VCE Software Development (2016–2019)

School-assessed Coursework report

This report is provided for the first year of implementation of this study and is based on the coursework audit and VCAA statistical data.

Unit 3

General Comments

The findings of the Unit 3 School-based assessment audit showed that many schools were able to deliver assessment tasks that satisfied the assessment requirements of both Outcomes 1 and 2 for this study design. The audit panel particularly looked for:

* the connection between the task requirements and mark allocations with the VCAA descriptors/rubrics
* whether the requirements of the tasks were being followed as stated in the study design.

The structure of Outcome 1 is new for the (2016–2019) study design. It involves students interpreting designs provided by the teacher and developing working modules. While most schools managed to develop appropriate tasks, there were some difficulties with the design aspect of this task, particularly with some tasks requiring students to create data dictionaries, write pseudocode, draw mock-ups and annotate diagrams, rather than interpret given designs.

The structure of Outcome 2 is significantly different from outcomes found in previous Information Technology study designs, moving from a SAC task to a SAT. This change posed several issues for some schools, including using incorrect marking schemes, not following VCAA rubric descriptors, not considering the detail required in each criterion and the time given to complete the individual components of the SAT. It should be noted that while there is no mandated order in which the criteria are assessed, students should be preparing their project plan early in the SAT process, as the plan needs to cover all stages of the problem-solving methodology.

Many teachers realised that audit questions regarding specific content for both Outcomes 1 and 2 required responses referencing the study design. This was generally completed satisfactorily; however, some teachers gave poor responses, which raised concerns about their understanding of the study design.

Based on the Unit 3 audit submissions, there was a range of time allocations devoted to each of the outcomes. The time allocated to students completing working modules in Outcome 1 ranged from 90 to 480 minutes. A fair allocation of around 200 minutes would be expected. The time allocated to students to complete the Outcome 2 requirements ranged from one to 11 weeks. A fair allocation of around nine or 10 weeks would be expected.

Specific information

Outcome 1

On completion of this unit the student should be able to interpret designs and apply a range of functions and techniques using a programming language to develop working modules.

Task type: In response to teacher-provided designs, create working modules to meet specific needs.

Just over half the submitted tasks in the audit were commercially prepared tasks.

Outcome 1 is strictly limited to the development stage of the problem-solving methodology and the activities of coding, testing and documenting.

Most schools were using tasks that enabled students to use a programming language to develop working modules. Over 80% of teachers followed the performance descriptors provided in the Advice for Teachers or variations. The remainder used commercially developed descriptors.

The most popular programming language was Visual Basic.Net or variations of the language used by over half of the schools. The next most popular language was Python used by approximately a third of schools.

Over two-thirds of teachers had students complete multiple tasks for their working modules. It was interesting to note that while some teachers indicated that students were completing one task they were in fact completing sub-tasks within one major task.

Teachers demonstrated a good grasp of the required searching algorithms including linear and binary searching.

Some teachers did not provide tasks that enabled students to interpret given designs and use a range of functions and techniques. It should also be noted that the marking scheme should total 100 marks.

Some tasks included content that was not included in the key knowledge for the area of study or demonstrated a misunderstanding of the outcome. For example, many teachers taught and included validation in their assessment. Validation should not be assessed in Unit 3 Outcome 1.

Students also completed designs using a range of design tools, rather than interpreting given designs by the teacher. This problem was also seen in some of the commercial tasks.

Teachers who closely followed the study design for Area of study 1 and the Advice for Teachers clearly met requirements.

Assessment

Most teachers provided evidence of their assessment rubric/marking scheme drawing on the performance descriptors in the Advice for Teachers or variations of them. Some teachers provided limited assessment evidence.

Some teachers used similar SAC tasks to previous years with the same marking scheme, which did not fully allow for students to meet the performance descriptors in the Advice for Teachers.

The number of marks awarded also varied.

Outcome 2

On completion of this unit the student should be able to analyse and document a need or opportunity, generate alternative design ideas, represent the preferred solution design and formulate a project plan for creating the solution.

Task type:

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

AND

* A folio of two to three alternative design ideas and the detailed design specifications of the preferred design

AND

* A project plan (Gantt chart) indicating times, resources and tasks.

Just under half the schools provided student instructions for the SAT that were commercially prepared. Some instructions and timelines that were submitted were commercial ones although they had been de-identified. It is important that schools acknowledge copyright when using other’s intellectual property when de-identifying such materials. If further evidence is required in Stage 2 a copy of the teacher’s instructions can be requested.

Outcome 2 is strictly limited to the analysis and design stages of the problem-solving methodology stated. The analysis is documented in terms of solution requirements, constraints and scope and presented as a software requirements specification. The design stage involves generating design ideas, selecting the preferred design idea using student-generated criteria and then fully developing the design for the preferred idea.

Many teachers provided an instruction statement to students describing what they needed to achieve in order to identify a real-world need or opportunity. Several teachers included copies of the criteria rubric within their audited instructions to show their understanding of what students needed to achieve. Nearly all teachers adequately spread the due dates for the submission of evidence related to Criteria 1 – 4 throughout Term 2. Many teachers indicated that they gave more detailed formative feedback to students using their school Learning Management System, OneNote and spreadsheet files, rather than just the Authentication Record Form. Over 80% of teachers attended the SAT training day in February.

The majority of teachers understood the details required for the project plan stated in the key knowledge. This has changed since the previous study design. The plan needs to include concepts, such as milestones and dependencies and processes, such as task identification, sequencing, time allocation, resources and documentation using Gantt charts. However, some teachers’ tasks indicated that not all the required details from the key knowledge were being assessed. This would make it very difficult for students to provide evidence stated in the Very High band.

Most teachers were aware of allocating 10 marks for each criterion, however, around 20% used a variety of other marking allocations. Teachers need to ensure that they refer to the VCE *Computing: Software Development: Administrative information for School-based Assessment*.

While most teachers understood the styles of modern application architecture, as listed in the key knowledge, several teachers had no understanding of this. A definition is in the study design glossary.

Some teachers, particularly those using commercial instructions, included evidence for Criterion 3 (Design Folio) that included some incorrect design tools such as data flow diagrams and use case diagrams. Teachers need to ensure they follow what is stated in the key knowledge.

Note: where schools use commercial instructions, it is the responsibility of the teacher to check the accuracy of the instructions against the study design requirements. No commercially produced instructions or tasks are endorsed by the VCAA.

Teachers must not provide students with a need or opportunity, nor are they to assign a common need or opportunity to a class. Students are to determine their own need or opportunity.

There were some instances of heavily modified and simplified versions of the VCAA assessment rubrics. They lacked the significant detail required to enable the student the opportunity to achieve a score of 10.

Assessment

Most of the submitted tasks used the VCAA performance descriptors from the rubrics for assessment. While each criterion is out of 10 marks, there were several variations of this, particularly with commercial instructions.

Some instructions had a lack of required detail and did not include scope, context diagrams, etc, while others included content such as Input-Process-Output charts and data flow diagrams for design tools.

Final comments

Teachers are to ensure that students go out and individually identify their own real-world need or opportunity for the SAT. Teachers are not to provide students with a task. Students need to be fully aware of the scope of the project that they are undertaking and that it is to meet the requirements of Unit 3 Outcome 2 and Unit 4 Outcome 1.

While the software development teaching community is well-serviced through teachers sharing examples of work, the discussion of content and the availability of commercial tasks, it is very important that schools view all material carefully and match them against the requirements of the current (2016–2019) study design (problem-solving methodology, areas of study, key knowledge and key skills), the performance descriptors in the Advice for Teachers and criterion rubrics in the *Administrative information for School-based Assessment*. It is the teacher’s responsibility to ensure that modifications are made to a commercial task to ensure it meets VCAA requirements.

Unit 4

General Comments

The findings of the Unit 4 School-based Assessment audit indicated that many schools were able to deliver assessment tasks that satisfied the requirements of Outcome 1 for this study design. However, many schools experienced difficulties meeting the requirements for Outcome 2. The following areas of Unit 4 were of particular concern:

* the adequacy of time given for students to complete the SAT component (Outcome 1)
* the use of the VCAA performance descriptors/rubrics as a guide for marking in Outcome 1
* whether the case study and nature of the written report in Outcome 2 were being followed as in the study design.

The structure of Outcome 1 is very different from any outcomes in previous study designs as it contributes to a SAT that is undertaken over many weeks rather than a SAC done over a number of periods. From the evidence provided teachers handled the Unit 4 SAT requirement better than the Unit 3 requirement.

The task for Outcome 2 in this study, while still using a case study as stimulus material, has different task types, namely either a written report or an annotated visual report. Some schools, however, provided students with ‘exam style’ tests comprising multiple-choice, short answer and case study questions. The Stage 4 audit submissions of further evidence showed that many case studies including proposed information systems, lacked significant detail to allow achievement at the highest level and included questions and/or detailed prompts as well as inadequate marking schemes.

All of the Stage 3 audit submissions indicated that the VCAA performance descriptors from the criteria rubrics in Outcome 1 were going to be used for assessment, and all but one mentioned that the marks for each criterion was out of 10 marks. This was a significant improvement over the Stage 1 and 2 audits in which around 20% used other marking allocations. Seventy five per cent (75%) of teachers indicated they were using the VCAA performance descriptors for Outcome 2.

Based on the Stage 3 audit submissions, there was a range of time allocations devoted to each of the outcomes. The time allocated to students completing working modules in Outcome 1 ranged from two to 13 weeks. A fair allocation of around eight to 10 weeks would be expected. Time allocations for students to complete the Outcome 2 requirements ranged from 50 to 450 minutes. A fair allocation of around 100 minutes would be expected.

Specific information

Outcome 1: Software solutions

On completion of this unit the student should be able to apply stages of the problem-solving methodology to create a solution using a programming language that fulfils identified requirements and assess the effectiveness of the project plan in monitoring progress.

Task type:

* A software solution that meets the software requirements specification and the results of the usability test

AND

* An assessment of the extent to which the project plan (Gantt chart) assisted in monitoring project progress in one of the following:
* a written report
* an annotated visual plan

This is the second part of the SAT and involves the development stage of the problem-solving methodology to produce the software solution and the evaluation stage to produce the assessment of the project plan and the evaluation of the solution.

Some teachers provided a half page description of what was required in order for students to complete the outcome. Some teachers did not include the appropriate VCAA documentation, especially the administrative information, which included details relating to the task such as: the nature of the task, scope of the task, Criteria 5–8 rubrics, authentication details and the assessment sheet.

It should be noted that students should not be solving a problem set by the teacher. Students are required to develop a solution to a real-world need or opportunity that is identified by themselves.

With the introduction of the new study design there is a change to the use of sorting algorithms. Selection sort and quick sort were the sorting algorithms that students were required to learn and use. However, some teachers stated in the Stage 3 survey that bubble sort was one of the required sorting algorithms. Teachers are encouraged to become familiar with the key knowledge for each of the outcomes and to refer to them when answering questions in the Stage 1 or Stage 3 audit surveys.

Note: Where schools use commercial instructions, it is the responsibility of the teacher to check the accuracy of the instructions against the study design requirements and make modifications if necessary. No commercially produced instructions are endorsed by the VCAA.

Generally the timelines provided by teachers were adequate for students to complete the SAT over the majority of the term. However, some teachers still appear to be having students complete the SAT in a condensed time over a number of periods, like the programming SACs in the previous study design. Condensed time frames would make it difficult for students to meet the necessary detail in a criterion in order to achieve a score of 10.

Assessment

The majority of teachers provided evidence of assessment. These all used the VCAA performance descriptors from the rubrics for assessment. Each criterion is out of 10 marks and it was encouraging to notice that this was not varied in this unit.

Outcome 2: Interactions and impact

On completion of this unit the student should be able to analyse and explain the dependencies between two information systems and evaluate the controls in place in one information system to protect the integrity of its source data.

Task type:

In response to a case study, one of the following:

* a written report
* an annotated visual report.

The purpose of this task is for students to produce a written report or an annotated visual report in response to a case study. The case study should provide details about the interactions between information systems that share data, the dependence on data integrity for one of the information systems, data management practices in the storage, communication and the disposal of data, capabilities of the information systems in a networked environment and the application of protocols when interacting with these information systems.

The majority of the submitted tasks were commercially prepared ones. All the submitted tasks, including the non-commercial tasks, required revision. Teachers experienced difficulty in writing appropriate case studies and using prompts that were not overly detailed. Several tasks referred to proposed information systems and lacked details. This makes it difficult for students to adequately prepare a report. It is recommended that the case study include existing information systems that have sufficient detail to enable students to meet requirements.

When writing the case study, teachers should consider how it will enable students to write about:

* the existing network environment
* interactions between information systems
* identifying the causes of conflict
* evaluating data management practices
* how legislation affects data management practices
* characteristics of data integrity and the impact of diminished data integrity on the organisation
* how the organisation secures data and information
* evaluating how the information systems objectives are being met.

Many teachers stated that their students would be completing a written report. However, often the written report was a series of questions or detailed prompts/statements with mark allocations – not features of a written report. Also there were some instances of an ‘exam style’ format with multiple choice, short answer and case study questions. This format does not meet the study design requirements.

Appropriate prompts can be included for students to assist them in writing the report; however, students should not be provided with questions or detailed prompts that could be considered undue assistance. For example, students could be directed to write a report that considers the following areas: types of networks, nature of security measures, data interdependencies, etc.

Assessment

The majority of the submitted tasks used the VCAA performance descriptors for decision-making about assessment. Some users of the commercial tasks chose to use commercially developed marking guides.

A variety of marking schemes were used by teachers. Outcome 2 is to be marked out of 100. Submitted tasks varied with total scores out of 20, 30, 40, 67 and 100. Marks for questions or prompts varied from one mark to 20 marks. Some marking schemes were awkward and made differentiation between student performance difficult as there was limited opportunity for partial credit. Marking schemes should be suitable for the task given with whole marks awarded for responses.

Final comments

Teachers are encouraged to become familiar with the relevant VCAA course documentation including the study design, particularly the key knowledge and the administrative information. It is important to plan, deliver and assess content with these documents in mind. Students should also be given copies of these documents at the commencement of the course.

While many teachers thought they were giving their students an acceptable case study and prompts for them to write a written report, it was apparent many teachers did not understand what should be expected in a case study. It is recommended that teachers make an effort to write their own case studies following the appropriate VCAA documentation with suitable prompts and marks allocated.