Digital Solutions 2019 v1.2

Unit 2 sample assessment instrument

June 2018

Project — digital solution

This sample has been compiled by the QCAA to assist and support teachers in planning and developing assessment instruments for individual school settings.

Schools develop internal assessments for each senior subject, based on the learning described in Units 1 and 2 of the subject syllabus. Each unit objective must be assessed at least once.

Assessment objectives

This assessment instrument is used to determine student achievement in the following objectives:

1. recognise and describe programming elements, data and useability principles, and data management processes
2. symbolise and explain information, ideas and data flow relationships within and between systems related to programming problems
3. analyse problems and information related to the selected technology context
4. determine solution requirements and prescribed and self-determined criteria of a programming problem
5. synthesise information and ideas to determine possible digital solutions
6. generate user interface and programmed components of the prototype digital solution
7. evaluate impacts, components and solutions against criteria to make refinements and justified recommendations
8. make decisions about and use mode-appropriate features, language and conventions for particular purposes and contexts.

Queensland Government | Queensland Curriculum & Assessment Authority

171858

For all Queensland schools

Subject	Digital Solutions
Technique	Project — digital solution
Unit	2: Application and data solutions
Topic	Topic 1: Data-driven problems and solution requirements Topic 2: Data and programming techniques Topic 3: Prototype data solutions

Conditions			
Duration	Up to 8 weeks		
Mode	Multimodal	**Length**	• 8–10 A3 pages • 2–4 minute demonstration of the functionality of the user interface, data and coded components of the digital solution by video recording • 4–6 A4 pages of code with annotations
Individual/ group	Group	**Other**	• The reference list is not included in the page count. • Schools implement authentication strategies that reflect QCAA guidelines.
Resources available	Computers, internet and software including, but not limited to – WAMP stack – MySQL Workbench – Dreamweaver or other editor providing support for HTML/CSS/PHP and SourceTree.		

Context

Your school would like to use a vertical academic tutoring process, where older students (mentors) tutor younger students (mentees) in subjects. However, the school is concerned that younger students will not know how to find or book a session with a mentor. A solution is required. The students all have laptops but use a variety of different browsers. The school has considered introducing a bring your own device (BYOD) program, which would allow students to use up to three devices on the network.

Task

You are to document use of the problem-solving process in Digital Solutions in responding to the problem. You will explore, develop, generate and evaluate a prototype interactive web application to assist students to find and book a tutoring session with a mentor. The technical specifications (stimulus) provide information about the requirements of the prototype interactive web application.

To complete this task, you must:

- recognise and describe
  - programmed and user-interface components
  - useability principles including accessibility, effectiveness, safety, utility and learnability
- symbolise
  - the user and developer problem using mind maps and one or more constructed sketches, annotated diagrams, images or screenshots
  - algorithms communicated in pseudocode that demonstrate knowledge and understanding of programming features

  - interrelationships between user experiences and data in the prototype interactive web application
- explain
  - internal and external data components and data structures using appropriate symbols, code, data samples and screenshots from the prototype interactive web application with annotations
  - the prototype interactive web application from a user-experience perspective communicated by way of a collection of annotated images of the user-interface components
  - how programming elements and user-interface components connect, communicating it through an annotated diagram
  - the functionality, useability and efficiency of the coded components communicated through code comments and annotations on the 4–6 A4 pages
- analyse the prototype interactive web application problem and information to identify
  - data inputs
  - data and programmed components and their relationships to the structure of the prototype interactive web application
  - the prototype interactive web application’s potential personal, social and economic impacts
- determine
  - solution requirements that include
    - essential elements and features of the user interface based on useability principles
    - data structures and linkage to interface and code
  - prescribed and self-determined criteria
- synthesise ideas and information about solutions for
  - user interfaces
  - data and programmed components of the prototype interactive web application, for example annotated diagrams identifying and describing proposed components of the prototype web application
  - data repositories
  - programming to generate a prototype interactive web application
- generate
  - sample code for the digital prototype on the 4–6 A4 pages, demonstrating
    - selection
    - iteration
    - user input
    - data output
  - a prototype interactive web application by combining the user interface, data and coded components
- evaluate against criteria relating to
  - personal, social and economic impacts supported by a collection of data samples or representations
  - accuracy and efficiency of the coded components supported by a collection of annotated code segments in tables, diagrams and written paragraphs identifying errors and actions
  - the prototype interactive web application from a user-experience perspective supported by a collection of annotated images of the provided user-interface components
- make refinements and justified recommendations for current and future improvements.

Stimulus

See Technical specifications

Checkpoints

☐ Term 4 Week 3: Submit exploration of solutions, identification of algorithms and user interface sketches

☐ Term 4 Week 4: Complete draft submission

☐ Term 4 Week 8: Final submission

Feedback

Authentication strategies

- Students will each produce a unique response by identifying which aspects are group work and which aspects are individual work.
- Students will provide documentation of their progress at indicated checkpoints.
- The teacher will collect copies of the student response and monitor at key junctures.
- Students must acknowledge all sources.
- Students must submit a declaration of authenticity.
- The teacher will conduct interviews after submission to clarify or explore aspects of the response.
- The teacher will compare the responses of students who have worked together in groups.

Scaffolding

Your response must include:

- headings that organise and communicate the iterative phases of the problem-solving process in Digital Solutions
- A3 pages that
  - demonstrate all phases of the problem-solving process
  - communicate knowledge and understanding by way of annotated sketches, diagrams, images or screenshots
- a video
  - in mp4 file format
  - no larger than 200 MB
  - demonstrating the functionality of the prototype interactive learning object's user interface and coded components
- A4 pages of code with annotations of analysis, synthesis and evaluation related to the code element or problem
- referencing of sources, using the school's referencing style
- written and visual features, as well as grammatically accurate language conventions, to communicate decision-making.

Note

- After the first checkpoint, you will be provided with the following samples
  - database structure
  - student database
  - preliminary database tables.
- You may work in a team of three to collaboratively develop the solution, however each person is individually responsible for defining and documenting
  - pages for mentees requesting help, the mentors providing help and the teacher or tutor
  - a solution, including the required database structure and the contributing coded solution for either the mentee requesting help, the mentor providing help or the teacher or tutor.
- You may use the website, GitHub for code sharing and combining your individual components into a whole. You must include your teacher in your GitHub repository.

Technical specifications

The prototype interactive web application must allow

- users to be able to register for a subject as either a mentor or mentee
- mentees to be able to
  - find mentors in their house
  - request help for a subject that they currently study and be able to book a session with the mentor in the peer-support lesson (Monday, period 6)
  - provide feedback on the mentor who supported them. You may consider other reports that should be generated
- teachers to be able to
  - see all the tutoring sessions provided by mentors and the sessions booked by mentees
  - generate a report that displays the number of times sessions are booked for each subject/year level combination
  - print a list of the students in their Tutor group and examine each student’s activity
- data to be accessible only to students and teachers at the school and it should work on all modern browsers, regardless of view port size.