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Moderators' Report/ Principal Moderator Feedback

Summer 2013

GCE Design & Technology (6GR01)
Paper 01 Portfolio of Creative Skills

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Introduction

Almost all submissions to this specification were appropriately submitted on A3 landscape portfolios, having the three sections discernibly divided within the portfolio. It is most helpful to the moderator if the contents within the portfolio follow the order of the mark scheme.

The coursework submitted by centres this year showed an increase in the leaning towards more resistant materials type practical outcomes than we have previously seen. Whilst this is itself is not an issue with the submission, it is felt that students on the Graphics route would benefit from learning how to model appropriate Graphic outcomes in preparation for A2.

It was felt Marking by teacher assessors, was more accurately applied than previous submissions, with centres clearly getting more familiar with the requirements of the course and the demands of the board. The vast majority of centres supported their marking with appropriate annotation and this always helps moderators when establishing agreement with centres or writing E9 feedback to centres.

Administratively this year there was a decrease in problems from centres, possibly due to the fact that the specification has run for a few years now and centres are now familiarised with the requirements and nature of the documentation. There were a number of addition errors, incorrect transfer of some marks to OPTEMS from CABs , but less CABs not signed by teachers and students. Although there are now very few centres submitting work on CAB's that are incorrect, previously being obtained from Edexcel's website (later withdrawn as they have numeric errors on the assessment scheme), they do till appear occasionally.

A few centres failed to label folders and pages clearly. This made the moderation process much more difficult for the moderators. Centres should ensure that each page in the portfolio is clearly labelled with student name and number, and title each page so it can be clearly connected with the relevant section of the coursework.

Electronic submissions must be in either PDF or PowerPoint formats, or we cannot guarantee them being seen. A number of centres had to be contacted this year, to provide hard copies of the work as the electronic files could not be accessed. Each A3 page should be viewable in one without the need to zoom in to view individual words.

This submission is moderated 'in house' and as such the work should be sent to a central clearing location by June 15th. The work is not sent to moderators homes, there was some confusion about this, this year. A number of centres sent their samples in very late and often without the CAB's. The work cannot be moderated without the CAB's. In addition to this we saw a slight increase in the number of centres failing to send photographs of the coursework in with the CAB's. It is a requirement that photographs be submitted to provide evidence of the marks allocated in the making section. Centres should not simply state 'see photographs in the folder' as the CAB and the folder are sometimes separated.

The fact that the majority of centres accurately marked their work this year has meant there has been a reduction in centres having problems in meeting the

requirements for the highest assessment criteria. Some centres however, still face problems centred on students who had not met the level of demand required for an AS level submission. Despite this there has been an increase of work coming from centres that introduced elements of choice and diversity into their tasks encouraging individual work that fulfilled course requirements but allowed students to express their skills and talents. Many centres still adopt a formulaic approach where all students investigated the same product, were given a very prescriptive design brief and all produced the same manufacturing task, or all 'investigating' the same product. Where students are asked to investigate exactly the same product, they sometimes "share" information, which can show enormous similarities in content between students and will in severe cases, be referred to the compliance department at Edexcel on malpractice grounds. Centres are therefore encouraged to very carefully check work in these situations, to ensure that all students are submitting their own individual work.

Product Investigation

The requirements of the Product Investigation element of the course are now familiar to centres, the vast majority coping well with this section, producing commendable work. Most of the problems in this section still tended to be associated with the comparison of products that were too similar. In general we saw far less of products that were too complex, although one or two students still offer comparisons of mobile phones or other complex devices.

This section continues to be completed well, with centres often using the template system based upon the mark scheme sub-headings to enable students to focus their answers. There appeared to be less centres this year where all students studied the same products. We obviously recognise this as a useful and acceptable management tool, particularly in larger classes, however the work can often turn out to be formulaic and very similar. The utilisation of a wider range of products in the class for this part of the submission often helps the centre to discover different products, manufacturing techniques, and processes; thus in turn, extending the knowledge base for commercial manufacturing processes and aiding understanding for the unit 2 examination.

This section was again generally well presented by centres, the majority of centres following an established pattern of presentation. We saw an increase in the use of disassembly photographs from last year this helped enhance the understanding of the work being presented. Where centres fail to submit an image at all of the product under investigation, it makes it very difficult to justify the answers submitted in the rest of this section.

As in previous years, where the students failed to perform well; the majority did not select an effective second product which was different enough to allow an informative comparison / contrast. This was a particular issue with the submission of perfume bottles, with moderators seeing a great deal of comparison being attempted between two blow moulded glass containers, with comments being made about the similarity of each product. It is difficult to justify marks allocated for a justified comparison, if the student is simply stating 'there is no alternative'; hence this is a bad comparison to use.

The use of ICT helped students to organise and manage their work. Although the wholesale copying of information and then pasting onto sheets was again not helpful and we need centres to discourage this from the outset as the structure of the vocabulary and language used often stands out from other work submitted by the same student. As in previous submissions, the best work was seen where students had disassembled products in order to analyse the component parts in detail or at the very least had used or handled the products. Some students used only photographs of products to investigate, which severely limited their experience in this section.

Criterion A - Performance analysis

Yet again many students were successful at accessing the bulk of the marks in this section; it is noticeable that the very highest mark range was again less easily accessed. Too many students still do not give sufficient detail to earn the maximum marks; they failed to justify their choices. A few still dealt in generic terms and some gave the information about the function etc. and failed to apply it to the chosen items. Too many students still fail to consider the commercial manufacturing process when justify the shape of products, tending to stick rather generically to the aesthetic or ergonomic properties. It is a common misconception to simply state what materials have been used in the two products in this section, when students should stating what the performance requirements of the materials should be, then suggesting the appropriate material in the next section.

As previously reported the most successful scenario for the majority of students was to set the evidence out as described in the assessment criteria; form, function etc. and then go on to detail each of the elements and attribute them to the products to be compared. The choice of a similar product to compare and contrast was again central to reaching the higher marks and many students failed to consider this fully, selecting products that were too similar such as a card package, compared to another card package. Where students pursued these very similar products, opportunities to compare and contrast them were minimal. Although packaging products in themselves make an excellent focus, if the contrasting package is made from a different material and a different manufacturing process.

Criterion B – Materials and components

There has been some improvement on last year’s submission in the selection of products to be studied. We saw less products having multiple (more than 3) materials being discussed and a sensible focus on 2 or 3. A significant number of students missed out on the top marks by not directly relating the information to the product and too few used good technical terms for the materials properties, we see less reference to materials such as ‘metal’ or ‘plastic’ but have seen an increasing number of inappropriate material. A significant problem again this year was the lack of engaging in evaluating the materials advantages and disadvantages, a specific requirement of the mark scheme. Alternative materials were usually suggested, however their justification again failed to focus on the specific material properties to do the job required of the product. Sustainability was addressed by most students and was dealt with in a more informed way than previously, although we still saw some students failing to recognise the sourcing of certain materials as being environmentally unsustainable. Students

sometimes failed to apply their analysis directly to their chosen product. When describing the environmental impact of using particular materials, many responses were generic and superficial, usually mentioning energy use, depletion of resources and problems of disposal, although the centres have clearly recognised much of this in their marking.

Criterion C – Manufacture

It was again, rarely a problem for a student to identify a manufacturing process, but it was still increasingly uncommon to see that process fully justified in terms of the need for the process in the products manufacture. The package bottle may well have been die cut as a suggested manufacturing process, but few recognised the justification of the process in terms of; a net shape, good replication, accurate products, and applying these to the products specifically. There were still a large number of entries that settled on a description of the manufacturing processes, indeed often copying wholesale from text or internet sources rather than justifying why the choice had been made. We also saw an increasing failure to offer advantages and disadvantages against the chosen processes in this section. The majority of students dealt with the impact on the environment, although many again slipped into talking about the material rather than the process. Transportation of raw materials and components for processing and assembly was largely overlooked.

Criterion D – Quality

This part of the submission seemed to have improved in most areas. Quality assurance diagrams are now regularly submitted for the manufacture of the entire product, from sourcing materials to after sales. Quality standards are either omitted completely or correctly applied, but sometimes not connected to the product specifically. Quality control is still one are that can be varied in its success. Some centres failed to address specific forms of quality control stating still where and what quality control would take place rather than how it would take place.

Product Design

This section was a disappointing part of the portfolio, although some improvement on last year was noted. The work was still often formulaic and restricting, with students submitting work of a simplistic nature, lacking in creativity. Whilst work was seen at the highest end of the mark scheme, there is still a lot of mediocre designing offered this year. Last year it was suggested that centres were failing to teach design strategies, this year showed some improvement in this area. With students using source materials and modelling strategies at the higher levels. There was still a considerable majority who adopted few strategies and simply drew pictures of ideas from their head.

More centres perhaps than last year set topics that stayed within the safety zone of what they have been comfortable with in the past, some preferring to adopt a resistant material approach to their designing, by submitting designs for furniture or lamps. Not a problem where the level of demand is not an issue, but some students found it difficult to demonstrate the designing skills sought because of over simplistic tasks set by centres. It would again appear that a

significant number of centres have a preference for architectural projects in this section, often not an easy way of accessing the marks available due the complex nature of the products being designed work.

We saw fewer projects offering a 3d and 2d element (this is not required) and a fall in the number of multiple submissions in this area.

Criterion E - Design and development

The work submitted in this section was often simplistic and lacking in depth for this level. Body styling exercises were common and these failed to deal with the technical detail and sub-system design work required for mark at the highest level. The best all-round work came from students who added informed, succinct and useful annotation to designs, which demonstrated their understanding of materials and processes likely to be used in manufacture, and who presented summative evaluative statements focused on the set design criteria. Students should not be afraid to insert additional information at this stage to support their design work, such as technical information sourced from primary sources or the Internet. However, considering the nature of the course, this section was a little disappointing in terms of the quality and range of designing techniques employed.

The development section was especially limited in a number of folios, with a selected design idea quickly appearing as the Final Design with little changes or refinement in between.

Development of a final design proposal commonly lacked demand, variety of alternatives and a real understanding of what development should be. Good levels of credit were achieved by students where they understood that development meant ‘change’, and that they should illustrate this by bringing together the best or most appropriate features of their design ideas into a coherent and refined final design proposal that met all of the design criteria.

For successful development there should be evidence of the final design proposal having moved on from an original idea through the results of graphical exploration and evaluation. It is not acceptable to simply take an initial idea and make superficial or cosmetic changes to it and then present it as a final developed proposal. Students should include as much detailed information on all aspects of their developed design as possible, as this is an opportunity to show knowledge and understanding of their design and make activities.

The use of modelling was almost always evident, but again not as a developmental tool. Too often it was offered at the end of the process to ‘prove’ the final design would work. We ask the centres encourage students to use the models made to improve designs and move the design forward. Similarly where CAD was used often the final design was not significantly different from, or improved on, the early attempts. Traditional 3D modelling was occasionally very well evidenced to show real development work although this was sometimes replaced by limited CAD modelling, rather than combined with or supported by it. This CAD modelling was sometimes evidenced as simple changes to colour-ways rather than structural product development. The best use of the CAD was to show clear changes and make realistic presentations of how the changes will work in the final product, then assess them and choose the way forward to the

final design. A viable working drawing in orthographic was then invariably supported with an isometric derived from the orthographic, even better with an exploded view to better illustrate how the components interact with each other.

The evaluation of this section was better completed similarly to previous year's submissions, the work was often formally evaluated at the end, the designs were often evaluated as they progressed and centres often developed a formula approach to ensure this was completed. Evaluative comment can then accompany the development of the section and the specification be used to objectively evaluate at the end.

Criterion F - Communicate

Many students achieved good marks in this assessment section. Credit in this section can be gained from communication evidence throughout the design portfolio. However, the level of communication was very varied. Students, in some cases, had been coached to use a variety of media to good effect. The use of CAD is increasing and often of high quality and the vast majority of students demonstrated expert skills in using CAD programs they were familiar with, increasingly with expert submission from 'Google Sketchup'. Although we are noticing an over-reliance of the use of CAD as a production tool for working drawings, these drawings are often presented inaccurately, upside down or without appropriate dimensions.

There was again too little evidence of students producing drawings and enough information for a skilled third party to manufacture a designed product. A disappointing feature of this section was again the widespread lack of basic drawing ability. It was obvious that some centres had spent time on developing skills in drawing and this was reflected in the work presented by their students, but in many other instances, drawing and sketching was weak and lacking in precision. The disappointing feature this year was the lack of use of modelling (3d or CAD) as a design tool, there was plenty of evidence of it as practice presentational piece, but little to establish change or decisions. Students were consistently failing to demonstrate a real understanding of the design issues, or the detail that drives the real solution, to the kind of problems being tackled. Where students had offered design work for products of a commercial or industrial design nature they tended to largely overlook the needs of manufacturing processes or the assembly of products.

Product manufacture

Making was a significant element for most students in eliciting marks and overall there was evidence of some good quality work, although a few centres allowed students to submit work that was barely of KS4 quality. Yet again some centres submitted only a single product outcome, hence failing to demonstrate the range of processes and manufacturing techniques looked for. The most successful centres offered two product outcomes, often from different graphical pathways, i.e. architecture and packaging. Some had found demanding projects that allowed for a very wide range of skills in the single outcome, such as a demanding architectural submission that did not depend upon a single manufacturing output. Centres are increasingly finding new technologies to assist with the manufacturing process and we see an increase in the use of CAM outputs every year. This must always be balanced with other modelling skills

and the students must produce a range of skills, not just repeat the same ones. The utilisation of 3d printing for the manufacture of a designed or given product is ok when balanced against the more traditional manufacture of something else. Centres found it difficult to demonstrate a range of manufacturing processes when they have only pressed the go button ion a 3d printer or a laser cutter.

Criterion G – Production plan

This section was often completed to a good standard. Detailed production plans of the manufactured product appeared in most folders, with clear evidence of tools/processes chosen. A significant number of centres do not offer a sequence of key deadlines. This is often most usefully delivered visa a Gantt chart, with broad deadlines offered for key components. A diary was often given as supporting evidence; although this did not support the assessment in this section it was useful as a guide for criterion H. Detail at the highest level is sought in the planning paper work, to present planning charts that state make 'vacuum forming mould' or turn 'perfume bottle' do not provide the detail required in those operations for this level. The students must breakdown the manufacturing procedures into more manageable steps.

Criterion H - Making

Many centres who have opted to set only one manufacturing task, have recognised that this does not always elicit marks at the top end of the mark scheme, and adjusted their marking appropriately, with less adjustment needed in this section. Where a task uses only a single material, it does not match the criteria for the higher levels of response. The assessment criterion states that a 'range' of appropriate materials must be selected and those students should work with a 'variety' of materials, processes and techniques. In order to fulfil these requirements, the use of at least two materials and processes must be evidenced. It is important to note that students for Graphic Products do not need to submit a 3 and 2d element for this submission, but where they did it no doubt supported the understanding of the theoretical elements involved in other parts of this course and can enhance the range of skills seen in this section. This said, some products, packaging in particular would seem pretty unfinished should they not have the 2d element (applied graphics) as well as the 3d element (packaging container).

Many centres embraced the ethos of this section and set manufacturing tasks that allowed students to experience a range of materials, processes and techniques, planned to develop skills that students could call upon when designing and making their A2 project, and some high quality outcomes were seen. Having said this there are a number of centres who have opted to allow students credit for skills or processes that re exceptionally simplistic. Cleverly designed manufactured outcomes that have a 6 or 7 different processes utilising lathes or plastic processing equipment that have no or little demand will not gain the credit required at the high end of the mark range, despite technically having the range of skills. To simply place a pre made mould into the vacuum former and form a piece of HIP's is not beyond a KS3 student. To drill a hole, or use a sander, glue gun or even face off a piece of material on the lathe, would not be beyond a KS4/3 student. The level of demand must be appropriate to KS5 and the student would be expected to design and build their own moulds or jigs appropriately. Most centres set two tasks, which were complimentary in

manufacturing output terms, hence providing a wider range of manufacturing processes than would normally be seen from one outcome. Where highly controlled single tasks were set and all students in a cohort were given the same detailed working drawing, cutting list and materials, the outcomes were often difficult to differentiate between unless high quality photographs showing individual skill levels were provided. In much of the work presented, there were opportunities for students to make manufacturing decisions, such as choice of materials from those available in a centre, choice of joining techniques, use of certain processes, finishes etc, which would have given students more ownership of their work and helped in differentiation. The Level of accuracy and precision needs to be in-built to the project selected. Using a laser for cutting and printing did mean that some of the projects were unable to show a full range of skills and techniques. The work produced was unquestionably of a good quality, but this is not within the spirit of the course or the exam or demonstrating arrange of skills and processes. It is vital that centres control the range of skills utilised in the manufacturing section, in order that students demonstrate a range of manufacturing processes. A simplistic guide is 50/50. Where students were given no choice of materials, for example when a task involved aluminium casting, they should still have an understanding of why that material was appropriate to the product under construction, i.e. good strength to weight ratio, printability, fluidity for moulding, good light conductivity, etc. This information should be offered as justification. Where it was carried out successfully, justification of selection was evidenced through annotation of photographs of making or in the plan for production. Where photographic evidence was shown of the making it made it much easier to credit a range of making skills, techniques and materials. Safety awareness was invariably demonstrated through statements within the schedule of making.

Criterion I – Testing

The submissions for this area were relatively well marked; many students are still completing subjective evaluations and leaving the testing as a minor aspect, but many centres have recognised this and marked accordingly. Centres need to be aware that a range of tests should to be carried out and these clearly explained, justified and put into context. In some cases this again was not recognised by the centres and the work was generously marked because of this. Indeed some centres pointed to credit being given for annotation and evaluative comment given within the design work. This is not acceptable. This is a stand-alone section and should be a formal summative evaluation of the manufactured product only.

With many centres it was still obvious that this section was a very last minute activity with third party testing being very superficially applied. To enable the evaluation and testing to take place with some value attached, it is worth the student putting together at the outset, a manufacturing specification for the projects undertaken, care being taken not to offer comments about design constraints. Students then should apply tests to the specification points and use this data to inform their evaluation of the product manufactured. Some students failed to earn full marks as they carried out an evaluation solely from a personal stand-point. Where third parties were involved, often with a questionnaire, results were fuller and more interesting in that they usually carried a broader spectrum of comment. The use of photographic evidence was invaluable at this

stage and often conveyed the outcomes or experiences of testing at a glance. It was also a significant source of evidence of the use of 3rd party testing, where this had not been evident elsewhere in the portfolio.

Grade Boundaries

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