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Moderators' Report/ Principal Moderator Feedback

Summer 2014

Pearson Edexcel GCE in Design & Technology (6RM04) Paper 01 Commercial Design

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Unit 6RM04
Commercial Design

The 6RM04 course in RMT focuses on a synoptic task of a student'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 students 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, students should consider sustainability and the impact their product might make on the environment.

It is expected that student work will be presented on about 30 -35 sheets of A3 paper, but there is no penalty for exceeding this number.

Research and analysis

In this section, most students scored significant marks, usually two or three, but more were able to achieve full marks this year than previously.

All students identified a client or user-group and the best work saw reference to their needs throughout specification writing, design, review, development and testing and evaluation. Unfortunately, on many occasions clients and user groups were not referred to again, or if they were, this was done cursorily.

It is important to have a true client who can be referred to, consulted and assist in guiding design decisions and it is all too obvious when no real client exists, resulting in superficial and congratulatory statements that have no substance or information useful in progressing the work in hand.

In this section it is important to establish client needs and this is best done through a detailed first hand interview. Where this was done well, realistic and detailed design criteria were derived and were used to develop relevant and strong product specifications.

Many students presented client conversations, but in the third person, making statements such as "when I asked my client he/she agreed with this suggestion" or "my client liked all of my ideas", which does not exemplify discussion and design compromise, as would be the case in a commercial context.

Mind maps and bubble diagrams were quite common, but these were often generic and did not focus in detail on the intended product. Use of this analytical tool requires understanding of the problem and skill in being selective of specific terms. Many of these diagrams consisted of lots of D&T related words without any progression or direction attached and were often no more than a collage of words.

Many students produced questionnaires based on client information and circulated these quite randomly. However, the ethos of this design and make task is that the client or user group should supply information and feedback exclusively, as the student should be working as a designer dedicated to those specific people.

In general, research gathering was quite selective and related to identified design needs. There was less generic research into materials, processes and equipment and a good number of students waited until design and development sections to research materials, when particular designs demanded specific properties, narrowing the field of necessary research.

There were still a lot of students who gathered information but missed out important areas; there were many examples of products that were designed to store items, but students failed to find out dimensions, weight, how many were to be stored, what space was available, what anthropometric data needed to be considered etc.

At the end of this section, students should ensure that they have established design needs, carried out relevant and selective research and have identified key points to include in their product specification.

Product specification

In this criterion most students were able to score in the medium range of marks, but it was rare to see maximum marks gained. This was usually as a result of statements lacking technical, measurable and justified points. Some statements were generic and did not include the important areas of user and performance requirements, where technical, 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.

More able students addressed this section well, but in many other cases, specification statements were generic and not organised under recommended headings. Too many statements were non-technical and could not be used to realistically evaluate designs and final product against. Some students wrote only a single statement under each specification sub-heading and many statements were vague and non-specific. Surprisingly, in these instances, full marks were often awarded by the centre assessor.

Reference to sustainability was generally weak, poorly addressed and in some cases ignored.
Good 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

Overall, marks awarded by teacher assessors were lenient. Although some excellent designing was in evidence with students using high level graphic skills to communicate their ideas, this was the exception.

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.

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

Many students felt it was acceptable to simply draw shapes as designs without accompany this 'body styling' with the level of technical detail that would demonstrate how ideas might be constructed.

Design details such as how mechanisms worked or how a component part swivelled or slid were not often explained or explored graphically. Such sub-systems should be considered in some detail.

Where ideas were limited, this was often due to starting points that were simplistic and lacking in challenge.

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

Review was generally done by referencing specification points, but few students compared one design idea against another to determine which fitted the specification best and which should be taken forward for development.

Consideration of sustainability issues in this section was generally weak and usually only briefly mentioned, if at all. Client feedback was often superficial, especially where there was no genuine client.

Hardly any students summarised their findings in a final statement to justify their selection for development and to explain how client/user group feedback would guide further design input.

Design and development – Develop

Some excellent work was seen in this section from more able students, with well structured development activity in evidence, based on the results of review and client feedback and including further design input. However, the majority of students still struggled 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 construction details.

Modelling was used by most students, but it was rare to find any realistic testing of design features when modelling and rare also to find any conclusions being drawn.

Some excellent use of 2D and 3D CAD was seen and almost all students are expert users. Some students however used CAD simply to draw a neater version of a final design proposal, which is not worthy of credit; CAD should be used to test and develop some aspect(s) of a design proposal.

Design and development – Communicate

In this section most students were able to achieve well and teacher assessors marked accurately in most cases.
A wide range of communication techniques was seen and it is now a rarity for students not to use CAD during 'Development'.
Freehand sketching was sometimes of a poor quality, which is surprising as this is a tool that should be in constant use throughout AS and A2 work.
A significant number of drawings were scanned and then had typed comments around them which did not demonstrate flair or imaginative thinking.
Many students 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

Most students achieved good levels of success in this section. Evidence 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.

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

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

Hardly any students recorded appropriate quality control checks, using statements such as "are dimensions correct" or "does it fit", which are questions not checks. QC checks should be described to say what they are and how they should be carried out e.g.' check that dimensions are correct using a micrometer'.

A small number of students 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 instances where 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 students 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 students 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 students 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

In general this assessment section was marked fairly by 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 some tasks lacked the scope and potential to allow students to demonstrate their abilities.

Not many students 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 students 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 students 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 leniently, where students 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 students to demonstrate their personal manufacturing skills. Only a few centres allowed an over-reliance on CAM in their students work.

Testing and evaluation

In this section, some very good work was seen where students 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.

Unfortunately many tests were simplistic, cosmetic and subjective, especially where specification points were lacking in technical, performance related statements that could not be used to realistically test against. Some students wrote about how tests could be carried out but offered no evidence of having done so.

The majority of Client/user group evaluation was often no more than a series of congratulatory statements and it was rare to see perceptive comments made against points of specification.

Life cycle assessment was tackled by most students, but it was often generic and not directly related to the product. In the best instances students used a detailed 'cradle to the grave' analysis.

Grade Boundaries

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