Moderator's Report
Principal Moderator Feedback

Summer 2017

Pearson Edexcel GCE
In Design & Technology (6RM04)
Product Design
Paper 01: Commercial Design

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The 6RM04 course in RMT focuses on a synoptic task of a candidate's own choice and offers individuals the opportunity to demonstrate the skills and competencies assimilated during the entirety of the course so far.

In this course candidates are required to work on a single integrated design and make task that reflects how a professional designer might work in dealing with a design problem and its resolution. They have free choice of design task, but must work with an identified client or user group seeking feedback at a number of stages in the design and make process.

It is a requirement that when researching and designing, candidates should consider sustainability and the impact their product might make on the environment.

It is expected that candidate work will be presented on about 30 -35 sheets of A3 paper, but there is no penalty for exceeding this number.
The overall impression of the quality of work seen this year was that despite some excellent work from some candidates, the majority took few risks in designing and making, opting for the safe approach of working within their comfort zones to produce projects that targeted marks well, but lacked flair and excitement.

Research and analysis

Most candidates were able to score two or three marks in this section, but it was rare to see work deserving of maximum marks, although this was often awarded by centre assessors. Most candidates were able to focus on relevant research, concentrating on analysing the problem and using that as guidance. The best work contained precise, information that focused on performance related and measurable issues borne out of a perceptive analysis, which in turn was the result of a detailed client interview to establish design needs.

All candidates identified clients, and used them to varying degrees. In the best work, the client was an important element, being fully consulted regarding decisions made during research gathering. Unfortunately, a significant number of clients were not consulted for their input and in many cases little further reference was made and no useful discussion was recorded.

Research into materials, processes, finishes and so on was often generic and would have been more appropriately carried out during designing and development, after design decisions were made and research could be more selective and relevant.

Research tools such as mind maps and bubble diagrams were used, but these were often generic and could have referred to many products.
As was the case last year, where storage was a feature of the proposed design, many candidates failed to look at sizes, quantities or range of items to be stored.

Questionnaires were in evidence based on identified design needs and were widely circulated. However, when working for a client on a bespoke product, all relevant information should be focused on the results of interviews from the client.

Hardly any candidates summarised the results of their research to identify key points that should be included in the product specification as a priority.

Product specification

Specification writing continues to improve and many candidates have a good grasp of what is required, which is that statements should be technical and measurable, and justified whenever possible, to say why they are appropriate to the needs of the proposed product.
Unfortunately, many specification statements were generic, vague and non-technical. Most candidates presented specifications under the recommended headings of form, function, user requirements etc, but often offered only a single statement for each. The important areas of user requirements and performance requirements were often treat cursorily, but should have been focused on in detail as this is where technical, performance related statements appear, which are used in designing, review, development and final outcome to test and evaluate against.
Good specifications referred to research material, while others gave no mention of the information gathered, failing to link research to the specification.

Design and development – Design

This section, along with 'Development' remains a problem for many candidates. Some excellent designing was in evidence with candidates demonstrating high calibre work and advanced knowledge and understanding of materials and processes, but many candidates struggled to produce commendable work.

Most candidates were able to produce a range of workable design ideas that included detailed part-sketches, showing how design features might be made to work. In the best work, the number of design ideas was limited to three or four, so that candidates could really focus on details, rather than producing several designs that did not proceed beyond basic levels of detail.

At the opposite end of achievement, many ideas were simplistic and alternatives were repetitive and lacked the depth and detail to demonstrate a good level of knowledge and understanding of materials, processes and techniques.

A surprising number of candidates produced pages that contained a single sketch, often poorly drawn, surrounded by copious amounts of annotation. In such cases, it would have been far more informative to have included 'cameo' sketches to explain how design details integrated with the whole design, instead of trying to write a long explanation. It was disappointing to observe that after two years of practising design methodology, so many candidates could not effectively illustrate their ideas graphically.

In high achieving work seen, candidates referred to specification points as designs progressed, to check their viability, and sought client feedback for objectivity, emphasising the commercial approach to designing. In many cases however, specification points were not mentioned, which rendered research and specification writing meaningless.

Design and development – Review

This section showed improvement from last year, where most candidates were able to compare initial ideas objectively against specification statements. However, the purpose of this section is to compare one design against another to determine which was the 'best-fit' for the specification and should be carried forward for further design input and development; not all candidates did this, and some relied on client feedback to decide which idea to carry forward for development.
In the best work, candidates summarised their findings in a statement to justify their selection for development and to explain how client/user group feedback would guide further design input. Those candidates who used marks out of ten or tick boxes to determine the viability of designs were not able to discuss or justify their decisions.
Consideration of sustainability issues in this section was often only briefly mentioned and although client feedback was usually present, it was often superficial and not always believable.

Design and development – Develop

Once again, some excellent work was seen in this section from more able candidates, with well structured development activity in evidence, based on the results of review and client feedback and including further design input. However, a lot of candidates made simplistic or cosmetic changes to an initial idea then focused only on construction details.

Many candidates appeared not to place much value on this section, or understand what is required to achieve high marks. Development should include further design input based on review and client feedback in order to progress a design on to a refined final design proposal.

Modelling was used effectively by many candidates to test some aspects of proposed designs. Although most modelling was used constructively, some was used for cosmetic or presentation purposes and some models were so badly made they could not possibly have informed the design process in any useful way.

Design and development – Communicate

In this section, the vast majority of candidates were able to communicate their ideas effectively through a wide range of communication techniques. Expert use of 2D and 3D CAD was in evidence and other techniques included digital photography, use of marker pens and technical annotation. Although some high quality freehand sketching was presented this was the weakest area of communication, surprisingly so as this is a communication

skill that should have been in constant use throughout the AS and A level courses
Some candidates did not appreciate that enough information had to be included in final design drawings to enable third party manufacture and where working drawings were generated automatically from 3D CAD sketches dimensions were often unrealistic, being labelled to two or three decimal places.
Planning

In this criterion most candidates were able to present an appropriate sequence of making activities with enough detail to allow a third party to follow the plan. The weakness in most planning was the inappropriate quality control statements recorded.

Statements such as “does it fit” or “are the corners square” are questions not checks and “check that it is the right size” gives no indication of how or with what equipment the check should be carried out.

As usual, planning was presented in the form of flow charts or Gantt charts which considered the order of assembly of parts or components, tools, equipment and processes to be used during manufacture.

A minority of candidates recorded ‘time’ in lessons, weeks or dates, which does not convey real-time i.e. hours/minutes.

Product manufacture

As has been the case for several years now, the making sections have become stable in their outcomes, where centres who are fully aware of requirements and who apply the mark scheme accurately, by and large have their marks agreed.

Where marks were not agreed during moderation it tended to be because the task tackled lacked the complexity or potential to achieve at the highest levels. Where CAM was used this tended to be well-balanced by hand skills in most cases, but there were some centres where over-use was encouraged, leading to disappointment when marks could not be agreed.
Making – Use of tools and equipment

Marks awarded by centres in this section were generally accurate and some high quality skills and competencies were in evidence. However, despite demonstrating good skill levels, some candidates produced undemanding work that could not support the marks awarded by centres. Simplistic and undemanding work, no matter how well made using appropriate tools, equipment and processes, that is unchallenging, cannot elicit high levels of credit here, so centres must ensure that the work candidates embark upon is appropriate to the capabilities of individuals and will allow them to achieve their potential.
In this section marks are awarded for the skills used by candidates in manipulating tools and equipment. High level skills will demonstrate precision and accuracy. Consideration of safety awareness should be

credited here, but any risk assessment illustrated in planning can be used as evidence.

Making – Quality

This section was marked accurately by most centres. Marks are gained here for the quality of the completed work and its component parts, whether it functions as it is meant to, whether it matches the final design proposal and whether it is appropriate to expected A2 levels of response.

Some excellent work was produced but a minority of tasks lacked the scope and potential to allow candidates to demonstrate their abilities. More ambition and risk taking would be of benefit to candidates at the outset.

More candidates justified their choice of materials for manufacture this year, which was pleasing to note and an indication that teachers were taking heed of advice in E9 feedback.

Photographic 'diaries of making' were of excellent quality in general, displaying a progression through the making task and illustrating the tools equipment and processes used by candidates. A minority of candidates presented photographs that were too small to illustrate technical details and it would have been better to have had fewer, larger and more detailed images than many thumbnail size ones that were difficult to see.

Making – Complexity/level of demand

In this section, some high level work was seen which was generally well marked by centres, but conversely some work was of mediocre quality which was rewarded generously, where candidates had produced well made products which demanded relatively low level and repetitive skills. Where it was in evidence, it was pleasing to note that most centres had restricted the use of CAM to the recommended 50% or less, allowing candidates to demonstrate a range of other manufacturing skills. Only a few centres allowed an over-reliance on CAM in their candidates work.

Testing and evaluation

In this section, some very good work was seen where candidates tested their products against technical and measurable points of specification, describing the point of the tests and recording in detail how they were carried out. Client testing was also a feature of high level responses as were photographic evidence of realistic field trials.

As a result of a weak product specification, some candidates did not have clear, measurable criteria to work from so effective and realistic testing was not always possible. Some testing was limited to comments on a few photographs of a product with no explanation of what aspect of performance was being tested. In weaker testing and evaluation, quite often the client did not feature strongly, possibly because the client was made up.

Suggestions for future modifications to improve the performance and quality of the finished product were realistic where effective testing was carried out, but were often cosmetic and superficial where testing was simplistic and lacked rigour.
Life cycle assessment was tackled well by most candidates, but it was sometimes generic and not directly related to their product. In the best instances candidates used a detailed ‘cradle to the grave’ analysis.

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