

Summary and Purpose – Fall 2015

Real-World Problem-Solving Report & Rubric

In designing the next QEP, we are aiming to develop a universal assignment and measurement to be completed by students who are engaged in real-world problem-solving. Here we provide a proposed assignment (called a "Learning Reflection Report") and measurement (a grading rubric) to be used for QEP (2016-2021). This report and rubric are intended for use across any discipline. Using a single report & rubric across campus will provide cohesiveness to the QEP implementation and experience, and also streamline measurement of the system-wide impact of the QEP.

Students will complete the Problem-Solving Reports during or after engagement in real-world problem-solving work (that typically will last anywhere from weeks to a year). After a report is submitted (electronically), the supervising faculty will score the report according to the provided rubric. All submitted reports will be collected in a campus-wide database to be called a "portfolio" that will house and present problem-solving activities of students at CSU.

This version of the problem-solving report and rubric will be used during fall 2015 pilot tests. This will be distributed to faculty via Word document for their use in paper or electronic form. The QEP Design Team will need paper versions (either printed or hand-written) of the completed reports & rubric by Jan 1, 2016. Along with the completed reports & rubrics, the QEP Design Team will want to know from each faculty answers to the following questions.

1. Was this learning report useful for problem-solving activities by your students? Explain.
2. Are there any items on the learning report that were problematic? What would you change and why?
3. Comment on the clarity and usefulness of the rubric. What could be improved and how?
4. What were the most difficult items or areas to understand or use? Would you eliminate any aspects of the rubric? Explain.
5. Would you use this report & rubric again in one of your classes to promote and measure problem-solving on campus? Why or why not?

Real-World Problem-Solving Report

These items will be completed by students based on problem-solving experiences.

The report can be completed during the process (e.g., throughout a semester) or can be completed after the process.

Discovery Process

1. What was the real-world problem that you or your team addressed, and why is this problem important?
2. What information, processes, and/or collaboration did you or your team use to understand your real-world problem and its challenges?

Design Process

3. What concepts or strategies did you or your team create or consider using to address your real-world problem?
4. After further reflection or testing, which concepts or strategies did not seem appropriate for addressing your problem? Explain.
Which concepts or strategies did seem most appropriate for addressing your problem, and why?
(If your evaluation of the appropriateness of these concepts or strategies changed over the course of the problem-solving process, discuss how and why it changed.)

Delivery Process

5. Which concept(s) or strategy(ies) would/did you or your team use, combine, and/or test to address the problem, and how is this approach reasonable and effective?
6. How was your or your team's approach to the problem communicated to an audience, and what feedback, if any, did you receive?

Problem-Solving Reflection Items

7. What new learning or insights did you gain about creative, real-world problem-solving from this experience?
8. After this experience, how would you rate your level of creative, real-world problem-solving skill in this particular content area on a scale of 1 (extremely weak) to 5 (extremely strong)?
9. Explain your self-rating of problem-solving skills in this content area. Provide evidence or examples to justify your skill level (regardless of whether your self-rating is low or high).
10. After this experience, how would you rate your general level of skill in creative, real-world problem-solving on a scale of 1 (extremely weak) to 5 (extremely strong)?
11. Explain your self-rating of general problem-solving skills. Provide evidence or examples to justify your skill level (regardless of whether your self-rating is low or high).

Other Identifying Information to be collected (either by answers or by automatic tracking):

- Student ID number of report's author
- Experience sponsor: course discipline/number/title or student organization name

Grading Rubric for Real-World Problem-Solving Report: Discover, Design, Deliver Processes

This rubric will be used to assess the first six items of the Real-World Problem-Solving Report, which address the three processes of problem-solving. A separate rubric (see p. 5-6 of this document) will be used to assess answers to the Problem-Solving Reflection Items.

Any answers that do not meet the requirements for “Beginning”, or benchmark-level progress, should be assigned a zero (0) score.

		Beginning 1	Developing 2	Competent 3	Accomplished 4	Exemplary 5
Discover Process	What was the real-world problem that you or your team addressed, and why is this problem important?	The problem is articulated with limited clarity, cohesion, and connection to the real world.	Problem is described with <u>more than one</u> critical limitation, such as minimal scope and relevance, incomplete logic, or limited rationale.	Problem is described with <u>one</u> critical limitation, such as minimal scope and relevance, incomplete logic, or limited rationale.	Problem is described within a complex real-world context and the statement is detailed enough for clarity and cohesion.	Problem meets all the criteria for “Accomplished”, but also is <u>unique/novel</u> or exhibits high level of <u>complexity/difficulty</u> .
	What information, processes, and/or collaboration did you or your team use to understand your real-world problem and its challenges?	The information and processes described do not include clear references to collaboration or attempts to gather information about the problem and its impact.	The information and processes described refer to <u>limited</u> number of resources and limited amount of collaboration among team members (or between the student and others).	The information and processes described indicate consistent use of scholarly resources and collaboration, but some of these activities are not clearly linked to the problem.	Demonstrates a clear ability to differentiate and consistently use problem-appropriate scholarly resources for problem development, and the ability to evaluate the resources critically.	The information and processes described meet the criteria for “Accomplished”, and also demonstrate <u>creative</u> use of resources, information, and/or collaboration techniques that are rigorous and/or varied.
Design Process	What concepts or strategies did you or your team create or consider using to address your real-world problem?	The concepts, strategies, or solutions described are limited in number and quality; they lack clear connection to the problem or are too vague to evaluate.	The concepts, strategies, or solutions described are fairly clear, but they are limited in number (e.g., one) or lack a strong connection to the	The concepts, strategies, or solutions described are limited in number (e.g., one or two); strategies are clearly written and are connected to the	Describes multiple concepts, strategies, or solutions clearly; almost all concepts, strategies, or solutions are linked to the problem stated; at least one of the	At least three concepts, strategies, or solutions are described clearly. All strategies are linked to the problem, and at least two of the strategies are <u>creative</u>

			problem stated.	problem, but lack creativity (i.e., represent “standard” approaches to the problem).	concept, strategies, or solutions is creative and considers its impact within a larger context.	or <u>complex</u> and their impact within a larger context is described.
	After further reflection or testing, which concepts or strategies did <u>not</u> seem appropriate for addressing your problem? Explain. Which concepts or strategies did seem most appropriate for addressing your problem, and why? (If your evaluation of the appropriateness of these concepts or strategies changed over the course of the problem-solving process, discuss how and why it changed.)	Reflection about what worked <u>clearly</u> describes <u>one</u> of the following: -Logical assessment -Practical considerations -History of problem & attempted solutions -Potential impacts	Reflection about what worked <u>clearly</u> describes <u>two</u> of the following: -Logical assessment -Practical considerations -History of problem & attempted solutions - Potential impacts	Reflection about what worked <u>clearly</u> describes <u>three</u> of the following: -Logical assessment -Practical considerations -History of problem & attempted solutions - Potential impacts	Reflection about what worked <u>clearly</u> describes <u>all four</u> of the following: -Logical assessment -Practical considerations -History of problem & attempted solutions - Potential impacts	Reflection meets all the criteria for “Accomplished”, and also indicates <u>insightful</u> understanding of potential solutions. Answer articulates <u>multiple implications</u> of the concepts or strategies.
Deliver Process	Which concept(s) or strategy(ies) would/did you or your team use, combine, and/or test to address the problem, and how is this approach reasonable and effective approach?	Description of solution is disorganized and partially incoherent. It is too vague to evaluate the quality of the solution.	Description of solution is focused and organized, but there are errors that detract from its clarity. Quality of solution is difficult to evaluate.	Description of solution is focused, organized, and clear, but the logic and efficacy of the solution is not articulated clearly.	Description of solution is focused, organized and clear. The solution is logical and its efficacy is articulated.	Description of solution contains all aspects of an “Accomplished” solution, but also is particularly <u>creative</u> or <u>complex</u> .
	How was your or your team’s approach to the problem communicated to an	The presentation was completed by the student, but there were 1-2 areas in	The presentation met all requirements described by the dissemination outlet,	The presentation was clear, contained all components of problem solving, and	The presentation met all requirements for “Competent” and also received positive	The presentation met all requirements for “Competent” and received formal

	<p>audience, and what feedback, if any, did you receive?</p> <p>(Be sure to include the location and date of the delivery in the available areas of the form. Note: communication can occur in various forms, e.g., video, paper).</p>	<p>which the student failed to meet requirements described by the dissemination outlet (e.g., presentation length) and there was at least one area in which clarity could have been improved.</p>	<p>but there was at least one area of problem-solving that lacked clarity (in terms of the process, connection to the problem, or its impact).</p>	<p>met all requirements described by the dissemination outlet, but was not notable in any particular area.</p>	<p>feedback from audience. Examples include follow-up contact from peers, request to provide other presentations, collaboration invitations, or nominations for awards.</p>	<p>accolade (e.g., an award) by an audience.</p>
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Grading Rubric for Real-World Problem-Solving Report: Problem-Solving Reflection Items

This rubric (p. 5-6 of this document) will be used to assess answers to the Problem-Solving Reflection Items (i.e., the last 5 items of the Report).

	No Gains 1	Minimal Gains 2	Some Meaningful Gains 3	Significant Gains 4	Maximal Gains 5
What new learning or insights did you gain about creative, real-world problem-solving from this experience?	No learning or insights reported; zero change in understanding of problem-solving processes.	Self-reported insights are minimal; only <u>1 learned skill</u> identified or basic-level understanding is indicated.	Self-reported insights include <u>2-3 skills</u> or moderate level of understanding problem-solving processes.	Self-reported insights include <u>at least 3</u> additional skills; at least one aspect of learning is linked to the student's understanding of problem-solving processes.	A gain of <u>3 or more</u> skills is reported, and more than one reported gain is linked to the student's understanding of problem-solving processes.
	Extremely Weak 1	Weak 2	Average 3	Strong 4	Extremely Strong 5
After this experience, how would you rate your <u>general</u> level of skill in creative, real-world problem-solving on a scale of 1 (extremely weak) to 5 (extremely strong)?	Self-reported level of creative, real-world problem-solving is 1.	Self-reported level of creative, real-world problem-solving is 2.	Self-reported level of creative, real-world problem-solving is 3.	Self-reported level of creative, real-world problem-solving is 4.	Self-reported level of creative, real-world problem-solving is 5.
	Extremely Weak 1	Weak 2	Average 3	Strong 4	Extremely Strong 5
Explain your self-rating of <u>general</u> problem-solving skills. Provide evidence or examples to justify your skill level.	There is no explanation or justification for the self-rating.	Justification for the self-rating is brief and partially vague (e.g., uses broad adjectives without concrete evidence or examples).	Some clear evidence for the rating is provided, but the answer is brief and/or doesn't fit with the rating.	<u>At least 3</u> pieces of evidence or examples are provided and they seem linked to the self-rating.	<u>At least 3</u> pieces of evidence or examples are provided, along with explanation of how those examples represent the level of problem-solving ability chosen in the self-rating.

	Extremely Weak 1	Weak 2	Average 3	Strong 4	Extremely Strong 5
After this experience, how would you rate your level of creative, real-world problem-solving skill in this particular content area on a scale of 1 (extremely weak) to 5 (extremely strong)?	Self-reported level of problem-solving in this content area is 1.	Self-reported level of problem-solving in this content area is 2.	Self-reported level of problem-solving in this content area is 3.	Self-reported level of problem-solving in this content area is 4.	Self-reported level of problem-solving in this content area is 5.
	Extremely Weak 1	Weak 2	Average 3	Strong 4	Extremely Strong 5
Explain your self-rating of problem-solving skills in this content area. Provide evidence or examples to justify your skill level.	There is little explanation or justification for the self-rating.	Justification for the self-rating is brief and partially vague (e.g., uses broad adjectives without concrete evidence or examples).	Some clear evidence for the rating is provided, but the answer is brief and/or doesn't fit with the rating.	<u>At least 3</u> pieces of evidence or examples are provided and they seem linked to the self-rating.	<u>At least 3</u> pieces of evidence or examples are provided, along with explanation of how those examples represent the level of problem-solving ability chosen in the self-rating.

Sources used to create the rubrics:

- AACU Problem Solving VALUE Rubric
- Georgia Gwinnett College STEM Department Evaluation Rubric (for research, metacognition, etc.)
- Florida Atlantic University QEP Rubric (Distinction Through Discovery Student Achievement Rubric)
- PULSE Vision & Change Rubrics