2022 Design, Technology and Engineering Subject Assessment Advice

Overview

Subject assessment advice, based on the 2022 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.

Across the Assessment Types for this subject, students can present their responses in oral or multimodal form, where 6 minutes is the equivalent of 1000 words. Students should not speed-up the recording of their videos excessively in an attempt to condense more content into the maximum time limit.

From 2023, if a video is flagged by markers/moderators as impacted by speed, schools will be requested to provide a transcript and markers/moderators will be advised to mark/moderate based on the evidence in the transcript, only considering evidence up to the maximum word limit (e.g. up to 2000 words for AT3).

If the speed of the recording makes the speech incomprehensible, it affects the accuracy of transcriptions and it also impacts the ability of markers/moderators to find evidence of student achievement against the performance standards.

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.

Teachers can elicit more successful responses by:

* planning and presenting the Specialised Skills Task as an opportunity to demonstrate confidence and ability with a range of processes and equipment which then directly inform their choices for AT2: Design process and Solution
* understanding that while the AT1: Specialised Skills Task provides the opportunity for general skills and knowledge development early in a course it needs to be recognised that it is a summative assessment process and should not dominate time allocation at the expense of other course requirements
* avoiding tasks that provide limited opportunity for differentiation in the assessment of individual student learning and skills e.g. following a step-by-step skills tutorial which resulted in a common outcome for all students.

The more successful responses commonly:

* demonstrated a logical sequence of skills development using clear photographic evidence
* provided evidence that clearly illustrated the sophistication of the skill through well-considered images, screenshots or short videos
* identified the importance and relevance of the chosen specialised skills to the successful completion of their AT2: Design Process and Solution
* provided specific, targeted, and relevant evidence concisely in dot points or annotations
* identified problems and highlighted the best ‘solution’ for their situation, rather than generic outcome statements
* clearly reflected on the results of their skills development. For example, rather than simply describing what was done in the skills task, the student explained why and how the result affects their decision making
* reflected on the direct application of these skills to the manufacturing of the AT2: Design Process and Solution
* used terminology and language most relevant to specific data, features and or skills
* included relevant and appropriate reflective comments that were both comprehensive, insightful, and inclusive of the depth and rigour needed at this level
* demonstrated high-order personal critiquing and evaluation of skills developed, then reflected on its application in the final product outcome.

The less successful responses commonly:

* showed limited or no proficiency in the use of equipment and techniques
* showed little personal involvement in skills development
* showed little or no understanding of the purpose of the skills task
* used simplistic technical skills
* provided minimal or no evaluative comments and reflective evidence
* used skills tasks that did not really provide the student with the opportunity to demonstrate highly sophisticated use of skills.
* responded to generic teacher-directed tasks rather than those negotiated by students
* did not use specific and relevant technical terminology or annotations
* provided poor quality visuals or too many small, unnecessary images
* did not document the resolutions of issues that occurred
* evaluation was a simple recount of the processes undertaken
* provided low-level responses or demonstrated little insight into the processes or task.

Assessment Type 2: Design Process and Solution

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

Teachers can elicit more successful responses by:

* ensuring that students have the opportunity to progressively maintain notes and records that address all the performance standards in detail. This can also including using multimodal evidence such as videos and photographs to capture progressive development and learning.
* recognising the significance of student learning and use of the design and realisation process. It is encouraged to avoid heavily scaffolding projects for students where much of the student design and production activity will be common.

The more successful responses commonly:

* clearly linked the design and planning with product development and outcomes
* identified a clear need statement, design brief, and constraints with pictures of how or where the solution would be used
* critically investigated many options for their product and included a clear summary of their findings
* clearly presented well-organised evidence of their thinking and planning
* 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
* identified success criteria for the major product that provided a source of evaluation
* included preliminary planning with sketches clearly annotated with technical language describing concepts and possible procedures
* ‘published’ their design brief, acknowledged and referenced it often in their folios
* used authentic design sketches and included CAD for final drawings
* used multimodal responses to present the design process, to provide well-organised evidence of product development
* applied thoughtful testing and assessment of components that influenced product features
* included strong evaluation that explains the student’s decision-making in detail and depth
* showed an in-depth analysis of existing products using correct technical language
* supplied visual evidence of materials in the design process and annotated their use and relevance to the aims identified in the brief
* examined more than one design solution, refined and problem-solved to develop a final design concept
* identified, described and illustrated changes or decisions they made to their solution
* demonstrated a high standard of construction techniques and integrated different materials into their finished product
* used clear planning that results in confident approaches to application and highly proficient production outcomes
* recorded evaluative comments/observations that were authentic and targeted throughout the entire process
* considered design and production options throughout the manufacturing process and provided reasons and justification for changes
* demonstrated innovation and highly proficient technical skills in the final product
* adhered to word count and references were formatted correctly
* included large and detailed images or video of their product to highlight completion and detailed elements to showcase their product
* comprehensively analysed the solution features and processes undertaken in the evalutaion.

The less successful responses commonly:

* showed little evidence of the use of a design model being used, which provides a foundation for the student’s investigations and subsequent decision making
* produced a design brief that was too vague or broad
* provided a simple recount of what the student did
* 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 and detail in the evidence for Investigation and Analysis
* displayed superficial analysis of existing products. For example, simply indicating preference or choice without justification
* did not demonstrate depth and rigour in design and skill development
* included large sections of text from AT3: Resource Study that were not relevant
* did not use correct or appropriate 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
* showed limited testing or evidence to support the planning of the product
* used a highly scaffolded template to simply fill in the blanks, limiting creativity
* were well over the word count often due to a long recount of the product solution
* lacked a justification for their final design or any discussion about why the key features/elements were included
* evaluation did not refer to the design brief (including constraints/criteria) and whether their product met this.

External Assessment

Teachers can elicit more successful responses by:

* providing guidance to student selection of testing regimes and topics for materials and issues investigation while supporting individual approaches and outcomes
* recognising that the Resources Study has two distinct yet related parts. Student responses need to reflect learning and engagement in each
* encouraging students to link the Part One: Resource Investigation to the planning and product realisation aspects of the course. This will provides context and application to the research, testing and evaluation and supports meaningful communication in student’s responses.

Assessment Type 3: Resources 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.

Resources Study Part One: Resource Investigation

The more successful responses commonly:

* identified clearly which aspect of AT3: Resource Study was being addressed (Resources/Issues) by providing clear titles and headings or even separate files
* selected and clearly identified two or more materials or components that were going to be investigated
* began with a brief and clear introduction to the report identifying the rationale and application of the testing in planning for product realisation
* clearly contextualised the relevance of the investigation to the student’s AT2: Design Process and Solution 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 well-considered and relevant comments that were linked clearly to how the specific result(s) would impact the final intended solution
* showed clear linking of project idea with reasoning for required investigation and experiments
* used thoughtfully selected tests that incorporated both qualitative and quantitative data that were clearly analysed and represented with the use of charts or images
* showed the method of testing the results and could prove why the resources were suitable for the product
* used clear sequential report including effective photos/video which highlighted experiment/testing
* provided evidence of data sets, graphing, and reflection of data along with the impact of choices
* reflected on results of experiments and made comparisons to the hypothesis, resulting in evaluative judgements supporting product realisation for AT2
* showed both qualitative and quantitative data using, where applicable, graphs/tables to present results for each test
* discussed the validity of results obtained, including limitations, trends and outliers in data obtained
* highlighted the key characteristics of materials, processes, or products, while avoiding dedicating too much time to pure research
* gathered information from relevant, and where possible local sources of information to ensure relevance
* provided concise research into the materials that were going to be tested
* included evidence through annotated photographs or video demonstrating testing procedures and the equipment used
* investigated procedures that included a ‘Risk Assessment’ of potential hazards demonstrated thoughtfulness and insight by students considering a range of issues arising from their learning
* clearly linked the testing regime to the functional requirements of their product
* detailed conclusions that not only summarised results but also informed modifications/improvements in materials and production processes for product.

The less successful responses commonly:

* provided no context as to why the investigation was chosen, or the investigation was generic or not relevant to the student-negotiated AT2: Design Process and Solution
* made ‘sweeping’ statements that were in many cases unchecked, false and misleading
* chose to describe processes rather than testing materials or components
* provided no testing of the components
* focused on too many components to test with any rigour or depth
* did not draw conclusions or evaluate results of testing that is completed
* used testing that was incongruent with the intended use, or design of the solution. For example, 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
* selected too many processes or materials making the investigation too general and lacking in specific depth and detail
* provided little or no data sets or evidence of testing. Multimodal evidence is encourage to capture testing, such as photos or screen captures.
* used a generic test, sometimes completed by all class members. This limited the connection and relevance to the students’ own product
* had little or no explicit links to the AT2: Design Process and Solution
* used no references/sources or included incorrect formatting of references
* did not provide analysis of results to draw conclusions or make predictions to inform decisions for their product
* did not clearly establish a relevant purpose for the testing undertaken
* did not provide sufficient evidence of testing, such as results and photos to substantiate that this investigation did occur
* provided very little evidence and detail about the processes undertaken, with results being vague or dubious and conclusions unclear
* had minimal detail about what the student had learnt and how they had applied this to their major project (solution).

Resource Study Part Two: Issues Exploration

The more successful responses commonly:

* clearly stated the issue that was going to be discussed and its relevance
* discussed and analysed with detail, relevant, local, and emerging issues relative to the design solution
* explored a relevant issue (or issues) related to the use of that AT2: Design Process and Solution task at any or multiple phases in its lifecycle. This could be in the design, manufacture, use or disposal phases
* included a depth of investigation with referenced sources
* provided or cited very pertinent and current references using both local and national perspectives
* developed a convincing argument rather than just giving information
* were supported by a relevant bibliography and used in-text referencing or annotation with correct formatting of these references
* presented well-articulated personal opinions and analysis
* included referencing to cite facts, studies, and statistics to strengthen the research
* 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 development 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, individuals or organisations
* validated opinions against research and evidence
* included a clear evaluation of the issue that had been researched and a conclusion that highlighted the student response to their findings
* introduced/concluded their topic with clear links to their AT2: Design Process and Solution
* considered more than one perspective or opinion on issues, such as highlighting both pros and cons
* strongly connected the issues and the testing to the product they were developing.

The less successful responses commonly:

* did not clearly define an issue but explained a production process.
* 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
* tried to cover too much using sub-headings (sustainable, legal, economic, ethical), limiting the opportunity for the student to go into depth
* selected a topic/issue with no clear links to AT2: Design Process and Solution
* used a limited range of resources, and were limited to statements of fact or procedure rather than a critical evaluation of the information
* were brief and used little or no sources, references or bibliography
* discussed multiple themes or topics which did not allow for depth of discussion
* included discussion that was not relevant to the topic, often accessing foreign resources which described circumstance’s or materials not available locally.