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Principal Moderator Feedback

Summer 2014

Pearson Edexcel GCSE
in Statistics
Controlled Assessment 5ST02_01

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GCSE Statistics 5ST02
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Introduction

Many students responded well to their chosen theme. The most popular theme this year was Time, followed by Cars.

In general the work from centres was well presented, neatly packaged and arrived in good time. Many centres had difficulty dealing with the administration procedures, which caused a considerable amount of extra work for many moderators. As usual a check list is offered at the end of this report to assist teachers and examinations officers in preparing controlled assessment tasks for submission.

Many centres did not use the Student Record Form to record teacher feedback to candidates, so it was unclear whether this vital aspect of the Planning stage had actually taken place. Centres are reminded that any changes to the initial plan must be agreed by the teacher and recorded on the Student Record Form.

Some centres submitted work that had not been annotated in any way, and that significant errors in the applications of diagrams and calculations had not been identified. Again, this caused many moderators a considerable amount of extra work in trying to untangle what the candidates had done. Centre assessors are expected to identify errors in students' work.

A significant number of students produced tasks that attempted to demonstrate all the techniques they had been taught, and often beyond their apparent ability. This resulted in a collection of mini investigations without any coherent aim or strategy. This significantly increased the amount of work for many candidates but did not help them to access the higher marks. Candidates should be discouraged from producing a collection of mini investigations.

Some centres provided data sets for their students. This is not recommended as it often restricts the ability of candidates to access the higher marks in all strands (not just Strand 2a). The collection of real data is a vital aspect of controlled assessment in GCSE Statistics, giving candidates the real sense of solving problems in a statistical context, and this should not be denied to them.

Centres are reminded that internal moderation must take place if there are two or more assessors marking the work.

Specific comments

Strand 1: Planning

Students should be advised **not** to produce investigations involving the use of a number of hypotheses that are only loosely related by the general theme. As in previous years, the best tasks this year were produced by candidates who were able to deal with more complex investigations. Complexity in this context involves the use of (a) interrelated variables, or (b) a sequencing of three or more techniques.

Students need to give detailed reasons for their particular choice of techniques and explain why these are appropriate in the context of the data and the aims of their investigation. Simply stating that, for example, a scatter diagram will be used to compare the correlation of data is a low demand justification for the use of that technique.

It should be noted that to award the higher marks in this strand, students need to do more than simply give a simple reason for why a particular techniques will be used, eg “I am going to draw a box plots to compare the medians and interquartile ranges” is a low demand justification for the choice of the technique. A more demanding reason would include a discussion of the type of data that was being used.

The amount of data to be collected should be discussed and related to the choice of techniques being used, eg a comment such as “I will collect 30 items of data as it won’t take me long” is a low demand justification for the amount of data to collect. A more demanding justification would include detailed consideration of the amount of data needed for the chosen technique to ensure reliability in the results obtained.

Simply stating that outliers will be removed is a low demand treatment of outliers. A more advanced treatment would be to give details of the criteria used to identify them and include a discussion, in context, of the probable effect of their inclusion, or exclusion on the reliability of the results.

Strand 2a: Data collection

Generally this strand was not done well. A significant number of candidates treated the data collection strand as merely an exercise to get the numbers they needed to use with their techniques. Only the best candidates had any appreciation that the quality of the data had any implications on the reliability of the conclusions that could be drawn.

Candidates should give more detail in explaining their sampling methods, eg when taking a random sample they should explain how the data items will be numbered and the randomisation process they will be used to select them, eg 50× Ran# on a calculator. In particular candidates should be advised to explain why they decided to take a stratified sample from a small data set when it would appear that the use of the whole data set would be more appropriate.

Candidates should give more details about how the data is collected. When collecting secondary data they should state the web addresses they are using and what they did to check the accuracy of the data. When collecting primary data they should explain how the data was collected and, if working with others, their role in the data collection and what was done to ensure that the data was collected correctly by each participant.

Strand 2b: Processing and analysing

Moderators reported that the centre assessment of this stand was often generous.

It should be noted that it is not the difficulty of the technique that is being assessed in this strand, but the sophistication of its use. For example, the use of the standard deviation to compare the spreads of two data sets is considered to be a low demand application of the technique, whilst the use of the standard deviation in a test for normality is a more demanding activity. The use of the standard deviation to compare standardised scores would be an even more demanding activity. Similarly, the calculation of a Spearman coefficient to conclude merely that there is “a positive correlation” is a low demand application of the technique, whilst the interpretation of a Spearman coefficient in context is a more demanding activity. The comparison of two Spearman coefficients in context would be an even more demanding activity.

The use of ICT to do the more arduous calculations and representations is to be commended, but students should be encouraged to be more critical of what is produced. Calculations should be given to an appropriate degree of accuracy, and the inappropriate choice of axes, or the poor labelling of graphs, eg the omission of units, must be penalised.

Calculations or diagrams that have not been used in some way, whatever the difficulty of the calculation, cannot receive any credit in this stand if it has not been used.

Strand 3: Interpreting and evaluating

The centre assessment of this strand was slightly generous.

Many students interpreted their results as they went along. This is perfectly acceptable and should be commended, but it should be noted that to gain the higher marks in this strand students should do more than simply repeat their interim findings; they need to evaluate their results. This includes a discussion of the reliability of the results in terms of the quality of the data collected and the techniques employed to analyse it.

Only the best students were able to discuss the reliability of their results by discussing the sampling regime, the quality of the data, the amount of data used in the techniques and the particular choices and application of techniques employed, e.g. how the choice of class intervals in histograms effected the outcomes, how the inclusion/exclusion of outliers effected the outcomes, etc.

A significant number of students were unable to evaluate their findings in terms other than simply stating that if they had taken a bigger sample they would have got better results. This is considered to be a low demand evaluation.

Few students interpreted their findings in a wider context, eg the use of national statistics or dedicated data bases.

Administration check list

The following check list is offered to teachers and Examinations Officers to assist them in preparing samples in future submissions.

1. Have the marks been entered correctly on the OPTEMS?

2. Does the sample contain all the starred candidates on the OPTEMS?

3. Has the work of an absent candidate been replaced by an equivalent piece of work?

4. Does the sample contain the tasks with the highest and lowest marks?

5. Has the work been authenticated by both the teacher and the student? (Two signatures are required on the Student Record Form).

6. Has the centre retained a copy of the OPTEMs for its records?

Key points

- Centres are reminded that any changes to the initial plan must be agreed by the teacher and recorded on the Student Record Form.

- Centre assessors are expected to identify errors in students' work.

- Candidates should be discouraged from producing a collection of mini investigations.

- Centres are discouraged from providing sets of data for their students.

- Candidates should give more detail in explaining their sampling methods.

- It is not the difficulty of the technique that is being assessed in strand 2b, but the sophistication of its use.

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

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