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Moderators' Report/ Principal Moderator Feedback

Summer 2015

Pearson Edexcel GCE
A2 Design and Technology
Resistant Materials Technology
Commercial Design (6RM04/01)

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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.

Research and analysis

Most students were able to score two or three marks in this section but it is still quite rare to see all four marks being gained, although this is improving.

All students identified clients, but client interviews were often superficial and it was obvious when a client was made up and not genuine. In high quality work, client input was a feature, but in many cases little further reference was made and no useful consultation was recorded. In this section it is important to establish client needs and this is best done through a detailed first hand interview.

Some centres allowed students to produce large numbers of research pages that did not focus succinctly on the problem. Instead, copious amounts of generic information were in evidence regarding materials and processes, often unrelated to the proposed product. Many students produced in excess of 10 pages of research, when fewer more focused pages would have scored the same marks.

Mind maps and bubble diagrams were quite common, but these were often generic and could have referred to many products.

Where storage was a feature of the proposed design, hardly any students looked at sizes, quantities or range of items to be stored.

Many questionnaires were in evidence based on identified design needs and were widely circulated. However, when working for a client or small user group, all relevant information should be focused on the results of interviews from the client.

It was rare to see a summary of research to identify key specification points and to highlight important issues to consider when designing.

Product specification
Most students were able to score in the medium range of marks and more gained higher credit this year through a better understanding of requirements.

Where moderate or low marks were scored, this was as a result of statements lacking technical, measurable and justified points.

Some statements were vague and generic and did not include the important areas of User requirements and Performance requirements where technical and measurable points would normally be included and without which, evaluation throughout the design and develop stages and testing at the end of the making stage cannot be carried out effectively.

Some centres guided students to use the acronym ACCESSFM, but following this system when specification writing does not match Edexcel's assessment criterion well as there is little focus on performance requirements.

As already stated, the specification headings of user and performance requirements are key to technical and measurable statements, but many students made only single statements in these areas and similarly, statements relating to sustainability were usually limited and generic.

Well written specifications referred to research material, while others gave no mention to the information gathered, failing to link research to the specification.

Design and development – Design
Some excellent design activity was in evidence with students using a diverse range of graphic skills to communicate their ideas in a manner that showed genuine progression. However this was the exception rather than the rule and many centres still need to encourage their students to try and develop their initial design concepts more effectively on paper as designers.

In the best work seen, candidates referred to specification points as designs progressed, to check their viability and to keep a focus on design needs. In many cases however, specification points were not mentioned, which made specification writing a pointless exercise.

Many students drew undetailed shapes as designs and offered little graphical detail to show that they understood the sub-systems of the design and specific aspects of the problem. This 'body styling' was usually accompanied by very little information to demonstrate an understanding of materials and processes.

A lot of students produced very weak sketches of an idea and then wrote copious amounts of notes to describe it, shying away from using graphical skills to explore and explain design features.

Students who were in control of their work sought client feedback at this point, but many did not, once again ignoring the commercial approach to designing.

Design and development – Review
This year saw an improvement in this section, where more students produced a formal review rather than tagging comments onto design ideas.

Review of design ideas was done by a comparison with specification points, but students still fail to realise that the purpose of reviewing designs is to select and justify which one to take forward for development.

Some students did not include client comment or reference to sustainability in this section and hardly any summarised the results of review to say how development would be guided by findings.

The requirements of this section are misunderstood by a significant number of students. Review is a stand-alone exercise where completed design ideas are evaluated against each other using measurable specification points, which is different to the comments made during initial designing where reference is made to specification points to check ongoing viability of ideas as they progress.

Design and development – Develop
Some excellent, realistic development work was seen where students used a range of approaches to continue design input. However some students still struggle to understand what is required in development. It was rare to find students with an approach that reflected the results of review and involved further design input to change and refine an initial idea.

A lot of students made simplistic or cosmetic changes to an initial idea then focused only on developing construction details.

Some form of modelling was used by all students, but not all models tested aspects of designs and some were so badly made they could not have been used to elicit any useful information at all.

All students are expert users of 2D and 3D CAD, which was used appropriately to present final design proposals and working drawings. A few students used 3D CAD to present images that had no purpose other than to demonstrate CAD skills. It is important to explain the reasons for presenting CAD images.

Design and development – Communicate
Generally, in this assessment section marks were agreed by moderators and a wide range of expertly used communication techniques was seen.

Where drawings were scanned and reduced, these were usually difficult to understand and accompanying annotation was difficult to read. Where working drawings were generated automatically from 3D CAD sketches dimensions were often unrealistic, being labelled to two or three decimal places.

Many students still do not appreciate the need to present enough information to enable third party manufacture of the intended product,

which can be done through working drawings, pictorial/exploded drawings and detailed cutting lists

Planning
Most students were able to gain fairly good marks in this section, but not many achieved maximum credit because statements were often undetailed and quality control descriptions were frequently questions such as “does it fit” rather than checks described to say how they would be carried out, using what equipment.

All students were able to present a flowchart, table or Gantt chart showing an appropriate sequence of operations for the manufacture of their product, but timescales were sometimes missed out completely, or referred to as dates or lessons without further qualification to say how long in real-time these units were.

Where Gantt charts were used, a few candidates included the whole design and make process instead of focusing only on product manufacture

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

A very few candidates presented retrospective planning describing how processes ‘were’ carried out instead of how they ‘would’ be carried out and this changed a plan for production into a diary of events.

Product manufacture
The following three sections have become very 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
As was the case last year, work in this section was quite accurately assessed across the national cohort and most teachers are approaching this from a position of confidence.

Where marks needed to be adjusted it tended to be because the task tackled required limited skills or the skills demonstrated lacked precision. Some students produced very well made but simplistic work; no matter how well a product is made if it is not appropriate to the levels of response expected at A2 level, it cannot achieve high marks.

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

As was the case last year, this assessment section was marked fairly by most centres. High marks are gained here for the quality of the completed work, where its component parts are accurately assembled into a fully functioning product that matches the final design proposal and is appropriate to expected A2 levels of response.

Some excellent work was produced but some tasks lacked the scope and potential to allow candidates to demonstrate their capabilities.

Not many candidates justified their choice of materials for manufacture, which could be done easily through simple annotation of photographs or in planning.

The key to supporting teacher marks is for candidates to present a photographic manufacturing diary to illustrate skills and processes. A series of photographs taken over a period of time during manufacture is the ideal way to highlight skills and processes used and to provide examples of precision and attention to detail that may not be readily noticeable in an image of the finished product.

Most candidates presented a good range of clear images to support their practical work, but some photos were too small to illustrate technical details and some did not convey any useful information. It is better to have fewer, larger and more detailed images than many thumbnail size ones that are difficult to see.

Making – Complexity / level of demand

As was the case last year, 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 their personal 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 was photographic evidence of realistic field trials.

Unfortunately, as a result of a weak product specification, many students 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.

Quite often the client was not a strong part of testing which is difficult to understand when a student was working for that individual.
Those students who tackled a life-cycle assessment did so quite well, but few students identified improvements based on the results of testing, and when modifications were proposed these tended to be superficial and cosmetic.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
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