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General Certificate of Secondary Education
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ICT 45203

(Specification 4520)

Unit 3: Practical Problem Solving in ICT

Report on the Examination

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General

In June 2012, Unit 3 was available with six Problems, of which solutions to Problems 1, 2 and 3 were frequently seen by Moderators. The work presented by the majority of students was appropriate, as they attempted to indicate their understanding of the requirements of the problem. The project management approach needed appeared to be well understood by these students.

In Candidate Booklets the six Problems that students could choose from are:

- Help to organise a school visit to a local attraction.
- Help to organise a school prom
- Help to organise an event to raise funds for a charity
- Help to organise an event in school for senior citizens or mothers and toddlers
- Help to organise work placement arrangements
- Help to organise a school sports team.

Summary

It would help many students to state at the start which problem they are tackling.

The organisation of work within the portfolio was an issue for some students.

The work lacked focus and this impacted on other headings in the portfolio where students did not understand that the **Milestones** are about stages in solving the problems that the organiser has set.

The **Risks** section was generally tackled well but a few students interpreted this as 'whilst at the event' rather than in planning it.

Managing storage was **not** as well produced as expected with many students failing to refer to all three aspects needed (folders, filenames and versions).

In both **Collect** and **Select information** some students did not attempt all that was needed for a full solution.

Modelling with data often missed out one of the four elements needed. In the case of some students, there was little or no data analysis or selection.

In the **Develop information** section, although there was some exceptionally good work seen, in other cases the evidence was hard to find as it was scattered throughout the portfolio. Moderators noted that the quality and size of some supporting screenshots did not help the student to demonstrate how they had built and developed their solutions.

Produce a report was of variable quality with some students producing reports which were both pertinent and written in a style entirely appropriate for the purpose and audience – this was high quality work. However, other students were unaware of how a formal report like this should be presented or what it should include.

Evaluate others' use of ICT was attempted by some students in the same manner as for Unit 2, whereas it should have been an evaluation of how working as a team could have benefitted students results (for example, in three sections Milestones, Risk and Collect information).

Part 1: Planning and managing the problem

1a Milestones

Work presented by students varied, as some knew what milestones were and others wrongly interpreted them as the headings in their portfolio. However, many students showed they had read and understood the requirements of the problem and were able to list the appropriate steps (for example, creating a model of the 'costs', collecting the data, selecting the necessary lists, etc) to produce the planning stages. Students who used the Candidate Booklet (notably in sections 2 and 6) to identify the steps needed to solve the problem generally did well in this section.

Once the milestones had been determined, students needed to break them down into manageable sub-steps. Getting the sequence correct (some students used Gantt charts to help) and determining

the duration that each milestone might take follows on from the sub-steps. A final part was to consider the resources needed to produce them. This section should be developed as work progresses. Appropriate milestones are essential to be able to undertake sections 1c and 2g effectively.

1b Risk
All students may use the risk outlined in the Candidate Booklet. They should explain the issues involved with it and then plan a strategy which suggests how it could be avoided and what precautions would need to be taken. This section was generally done well by many students who attempted it. It was expected that students would select appropriate risks from the topics they had studied in the specification subject content or ones which directly related to the problem they had chosen.

1c Progress
Where milestones had been produced, students were able to monitor the status of each outcome, describe any barriers or issues encountered and confirm whether a milestone had been completed or not. Students' work in this section was mainly appropriate and tackled using a diary, blog or additional column to an existing table. It was not always evident that this had been done as the solution developed.

1d Managing storage
This section was tackled unevenly. Many students included effective diagrams (screenshots in most cases) of their folder structures, which were appropriate and well produced. Filenames were usually sensible, but not always explained. The area of managing storage which some students need to develop was in the use of versions of their files (where they were desirable).

Part 2: Independently using ICT

2a Collect information
Many schools/colleges marked this section correctly, with students first considering the data needed to solve the problem. Students who did this well went on to consider alternative ways of collecting the data (for example, paper based forms, online forms, e-mail capture, etc). They then produced their own collection method and included the final version here. A filled in 'form' (one is sufficient) should be included in the Portfolio – this was not always included. Although there were some exceptional collection methods seen, some data capture forms were inadequate at this level, as no thought had been given to the field names or their order on the form or the possible data size to be entered. A database structure should be set up with a database input form used to enter the data from the collection method. Students should ensure that field names used on the capture method match ones in the database table.

Because of the on-going nature of the problem, additional data to that initially collected should also be entered (eg in Problem 1, those who had paid in full for the visit). Students who understood the requirements of this section also reviewed the data collected and used. Able students may have separated the data collected into related tables, used validation rules to prevent unsuitable data from being entered or created a database input form which contained a sub-form.

The moderation process awarded a higher weighting to students' work on collecting and gathering information than to their consideration of alternative ways of collecting information or reviewing the information collected but all need to be taken into account.

2b Select information
The selection of information was different for each problem, but the level of demand was comparable. More able students considered what information was necessary to be initially sent to parents informing them about the 'event'. The next stage for each 'selection requirement' was to consider alternative ways of selecting what was needed (eg 'hard-wired' search, sort, 'parameter' search, 'wild card' search, etc). Many students had created necessary selection methods and included the final versions here. More able students ensured the outcome was fit for purpose by linking a selection method to a database report or mail merged document – there were some excellent examples of work shown for this aspect (which were fit for purpose). Again only the final version is required to be included in this section. It was especially noticeable that the most able students completed all aspects of selecting information correctly and in an appropriate way.

The moderation process awarded a higher weighting to students' work on selecting information than to their consideration of alternative ways of selecting or using information which is relevant and fit for purpose.

2c Format information

Students are required to show techniques used in formatting: page layout, text, tables, images, numbers and records/cells. This should have been a straightforward section in which to achieve marks but some students limited themselves to explaining only a few of the six formatting techniques required. In this respect it was disappointing as the descriptions of techniques shown were usually good. The purpose of the formatting is to make the 'end product' fit for purpose. More able students did explain/describe the use of page layouts in their Portfolio (or Report); text in various situations; tables in their Portfolio (or database) and images (for example, screenshots) used in their Report (or Portfolio). However, the formatting of number (which could have been used in a database or the model) and records/cells were less commonly explained.

2d Modelling with data

There are four things that students should include: the data chosen, the model created (for example, display the formulae/functions used), ask at least three suitable 'what if' questions, and interpret results. Some students were provided with a data sheet to assist them to analyse the data needed, others had used Internet sites to gather the data or a combination of the two. However, selection and analysis of data was not always shown in students' work.

The model needs only be simple, but it must be effective and tackle the essential nature of the 'costs' involved. Many students showed the model had been created (eg printing out the formulae/functions used). The use of 'what if' questions was usually well considered but the element which also needed development for more able students was in interpreting the results obtained in terms of the situation being modelled.

2e Develop information

This section was variably presented in this series. It varied from being presented as a separate section and at other times it was 'everywhere'. This section can be considered as the 'hub of the solution' (implementation) for some other sections in Part 2 of the Portfolio (for example, 2a, 2b, etc). It is perfectly acceptable for students to develop their solution here and then use the results to support their evidence in sections such as 2a, 2b and 2c.

In section 2e, it was expected that students would show stage(s) in producing their data collection 'form'; setting up their database table(s) and database input form(s); creating information letters, searches, database reports or mail merge documents. The completeness of this and students' commentary (explanation, description or statement) determined the mark awarded. Although there were some excellent examples of the type of work to be included it wasn't universally well produced across every school/college that entered students.

2f Produce a report

Almost all students presented a separate report which made use of previous solutions from their milestones. By doing this they achieved an aspect of the report which was to bring together a wide range of different forms of information collected from them. The report could be produced using Presentation or a 'Publishing' software. It should include final versions of 'solutions produced for the organiser' (ie no development work needs to be included). The report does not need to include sections of the Portfolio which are not directly involved in the solution for the organiser (for example, there is no need for Milestones, Risk, Evaluation, etc in the Report).

The report should be formal, which means referring to the recipient, the sender, the date produced and its purpose, with a contents section incorporated. The language used should reflect the audience (headteacher) for whom it is intended. The quality of the reports seen varied depending on students' abilities but a significant factor was how well (or not) students explained the reasons for including something. At the end of a report, a summary section was expected which included a conclusion and recommendations.

2g Evaluate

In the Evaluate section, students need to consider the milestones that they established in Part 1. Typically students will have about 6 major milestones. In general, this was well done by many students, but it is a demanding section in which to achieve the highest range of marks for discussion.

For the award of the higher ranges of marks, students should consider **three** of their milestones in depth and reflect on how well they were achieved and also make complete/reasonable reference to the other milestones. If they are able to describe how effectively three were solved, then an award of 7-8 marks is appropriate. If, in addition, a student is able to compare these effective descriptions with alternative effective solutions in each case, then they are considered to be discussing the milestone, which makes a mark award of 9-10 accessible.

2h Evaluate others' use of ICT
Although the heading of this section is very similar to that used in Unit 2, its requirements are different as it is about the impact of team work (working with others) on results.

The advice provided for Evaluate others' use of ICT is that students should concentrate on the three sections recommended in the Teachers' Notes (1a Milestones, 1b Risk and 2a Collect information). This section should allow a student to explain how working in a group could/should have assisted with the solution. It was obvious by the responses seen that, as suggested in the Teachers' Notes, some students had opportunities for collaborative work in these sections. This appeared to assist them to make more a considered response about how working with others had helped them.

Section 2h was not always well done and the following advice is offered: for higher mark awards of 4-6 marks, students should focus on the three recommended sections. Describe how working with others could have improved on what could/did happen to make the solution more effective (for example, efficiency, wider range of ideas, better sequencing, other ways of tackling a problem, reduced times, etc). To achieve 7-9 marks, students should suggest alternative effective ways of working with others in which an even more productive solution could have been achieved.

Many students only achieved 1-3 marks for stating a way(s) in which working with others in a team could make an improvement.

Administration

- Internal standardisation has a significant effect on students' awards. Schools/Colleges must standardise their marking across different teachers to ensure consistency.

- Teacher annotation: it is a requirement of the Regulator's Code of Practice that controlled assessment is annotated by the teacher to indicate how marks are awarded. It is evident that schools/colleges which did annotate students' work were more likely to have their marking agreed. It is perfectly acceptable for annotation to indicate simply where in the students' work a particular assessment criterion has been met.

- A positive aspect was that the majority of schools/colleges submitted the mark grid with the students' work and this was particularly helpful in being able to confirm the accuracy of school/college marking.

- As the majority of schools/colleges had used the electronic mark grid, there were few arithmetical errors on:

    - the Candidate Record Form
    - the transfer between the above and the Centre Mark Form

- All appropriate paperwork needs to be fully completed and signed - including the Candidate Record Form and the Cetnre Declaration Sheet. There were some portfolios without a Candidate Number and without the necessary Candidate Record Form. Failure to comply with these requirements can cause delays in carrying out the moderation.

- All necessary up-to-date paperwork can be located and downloaded from the AQA website.

- The Centre Mark Form, on which overall students' marks were entered for this component, is a three part carbonated form. Schools/colleges should ensure that:

    - the marks are clear on all three parts
    - alterations clearly show the correct final mark
    - both the second (pink) and third (yellow) copies go to the moderator (or 2 copies of the EDI forms).

- The vast majority of schools/colleges are to be congratulated in sending the work of their students for moderation in a well organised fashion that was securely fastened together using treasury tags.

Statistical data and information on grade boundary ranges www.aqa.org.uk/over/stat.html

UMS conversion calculator www.aqa.org.uk/umsconversion