Design and Technology Studies

2010 ASSESSMENT REPORT

Technology Learning Area

Government of South Australia

SACE Board of SA

DESIGN AND TECHNOLOGY STUDIES

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GENERAL COMMENTS

The Design and Technology Studies course has again shown an increased number of enrolments. There were 31 schools enrolling a total of 382 students. Even though the range of contexts remained similar to previous years, there were several schools enrolling students for the first time and several teachers involved in the course for the first time.

MODERATION

Each of the three stages of moderation entailed important checks to ensure that the final outcome will give students a fair and equitable opportunity to demonstrate their subject knowledge. The first stage was support moderation, which involved the checking of assessment plans and assessment tasks. Teachers were requested to provide to the moderator full details of the proposed assessment tasks and the proposed weightings for each criterion. Feedback was then provided on the course structure and task suitability. Any requests for further information were to be addressed with follow-up information to the moderator. Attention to detail at this stage of the course planning was designed to prevent problems at the final moderation process. In some cases, schools did not realise the potential of this assistance until later in the school year.

The second stage of moderation is the visit moderation; this occurred for Assessment Component 3: Product Development. As a group, the moderators visited one school to benchmark standards, which then gave them confidence to individually visit other schools to moderate with a high level of consistency.

Assessment Component 2: Product Design Folio and Assessment Component 4: Materials Study were each moderated during the third and final (central) moderation process.

Assessment Component 1: Technological Investigation was marked by the teacher and a central marking panel.

ASSESSMENT

Each assessment task has clearly stated assessment criteria with associated clarifying questions. Such assessment criteria should act to focus the student and the teacher on what needs to be achieved in each assessment task. Due to the broad range of contexts offered in the course, the clarifying questions are generic. It is quite valid and sound teaching practice to add extra detail to clearly relate the clarifying questions to the specific context of the course. For students to achieve at a high level, it is necessary for them to address their responses to all the criteria and clarifying questions. Exemplars of some assessment tasks are available on the SACE website; however, they should be modified to reflect accurately the course being taught at the school.

To facilitate the moderation process, individual student marks sheets for each assessment component should be presented with each student's work. These marks sheets should clearly show the allocated mark for each clarifying question associated with each criterion. For Assessment Components 2, 3 and 4, the marks sheet is also the place for teachers to make relevant comments about the allocation of marks for each criterion. Correct use of the marks sheet not only indicates the teacher's assessment thoughts, but also enables the moderators to make accurate validation of the marks awarded to the students.

The four assessment components are interrelated. The investigation provides an opportunity for students to use a primary source to focus on current industrial practice within a manufacturing site or workplace. Product design allows the student to apply a design process to the solution of a practical problem, the product development. In the materials study, students investigate the ways in which the properties of materials relate to their performance. The most successful student responses reflected the interrelationship between the components.

ASSESSMENT COMPONENT 1: TECHNOLOGICAL INVESTIGATION

Students who produced successful investigations reflected a clear focus of the integrated parts of this task: the critical discussion of 'production methods used to make designed products', with the 'focus on current industrial practice within a manufacturing site or workplace', and the critical analysis of 'the impact of technology on the individual, society, and/or the environment'. Each of these criteria should be given appropriate weighting of documentation to reflect the relevant allocated level of marks.

Investigation

The selection of an industry or industries appropriate to the course context and the identification of a relevant issue related to the technology studied are essential for a successful start to this task. Students who achieved well in this section provided both these details in a clear, well-structured topic statement with the appropriate emphasis on the technology. The creation of a topic makes it much easier for the student to develop a focused investigation. The topic and issue should be clearly focused on technology to allow the student to meet the criteria and clarifying questions, and to enable investigation and critical analysis with due level of rigour.

Critical Discussion

Industry links should be used as the primary source of information for this task, with suitable secondary resources to add depth of information to the discussion. Students who chose an industry or industries closely linked to the relevant technological context of the course, and successfully used this information, were able to address the criteria for this task very well.

The industry chosen should demonstrate an appropriate level of technology to enable the student to gain a depth of information sufficient to prepare detailed discussion. If a whole class investigates the same industry, it should be selected because it is diverse enough to allow students to have an individual focus in their investigation.

The use of a range of secondary sources can also enable students to demonstrate a level of individuality of topic. Students who used the technological information gained from industry visits as their primary source and then supported this information with

sound, reliable secondary sources were able to draw comparisons and write critical discussions of a high standard. The most successful students were those who included critical discussion and critical analysis of the industry with a strong emphasis on the use of technology in the creation of products. The inclusion of the impacts of these technological aspects of the industry enabled students to fully meet the criteria for judging performance.

Critical Analysis

The key task in this section is to identify an effect of technology on society, the environment, or the individual, and this effect must be linked clearly to the industry context. Successful students generally had this technological link and focus in their investigation. To meet the expected level of critical comment, the focus of the topic should be restricted to a particular technological aspect of the industry or its impacts. Too broad a topic range can result in superficial coverage of the information. The use of both primary and secondary sources is necessary to be able to make high-level critical or comparative analysis of a technological nature. A range of resources is necessary to enable the topic to be addressed to the rigour of investigation and technological discussion required.

Communication

In general, the student body presented the investigation in a clear, well set-out format, using correct paragraphing and referencing processes. The students who achieved highly in this section used technological information correctly and were able to relate their discussion to the purpose of the task in an insightful manner. The use of correct referencing procedures, and correct labelling of images, tables, or graphs, also enhanced the level of achievement.

ASSESSMENT COMPONENT 2: PRODUCT DESIGN FOLIO

The product design folio is prepared as an integral part of Assessment Component 3: Product Development, and is based on the design process detailed in the curriculum statement.

Investigation

It is important that students generate a clear design brief. Students can achieve this by clearly identifying a situation or scenario in which a problem exists. The brief should set a task of a high degree of technological difficulty that will allow a student to demonstrate extension of knowledge and individuality. The task must also be achievable in an appropriate time. Students should prepare a clearly worded design brief, which concisely states achievable design criteria and relevant constraints.

Students who investigated and gave insightful analysis of a range of elements associated with existing products, processes, or systems were rewarded with higher marks. The relevant analysis can be provided in the form of notations attached to the product examples, with an overall analysis presented as a concise summary of the outcomes.

Planning

This part of the design process should demonstrate a close link with the investigation stage. The most successful students demonstrated clear development of ideas for

product development which emanated from the analysis of products, processes, or systems analysed in the investigation process. Students who performed well in this section provided clear evidence of the sequence of product development ideas from initial conception to final idea. This information was presented in a method of communication relevant to the context in the form of high-standard graphic detail, sketches, screen captures, or other methods to show information about the product parts and shapes.

Investigation and planning are key elements in the design process and should be given appropriate weighting of time and detail. The most successful responses clearly and concisely documented what the student intended to do.

Modelling

The modelling stage demonstrates a student's ability to evolve a product from inception to finality. Evidence of this process should be present in a clear, concise manner, either written, graphic, annotated digital images, screen capture, or program data format. Insufficient evidence of a sound level of involvement in this process in both the folio documentation and at the evaluation of the product can impact negatively on the outcome.

Modifying and evaluation

Students who achieved well in these two criteria clearly linked their critical evaluations to the design brief with clearly stated, critical analysis of their ideas. Successful folios clearly documented modifications of the designed product and as a result the product better fitted the original design specifications. This was more easily achieved when the design brief was clearly stated. The process of evaluating and modifying is an integral part of the design process, so should be evident throughout each stage of the folio. As this is a significant part of the assessment, it should be given due weighting in time, process and documented evidence.

Communication

The most effective folios were those where students chose to present a folder of either A3 or A4 format that was structured to reflect each criterion heading and address the clarifying questions. The evidence presented should be carefully selected to demonstrate the student's abilities, rather than every step involved in the designing process. Meeting the 1000-word restriction was achieved most successfully by students who compiled brief summaries and detailed relevant outcomes at the end of each criterion. Alternatively, a single document referring to each individual criterion can be used (but it is important that the correct wording is used to clearly identify each criterion). The student's folio should focus on the quality of the analytical and critical discussion, as well as the other evidence gained in each of the investigation, modelling, and modifying stages of the design process.

There appeared to be a greater diversity of mediums used to present folios in 2010, with some students choosing to present this response in a digital movie.

General comments

The 1000-word limit for the report should be adhered to in order to meet the guidelines as set out by the SACE Board. The use of notations, either handwritten or word-processed, can be used to address the relevant criteria process. A summary of the outcomes of the notations should then be made for each criterion as part of the

word-count. Text boxes, which contain vital information to the outcome, should not be used to try to meet the word-limit.

The central moderation panel found that teacher comments on assessment sheets were helpful throughout the process.

ASSESSMENT COMPONENT 3: PRODUCT DEVELOPMENT

Moderation of the product development component was conducted within the school. As the product design folio and the product development are integrated assessment components, both were required for this moderation process. It was pleasing to see the manner in which many schools had used these two components to establish an impressive display of student work. This made it very easy for the moderator to determine the manner in which each student had been able to meet the required criteria. The more successful students presented detailed evidence for the testing and modifying sections of the product development, as specified in the curriculum statement.

Producing

The product development is the completion of the design process begun in Assessment Component 2: Product Design Folio. Students who successfully achieved all parts of the design process, especially the testing and modifying, focused on the complexity of the product, not the size. They were able to focus on tasks which emphasised the technological aspects of the chosen context, with a suitable timeline to enable testing and modelling to be effectively conducted. It was evident that students with sound background knowledge in the context of the course achieved well. To facilitate this, the use of effective formative activities were undertaken to enable sound preparation of students prior to beginning the product development task. This enabled students to create design brief specifications and outcomes that showed individuality, and to demonstrate fully their level of creativity, initiative and higher-order thinking.

Testing and Modifying

The testing of the product, process, or system against its design criteria is a key element of the design process. Students who achieved well for this section devised tests to draw opinions from several sources to ascertain how closely the produced outcome met the design brief specifications. However, to gain maximum outcome from this process, test procedures need to be clearly documented or evidence provided, along with critical outcome analysis reflecting the resultant modifying made due to the test outcomes. Testing and modifying should occur at all stages of development of the product.

Students who achieved well used a variety of methods to present their support material. Where the course was highly dependent upon computer processes, a journal entry method of documenting the sequence of processes and procedures was effectively used to record the events. Screenshots with annotations formed part of such a journal. Another method was to use a folder containing notes, sketches, and charts of all relevant stages of the designing and producing process which may not have been evident in the product design folio. These methods of recording the progress enabled students to clearly show the testing and modifying which occurred at different stages of the production process.

ASSESSMENT COMPONENT 4: MATERIALS STUDY

Due to the broad range of contexts involved in the Design and Technology Studies course, a wide variety of materials were selected and a large range of tests conducted to determine suitability for relevant products. As such, each course should have been structured to provide students with individual materials testing tasks to allow them to demonstrate a higher level of understanding of the materials being used within their product development. For a student to have a report of a high standard, the tests needed to analyse properties that had a clear and relevant technological link to the product being created. The materials being tested, and therefore compared for use, should have been of a similar type and use for effective analysis.

Testing

Successful students made an appropriate choice of tests relevant to the final product. Their series of tests used an appropriately high level of technical equipment to conduct meaningful tests on a least two materials. The use of correct technical terminology and clear documentation of the conducted tests was necessary for a high-standard report. The more successful reports provided clear images (pictorial or graphic) as evidence of the tests.

Analysis

The most successful reports used images or well-structured tables or graphs, accompanied by clear and insightful analysis of the results. The use of accurate technical language in explaining the link between material properties and the test results was evident in the high-standard reports. High-level reports also explained in clear and accurate technological terms the links between material properties and the specific use of the material in the designed product. Correct use of this information showed the students' depth of understanding of the context being studied. Reference should also have been made to any resources used to obtain information about the materials or the tests being conducted.

General comments

There were several creative methods used this year to provide a suitable and interesting range of presentations for this task. This seemed to stimulate the students with their level of research and information presentation in addressing the required outcomes. The word-count was adhered to in the majority of reports. It is important that testing be based around a clear hypothesis and that tests do not only reinforce common knowledge.

SUMMARY

Presentation of Assessment Component 1: Technological Investigation

The majority of reports were correctly presented, with teachers and students paying particular attention to ensure that only the student's SACE registration number appeared on the report. Teachers are reminded to use the prescribed cover sheet, available on the SACE website. No markings or comments by the teacher appeared on the investigations.

Word-counts

Where tasks have a prescribed word-count, it should be adhered to and be shown on the paper. To do so eliminates any confusion that might occur regarding this matter.

References and Bibliography

The correct use of references and bibliographies was evident in the more successful reports. Examples of correct procedure for this aspect of report writing are available on the SACE website.

Assessment Sheets

The format of the assessment marks sheets has a space for teacher comments, which was effectively used by some teachers to provide feedback to students, as well as being of benefit to moderators. The use of this space removes the need for the placement of any comments on the student work and also enables the moderators to understand the reasons for the mark allocations. All student work should have the marked, relevant Criteria for Judging Performance assessment sheet attached to it when presented for moderation.

Central Moderation

Where class sizes permit, it is requested that teachers follow the SACE Board requirements of only providing samples of marked work which indicate the range of grades. Sampling should be based on the combined mark of the folio and materials study. See the learning area manual for specific details.

Chief Assessor
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