Principal Moderator Feedback

Summer 2019

Pearson Edexcel GCE
In Design & Technology: Product Design
8DT0/02

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Introduction and general comments

There were a range of submission types: paper, and CD/USB sticks (please use PDF format to ensure compatibility); both of which were appropriate, provided they were in A3 format.
As with last year, centres were largely able to guide candidates through projects that were both suitable to the contextual challenge and appropriate to Advanced level.

Submissions ranged from architectural models, to clothing to, to furniture; with the ability to test the final product against the brief, specification and contextual challenge, ensuring the level of success or failure of the final outcome.

However, there was a huge range in the expectations of the demand appropriate to this level. Successful centres were able to offer a similar rigour of making to the legacy specification. Additionally, they were able to offer true iteration throughout the portfolio with successful and continued use of a client.

It is a requirement for all AS candidates to follow the contextual challenge set as part of this specification. As a result, those centres that did not respond to situations within the contextual challenge would have prevented their candidates from accessing the full range of marks. Candidates complete a full design and make task – normally in A3 folders or electronically – against the given context.

The context for this year was **'Conservation'** and within this, there were several subsections that students could select from. This was then set out within a portfolio that comprised of three sections:

- Identifying opportunities for design
- Designing a prototype
- Making a final prototype

Identifying opportunities
In this section, candidates will take the contextual challenge and identify a need – with a specific client in mind. Students should be analysing their specific problem to identify and conduct bespoke research to inform a detailed and technical specification.

Designing a prototype
In conjunction with the client, this section should follow a process of iteration – in whatever guise the student might undertake. This could be linear – design a range of ideas and selecting one to model and test offering changes and improvements along the way. Conversely, it could see a student following a process of one idea at a time – which is seen through to development/modelling/testing; before another idea is taken on.

Making a final prototype
In this section, students undertake the manufacturing of their design – at a level challenge and quality appropriate to AS. Students are also required to test their products and evaluate them against their specification criteria, user thoughts and the environment.

Coursework assessment booklets (CABs) were still an issue – in terms of arithmetic errors. However, centre should be congratulated for navigating (and using) the correct CAB.

Photographic evidence was generally well done. Most centres offered a plethora of evidence, both in the CABs and the folder. Where centres offered this detailed information, it was easier to see where the quality marks had been awarded. As mentioned last year, this specification is designed to unfold in way that will repeatedly encourage critical reflection, and provide continued opportunities for candidates to be challenged in the development of their projects, and their skill sets.

Architectural models and small-scale prototypes seem to be the most popular routes in this submission. However, there was a huge range in the expectations of the demand appropriate to this level.

Part 1: Identifying opportunities for design

Grid One: Investigation of needs and research

This section should be governed by the contextual challenge which then drives the candidates to explore relevant target markets or better, real clients. This in turn means that the research undertaken has a real focus to it.

Several centres were slightly lenient for this grid. Candidates rarely produced detailed analysis of proposals that met the contextual challenge. Most candidates did identify a client, but there was little, if any, reference to a target market. Where candidates failed to establish in sufficient detail the needs, wants and values of the prototype and end user, there tended to be pages of generic research without much evidence of iterative triggers, or perceptive links to the challenge. Reference to sustainability was rare. However, in all cases the candidates did fulfil the contextual challenge.

Although we did not really see any candidate that failed to use the context in some way, the candidates that designed and made furniture from recyclable materials only made a limited and somewhat tenuous link to the contextual challenge. This kind of link was certainly not within the spirit of this contextual challenge.

In this section we are looking for the candidates to fully explore the design possibilities and then use that to structure the research therefore making those perceptive links. In most case this was not seen, candidates tended to give some sound insights, but the work often didn't move on from that to make more perceptive judgements and justifications. For instance, in architectural projects disabled access may have been mentioned but not pursued e.g. the spacing required for opposed low angled ramping.

The other issue in this section was the generic research, this is common, and centres should try to advise students to find out what they need to know not simply produce textbook style research about joining methods or materials. This was also true where the candidates had undertaken product analysis almost for the sake of doing it! This section must be structured by the challenge, the client and what is needed to know to enable a concise specification to be written.

Grid Two: Specification

We did see a greater use of a refined brief this year, centres seem to be understanding that the brief cannot be considered or comprehensive without it being affected by the research and the client's requirements. In the best cases the brief is honed to reflect those influences.

The main area of concern in this section was two-fold. Firstly, the research was often too generic, for example "The table must be of a decent size". This clearly is far too general and has not been influenced by the research or the client. Secondly, the candidates lacked any real justification of specification point, for example candidates might suggest that the product is sustainable and justify that by suggesting that you wouldn't have to make it again! Missing opportunities to talk about life cycle analysis or de-forestation.

These kinds of omissions would restrict the progress of the students to the middle box. The specification points were usually justified, although not always linked to the research, especially where the research was generalised. Centre annotation claimed technical and measurable points were present in candidates' specifications, but sufficient technical and measurable elements were rarely evident and on occasions rather generic.

Again, in the best cases we should see candidates also suggesting changes to proposals as a result of completing the specification alongside the target market or client. This again might trigger potential iterations of the proposal, suggesting a perceptive analysis of the specification that relates to the contextual challenge.

Part 2: Designing a prototype

Grid Three: Design ideas

This is where we should really begin to see the iterative approach in that a range of different design strategies might be employed by the candidates. We should see the use of 2D and 3D drawing techniques, drawing on inspiration from others, the critical analysis of the work other designers relative to the design context and further ideas generated from consultations with the client/target market. These could be cultural and historical. The annotation must also show in-depth understanding of materials and processes evidencing the candidate's knowledge and understanding relative to the contextual challenge.

This section appeared slightly weaker than last year and although we did see some design strategies and especially the use of inspiration materials, this was not the norm. That being said, Centre marks for this grid tended to be more accurate, perhaps because this is similar to previous specifications. The main reason for differences was where candidates had failed to explore the sub systems for the proposal and annotate in sufficient detail the materials and processes that could be used. There were occasionally good highlighted links back to the research, but still some candidates referred to 'wood' rather than the various wood species they had researched. Reference to historical and cultural influences was rarely seen.

The use of the client was limited in many cases; therefore, the work didn't really have that iterative feel to it. Often the work was limited to single sketches with limited technical annotation and only some detail in the form of sub assembly designing. The client interaction often felt rather contrived. The candidates should be encouraged to adopt a more commercial approach to the context and really draw upon the research they have undertaken.

Grid Four: Review of initial ideas

This section was, as last year, rather weak - the candidates should be critically appraising the ideas and consulting with the user groups/clients. At best, there was some critical analysis but often this was really a descriptive analysis of the ideas. Sometimes centres got this right, particularly where there were discrete review sheets that picked up the salient points found in the annotation of ideas. Only a few candidates produced a balanced evaluative commentary with pros and cons which could have evidenced an iterative approach to their designing.

Even where there was good review detail, candidates rarely used this information to refine their ideas.

In the best cases the candidates did analyse the ideas and indeed discuss this analysis with involved parties but that was not the norm. In many cases the evaluative commentary lacked balance and so a 'for and against' analysis would benefit the candidates in this criterion.

Grid Five: Development of design ideas into a final design

This section was not attempted well by the candidates. If the candidates have drawn on the research, used modelling well to test aspects of the proposals and used client input to good effect they should score well in this area. The key is often high-quality annotation. This grid was rarely assessed accurately. Most candidates offered relatively superficial development that was neither effectively tested nor evaluated by the client; as a result, the ideas did not move on significantly. There was only limited evidence of an iterative approach and that was usually where the candidate had a client who was genuinely involved in the development of the prototype leading to further research and refinement. Arithmetic calculations were rarely presented or commented on in the centres' annotation.

Final ideas were always present, but rarely with sufficient technical details of materials, components and processes. Dimensional detail was often insufficient to allow third party manufacture, particularly on more complex prototypes. Centres may need to be encouraged to ask candidates to produce an assembly drawing with parts named and numbered and then to produce individual detail drawings of each component.

We did see some cases of good iterative modelling but often the models were of the final solution. This was also the case with the use of CAD. Candidates must be encouraged to use both forms of modelling to demonstrate to client's elements of the design for further commentary and therefore development. This illustrates the iterative method.

The other issue in this assessment criterion is the notion of third-party manufacture, this was often overlooked in terms of the detail that might be required for instance key dimensions on working drawings, or detailed drawings that showed how components are joined together.

Grid Six: Review of development and final idea

This section carries the largest number of marks - in terms of the designing elements of the assessment criteria - so needs to have some time and attention given to it to elicit the marks at the top of the criterion. Many candidates failed to access the higher marks mainly as a result of not utilising their client feedback on a regular basis or making clear design decisions about each aspect of their development. Often the final design proposal was not evaluated thoroughly against the design specification or shown to the client for feedback.

The candidates did not have an analytical evaluative view of their work, it was often descriptive and therefore lacking any perceptive analysis. The submissions this year lacked, in many cases, a balanced view and so often it was lacking in the opportunity to be iterative as a result of any review statements. Having said all of that, in several cases the candidates did use the client well and at least sought the views of others to gain a somewhat more balanced view of the proposal. However, this was the exception.

Centres may wish to consider starting with a structure to this section e.g. map against the contextual challenge, give advantages and disadvantages regarding refinements suggested in the development, review against similar products and then make further suggestions that inform further design changes.

Grid Seven: Communication

Centre marks were predominantly agreed for this grid. Where there were differences it was normally a product of the candidates lacking in well-constructed and effective annotation of a technical nature, for instance generic terms such as ‘plastic’ or ineffective detailed sketching perhaps lacking in detail or simplistic CAD usage. Most candidates demonstrated a range of different communication techniques and CAD designs. Annotation was used throughout, but it was rare to see the detail required at this level.

Part 3: Making a final prototype

Grid Eight: Tools and equipment

The work was generally too simplistic for this section - not even comparing well to the standards of the legacy specification. The notion of a small scale project should not diminish the level of quality and finish expected of a final product. Furthermore, it does not mean a scale model of a product that could be made fully functioning in a school workshop. It is imperative that the centres understand that at this level - as a stand-alone qualification - the skills evidenced should be at advanced level. This was not the case for many centres this year. Centres were often just slightly lenient when awarding marks for this grid. Candidates generally submitted some evidence of contextually linked manufacture, however the range of tools and equipment expected to be seen were not always at an advanced level. This was not always the case. The level of the processes undertaken was at best key stage four, for instance, simple parallel turning is not necessarily a high-level process but turning to a tolerance or for a particular fit is higher level and would gain a greater award in the assessment criteria. A range of basic skills were often used which allowed access to some of the marks, however, the moderators would like to see more advanced skills at this level for the top marks.

Grid Nine: Quality and accuracy

Centres were slightly lenient when awarding marks for this grid. Some of the work submitted lacked the level of complexity and quality required at this level. Centres would benefit from ensuring candidates' protypes have the opportunity for candidates to use complex processes and ensure that the quality of finish is at the highest level. On occasion, the quality of photographs was poor. Centres should ensure any photographs sent in are of a good quality and clearly show the finish and detail on the work.

In some cases, we did see high quality manufacturing that was accurate and had a very good finish, these candidates could access the higher levels of the assessment scheme. However; some work submitted lacked the level of complexity and quality required at this level, the candidates must be encouraged to use complex processes and ensure that the quality of finish is at the highest level if they are to gain the best marks available. A good example of this might be candidates who only undertook a simple body styling exercise with some simple shaping and finishing such as simple concept models or candidates that

wholly relied on CAM outputs without any interlocking or inter-reliant parts. In almost all cases the candidates did produce a fully functioning prototype but a simplistic outcome that fully functions does not demonstrate accomplished making skills for this level and so cannot access the higher levels for this criterion, some teacher annotation implied that this might be the case. The other problem that moderators faced was the use of recycled materials which may lead to, what might appear to be, a lower level of finish which we tried to balance with the range and quality of skills involved. Nevertheless, a recycling bin made from card tubes does not display the advanced skills required at this level.

Grid Ten: Testing and evaluation

Centres mostly marked this section at the correct level. In this section, we are looking for the candidates to discern the difference between the notion of testing and evaluating. The test element means to put the product into service and seek opinions which may then further move the product forward. In the evaluation, the work again must be a critique that would lead on to suggested modifications. Successful centres encouraged the candidates to put the prototype into service and seek opinions, then further move the product forward. With regard to evaluation, it was not unusual to see no suggestions for modifications. In all cases, there was some useful testing, but often little real analytical evaluative commentary was seen. Life cycle analysis appeared quite often, but it was usually a generalised afterthought, and there were examples of actual environmental impact such as loss of habitat; neither were there any mention of social, moral and ethical impact.

The testing was very polarised in the centres. It was either comprehensive or superficial, if a product is designed to hold something for a technician to work on but we do not see this in action or indeed then gather the opinions of the users to then conclude in an evaluative commentary - this does not constitute a high level testing and evaluating section.

The submissions seen often also did not use the specification to good effect or indeed the client in most cases. Conversely, we did on occasion see some balance in the form of an advantage/disadvantage analysis and more rarely modifications that were the product of the evaluation that suggested further refinements. That said, when this section was done well it was at a high level.

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