VCE Applied Computing: Software Development (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: Software Development* *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: Software Development 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: Software Development. 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.

Approximately half of the audit submissions for Unit 3 were completed by first-time teachers, and approximately half 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.

Many responses indicated an overall lack of familiarity with the Unit 3 Outcome 1 SAC task and Unit 3 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 task. Many schools used commercially produced SAC tasks that were either not significantly modified in terms of context and content to ensure student work could be authenticated or were not checked to ensure they met the requirements of the outcome. Where schools created their own tasks, these were typically in line with the VCE assessment principles. Schools are reminded that they must significantly modify any publicly available materials (including commercial tasks) in terms of context and content and check them against the outcome statement, key knowledge and key skills of the outcome.

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. Some Unit 3 Outcome 1 SAC tasks did not provide students with sufficient opportunity to meet the requirements of the outcome. Some submitted tasks included terminology from the previous study design and included activities that were outside the scope of the current study design. Some marking schemes were not consistent with the key skills or the suggested VCAA performance descriptors. In some cases, the VCAA performance descriptors were provided at the end of the task with no indication of how the task itself was marked.

Teachers are strongly encouraged to refer to VCAA resources on the VCE Applied Computing: Software Development 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.

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 included content that was outside the scope of the outcome. Teachers are encouraged to have the current study design and the current year’s *VCE Applied Computing: Software Development:* *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: Software Development study webpage on the VCAA website.

The timelines submitted for Unit 3 were generally appropriate. Schools are reminded to refer to the outcomes specified in the study design, the *Advice for teachers*, *VCE Applied Computing: Software Development:* *Administrative information for School-based Assessment* and *VCAA Important Administrative Dates* when setting timelines for coursework and assessment.

The majority of the Unit 4 audit submissions were completed by first-time teachers, and the majority of the teachers responding to the audit attended the SAT professional learning sessions provided by the VCAA in February.

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 Software Development. 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: Software Development: Administrative information for School-based Assessment*. These adjustments were for 2020 only. Teachers must refer to the Software Development study webpage at the start of the school year for the current study design and *VCE Applied Computing: Software Development: Administrative information for School-based Assessment*.

As in Unit 3, many responses to the Unit 4 audit 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. Some teachers referred to tasks rather than to the criteria to be completed. Teachers are encouraged to have the current *VCE Applied Computing Study Design* and the current year’s *VCE Applied Computing: Software Development: Administrative information for School-based Assessment* document with them when completing the audit questionnaire as this will help them with their responses.

Schools are reminded that, for the SAT, students must identify their own need or opportunity to be solved as a software solution. They should be working with a client or a target audience throughout the process. Teachers are not to provide students or classes with a need or opportunity.

Just under half of the audited schools provided their Unit 4 Outcome 2 SAC task. Case studies for the task should involve an organisation that develops software and should explore the current security risks to the software and data during the software development process as well as the use of the software solution. The case study should provide enough detail for students to respond to structured questions or prompts. Several Unit 4 Outcome 2 SAC tasks involved case studies with small one-person businesses that did not develop software.

Many of the submitted Unit 4 Outcome 2 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 to the structured questions or prompts for the written report, how the task itself was marked or the weighting of marks for each of the descriptors. 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.

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: Software development

Outcome 1

Interpret teacher-provided solution requirements and designs, and apply a range of functions and techniques using a programming language to develop and test working software modules.

Task type option/s

*In response to teacher-provided solution requirements and designs, create working modules.*

Many schools submitted modified versions of commercial tasks for this outcome. Where these publicly available materials were used, often they were not sufficiently modified to allow for authentication. In order to ensure assessment is equitable and student work can be authenticated, schools are reminded that SAC tasks must be significantly modified in terms of context and content each year.

Where teachers created their own Unit 3 Outcome 1 SAC tasks, it was evident that they had done so, and these tasks generally met requirements without significant concerns. The average number of modules for the task was either three or four, and the time allocation for the task was from 200 minutes to 400 minutes.

Most of the submitted Outcome 1 SAC tasks enabled students to demonstrate a range of programming skills. However, a number of tasks required students to develop designs as part of the assessment, whereas the outcome statement requires students to interpret teacher-provided solution requirements and designs.

A number of submitted Outcome 1 SAC tasks did not provide students with the opportunity to justify the use of appropriate processing features or explicitly undertake testing of the modules, despite this being explicitly stated in both the key skills for Unit 3 Outcome 1 and the VCAA performance descriptors. Schools are reminded that tasks should be designed to enable students to meet the requirements of the outcome and achieve the full range of marks available.

Assessment

Most Unit 3 timelines showed that schools were completing the Unit 3 Outcome 1 SAC task in Term 1.

The majority of schools indicated that the VCAA performance descriptors or a modified version were used. However, many schools were not able to clearly articulate how the performance descriptors would be applied to their specific task. Often tasks did not indicate how marks were allocated, and weighting was often an issue, with schools indicating the same marks for each set of descriptors in the VCAA 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.

Outcome 2

Analyse and document a need or opportunity, justify the use of an appropriate development model, formulate a project plan, generate alternative design ideas and represent the preferred solution design for creating a software solution.

Task type option/s

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

***AND***

*A justification of the selected development model as a written report*

***AND***

*An analysis that defines the requirements, constraints and scope of a solution in the form of a software requirements specification*

***AND***

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

The Unit 3 Outcome 2 SAT provides students with the opportunity to develop a software solution in response to a student-identified need or opportunity. A number of submissions contained terminology from previous study designs, such as the Software Development Life Cycle and design tools not referenced in the key knowledge and key skills for Outcome 2. 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.

Some submissions stated that only four criteria instead of five were being completed by students. Teachers are reminded to refer to the current year’s *VCE Applied Computing: Software Development: Administrative information for School-based Assessment* at the start of each year.

Several schools included dates for the submission of SAT criteria in their timelines for Unit 3, particularly Criterion 5, that were after the June VASS submission date for Criteria 1–5. Schools should refer to the *VCAA Important Administrative Dates* at the start of each year when planning their timelines.

Some schools provided students with commercially produced instructions that provided very detailed step-by-step instructions as to how to complete the SAT, which could constitute undue assistance. Conversely, a few 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: Software Development: 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 Unit 3 Outcome 2 SAT was being assessed using the provided VCAA assessment criteria and that these were being applied holistically. All schools used the current *VCE Applied Computing: Software Development: Administrative information for School-based Assessment*.

Unit 4: Software development

Outcome 1

Develop and evaluate a software solution that meets requirements, evaluate the effectiveness of the development model and assess the effectiveness of the project plan. (Note: assessing the effectiveness of the project plan was deleted as part of the *Adjusted Applied Computing Study Design for 2020 only*)

Task type option/s

*A software solution that meets the software requirements specification*

***AND***

*Preparation and conduction of usability tests* (Note: Preparation and conduction of usability tests was deleted as part of the *Adjusted Applied Computing Study Design for 2020 only*)

***AND***

* *an evaluation of the efficiency and effectiveness of the software solution*
* *an evaluation of the effectiveness of the selected development model*
* *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 deleted 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 deleted 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 Software Development, 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 and a lack of familiarity with the study design. Criteria that had been removed for 2020 were also referenced in some cases. Schools are reminded to refer closely to the study design and the *VCE Applied Computing: Software Development: Administrative information for School-based Assessment* when developing assessment tasks.

Some responses to the questionnaire included references to the Software Development Life Cycle (SDLC) rather than the Problem-Solving Methodology (PSM). It is important that school-based assessment reflects the language used in the current study design to ensure that students are familiar with key terminology.

There were several issues identified with timelines provided for Unit 4. Schools should pay attention to detail when developing timelines and be aware of the time required for students to commence and 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: Software Development: Administrative information for School-based Assessment in 2020*. Teachers are to refer to the *VCE Applied Computing: Software Development: Administrative information for School-based Assessment* published at the start of each school year.

Outcome 2

Respond to a teacher-provided case study to examine the current software development security strategies of an organisation, identify the risks and the consequences of ineffective strategies and recommend a risk management plan to improve current security 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.

This task requires teachers to provide a case study for their students to respond to. Common issues observed with this task included: insufficient detail in the case study to enable students to respond appropriately to the structured questions or in the written report; the use of a small business that was not involved in developing software; content outside the scope of the outcome; terminology that was inconsistent with the study design; an inappropriate number of marks awarded to questions; and key skills or VCAA performance descriptors not being referred to.

Teachers should develop case studies involving an organisation that develops software. The case study should include details of current security risks to the software and data during the software development process as well as the use of the software solution. Content within the case study should reference the key knowledge from Unit 4 Outcome 2. There should be no content included from outside the outcome.

There were a variety of types of structured questions and prompts provided to students. Some questions were too simple and awarded one mark for responses, and some case studies had too many questions worth only a few marks each for students to complete within a very short timeframe. Questions should not list the specific content for students to write about, such as security controls, risks or data integrity characteristics. Students should be able to analyse the case study and select these details to write about in their responses. 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 either a small amount of time for students to complete the task or too much time. Audit responses indicated a range of times from 60–250 minutes. It is unlikely that a time allocation of 60 minutes would enable the top students to achieve a score of ‘very high’ using the VCAA performance descriptors.

Several schools indicated they were using commercially produced SAC tasks for Unit 4 Outcome 2. While many of these tasks were modified, not all were checked to ensure they met the requirements of the outcome. Schools are reminded that, in addition to significantly modifying publicly available materials (including commercial tasks) in terms of content and context, these must also be checked against the outcome statement, key knowledge and key skills for the outcome.

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. Several tasks had marking schemes that did not total 100 marks or did not indicate how they were to total 100 marks. 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 task.

Additionally, authentication procedures must be followed when multiple classes are sitting the assessment task for Unit 4 Outcome 2. If the same task is to be completed by students in multiple classes, each class should sit the task at the same time. If classes are sitting the task at different times, the task should be modified for each class to ensure student work can be authenticated.