VCE Applied Computing: Data Analytics (2020–2024)

School-based Assessment report

General observations

This report provides advice for the first year of implementation of the *VCE Applied Computing Study Design 2020–2024*. The *VCE Applied Computing: Data Analytics* *Advice for teachers* provides teaching and learning advice for Units 3 to 4 and assessment advice for school-based assessment in Units 3 and 4. Other support materials for the study can be found on the VCE Applied Computing: Data Analytics study webpage on the VCAA website.

This report is based on the findings from the 2020 School-based Assessment Audit for Units 3 and 4 VCE Applied Computing: Data Analytics. Schools providing the VCE must deliver the course to the standards established by the VCAA, ensure the integrity of student assessments and ensure compliance with the requirements of the VCAA for the relevant assessment program. For school-based assessment, the standards and requirements are stated in the assessment specifications set out in the relevant VCE study design and the [VCE assessment principles](https://www.vcaa.vic.edu.au/Documents/vce/VCE_assessment_principles.docx). The School-based Assessment Audit checks that the standards and requirements set out in study designs are being followed and that assessment is being carried out in line with the VCE assessment principles.

In both Units 3 and 4, the majority of the audit submissions were completed by first-time teachers, and the majority of the teachers responding to the audit attended the School-assessed Task (SAT) and School-assessed Coursework (SAC) professional learning sessions provided by the VCAA in February.

In Unit 3, many responses indicated an overall lack of familiarity with the Outcome 1 SAC task and Outcome 2 SAT, including a lack of understanding of how to develop appropriate marking schemes for the SAC task and how to use the SAT criteria.

The majority of schools audited in Unit 3 provided their Outcome 1 SAC tasks. Where schools were not delivering assessment in line with the VCE assessment principles, the main issues were to do with task validity, balance and equity. Many of the schools indicated they were using commercially produced SAC tasks. While many of these tasks were modified to ensure student work could be appropriately authenticated, not all were checked to ensure they met the requirements of the outcome. For example, many schools did not check their tasks against the outcome statement to ensure their students responded to teacher-provided solution requirements and designs. Tasks often required students to complete designs or sometimes to determine requirements. Schools are reminded that, in addition to significantly modifying publicly available materials in terms of content and context, these must also be checked against the outcome statement, key knowledge and key skills for the outcome.

The SAT in Unit 3 Outcome 2 and Unit 4 Outcome 1 is now in its fifth year in the study. While many schools are becoming more experienced with the SAT, the audit identified a number of issues. Some schools are still referring to documents from the previous study design, including the *Administrative information for School-based Assessment*. Several schools had difficulty responding to the questions regarding the SAT and as a result, responded with limited details, incomplete responses or no responses at all. This often led to the schools having to submit their SAT instructions and SAT criteria as further evidence. Some schools were also not clear about the differences between the previous Units 3 and 4 Informatics study and the new Data Analytics study. Teachers are encouraged to have the current study design and the current year’s *VCE Applied Computing: Data Analytics:* *Administrative information for School-based Assessment* with them when completing the audit questionnaire.

Schools are reminded that the VCAA provides SAT professional learning sessions in February each year. Support materials for the SAT are updated after the professional learning sessions and uploaded to the VCE Applied Computing: Data Analytics study webpage on the VCAA website.

As a result of the coronavirus (COVID-19) pandemic in 2020 and students having to undertake remote and flexible learning, adjustments were made to the *VCE Applied Computing Study Design* for Unit 4 Outcome 1 in Data Analytics. This involved the deletion of some key knowledge and key skills dot points for the outcome. Two criteria from the Unit 4 Outcome 1 SAT were also removed from the *VCE Applied Computing: Data Analytics:* *Administrative information for School-based Assessment*. These adjustmentswere for 2020 only. Teachers must refer to the Data Analytics study webpage at the start of the school year for the current study design and *VCE Applied Computing: Data Analytics:* *Administrative information for School-based Assessment*.

As in Unit 3, many responses to the Unit 4 questionnaire indicated a lack of familiarity with the Outcome 1 SAT. Responses were often lacking in detail, and some questions were not responded to. With the adjustments made to the Unit 4 Outcome 1 SAT for 2020 only, several schools incorrectly labelled the criteria they were to complete. This required follow-up by the VCAA to ensure schools were completing the correct criteria in the SAT task. Teachers are encouraged to have the current *VCE Applied Computing Study Design* and the current year’s *VCE Applied Computing: Data Analytics:* *Administrative information for School-based Assessment* with them when completing the audit questionnaire as this will help them with their responses.

Around half of the audited schools provided their Unit 4 Outcome 2 SAC task. Schools are asked to note that case studies for this task should involve an organisation using an existing information system, not a proposed one. The information system should be computer-based using a network and not a paper-based system. The organisation should also have data and information security issues and have a sufficient level of complexity to it.

In both Units 3 and 4, many of the submitted SAC tasks included marking schemes as a separate document to the task. Often the VCAA performance descriptors were provided with no indication of the number of marks awarded or any indication of the weighting of marks for each of the descriptors. Where this was the case, schools were reminded that marking schemes should be developed beside the key skills and the VCAA performance descriptors, and should include the marks to be allocated to each question or prompt within the task.

The timelines submitted for Unit 3 were generally appropriate. However, there were some issues with timelines for Unit 4 as schools adjusted their timelines for teaching and learning into Term 4. Schools are reminded to refer to the outcome requirements specified in the study design, the *Advice for teachers*, *VCE Applied Computing: Data Analytics:* *School-based Assessment Information* and the *VCAA Important Administrative Dates* when setting timelines for coursework and assessment.

Teachers are strongly encouraged to refer to VCAA resources on the VCE Applied Computing: Data Analytics study webpage when developing teaching and learning activities, coursework and assessment. Where schools were required to provide further evidence, it was often clear that these resources were not used.

In both Units 3 and 4, the audit findings indicated that further work should be undertaken by schools to refine moderation, cross-marking and authentication procedures, as some audit responses indicated a lack of understanding of how these might be applied within their particular contexts and for the study. Teachers are encouraged to become familiar with these procedures in the *VCE and VCAL Administrative Handbook* and to work with their VCE Coordinators when responding to these questions in the audit questionnaire.

Specific information

Unit 3: Data analytics

Outcome 1

Respond to teacher-provided solution requirements and designs to extract data from large repositories, manipulate and cleanse data and apply a range of functions to develop software solutions to present findings.

Task type option/s

*In response to teacher-provided solution requirements and designs, create software solutions.*

Teachers are required to provide solution requirements and designs for their students to respond to for this task. Common issues experienced were schools not providing any solution requirements and designs for students or providing insufficient requirements to enable students to meet the requirements of the outcome and perform at a high level. Many schools incorrectly required the students to develop their own designs for their solutions.

The study design requires students to both study and use database software, spreadsheet software and data visualisation software. Approximately one third of audited schools were using spreadsheet software as the data visualisation software and were not using separate data visualisation software. Not all schools had their students developing solutions in both database software and spreadsheet software. Schools should be familiar with the software tools listed on page 25 of the study design and in the *Applied Computing: Data Analytics: Software tools and functions for 2020 and 2021* on the Data Analytics study webpage.

Several of the submitted tasks did not enable students to select, justify and apply formats and conventions to create effective data visualisations. This important key skill was often left out of the commercial tasks that teachers were referencing when developing their assessment tasks. Teachers are encouraged to check their assessment tasks and marking schemes against the outcome statement, key knowledge and key skills for the outcome.

The average number of tasks for the Unit 3 Outcome 1 SAC was between three and four tasks, and the time allocation for the SAC task was from three lessons to ten lessons, with an average of seven to eight lessons.

Assessment

Most schools indicated in their Unit 3 timeline that they were completing the SAC task in Term 1.

Many of the submitted tasks indicated that the VCAA performance descriptors or a modified version were used. The link between the performance descriptors and marks for the actual components of the task was not always clear in the submissions received. Weighting was also an issue, with several schools indicating the same number of marks for each set of descriptors in the performance descriptors. Schools are reminded that the marks and their weighting should reflect the depth, complexity and detail required of students, and should not refer to content that is not covered in the outcome. Appropriate weighting also helps to spread students’ marks out over the 100 marks available for the SAC task.

Outcome 2

Propose a research question, formulate a project plan, collect and analyse data, generate alternative design ideas and represent the preferred design for creating infographics or dynamic data visualisations.

Task type option/s

*A project plan (Gantt chart) indicating tasks, times, milestones, dependencies and critical path*

***AND***

*A collection of complex data sets that has been referenced*

***AND***

*An analysis that defines the requirements, constraints and scope of infographics or dynamic data visualisations*

***AND***

*A folio of alternative design ideas and detailed design specifications of the preferred design.*

Schools need to consider the amount of time required for students to work on the Unit 3 Outcome 2 SAT criteria during class time and outside of class time. Teachers also need to consider when they will formally observe evidence of student progression through the SAT so they can provide feedback in the Authentication Record Form. It is important for schools to provide enough time for students to complete the criteria within the class time allocated.

Most schools planned to have their students submitting the criteria for assessment using the milestone method, rather than submitting all the criteria for assessment and feedback for one due date late in Term 2.

Several schools provided a timeline with dates for the submission of SAT criteria that were after the original VASS date for the submission of VASS scores. Teachers should be aware of the time required to collect student work, assess with appropriate moderation and cross-marking procedures, provide feedback to students and then have time to input the SAT scores to VASS. The due date for any SAT criteria needs to be before the VASS date to allow these activities to occur.

A small number of schools indicated that they were not using both primary and secondary data sources and methods for collecting data. Schools are to use primary and secondary data sources and methods of collecting data in order to meet requirements.

A number of audit responses contained terminology from the previous study design, such as the use of a hypothesis or the use of the Harvard referencing system. Schools are reminded that current study-specific terminology should be used throughout the course of the study, including in the delivery of assessment and feedback.

A few schools provided students with commercially produced instructions that provided very detailed step-by-step instructions to students as to how to complete the SAT. The instructions could constitute undue assistance. Some schools provided little detail in their instructions for students. SAT instructions should be developed by the teacher with the needs of their specific student cohort in mind. The study design, *Advice for teachers*, and *VCE Applied Computing: Data Analytics:* *Administrative information for School-based Assessment* (including assessment criteria) provide teachers with the necessary information to effectively deliver the SAT to students.

Assessment

Most responses indicated that the SAT was being assessed using the provided VCAA assessment criteria and that the criteria was being applied holistically within each criterion. All schools used the current *VCE Applied Computing: Data Analytics: Administrative information for School-based Assessment*.

Unit 4: Data analytics

Outcome 1

Develop and evaluate infographics or dynamic data visualisations that present findings in response to a research question, and assess the effectiveness of the project plan in monitoring progress. (Note: assessing the effectiveness of the project plan in monitoring progress was removed as part of the *Adjusted Applied Computing Study Design for 2020 only*)

Task type option/s

*Infographics or dynamic data visualisations that present findings in response to a research question*

***AND***

* *an evaluation of the efficiency and effectiveness of infographics or dynamic data visualisations*
* *an assessment of the effectiveness of the project plan (Gantt chart) in monitoring project progress* (Note: an assessment of the effectiveness of the project plan (Gantt chart) in monitoring project progress was removed as part of the *Adjusted Applied Computing Study Design for 2020 only*)

*in one of the following:*

* *a written report*
* *an annotated visual plan.* (Note: an annotated visual plan was removed as part of the *Adjusted Applied Computing Study Design for 2020 only*)

Please note that due to the coronavirus (COVID-19) pandemic in 2020, adjustments were made to the *VCE Applied Computing Study Design* for Unit 4 Outcome 1 in Data Analytics, including the deletion of some key knowledge and key skills dot points. Two criteria were also removed from the *VCE Applied Computing: Data Analytics:* *Administrative information for School-based Assessment.* These adjustments were for 2020 only.

Responses to the questionnaire indicated a few issues with teacher understanding of the Unit 4 Outcome 1 SAT. Several responses discussed content that was outside the scope of the SAT. Content to be included in the SAT is detailed in the *VCE Applied Computing: Data Analytics:* *Administrative information for School-based Assessment*.

There were several issues with timelines provided by some schools in Unit 4. Schools need to pay attention to detail when developing timelines and be aware of the time required for students to complete their criteria, to collect student work, assess with appropriate moderation and cross-marking procedures, provide feedback to students and then have time to input the Unit 4 Outcome 1 SAT scores to VASS. Schools should refer to the *VCAA Important Administrative Dates* when setting timelines for coursework and assessment.

Assessment

All responses indicated that the SAT was being assessed using the provided VCAA assessment criteria. All schools used the *Revised VCE Applied Computing: Data Analytics: Administrative information for School-based Assessment in 2020*. Teachers are to refer to the *VCE Applied Computing: Data Analytics: Administrative information for School-based Assessment* published at the start of each school year.

Outcome 2

Respond to a teacher-provided case study to investigate the current data and information security strategies of an organisation, examine the threats to the security of data and information, and recommend strategies to improve current practices.

Task type option/s

*The student’s performance will be assessed using one of the following:*

* structured questions
* a report in written format
* a report in multimedia format.

Teachers were required to provide a case study for their students to respond to for this task. The following common issues were identified with the task: lacking sufficient detail in the case study for students to respond to in the structured questions or the written report; use of manual paper-based systems and proposed information systems; content outside the scope of the outcome; terminology that was inconsistent with the study design; and key skills or VCAA performance descriptors not being referred to.

Many schools included structured questions requiring responses for content outside the scope of the outcome, particularly in relation to the *Copyright Act 1968*. Teachers are encouraged to check their assessment tasks and marking schemes against the outcome statement, key knowledge and key skills for the outcome when developing the case study and the structured questions or prompts for the written report.

There were a variety of types of structured questions and prompts provided to students. Some questions were very simple and did not require much in the way of a response from students, some case studies had multiple questions with overlapping content, and some case studies had too many simple questions worth only a few marks each for students to complete within a very short timeframe. Appropriate structured questions and prompts should be developed to enable students to respond with a sufficient level of detail, with a range of marks on offer to enable the top students to achieve at their highest level and to spread student marks out over the 100 marks available for the Unit 4 Outcome 2 SAC task.

Due to the coronavirus (COVID-19) pandemic, the majority of schools had students complete the Unit 4 Outcome 2 SAC task remotely. Schools needed to consider the conditions for the task in these circumstances. This included the time students required to complete the task, how and when the task would be provided to students, when students would submit the task, and the authentication procedures to be followed. Many schools provided more time than usual for students to complete the task due to the change in circumstances. Normally schools would complete the Unit 4 Outcome 2 SAC task within 100–120 minutes when at school. However, this year quite a few schools provided a smaller amount of time for students to complete the task. Audit responses indicated times from 60–80 minutes. It is unlikely that this amount of time would enable the top students to achieve a score of ‘very high’ using the VCAA performance descriptors.

Assessment

Most schools indicated that they were completing the Unit 4 Outcome 2 SAC task in late Term 3 or early Term 4. Many of the submitted tasks included the VCAA performance descriptors. However, the link between the performance descriptors and marks for the structured questions or prompts were not always clear in the submissions received. The marks to be awarded for each question or prompt should be included. Weighting of marks was also an issue, with several schools indicating the same number of marks for each set of descriptors referenced in the performance descriptors. Schools are reminded that the marks and their weighting should reflect the depth, complexity and detail required of students when responding to the case study. Appropriate weighting also helps to spread students’ marks out over the 100 marks available for the SAC task.