Moderators' Report/ Principal Moderator Feedback

Summer 2014

Pearson Edexcel GCSE
in Design and Technology: Graphic Products
(2GR01)

Creative Design and Make Activities (5GR01)

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Introduction

This specification can now been seen to have settled into an established pattern for some centres. The work submitted is increasingly marked closer to the board's standard as centres are confident with the coursework requirements at each level. The moderators have seen a significant number of design and make projects submitted, centres overwhelmingly opting for the opportunity to design and make a model of the one product. However we have seen an increase in the number of separate design and make tasks, with centres opting to design a product such as a concept modelled hand held electrical device then model something that they consider to be much more demanding to design like a building or an interior. Many more centres have chosen this route this year despite it being the least popular route through the controlled assessment.

The vast majority of centres have chosen products to design that were selected from the appropriate lists of products on the Edexcel website at http://www.edexcel.com/quals/gcse/gcse09/dt/Graphic/Pages/default.aspx

I would also like to welcome to the board a large number of new centres who have chosen to enter students with us for the first time. I would urge you to glean whatever information you need from the following points raised in my report in order to enhance any future submissions for this qualification.

Administration

Naturally in a year when there are a significant number of new centres to Edexcel, there are likely to be a number of issues with regard the administration of this part of the examination. In all cases, any missing or incorrect admin should in the first instance have been dealt with via the centres examination officer, with follow up feedback given in writing or through the E9 report. It should be noted that the following issues were evident but as always there were a great many more centres who successfully navigated the administration of this exam without incident.

There were a small number of centres who failed to adhere to the Edexcel selection requirements, regarding the sample of students selected from centres. It is important to note that the submission of the selected students, as indicated on the OPTEM's form, should be supplemented with the highest and lowest marked students, where they have not already been selected. Centres also need to replace any students that have been selected, but are no longer part of the centre entry, with any additional student (usually on a similar mark). Where centres had failed to comply with this important starting point they would have to be contacted to complete the correct collating of the sample before any moderation could take place.

A very small number of centres sent incorrect sheets from the OPTEM's form, sending all copies to the moderator, or the wrong coloured copies. This in itself is not a significant issue to the moderation process and is

becoming a largely redundant requirement due to the growth in EDI entries. If EDI is not used it is important that the top copy be sent to Edexcel, in order that the centre marks are entered on the system. The green copy is retained by the centre for their record of marks sent and the yellow copy should be sent to the moderator. A number of varying combinations of these colour coded submissions were observed by moderators, but centres should have be informed of any errors in writing, usually on the E9, or by direct contact to the exam officer if the marks did not match the entry on the system.

The centre mark record booklets (CMRB) were completed very well on the whole. Centre markers completed the booklets as intended, including the annotation required for the evidencing of making skills undertaken in the manufacturing process. Very few failed to complete this section at all; those that did left their practical marking at risk of misinterpretation or corroboration by the moderator. Annotation in general was often excellent and most moderators found the additional comments to be of use to them during the moderation process. Very few centres failed to sign the CMRB to guarantee the work is that of the students. The single biggest issue that moderators found a problem with in the CMRB was again the failure for centres to add the marks correctly. These addition errors often jeopardised not only that student's mark but also how the rest of the centre would be treated during the moderation process. It is vital that any addition errors are corrected at source by the centre, so that the marks input by the centre are accurate, as addition errors could invoke adjustment with the final moderator mark and the incorrect mark that is on the system. All centres with addition errors would have been contacted by the moderator through the exam officer on an E6 form, which would have listed the errors. These corrections can only be made by the centre and must be accurately input if accurate moderation s to take place.

Photographic evidence for practical work was clear and well documented for many students, there were a number that were taken at too great a distance, or were not clear for technical reasons – printer cartridge needed changing! This has to be a more important priority for some centres. This is the opportunity for the centres to demonstrate clearly that the marks asked by the centre are evidenced in the photograph. Time needs to be set aside for this important part of the submission, ensuring that the photographs are going to clearly show how the marks asked can be justified against the products made. In the best cases, centres provided evidence in the folder of the products being manufactured as an addition to the summative photographs in the CMRB, in these cases it was often easy to see the processes that would not be evidenced in the final product.

With regard the actual design portfolios; centres are advised of the request that they aim to submit between 15 and 20 A3 pages for this part of the examination. Moderators have seen much more concise work than in the past with portfolios being maintained around this recommended figure and very few centres submitting the 80 plus pages seen in the past.
A growing problem with some centres is the failure to label folders effectively, with student name/number or centre name/number. Admittedly they often physically attached the CMRB to the folders in an attempt to

label the folders, however one of the first things a moderator will need to do upon receipt of the folders is to separate the CMRB from the folders, resulting in the need for them to label all the folders for the centre. Some centres also attached the CMRB's to the folders by very robust means; these were in danger of being ripped or torn when being separated from the folders, centres are requested to attach CMRB's loosely to securely bound folders, and to independently label the folders correctly.

The moderators reported that there was decrease in the number projects being submitted of a packaging nature with a growth in the number of Point of sales (POS) and leaflet dispensers being seen. Whilst leaflet dispensers are not a specific example offered in the suggested products, it is felt they are so similar to a POS that they are accepted as part of that route. Centres need to be careful that the final outcome in these cases has the demand in it for a GCSE outcome in the practical work. Many centres offered a manufactured package alongside the POS to ensure the evidencing of a wide enough range of practical skills.

Where students submitted separate design and make submissions, students did well if they manufactured a more complex product like an architectural model and designed a different product. Designing architectural products often proves quite demanding for most students.

Some centres entered projects as part of the manufacturing section that were themed class products. Indeed the class were set the same given product to manufacture. It is concerning in more cases than we would prefer to see, that there was too much teacher control in the tasks, leaving little for the students to interpret. In this situation it is preferable for the students to decide on the materials and manufacturing processes themselves, rather than be given the answers to all these issues by the class teacher, where the student is given the materials or has jigs and mould provided, they will not be credited with the range of skills in the same way as with a student who has made many more decisions themselves about their practical outcomes.

Design Activity

Analysing the Brief

Students, who had completed a successful thorough analysis, often presented it in the form of paragraphs of writing with specific headings. This produced focussed and relevant questions about the problem being considered. Some centres were frequently found to be generously assessing this section. This tended to be where students produced simple mind maps of criteria rather than a detailed analysis of the brief. Mind maps are a good starting point to highlight the issues that may need to be considered, but the problems to be faced, must then be alliterated. Some students were also limited by an unclear design brief that did not clearly state the intention of the task. The majority of submissions saw the students write their own brief. Where centre briefs were provided, the students often failed to develop an analysis in enough depth.

Research

The majority of centres generally assessed this section accurately. Centres that were generous tended to need greater focus on performance, materials, components, processes and quality when analysing existing products. There was far too much dependency upon the look of the product or the function, without reference to the key critical ergonomic information or reasoning for materials choice and manufacture. Where there was evidence of good product analysis it was from centres that used the criteria laid out in the mark scheme and encouraged students to adhere to this. Weaker performances by centres analysed existing product in a less structured format. Issues of sustainably were addressed by some centres as a page of global issues rather than in relation to the product being analysed. A clear understanding of sustainability issues did not come across from many students.

The single most common element that was missing was again the lack of critical data, sizes etc. Many students designed products with no indication of key sizes or legal requirements. A POS, but no indication of knowledge of the sizes of the product to be held, a package with no information about the necessary minimum legal information to be included on it, the design of the interior of a room without any primary dimensions as a starting point.

Questionnaires, when offered, were fairly superficial lacking useful questions and all too often the data not analysed in any significant way. The better submissions had a summary, explaining what had been gained by the completion of the questionnaire and clear indication of how this feeds into the specification.

The most successful submissions in this section demonstrated a clear understanding of the need to analyse the problem then answer the

questions raised through the research. The answers then directly link to the specification and what parameters must be considered during designing.

Specification

This is probably one of the most improved areas of the coursework submission. In the best performances, the students made obvious links to the research previously undertaken. Here the specification was presented as a series of answers to the questions raised in the analysis, but at times though, the points presented were not justified and lacked technical and measurable points. However centres largely took this into account in their marking. Students that used headings such as form, function, user requirements or other similar sub-dividers, tended to perform better than those without headings.

Some students lacked technical vocabulary when writing their specification, which limited their score in this area. Critical issues, such as product dimensions for packaging, must be addressed; this also prevented them from devising successful methods of reviewing, testing and evaluating their work later in their projects.

Initial ideas

It is a growing concern that students are offering more and more formulaic material for this section. Centres appear to be relying on the production of three ideas (a range) regardless of their quality and appropriateness. Concentrating too often on the whole product and failing to look in sufficient detail at its sub-system or key elements. This broad approach to designing does not allow the students to demonstrate a detailed understanding of the materials and processes that will be needed to consider the designs in detail. The opportunity to link to research as well as discuss alternative technical information is increased if the students are looking at the individual sub-systems that make up the whole.

Where students evidence initial ideas that are well produced, with a good range of ideas communicated in a range of formats, they have usually broken down the product into sub-elements and these have been key issues in their designing story. Indeed many design ideas were often well communicated, with the utilisation of good sketching techniques and a variety of CAD software being evidenced. A small number of centres successfully combined a variety of sub-systems to enhance their range of design strategies and presentation techniques; the use of CAD modelling for bottle design, physical card modelling for container design and the manipulation graphically of images to be used as logo or labels. There was a marked increase in the use of Google Sketchup in the presentation of building designs, both interior and exterior.

There was also an increase in the formula approach to designing, with centres providing heavily structured grids for students to place the directed information into. It should be noted that this sort of structuring by centres

is not in the spirit of controlled assessment and should be avoided. In extreme cases students were directed to place specific text topics into boxes, the decision to communicate specific information at this level should be with the students and not directed so heavily by the centre. In extreme cases the use of such similar textual inputs required referral to the compliance department at Edexcel.

Where centres failed to meet the board's standard in this element, the work lacked the depth, detail/information and range of ideas to justify the centre marking. However some centres adopted the strategy of devoting one A3 page to each idea which helped students to explore their initial thoughts in more detail, adding detail or alternatives to the sheets about sub-elements relevant to the design work. Attempts were made, to refer to materials and processes but in some cases references were generic: 'plastic', 'wooden' etc. The value of evidencing materials, processes and construction in general, was again largely overlooked by many students/centres in this section. Many ideas across the range of samples based their ideas on pure aesthetics and layout and there was limited evidence of technical annotation, generic material terms were plentiful.

Review

The review section has clearly improved on previous years' submissions. The work focused against specification criteria and was evaluated in a more detailed way than previously seen. Obviously it is easy to see how a structured approach can assist a centre in this section, but the work general took an objective stance against the work being reviewed, more importantly the work was largely accurately marked by centres.

The opportunity to gain and utilise user group feedback was still an area of weakness for some centres.

Communication

At the highest level of achievement there continued to be a wide variety of well communicated skills being demonstrated, with good use of CAD. Centres are increasingly evidencing demanding CAD programmes and some excellent use of Google Sketchup for interior and architectural work. Centres also need to be aware that the assessment criteria for this section can use evidence in the development section as well as the design section.

Development

Of all the sections, this overall was often the weakest in terms of detail and presentation. At worst, students work had a retrospective feel about how the final idea was made, as though decisions had been made already and there was no room for change. The specification tended to be ignored here and many outcomes were seen as the whole product rather than the development of the individual sub-elements. Far too few students looked at

individual components, processes or sub-systems in deciding what was required to ensure a quality outcome was proposed.

Students performed well when they made use of their specification to develop their selected idea so that it addressed most points of the product specification. CAD modelling was sometimes presented as a series of screen shots of the stages involved in building the single image, but the centre had credited each image as separate and discreet development when indeed it was merely the construction of a single proposal. Traditional material modelling was often completed and evidenced but was not used as a design tool, often being a practice model before the real one was made. Too often modelling in either CAD or more physical modelling was used as a presentational tool, rather than as a design strategy. It was a common theme for the models to have no changes made to them before the final model was presented.

To be successful in this section, centres need to teach students that this section involves change. It is not a section requiring a presentation of how a product is to be constructed; nor is it a section that only requires the presentation of a final solution. Students must look at the key sub-systems in the design, developing changes to those systems, how a box closes, how a bottle top can be applied securely, positioning and fixing of signage outside a building, access to batteries/switches/screen in an electrical product, etc.

The holistic approach to the body styled designers prevented them gaining credit for the application of changes and technical information. The inclusion of sub-system consideration meant that the students had much wider opportunities to demonstrate decisions, technical information and communication skills. The modelling of a grip or perfume bottle body shape can be quickly and easily shaped in Styrofoam and then reviewed. Bottle or package labels can be professionally reproduced on a variety of CAD packages from Photoshop to Word and reviewed. The modelling in CAD of a building entrance or signage can be reproduced with changes easily, and then reviewed. The development of these sub-systems will not only lead to more successful outcomes, but will also provide more opportunities for demonstrating a variety of communication skills, but they should be used as exploratory tools, not just as presentational devices.

Final Design

The application of the assessment criteria by centres within the *Final Design* section was sometimes significantly generous for many students. Many omitted to identify materials and processes which had been selected. Some students used tables to justify their choices. Clear, dimensioned final designs, containing levels of information sufficient to enable third party manufacture, were again rarely submitted.

The final design section is an opportunity for the student to present the chosen solution and justify its choice, giving clear and detailed information

for a third party with some technical knowledge to construct the product proposed.

Many students failed to meet these requirements, particularly if they used a CAD drawing from their development section, and simply converted it to a working drawing. This often showed their lack of understanding of the needs of a working drawing and its purpose. Students would benefit from asking a third-party to look at their final design and decide if they could be made without referral to the designer. Other technical detail was also often missing. Some students produced final illustrations but lacked detail of materials, processes, size etc.

Make Activity

Production Plan

Students' production plans often took the form of a flow chart showing a sequence of stages of production. The flow charts often had the correct sequences, but quality control (QC) points were often generic phrases, merely suggesting what needed to be tested without suggesting how. The specific QC was rarely named or described, for example 'check fit with pre-drilled hole', but was instead a question 'is column big enough?' Most could organise their practical work into a series of processes but many did not cover all the requirements of the assessment criteria to gain full marks. Many students produced Gantt charts and flow charts which included the same information rather than doing it one way in detail. There were a few examples of retrospective planning.

Quality of Manufacture

In this section the centre needs to demonstrate to the moderator that the student has used tools, processes and equipment with precision and accuracy. The moderators found that when centres had provided good quality photographs clearly showing the step-by-step manufacture of the product, assessment of this section was usually straightforward, and centre marks were often easier to agree. However, where this did not occur, it was much more difficult to agree marks as evidence was not always available.

Witness statements on the whole were generally accurate and helpful. Although there is still some evidence that some centres appeared to have allowed the students to fill this section in, which is clearly a concern if they have assessed their own level of participation?

Increasingly problematic are the centre submissions whereby the class have been involved in the manufacture of a class product. Whilst this is a perfectly suitable method of submission for this section, students should not be given any more guidance than the working drawing that can be provided

by the teacher. They then have to make their own decisions about the manufacture and selection of materials for the product. The provision of moulds and formers is clearly inappropriate for this submission and needs to be a decision that the students make for themselves, rather than following a step by step assembly as prepared by the member of staff or technician.

The majority of students undertook projects of an appropriate challenge. Where problems occurred, centres completed projects such as simplistic pop-up cards (not actually on the suggested project list provided by Edexcel), packaging (without a bottle) or very simple interior design models. This lack of demand often meant that centres incurred an adjustment due to a lack of demand or too many repeated simplistic techniques. To a lesser degree there was occasionally an over-reliance on one manufacturing technique, particularly the over use of CAM. A general guide for this should be no more than a 50/50 balance between CAM and more traditional manufacturing processes. Clearly an over-reliance on laser-cutting or 3D printing is not demonstrating a range of manufacturing processes. Students who do rely heavily on laser cut products or other such CAM outputs are likely to be restricted to a mid-criterion award in this section.

Quality of Outcome

Here we are looking to see the quality of the assembly and finish of the entire end product rather than the processes involved in the individual manufacture of the components, although the quality, assembly and fitting of the individual components into the final product, is an essential aspect of producing the finished item.

This section was again more accurately marked and evidenced than the previous section. The inclusion of as many photographs in the folder as the centre feels necessary to justify marks, is encouraged. This is often assisted by photographic evidence submitted in the evaluation section under testing. Where good quality photographs had been provided, moderation was often straightforward, although some students were marked a little generously.

Most students had produced some practical outcomes but not all were completed. Problems occasionally arose with centres over marking work that involved minimal skill and processes. There were some difficulties assessing identical make tasks particularly if not photographed clearly. It is important for the centre to offer very detailed justification of the marks in these cases in order that the marks can be accepted.

As previously pointed out, the demand and CNC issues did lead to some adjustments as the work submitted from a CAM output has a predetermined level of quality that is often little to do with the skill of the students. This said, where there were complex joining of laser cut component s to create a whole then credit was given for this as it is appreciated that the skill to ensure that components relate to each other and fit well need a significant amount of thought and effort.

Health and Safety

Good quality annotation of photographs showing the step-by-step manufacture of the product regarding safety was helpful. No dangerous practices were evidenced. Many students included elements of safety and risk assessments in their folder work which wasn't really necessary but good to see.

Testing and Evaluation

In this section students are expected to evidence a range of tests. This did not always happen, indeed around half the students seen did not offer the testing as expected, just ploughed straight into the summative evaluation. The evaluation should focus on the summative comments around the testing of the final product and not credit work submitted in the design section.

Students would benefit from being encouraged to test against the specification to determine the effectiveness of the final product. 'Tests' were sometimes omitted completely or amounted to a user/client survey. Students sometimes failed to focus upon the models that had been produced, referring instead to the real building etc. It would appear the many students had failed to plan for this section when writing their 'Specifications'.

In some cases however, the Evaluations were done well. Many centres evidenced student's evaluation against the specification as expected, even if it was only based upon the students own opinions. Third party opinions were evidenced to varying degrees, but were very much secondary to the student's immediate thoughts. Evidence of user group testing was generally limited by most students.

A significant minority of students did not attempt this section at all. Centres are reminded that QWC marks are only awarded for work produced in this section. Many did not read the requirements of the mark scheme and submitted generalised comments that did not relate to that requirement. Indeed justifying marks that had been allocated from evidence in other sections.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:
http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx