2020 Design, Technology and Engineering Subject Assessment Advice

Overview

Subject assessment advice, based on the 2020 assessment cycle, gives an overview of how students performed in their school and external assessments in relation to the learning requirements, assessment design criteria, and performance standards set out in the relevant subject outline. They provide information and advice regarding the assessment types, the application of the performance standards in school and external assessments, and the quality of student performance.

Teachers should refer to the subject outline for specifications on content and learning requirements, and to the subject operational information for operational matters and key dates.

Design, Technology and Engineering

Comprises of the following codes:

* Digital Communication Solutions (DCS)
* Industry and Entrepreneurial Solutions (IES)
* Material Solutions (MRS)
* Robotic and Electronic Systems (RES)

School Assessment

Assessment Type 1: Specialised Skills Task

Students complete two specialised skills tasks. They demonstrate skills and knowledge that will be required for the realisation of their solution. They apply the skills, processes, and techniques in the chosen context. This informs the design development for a solution in Assessment Type 2. Students evaluate and assess the development of their own skills in this assessment task. They review how these processes and techniques may influence their solution.

The more successful responses commonly:

* showed skill levels of highly developed and comprehensive production techniques
* included pertinent and appropriate reflective comments that were both comprehensive, insightful, and inclusive of the depth and rigor needed at this level
* used multimedia responses to respond to the criteria effectively
* displayed confidence and ability with a range of processes and equipment which then directly informed their choice for AT2 Production
* reflected on the direct application of these skills to the manufacturing of the product
* allowed students to go outside their comfort zone and encouraged exploration of more challenging aspects of the subject area.

The less successful responses commonly:

* undertook large projects that limited the time for AT2 Design Process and Solution
* showed little or no command in the use of equipment and techniques
* showed little personal involvement in work
* used simplistic editing skills or cad drawing skills
* did not evaluate the specialised skill
* provided few evaluative comments and reflective evidence
* were heavily scaffolded that did not enable students to achieve at the highest level
* used tasks that provided limited opportunity for differentiation in assessing skills e.g., following a CAD skills tutorial where following steps resulted in a common outcome for all students
* requested students present evidence for Investigation IA1 which was not required for this assessment tasks.

Assessment Type 2: Design Process and Solution

Students produce one task in the design process and solution assessment type that together provide evidence of the stages of the design and realisation process. The task must showcase and evaluate the solution or product.

The more successful responses commonly:

* clearly linked the design and planning with product development and outcomes
* presented evidence of their thinking and planning
* included preliminary sketches clearly annotated with technical language describing concepts and possible procedures
* had a clear design sequence, i.e., beginning with a concise and targeted design brief/statement of intent, and working through the investigation and analysis, design development and planning, through to realisation and evaluation
* acknowledged and ‘published’ their design model and referenced it often in their folios
* recorded evaluative comments/observations that were authentic and targeted throughout the entire process
* used multimedia responses to the design process, to provided evidence of work
* included a strong evaluation that explains the student’s decision in detail and depth
* were well organized, with unified meaning that was both interesting and or unique in the approach to the task
* supplied visual evidence of materials in the design process and annotated it use and relevance to the aims identified in the brief
* identified and illustrated changes or decisions they made to their solution
* demonstrated a high level of construction techniques and integrated different materials into their finished product
* finished off the finer details to their project and applied a quality finishes which matched their success criteria
* provided evidence to show the effort, planning or conceptualizing of the idea as well as showcasing good skill development to create a product/solution
* showed an in-depth analysis of existing products using correct technical language
* used authentic design sketches and included CAD for final drawings.

The less successful responses commonly:

* provided a recount of what the student did
* did not use the design model as required in the subject outline
* lacked structure and purpose in their response to the design process
* did not use a comprehensive and targeted design brief/statement of intent
* lacked depth in the evidence for Investigation and Analysis
* did not have the depth and rigor in design and skill development needed at this level
* did not use correct technical language
* did not demonstrate a comprehensive understanding of materials and techniques that the student was exploring or in showing their planning toward their solution
* used irrelevant testing or findings from the internet to support their design process
* made no evaluative comments, just included a product record
* were heavily structured projects whereby all the student design work was similar.

External Assessment

Assessment Type 3: Resource Study

Students undertake one resource study comprising two parts.

Part One: Resource Investigation

Students investigate and analyse the functional characteristics and properties of two or more materials or components that they are considering for use in the creation of their solution. They report on how their research into and testing of the functional characteristics and properties of these materials or components will affect the student selection for use in the realisation of their solution.

Part Two: Issue Exploration

Students investigate and analyse ethical, legal, economic, and/or sustainability issues related to their solution.

Resource Study Part One: Resource Investigation

The more successful responses commonly:

* clearly linked the Investigation to the planning and product realisation aspects of the course. It provides context and application to the research, testing and evaluating and this enabled meaningful communication in student’s responses
* began with a brief and clear introduction to the report identifying the rationale and application of the testing in planning for the Product
* clearly contextualised the relevance of the investigation to the student’s AT2 Major Project and provided very purposeful, relevant, and well targeted testing
* used a scientific report approach to provide a hypothesis and an outline of the purpose and procedure to be used and why
* made specific and relevant comments that were ‘on point’ as to how the specific result(s) would impact on the final intended solution
* selected and clearly identified two materials
* made direct links to the product
* had good depth of discussion backed up by references
* used well thought-out tests that incorporated both qualitative and quantitative data that were clearly analysed and represented with the use of charts or images
* showed clear linking of project idea with reasoning for required investigation and experiments
* used clear sequential report including effective photos which highlighted experiment/testing
* provided evidence of data sets, graphing, and reflection of data along with impact of choices
* reflected on results of experiments and made comparisons to hypothesis and made concluding judgements towards the project development for AT2
* explained the specific purpose for testing and justified why it should be done
* used current and relevant research information from Australia or local business group
* showed the method of testing the results and could prove why the resources were suitable for the product
* discussed what the product was and directly linked the testing
* showed both qualitative and quantitative data.

The less successful responses commonly:

* used a ‘product record’ approach to Part One Resources Investigation. This limited research, testing and analysis when the content remained primarily a list of steps taken to develop skills or complete a product
* provided no context as to why the investigation was chosen or it was far too generic or simply not relevant to the student negotiated AT2 solution
* made ‘sweeping’ statements that were in many cases unchecked, false and misleading
* used poor or no referencing
* provided no testing of the components
* focused on too many components to test with any rigor
* did not draw conclusions or evaluate results of testing that is completed
* had testing that was incongruent with the intend use, or design of solution. i.e., soaking timber in water to gauge water absorption or damage for timber that was to be used for indoor furniture solution — very unlikely for this damage to occur
* lacked adequate testing and qualitative results that included data represented in charts
* chose to describe processes rather than testing materials or components
* selected too many processes or materials making the investigation too general and lacking in specific depth and detail
* no clear process of testing/experiments
* no data sets or evidence of testing (photos, screen captures, etc.)
* the inclusion of both Issues Exploration and Experiments
* over word count
* did not discuss why the testing needed to be done and for what purpose
* used a generic test, sometimes completed by all class members which did not relate to their product.

Resource Study Part Two: Issues Exploration

The more successful responses commonly:

* selected an issue that was well thought out and clearly identified
* linked the issue to the product being developed
* focused on issues that were carefully considered and related very specifically to HOW the solution was to be designed and made, WHY the intended solution can ‘disrupt’ or challenge existing ‘stereotypes’ or ‘clichés’ or WHAT impact future versions of similar solution would have
* provided or cited very pertinent and current references using both local and national perspectives
* developed a convincing argument rather than just giving information
* used in-text referencing
* use of relevant information and data
* gave personal opinions and analysis
* included referencing throughout the Issues Exploration, citing facts, studies, and statistics to strengthen the research
* discussed and analysed with detail, relevant, local, and emerging issues relative to the design solution
* discussed ethical, legal, economic or sustainability issues that were directly relevant to the project being undertaken, and the student was able to comment on the effect these considerations might have on the choices they made regarding the design or fabrication of their major project
* referenced sources of information about the identified issue, with the best examples using a combination of secondary sources, and primary information gained from actual businesses, suppliers, or organisations

The less successful responses commonly:

* were when a whole class did the same issue or similar investigations
* had no link to product
* tried to cover too much using sub-headings (sustainable, legal, economic, ethical) hence discussion lacked depth
* did not define an issue
* provided a discussion of issues rather than analysis, and opinions stated rather than in-depth, supported research into the issue
* relied on unsubstantiated personal views and opinions rather than constructing a sound point of view based on the data or information discovered
* used a limited range of websites, and were limited to statements of fact/procedure rather than a critical evaluation of the information
* provided minimal or no bibliography.