

Introduction

This file describes how “Problem solving” as a generic competence can be deconstructed into distinct learning outcomes in a university education setting.

It is one of 16 descriptions in LOUIS (Learning Outcomes in University for Impact on Society); LOUIS is part of the Aurora Competence Framework.

The descriptions are based on the VALUE Rubrics developed by the American Association of Colleges & Universities AAC&U.



Problem solving is the process of designing, evaluating, and implementing a strategy to answer an open-ended question or achieve a desired goal

Problem solving components:

- Define problem
- Identify strategies
- Propose solutions / hypotheses
- Evaluate potential solutions
- Implement solutions
- Evaluate outcomes

Problem solving: Define problem

Demonstrates a limited ability in identifying a problem statement or related contextual factors



Begins to demonstrate the ability to construct a problem statement with evidence of most relevant contextual factors, but problem statement is superficial



Demonstrates the ability to construct a problem statement with evidence of most relevant contextual factors, and problem statement is adequately detailed.



Demonstrates the ability to construct a clear and insightful problem statement with evidence of all relevant contextual factors.

Problem solving: Identify strategies

Identifies one or more approaches for solving the problem that do not apply within a specific context



Identifies only a single approach for solving the problem that does apply within a specific context.



Identifies multiple approaches for solving the problem, only some of which apply within a specific context.



Identifies multiple approaches for solving the problem that apply within a specific context.

Problem solving:

Propose solutions / hypotheses

Proposes a solution/ hypothesis that is difficult to evaluate because it is vague or only indirectly addresses the problem statement.



Proposes one solution/ hypothesis that is "off the shelf" rather than individually designed to address the specific contextual factors of the problem.



Proposes one or more solutions/ hypotheses that indicates comprehension of the problem. Solutions/ hypotheses are sensitive to contextual factors as well as the one of the following: ethical, logical, or cultural dimensions of the problem.



Proposes one or more solutions/ hypotheses that indicates a deep comprehension of the problem. Solution/ hypotheses are sensitive to contextual factors as well as all of the following: ethical, logical, and cultural dimensions of the problem

Problem solving: Evaluate potential solutions

Evaluation of solutions is superficial (for example, contains cursory, surface level explanation) and includes one of the following: considers history of problem, reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution



Evaluation of solutions is brief (for example, explanation lacks depth) and includes two of the following: considers history of problem, reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.



Evaluation of solutions is adequate (for example, contains thorough explanation) and includes three of the following: considers history of problem, reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.



Evaluation of solutions is deep and elegant (for example, contains thorough and insightful explanation) and includes, deeply and thoroughly, all of the following: considers history of problem, reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.

Problem solving: Implement solution

Implements the solution in a manner that does not directly address the problem statement..



Implements the solution in a manner that addresses the problem statement but ignores relevant contextual factors.



Implements the solution in a manner that addresses multiple contextual factors of the problem in a surface manner.



Implements the solution in a manner that addresses thoroughly and deeply multiple contextual factors of the problem.

Problem solving: Evaluate outcomes

Reviews results superficially in terms of the problem defined with no consideration of need for further work



Reviews results in terms of the problem defined with little, if any, consideration of need for further work.



Reviews results relative to the problem defined with some consideration of need for further work.



Reviews results relative to the problem defined with thorough, specific considerations of need for further work