

Assessment highlights insights

from Brad Walmsley, Principal Education Officer for Engineering

Q Why was this student response selected for Assessment highlights?

A This IA3 response provides a good example of how careful assessment task development provides students with the opportunity to demonstrate their ability to apply Unit 4 syllabus subject matter knowledge to effectively solve a real-world related machine and/or mechanism problem using the problem-solving process in Engineering.

Q How has the student effectively responded to the school's assessment instrument and demonstrated the qualities of the top performance-level descriptors (PLD) of the instrument-specific marking guide?

A The folio developed by Drishti provides an accurate and discriminating account of the characteristics of the cement bagging and distribution problem. She displays intellectual perception when distinguishing between knowns, unknowns, assumptions made, and the boundaries defined for problem exploration. In her response, Drishti demonstrates a discerning description of related engineering technology knowledge, control technologies and mechanics and materials science concepts and principles.

The folio includes representations of ideas and a solution using highly skilled sketches, drawings, pictures, engineering drawings with basic drawing standards, logic circuit diagrams, graphs and tables. These representations include valuable and relevant annotations that display intellectual perception when providing additional information about research, testing, data, ideas and a solution.

The folio shows the development of knowledge about the problem's characteristics through insightful analysis of pertinent engineering mechanics, control technologies, materials science, technology and research information. The student has acknowledged the complex nature of the relationships that exist between the applicable elements, components and features of the problem. Solution success criteria have been determined using an accurate and discerning understanding of the critical aspects of the problem's characteristics.

The folio provides evidence of a well-structured, rational and valid integration of engineering mechanics, control technologies, materials science, technology, research information and ideas, and predicts a real-world related solution to the cement bagging and distribution problem. Prototype performance data, calculations and solution success criteria are used to critically evaluate and to make discriminating refinements to ideas and the solution.

Thoughtful and accurate recommendations, justified by data and research evidence are made for future modifications or enhancements to ideas and the solution.

The folio includes the use of written and visual features that are selected for their value and relevance and are structured to provide an articulate and thoughtful presentation of information to a technical audience. The folio includes headings that demonstrate the organisation of the student's thinking during the problem-solving process and are easily followed using the correctly formatted contents page. A reference list and a recognised system of in-text referencing is evident.

Q What were the qualities or features of the student’s response that made it stand out from other student responses?

A The project — folio Part A displays evidence of how recognition, description and analysis of the problem, including use of calculations and sketches with annotations, may be used to identify and demonstrate understanding of the characteristics of the problem and determine solution success criteria. The student response includes knowledge of Unit 4 mechanics, materials science, control technologies and engineering technology concepts and principles.

This knowledge is used to demonstrate an understanding of the complex relationships that exist between the applicable elements, components and features of the cement bagging and distribution problem. The student response includes an accurate assessment of the problem’s characteristics to establish solution success criteria that are prioritised by importance for developing an engineered solution. Evaluation and refinement of the predicted solution is justified using performance data produced as a result of virtual testing of the prototype. The student response includes explicit use of prototype performance data and data produced using relevant calculations to justify refinement of the real-world related solution.

The project — folio Part B summary report indicates that analysis of Part A has identified the essential elements of information, including ideas, data, research information and visual representations. This information was selected for its value and relevance and combined to communicate a concise account of the recommended solution to a technical audience.

 © State of Queensland (QCAA) 2022

Licence: <https://creativecommons.org/licenses/by/4.0> | **Copyright notice:** www.qcaa.qld.edu.au/copyright — lists the full terms and conditions, which specify certain exceptions to the licence. |

Attribution (include the link): © State of Queensland (QCAA) 2022 www.qcaa.qld.edu.au/copyright.