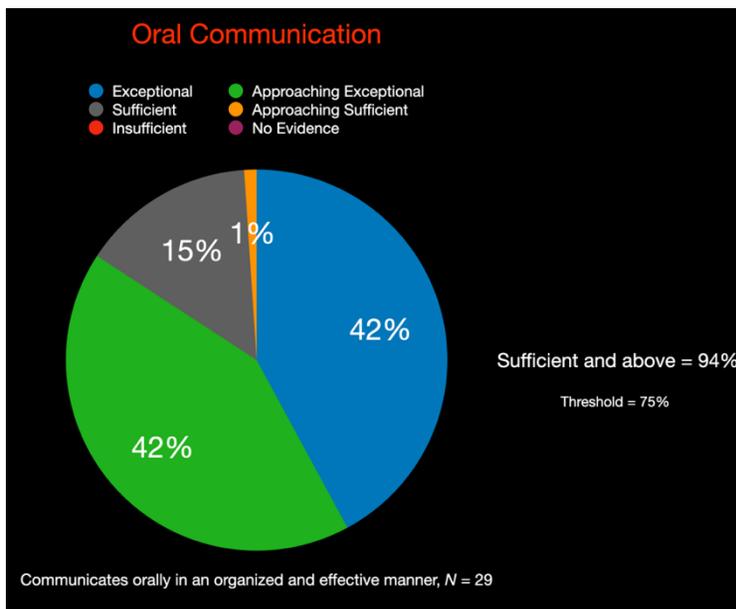
CAPSTONE PAPER				
CHAPTER 1	CHAPTER 2	CHAPTER 3	CHAPTER 4	CHAPTER 5
<ul style="list-style-type: none"> Provides the background needed to understand the educational context and demographics of the community, school, and teaching environment, including data-based descriptions. Articulates a purpose of the study that helps the reader assess the importance of the study relative to individual values. Provides a clear and aligned rationale for the research questions studied during the capstone project. Includes a clearly stated and measurable focus question and sub questions, if needed. 	<ul style="list-style-type: none"> The body paragraphs provide a clear overview of the research literature published in support of the research question(s). Organizes themes in the literature using section headings which clearly connect to the research question(s). Paragraphs provide evidence to support the theme using diverse perspectives from peer-reviewed literature, include analysis of the evidence, and a rationale and connection for the current study. Paragraphs include a mix of parenthetical and in-text citations to provide evidence to support a claim. 	<ul style="list-style-type: none"> The introductory paragraph clearly and briefly summarizes the purpose of the study and research questions, and their alignment to the research design. A clear description of the total number of participants (sample size), the demographics, and grouping information. Includes information to determine the appropriateness of a comparison group or data. Includes a clear statement that the project has been approved by IRB and references the IRB approval in the Appendices. A clear description of the research design and the treatment (what did you do differently?) implemented with the research participants is included. Includes clear descriptions of the strategies implemented during the study. Includes clear descriptions of the qualitative and quantitative measures used during data collection and how the data was collected and analyzed. Includes a data triangulation matrix which clearly identifies multiple data sources for each research question. 	<ul style="list-style-type: none"> Includes a clear synthesis of the themes and patterns for each research question based on the collected quantitative and qualitative data across instruments during the treatment. <ul style="list-style-type: none"> at least one claim for each research question is included and aligned. evidence from multiple sources <u>are</u> used to support each claim. a mix of quantitative and qualitative data (i.e., quotes) are used to support each claim. Appropriate tables and figures are included to illustrate the intervention plan. Tables and Figures are properly formatted and include alternative <u>text</u> so they are accessible to all readers. 	<ul style="list-style-type: none"> Clearly provides further explanation of the claims shared in the data and analysis section and synthesizes 2-3 major findings. Makes clear connections between the study, personal experience, and the literature. Effectively utilizes the claims, evidence, reasoning format throughout the paragraphs. Provides a clear description of the values of the study on science pedagogy (i.e., student impact, teaching practice) and its connection to the research. Provides a clear description of the opportunities for further research. Makes clear and strong connections back to the action research literature. Describes how you changed through the action research process.
CREATIVITY & INNOVATION	WRITING		FORMATTING GUIDELINES	REVISIONS
<p>The action research project explores a creative and innovative approach to teaching and learning based on the needs of the researcher and their students.</p>	<ul style="list-style-type: none"> The writing is clear, coherent, and unambiguous. It includes all required elements and communicates effectively to the intended audience. Paragraphs contain a topic sentence and 3-4 detail sentences (claims – evidence – reasoning). The writing is free of grammatical, spelling, and other errors. When incorporating literature or discussing data, multiple sources are used throughout the paragraphs and represent diverse perspectives. 		<p>The formatting expectations outlined on the Capstone Guidelines page are demonstrated throughout the capstone paper.</p>	<p>Completes revisions as requested by the graduate committee.</p>

Section Standards Met out of 31 Weighted score 35% |

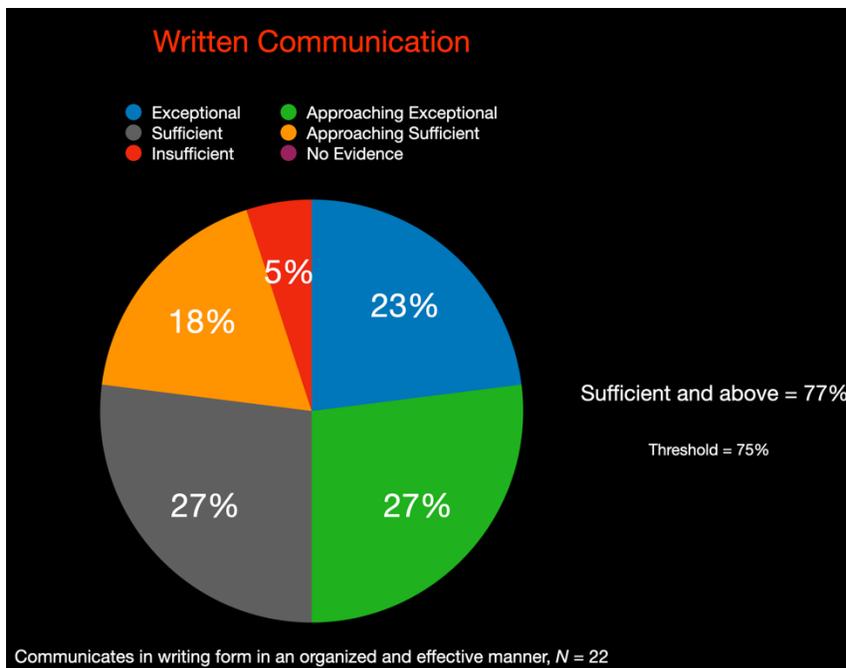
Note: Rubric scores 31/31 = Exceptional; 29-30 = Approaching Exceptional; 28 = Sufficient; 26-27 = Approaching Sufficient; 26 and below = Insufficient; 0 = No evidence

What Was Learned

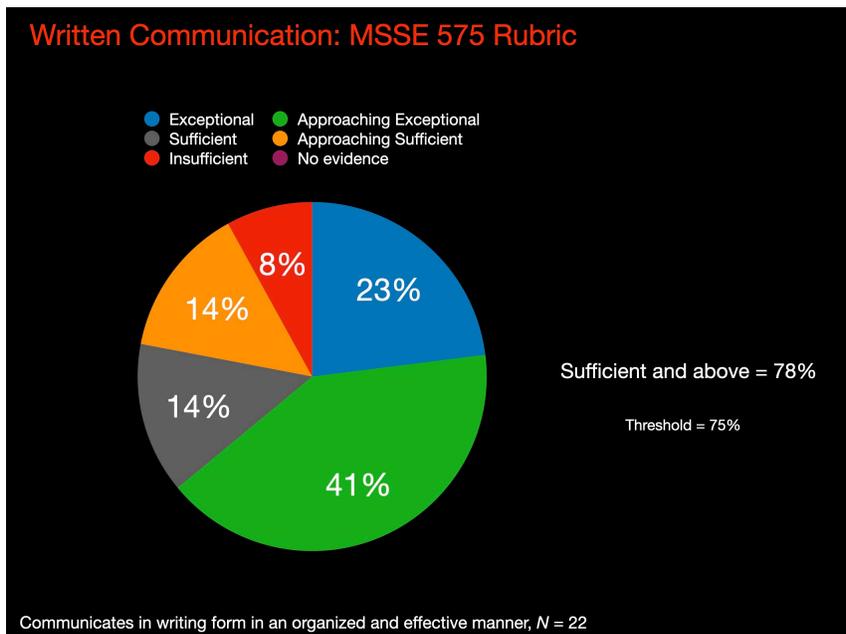
The results of the Oral Communication Rubric indicated that 94% of the oral Capstone presentations assessed scored at or above the sufficient level, meeting the threshold of 75%, ($n=29$).



The results of the Writing Communication Rubric indicated that 77% of the artifacts assessed scored at or above the sufficient level, meeting the threshold of 75%, ($n=22$).



The results of the assessment of Capstone Paper Rubric indicated that 77% of the assessed papers scored at or above the sufficient level, meeting the threshold of 75%, ($n=19$).



Areas of strength of the program identified through the assessments include the oral presentation of the Capstone project. Over the years, we have refined the guidelines of the presentation. Prior to the assessment year, we changed the length of the presentation from an hour to 20 minutes. In addition, all four Core Instructors set up online presentation practice sessions for students prior to coming to campus to present. Anecdotal observations were that students' presentations were better organized, were succinct, and flowed better than presentations in past years.

We also believe that the professional paper written by MSSE students is a strength of our program. We contribute this to refining the MSSE Capstone Paper Rubric and including language like "effectively utilizes claims, evidence and reasoning" and "includes a clear synthesis of themes and patterns for each research question based on the collective quantitative and qualitative data across instruments during the treatment."

How We Responded

The results of the assessments were shared with the Core Instructors at the Fall 2022 Retreat. We reviewed the results and discussed ways to address concerns. Regarding oral communication, the Core Instructors agreed to continue the model of keeping the presentation length to 20 minutes, providing online practice time before the Capstone Symposium, and leveraging the standardized rubric for class assignments as a way to maintain high achievement for students for this program learner outcome.

For the outcome of written communication, the faculty discussed that requiring a specific writing rubric across all 50 or so courses offered in our program would be problematic due to the diversity of science content courses offered. Therefore, as the Core Instructor team, we will focus on writing in the four core courses that lead up to the professional Capstone paper. To accomplish this goal, we will continue to

- consistently use the Capstone Writing Rubric as a component of all written assessment in our core courses.
- develop writing resources aligned with the written communication needs of our students and post them in our online courses.

As a program, we will partner with the Writing Center in Fall '22 to create opportunities for students to get writing support throughout the Capstone writing process. The Writing Center is equipped to work with MSSE students, all of whom are online, in both small groups and individually. We have established key points during the writing process when students will be encouraged to meet with a writing tutor.

Finally, the results of these assessments were shared with the MSSE Steering Committee.

Closing the Loop

In reviewing the 2020 Program Assessment feedback, we now feel the assessment of the research outcome conducted two years ago was insufficient. Discussions with both education and science faculty who serve as committee members for Capstone Projects are planned for the

Spring 2023 MSSE Faculty Retreat. It is anticipated that the outcome of this discussion will provide direction to better assess the research learner outcome in the future. We also hope to assess research being conducted on a smaller scale in individual science courses.