

# Empirical and Quantitative Skills Rubric



This rubric was developed by the empirical and quantitative skills committee at Stephen F. Austin State University in the Fall 2013 semester. The development process examined many existing campus and AAC&U's rubrics. This rubric articulates fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubric is intended for institutional-level use in evaluating and discussing student learning, not for grading. The utility of this rubric is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared through a common dialog and understanding of student success.

## **Definition**

Empirical and Quantitative (EQ) skills are those skills necessary to frame a problem, analyze empirical information, draw conclusions from the analysis, and communicate the results to an audience. Often, EQ skills are synonymous with critical thinking skills, and they closely correspond to the Quantitative Literacy definition developed by AAC&U. Individuals with strong EQ skills possess the ability to reason and solve quantitative problems from a wide array of disciplines and real-life situations, and they can clearly communicate the process and results in a variety of formats (e.g., words, tables, graphs, mathematical equations).

## **Empirical and Quantitative Skills Across Disciplines**

Most academic disciplines seek to foster strong EQ skills in their students. These skills are critically important for success in today's data-driven marketplace. Employers seek applicants with strong EQ skills, and these employees tend to have upward mobility, all else being equal. Since EQ skills are important for students, faculty are encouraged to develop assignments that provide opportunities for students to develop their critical thinking skills including but not limited to analyzing quantitative information, representing quantitative information in appropriate forms, completing necessary calculations to answer meaningful questions, making judgments based on quantitative information, or communicating the results of that work for various purposes and audiences. This rubric can be used as a framework for faculty to design assignments that provide students with the opportunities to enhance their empirical and quantitative reasoning skills.

## **Framing Language**

This rubric has been designed for the evaluation of work that addresses EQ skills. EQ skills go beyond mere calculations or citing data. Students must be able to understand a question, seek the most appropriate information to answer the question, analyze this information, and draw conclusions that have practical significance.

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	<b>Capstone 4</b>	<b>Accomplished 3</b>	<b>Developing 2</b>	<b>Beginning 1</b>	<b>Unacceptable 0</b>
<b>Define Problem/Topic</b>	Demonstrates the ability to construct a clear and insightful problem/topic statement with evidence of <u>all</u> relevant contextual factors.	Demonstrates the ability to construct a problem/topic statement with evidence of most relevant contextual factors, and problem statement is adequately detailed.	Begins to demonstrate the ability to construct a problem/topic statement with evidence of most relevant contextual factors, but problem statement is superficial.	Demonstrates a limited ability in identifying a problem/topic statement or related contextual factors.	Does not define problem/topic.
<b>Devise/Formulate a Plan</b>	Uses information or observation to form a correct plan to achieve a solution. Analyzes each step of the plan for plausibility and correctness.	Uses information or observations to form a correct plan to achieve a solution.	Uses information or observations to form a partially correct plan to achieve a solution.	Uses information or observations to form an incorrect or incomplete plan to achieve a solution.	Does not formulate a plan for solution.
<b>Data/information collection and/or selection</b>	Skillfully gathers or converts relevant information into insightful portrayal that contributes to further or deeper understanding of the problem/topic.	Converts/gathers relevant information into an appropriate portrayal of the problem/topic.	Converts/gathers relevant information into a partially appropriate portrayal of the problem/topic.	Attempts to gather/convert information, but the information is incomplete or irrelevant to the problem/topic.	Does not attempt to gather/convert information.
<b>Analysis</b>	Analyzes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to problem/topic.	Analyzes evidence to reveal relevant patterns, differences, or similarities related to the problem/topic.	Analysis is partially effective in revealing patterns, differences or similarities.	Analysis is not effective in revealing patterns, differences or similarities.	Does not attempt analysis.
<b>Conclusion</b>	Conclusion(s) is/are correct, insightful, and relate to the original problem/topic.	Conclusion(s) is/are correct and relate to the original problem/topic.	Conclusion(s) is/are partially correct and relate to the original problem/topic.	Conclusion(s) is/are incorrect or unrelated to the problem/topic.	Does not form a conclusion.

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