Unit 3 Coursework

GENERAL COMMENTS

The tasks to be undertaken by students for school-assessed coursework in Systems and Technology Unit 3 are specified on page 21 of the Systems and Technology study design. These tasks must be a part of the regular teaching and learning program, and completed mainly in class, under teacher supervision. In addition to the study design, the VCAA has provided advice to assist teachers in the implementation of coursework assessment in the 'Advice for teachers' sections of the Systems and Technology study design, the *Technology Assessment Guide Revised VCE 2001* and the *VCE Implementation Resource Kit* distributed to schools in May 2001.

The assessment guide provides advice on the scope of the assessment tasks and the criteria for assessment. Most teachers used the criteria in the assessment guide. They produced clearly set out assessment sheets using the criteria mark allocations to assess student responses. In some situations, teachers developed their own assessment criteria, which in general, were appropriate to the task. Where teachers used structured questions, a marking scheme was preferred for assessment rather than criteria. Teachers need to be confident that they are able to discriminate between different levels of student performance.

Most tasks met the requirements of the study design. Assessment tasks included details taken from the scope of the task such as task duration, recommended word limits, the allocation of marks and the nature of any materials that could be utilised by students when completing the task.

Teachers must ensure that the assessment tasks are designed to allow students to demonstrate key knowledge and skills associated with the outcomes. The assessment tasks should be able to be completed by students in the timeframe outlined in the assessment guide. Students should be aware of the assessment criteria and it is best provided to students in advance.

The practice of designing and cross-marking assessment tasks in network groups is to be encouraged. This activity can assist in clarifying understanding of both the design and assessment of school-assessed coursework.

The standard of student work was impressive, particularly given that the work was done in class under time constraints. The work suggested students were well prepared with a good understanding of both the content of material and the requirements of the task.

SPECIFIC INFORMATION

Outcome 1

Students should be able to explain concepts and principles associated with integrated systems.

The options for the nature of the task were:

- a report in multimedia format,
- a short-answer, open-book test or
- a short written report.

While the most popular assessment instrument was the short-answer, open-book test, alternatively, a number of teachers set a multimedia report as the assessment task.

Where a test was chosen as the preferred assessment instrument, a wide range of question styles was used. Rather than purely recall questions, teachers also included questions that involved analysis, design, description, drawing, and calculation. This allowed students to demonstrate a wide range of skills.

Generally, the proportion of questions relating to different elements of the key knowledge reflected the marks apportioned to those elements. Marks were given that reflected the degree of difficulty of each question.

Teachers used an impressive variety of sources for test items. Past Systems and Technology examination papers, the sample questions published in the December 2000 *VCE Bulletin* Supplement 1, technical data sheets, journals such as *Popular Mechanics* and *Silicon Chip*, and various Internet and computer software resources such as *Crocodile Technology* were used to deliver authentic contexts and provide diagrams to support questions. There was a strong endorsement of the 'integrated systems' orientation of the revised study as evidenced by the test items reflecting all elements of the key knowledge associated with Outcome 1. Very rarely did the test consist only of questions relating solely to mechanical systems, or to electronic/electrical systems.

Generally students performed well in this task. They demonstrated sound knowledge of the concepts, principles, and components associated with integrated systems. However, it was evident that some students were better able to respond to questions related to their preferred area of systems. Symbolic representation related to the operation of integrated systems using block or flow diagrams tended to be an aspect of the key knowledge that was not adequately represented in the assessment task. Many tests did not provide an opportunity for students to demonstrate an understanding of this component of the required knowledge.

In a few cases, teachers set the task with broad parameters such as, 'Select a system of your own choice and write a report on it.' This approach does not provide the students with adequate guidelines to respond to the aspects of

key knowledge within the outcome. Even the use of headings does not always guarantee the focus or depth required. Students are best directed more specifically to the knowledge they need to demonstrate.

Where a report in multimedia format was chosen as the preferred assessment instrument, there was some confusion as to whether the support material and formatting was part of the assessment. This is a teacher decision; however, it is the content of the report completed in class time that should be the focus of the assessment. Typically, in approaching this task, a system, such as an electric motor, was selected and the key elements related to the system investigated, including concepts, principles, and components. The information gained from the investigation was then used to prepare the multimedia report. Generally, this took the form of a PowerPoint presentation and was submitted with notes outlining the slides and the accompanying talk.

Outcome 3

Students should be able to explain the relationship between technological systems and the natural environment.

The assessment instrument for this assessment task was a short written report. Most teachers followed the VCAA assessment criteria and there was a high level of compliance to the task. In setting this task, many teachers referred to the guidelines outlined in the *Technology Education Association of Victoria VCE Support Material for Systems and Technology* (page 20).

It was evident that teachers encouraged students to undertake of a range of learning activities in class, in the school's resource centre and by accessing outside experts or hobbyists prior to the administration of this assessment task. Students who were only provided with the criteria to write to struggled to demonstrate understanding of the key elements of the outcome. Teachers need to provide more specific guidelines about the content of the task.

The task requires that students produce a short report on the interactions between technological systems and the natural environment, the environmental implications of the selected system and the range of options for system design and management. Teachers can influence the success of their students through topic selection. This process begins during student/teacher discussion at the start of the investigation. Appropriate and sufficient sources of information for student use should be identified before a final topic selection is made. **Current technological systems should be the focus when choosing a topic, not technology that has plateaued or reached its use-by date.** Well-known, recently developed, or evolving technological systems are easier to investigate because information may be more readily available. If current, readily available and specific information for a particular topic cannot be identified, then another topic should be chosen.

Students are more likely to score highly when investigating topics of their own choice. Topics need sufficient depth and accessible information to enable access to higher grades. Topics that are popular and allow for sufficient exploration include four wheel drive and recreational vehicles, watercraft and mobile phones.

Assessment

Documentation needs to be comprehensive and include teacher task, assessment criteria (or relevant marking scheme). Often a grid was provided linking the test items to the reference key knowledge and skills elements. This provided a useful method to establish a balanced treatment of the elements of the key knowledge and skills and to ensure there was coverage of electrical and mechanical concepts, principles and components of integrated systems.

Just using a copy of the criteria from the assessment guide, is not sufficient documentation for the work expected of students.

Unit 4 Coursework

GENERAL COMMENTS

The tasks to be undertaken by students for school-assessed coursework in Systems and Technology Unit 4 are specified on page 26 of the *Systems and Technology Study design*. These tasks must be a part of the regular teaching and learning program, and completed mainly in class, under teacher supervision. In addition to the study design, the VCAA has provided advice to assist teachers in the implementation of coursework assessment in the 'Advice for teachers' sections of the study design, the *Technology Assessment Guide Revised VCE 2001* beginning on page 31 and the *VCE Implementation Resource Kit* distributed to schools in May 2001.

The assessment guide provides advice on the scope of the assessment tasks and the criteria for assessment. Most teachers used the criteria in the assessment guide. They produced clearly set out assessment sheets using the criteria mark allocations to assess student responses. In some situations, teachers developed their own assessment criteria, which in general, were appropriate to the task. Where teachers used structured questions, a marking scheme was preferred for assessment rather than criteria. Teachers need to be confident that they are able to discriminate between different levels of student performance.

Most tasks met the requirements of the study design. Assessment tasks included details taken from the scope of the task in the assessment guide such as task duration, recommended word limits, the allocation of marks and the nature of any materials that can be utilised by students when completing the task. Teachers must ensure that the assessment tasks are designed to allow students to demonstrate key knowledge and skills associated with the outcomes. Assessment tasks should be completed by students in the timeframe outlined in the assessment guide. There should be an awareness of the assessment criteria and this is best provided to students in advance.

The practice of designing and cross-marking assessment tasks in network groups and partnerships is to be encouraged. This activity can assist in the clarity and understanding of both the design and assessment of school-assessed coursework.

The standard of student work was quite impressive, particularly given that the work was done in class time under time constraints. The work suggested students were well prepared with a good understanding of both the content of material and the requirements of the task.

SPECIFIC INFORMATION

Outcome 1

Students should be able to explain concepts and principles associated with integrated systems with control devices.

The options for the nature of the task were:

- a report in multimedia format
- a short-answer, open-book test
- a short written report.

Most common was the short-answer, open-book test, although a growing number of teachers set a multimedia report. Where a test was chosen a wide range of question styles was used. Rather than purely 'recall' questions, teachers also included questions that involved analysis, design, description, drawing, and calculation. This allowed students to demonstrate a wide range of skills.

Generally, the proportion of questions relating to different elements of the key knowledge reflected the marks apportioned to those elements. Marks were also given that reflected the degree of difficulty of each question.

Teachers used an impressive variety of sources for test items. Past Systems and Technology examination papers, the sample questions published in Supplement 1 to the December 2000 *VCE Bulletin*, technical data sheets, journals such as *Popular Mechanics* and *Silicon Chip*, and various web and computer software resources such as *Crocodile Technology* were used to deliver authentic contexts and provided diagrams to support questions. There was a strong endorsement of the 'integrated systems' orientation of the revised study as evidenced by the test items reflecting all elements of the key knowledge associated with Outcome 1. Very rarely did the test consist only of questions relating solely to mechanical systems, or to electronic/electrical systems.

Generally students performed well in this task. They demonstrated sound knowledge of the concepts, principles, and components associated with integrated systems. However, it was evident that some students were better able to respond to questions related to their preferred area of systems. Symbolic representation related to the operation of integrated controlled systems using block or flow diagrams tended to be an aspect of the key knowledge that was

not adequately represented in the assessment task. Many tests did not provide an opportunity for students to demonstrate an understanding of this component of the required knowledge. On occasions teachers used the Unit 3 examination sample provided in the teacher resource kit to assess student's understanding of Unit 4 systems. This sample does not have any assessment for systems with control devices and consequently is inappropriate for this semester.

In a few cases, teachers set the task with broad parameters such as, 'Select a system of your own choice and write a report on it.' This approach does not provide the students with adequate guidelines to respond to the aspects of key knowledge within the outcome. Even the use of headings does not always guarantee the focus or depth required. Students are best directed more specifically to the knowledge they need to demonstrate.

Where a report in multimedia format was chosen there was some confusion as to whether the support material and formatting was part of the assessment. It is the content of the report that is completed in class time and assessed. In approaching this task, a system was selected and the key elements related to the system were investigated, including concepts, principles, and components. The information gained from the investigation was used to prepare the multimedia report. Generally, this took the form of a PowerPoint presentation and was submitted with notes outlining the slides and the accompanying talk.

Outcome 3

Students should be able to explain the concepts of diagnosis, evaluation, adjustment, and repair as they relate to an integrated system and its control devices.

Short written report

There was a high level of compliance to the task and most teachers followed the VCAA's criteria in the assessment guide. In setting this task, many teachers referred to the information provided in the *Technology Education Association of Victoria VCE Support Material for Systems and Technology* (page 27). In a few rare instances, assessment criteria taken from the assessment guide were presented to students as the only instructions for this outcome and consequently students experienced difficulty in understanding the nature of the task. Teachers need to consider how they can provide an accurate student-focused interpretation of the task. It is essential that teachers provide students with clear tasks and guidelines using appropriate language.

It was evident that most teachers encouraged students to undertake a range of learning activities in class, in the school's resource centre and by accessing outside experts, hobbyists or commercial repair establishments prior to the administration of the assessment task to address Outcome 3. Students generally based their reports on the integrated system and control devices designed and produced as part of their production. This provided the opportunity to demonstrate an understanding of the related knowledge and skills they developed when undertaking the diagnostic testing, evaluation, adjustment and repair of their own product.

Assessment

In most cases, the supporting documentation was comprehensive and included the teacher task, the assessment criteria, and the relevant marking scheme for each task. Often a grid was provided that linked the assessment to the related key knowledge and skills. This provided a useful method to establish a balanced coverage of the elements of the key knowledge and skills including both the electrical and the mechanical concepts, principles and components of integrated systems.

In some cases the supporting documentation was insufficient and consisted of a copy of the criteria from the Technology assessment guide. Overall, teachers' comments were useful. However, the criteria for marking each question or section should be evident, and when this was evident with a marking scheme for Very High to Low, it was very useful for students. Where the criteria from the assessment guide are used, the allocation of marks needs to be clearly linked to those recommended for each criterion.