2019 Digital Technologies Subject Assessment Advice

Overview

Subject assessment advice, based on the previous year’s assessment cycle, gives an overview of how students performed in their school and external assessments in relation to the learning requirements, assessment design criteria, and performance standards set out in the relevant subject outline. They provide information and advice regarding the assessment types, the application of the performance standards in school and external assessments, and the quality of student performance.

Teachers should refer to the subject outline for specifications on content and learning requirements, and to the subject operational information for operational matters and key dates.

School Assessment

Assessment Type 1: Project Skills

Students produce four project skills tasks in which they examine approaches to identifying, deconstructing, and solving problems of interest by applying:

* computational thinking skills, including abstraction
* data analysis skills
* design and programming skills
* iterative project-development techniques.

The problems chosen should be of interest to the students.

At least one of the tasks should involve students working collaboratively, with each student providing individual evidence of their role in and contribution to the collaborative task.

At least one of the tasks should focus on students analysing simple and complex data sets related to a problem of interest to identify patterns and/or trends, draw conclusions, and make predictions.

At least one of the tasks should involve an assessment of programming skills.

In at least one of the tasks, students research and discuss the ethical implications of data use and/or digital solutions for individuals, groups, societies, and/or the environment.

The tasks should be presented in multimodal form. Together, the four tasks should be the equivalent in multimodal form of a maximum of 20 minutes.

Tasks may include, for example:

* a screen-capture validation, highlighting innovative features
* a multimedia presentation of a solution to a problem, analysis of data, or prediction of trends
* an annotated prototype solution or proof of concept
* an informed debate about the ethics of data storage and use.

For this assessment type, students provide evidence of their learning primarily in relation to the following assessment design criteria:

* computational thinking
* development and evaluation
* research and ethics.

*The more successful responses commonly:*

* stuck to maximum time limit of 20 minutes
* addressed all criteria in the multi modal video evidence
* submitted only 4 videos or 1 combined file (example: PowerPoint with 4 video files embedded)
* clearly presented iterations, development, modification and testing
* showed computational thinking and problem breakdown
* focussed on one language rather than many
* clearly demonstrated computational thinking in flowcharts and pseudocode
* explained both the ethics and research (not just the research) — students voice/opinion came through in the files submitted
* task design allowed multiple opportunities for students to plan and write original code. Students were given an opportunity to write code at a complex level should their skill set allow
* where there was an issue with audio content, students provided a script of what was said for audio clarity to assist with moderation
* student met all assessment task requirements.

The less successful responses commonly:

* showed research, but no ethics, i.e. students were only able to meet part of the criteria, not all. Some student responses talked about the positives and negatives of technology, but not the ethical considerations
* duplicated documents that were shared across several students, each submission of work needs to be that of individuals own contribution and evidence
* code was not readable, diagrams were unclear. Student’s voice needs to be clear and audible
* work submitted was non-multimodal evidence
* missing tasks, students should have 4 tasks provided
* lacked design abstraction and did not identify core concepts
* too many files included, many unnecessary and did not assist in providing required evidence
* neglected to show evidence or research, such as in-line citations and bibliography
* task design limited student achievement at highest grade bands
* limited task design that gave students no opportunity to innovate
* minimal to no evidence provided of own role in group tasks
* short presentations with lack of depth.

Assessment Type 2: Collaborative Projects

Students apply their learning about iterative project development to create a digital solution through a collaborative project. Each student presents individual evidence of their contribution to the project.

Students create:

* A digital solution (product, prototype, or proof of concept). When submitted should be no more than 1 GB and be presented in a digital or multimodal form.
* An explanation of the solution with an individual evaluation of each student’s own role in developing the solution, and of the effectiveness of the collaborative working process. The explanation and evaluation should be oral and multimodal and be recorded.

The teacher assesses each student’s individual contribution to the digital solution, explanation, and evaluation.

For this assessment type, students provide evidence of their learning primarily in relation to the following assessment design criteria:

* computational thinking
* development and evaluation.

The more successful responses commonly:

* clearly showed deconstruction of problem and computational thinking before solution was developed
* emphasised key parts of code rather than speaking through what each type of variable was and what it held
* demonstrated iterative development and testing
* had completed prototypes/products which were shown to be working
* followed and built on skills learnt in previous project skills tasks
* had a clear outline of what the individual role students had in the collaborative project
* had videos presented by individual
* individual student videos clearly identify and demonstrate effectiveness and own role in the collaborative project.

The less successful responses commonly:

* showed limited computational thinking
* reused the same presentations for work submitted in AT1 and AT2, this is not appropriate
* collaboration roles of students not clear in the evidence provided
* no supporting evidence of collaboration
* did not clearly identify student’s own roles and contributions and did not stick to the prescribed time limit stated in the subject outline of maximum 5 minutes
* multiple students in the same video evidence provided. Evidence should be individualised
* not contributing in any way to creating code (computational thinking or actual software programming), hence student could not show evidence of CT4 and DE3.

Issues/advice from first year of subject — School Assessment

* on occasions too many files were submitted for assessment
* adequate evidence below for Assessment Type 1 and Assessment Type 2:
* Project Skills (AT1)

4 individual files (mp4 or ppt) (1 for each task). OR

1 PowerPoint file that includes 4 separate video files — either format must only be a maximum of 20 minutes in total.

* Collaborative Project (AT2)

2 individual files or 1 file if combined (mp4 or ppt).

Explanation of the project, the students role in the project, their evidence of computational thinking, iterative development and effectiveness of the solution.

Walk through of the digital solution explaining the students individual part of it.

* work of the assessed student in all collaborative tasks needs to be clearly identified. Documents that are shared between students should not be uploaded against both students, work submitted for assessment must be individual evidence
* code needs to be clearly visible and readable and should be working code
* the same documents cannot be uploaded against multiple assessment types, even if the students are building on one assignment to make the next. Each task should have separate documentation and evidence which is then assessed against for each assessment type. Work can only be assessed once regardless of the assessment type it is provided under
* clearly show iterations in development rather than thinking at the start and solution at the end
* HTML assignments/web based assignments need more use of general purpose languages. Need to include JavaScript or PHP or Python
* overall, there was a general lack of computational thinking skills/tools/techniques used in the iterative process prior to coding
* all teacher task and LAP files should be collected and provided for moderation
* explanation and evaluation evidence should be only of one individual student and their role
* should clearly show timeline of collaboration tasks and roles of the group
* students presented a cut-paste version of their actual code as their pseudocode, indicating that they did not follow the iterative process of designing their solution (using pseudocode) before coding their program
* work must be marked holistically. The final assessment and online completed performance standard record sheet needs to be a collation of all 4 Project Skills tasks
* all documents must be uploaded against each of the assessment types
* appropriate saved file names for each task included in the free text in addition to the approved online submission formula e.g:
* 123456R-2DGT20-AT1 — Task 1 Collaboration Task
* 123456R-2DGT20-AT1 — Task 2 Analysing Simple and Complex Data Sets
* 123456R-2DGT20-AT1 — Task 3 Programming Skills
* 123456R-2DGT20-AT1 — Task 4 Research and Ethics.
* audio does not need to be polished, but should be capable of being heard. Be aware of background noise, students need to articulate their words
* when students are submitting screencasts of working programs, students need to demonstrate and show the complexity of their code as the approved SACE accepted file formats do not allow moderators to access source code:
* leverage the advantages of multimodal by having a presentation prepared that compliments the audio commentary
* include diagrams, dot points and code extracts
* encourage students to become familiar with each performance standard and to self-assess that they have addressed each one before submitting their work.
* make sure that the tasks specified on the LAP and what is to be assessed matches what is provided to students in their assigned task sheet and then assessed against. All students unless an addendum has been made should be marked on the same performance standards for each task.

External Assessment

Assessment Type 3: Individual Digital Solution

Students apply iterative project techniques to independently identify, deconstruct, and solve a problem of interest by creating and evaluating a digital solution or prototype.

The problem should be chosen by, and be of interest to, the student. The problem should be manageable and have sufficient complexity to enable the student to achieve at the highest level. The problem may take as a starting point an aspect of a problem or solution created for Assessment Type 1 or Assessment Type 2, but must not repeat work already submitted for assessment.

In creating their digital solution or prototype, students should be mindful of any ethical considerations.

The solution or prototype should include:

* original source code and/or adapted code displaying selection, repetition, and sequencing, accompanied by design comments
* algorithm design
* graphical user interface and/or instructions for use.

The solution or prototype must be supported by a designer’s statement that discusses:

* the effectiveness of the solution or prototype
* a feature or features that could be considered innovative in solving the problem.

The individual digital solution and supporting documentation (code, design comments, graphical user interface and/or instructions for use) should be submitted in multimodal form. The digital solution or prototype should be no more than 1 GB.

The designer’s statement should be a maximum of 3 minutes if oral, 500 words if written, or the equivalent if multimodal.

The following specific features of the assessment design criteria for this subject are assessed in Assessment Type 3: Individual Digital Solution:

* computational thinking — CT1, CT2, CT4
* development and evaluation — DE1, DE2, DE3.

The more successful responses commonly:

Choosing the Problem

* identified a genuine problem which the digital solution solved, and this remained a recurring theme throughout the iterative process. For example, in a game designed to raise an awareness of an issue, the student continued to discuss and evaluate features which address the identified issue
* students had a real interest in the problem they were trying to solve
* students engaged genuinely with the community to find stakeholders, gather feedback at multiple points in the development cycle, and reflect on how they have used this feedback to improve their solution
* consulted stakeholders and included discussion before and after the program was written to show if the problem the Digital Solution aims to solve had been addressed.

Iterative Development

* consistently applied iterative development processes, and highlighted changes through testing and modification. Showing evidence at each iteration.

Computational Thinking/Planning

* showed evidence of Computation Thinking which included complex algorithmic design and adjustments where necessary
* showed more than one method of computational thinking (e.g. designs/concept drawings, flowcharts and other diagrams for modular design, pseudocode) and explained the thinking behind these
* provided supporting documentation that showed computational thinking, planning and design.

Code/Testing/Validation/Evaluation

* had video walkthrough evidence of the solution with voice over explanation
* showed evidence of the code with comments
* demonstrated testing and validation of the code
* evaluated the digital solution as opposed to personal performance
* critically evaluated the effectiveness of their solution explaining strengths and weaknesses
* were able to identify innovative features within their solution and clearly explained how the product was innovative to them
* evaluated the overall effectiveness of the solution rather than parts, giving both positives and places for improvement
* highlighted key elements of code
* gave meaningful and honest evaluation that reflected an understanding of the technical issues, social issues and usability issues
* showed complex programming constructs, including nested loops, functions, arrays and file input/output.

The less successful responses commonly:

* had voice overs which didn’t add more value (regurgitating written text)
* over emphasis over the aesthetic of their digital solution rather than the computational/algorithmic design
* applied instances of a class and calling methods which were in-built, not created by the student
* evidence provided did not show work which constitutes 9 weeks, worth of development
* solutions that were websites with only HTML and CSS and no actual programming language used were not able to demonstrate programming concepts
* were structured like the old Information Technology course, showing validation and testing with limited discussion of innovations and iterative development
* limited or extremely brief evaluations. Designer’s statement was only a few sentences
* although it was possible to show innovation, many students who created solutions that were databases (VBA) were not as successful, particularly with the innovation and initiative in design
* showed only the final digital solution and had no or very limited evidence of the iterations. Although timelines showed planning many were not followed and it was difficult to see if the iterative development had taken place
* showed no evidence of the digital solution, even in a prototype form
* evaluations that did not evaluate the ‘effectiveness of the digital solution or prototype’. Sometimes this was just recounting what they did, sometimes evaluating their walk-through video, and sometimes evaluating a part or a few parts of the system
* did not show the code at all, or included a copy of the code in a PDF or Word doc with no explanation
* discussed general purpose of things/coding conventions but did not connect this to their own solution. i.e. discussed the importance of having a flowchart but did not show one for their system
* did not discuss why the solution was innovative to them or were not able to identify innovative features in their solution
* large focus on ethics when this was not assessed
* recreations of existing products with limited changes
* the chosen problem was not an interest to the student and/or was a problem given to them by the teacher
* did not analyse the problem or show iterative development in the development of their solution
* did not demonstrate evidence of computational thinking through adequate planning of their solution
* evaluated the process and their abilities rather than the product's user-friendliness, effectiveness, portability, security, privacy, reliability, etc.

Issues/advice from first year of subject — External Assessment

* on occasion, too many files were submitted that were actually not necessary as all the evidence was already provided in the first video so the PowerPoint, PDF and other files that were also submitted were just duplicates of what was included in the video
* adequate evidence below for Assessment Type 3: Individual Digital Solution (AT3)
* 2 files maximum (mp4 or ppt) Video evidence of planning, computational thinking and design, iterative development and the code of the solution including the solution working (if not a prototype) — maximum file size no more than 1 GB
* Designers Statement — stating the effectiveness of the solution and innovative features. — maximum 3 minutes oral or 500 words total
* many files that were submitted were unable to be accessed by markers/moderators. Only those listed as acceptable SACE file formats should be uploaded. No coding files should be submitted, nor should students link to files in outside sources – refer to the list of SACE accepted file formats
* the Individual Digital Solution should be a 9 week project and all students should be given this amount of time to be fair across the schools
* students, schools and teachers should not be identifiable in externally marked assessments. For external assessment files must not be labelled with the student’s name or include title pages that have identification on them, it should be SACE ID number only
* inspiration is good, but it doesn’t really link with any of the assessment criteria. A number of students had clearly spent significant time researching and analysing solutions that already existed as the detriment of their own solutions development and evaluation
* similarly, ethics is not something that is assessed in the external but some students had gone into a lot of depth in this area
* make sure code and planning is easily readable. If this is in a video, don’t have it super small in the corner of the screen
* videos:
* do not need to be polished, but try to be prepared before you film (check diagrams etc. so you don’t have to edit them while you are filming or after
* some students set their videos to music and had really fancy effects. Sometimes this came at the expense of sections where they could get marks
* don’t spend time in the video telling the marker to read the documentation, they will.
* try to keep to a maximum of 15 minutes for a walk through, any more is unnecessary
* in some cases video and audio files were separate making it very difficult to watch/listen together. Ensure files are submitted together as this also stops the issue of audio files accidentally being forgotten to be uploaded
* HTML and CSS are not programming languages. To meet the subject requirements there must be a programming language accompanying the creation of a website such as JavaScript, PHP etc.
* many evaluations focused on what the student should have done rather than evaluating the effectiveness of the features they did do
* files (particularly zip files submitted) were far too big and took too long to download i.e. 620MB some taking 15 mins to download. Zip files use should not be required
* some screen shots included in video evidence that were not readable, ensure all information is readable for the marker
* in the individual Digital Solution, students must reflect on how their solution is innovative and describe this in the designer’s statement.