# 2018 VCE Computing: Informatics examination report

## General comments

The 2018 VCE Computing: Informatics examination contained three sections: Section A (Multiple-choice questions), Section B (Short-answer questions) and Section C (Case study).

The multiple-choice questions were answered well. Areas in which students performed well related to validation, file naming, conventions, threats and security. Areas that students struggled with were online data, table normalisation, secondary sources of data, efficiency and comparing data sets.

It was evident in student responses to the short-answer questions that students understood data types, variables and data validation. Responses were also strong in the areas of data entry methods, integrity of data and project management.

It was clear that students struggle to reference correctly (for example, in responses to Section B, Question 7b.). Students need to know what the referencing method is and the structure around the selected referencing method (author, date, title, retrieved [American Psychological Association] and URL).

Another area for improvement is the writing of criteria (Section B, Question 3 and Section C, Question 5b.). While a criterion does not have to be in the form of a question, for students who struggle with the concept it may assist them to formulate one. The statement must be measurable; however, a large number of students made criteria statements that were not measurable, and therefore could not be awarded marks.

Many students struggled with the fundamentals of file management in Section B, Question 5. Students could not identify what the issue was or suggest how to fix it.

Archiving was another area that requires improvement. A large number of students did not respond to Section B, Question 4. Of the students who did attempt the question, many could not articulate the reason why the patient files would be selected for archiving.

Students are advised to remove the detachable insert from the centre of the examination during reading time. Students may find it easier to refer to the Case study when it is separate from the question and answer book.

# Specific information

This report provides sample answers or an indication of what answers may have included. Unless otherwise stated, these are not intended to be exemplary or complete responses.

The statistics in this report may be subject to rounding resulting in a total more or less than 100 per cent.

## Section A – Multiple-choice questions

**The table below indicates the percentage of students who chose each option. The correct answer is indicated by shading.**

| Question | % A | % B | % C | % D | Comments |
|---|---|---|---|---|---|
| **1** | 2 | 73 | 19 | 6 | |
| **2** | 32 | 20 | 47 | 1 | |
| **3** | 4 | 93 | 2 | 1 | |
| **4** | 83 | 2 | 4 | 11 | |
| **5** | 3 | 20 | 34 | 42 | Option D was the most accurate as third normal form (3NF) requires each table to have fields that are dependent on the primary key. |
| **6** | 12 | 15 | 26 | 47 | The photos Peta has found are non-digital. It is a primary data source as Peta is correcting the data of the trees. It is quantitative as she is counting the trees. |
| **7** | 75 | 5 | 7 | 12 | |
| **8** | 0 | 22 | 1 | 77 | |
| **9** | 18 | 7 | 19 | 56 | |
| **10** | 6 | 59 | 30 | 4 | Option C, calculate the mean and the median of each data set, is the best way to show the difference. Option B, plot the first data set against the second data set, was not correct as there is not enough information to know what actual data you are plotting and what it would look like. Options A and D did not provide any meaningful information with which to compare the data sets as a whole. |
| **11** | 63 | 4 | 11 | 22 | |
| **12** | 13 | 74 | 11 | 3 | |
| **13** | 74 | 13 | 3 | 10 | |
| **14** | 21 | 10 | 57 | 11 | |
| **15** | 9 | 9 | 5 | 77 | |
| **16** | 6 | 16 | 62 | 17 | |
| **17** | 7 | 20 | 37 | 35 | The study design states that ‘measures of effectiveness of an information management strategy include integrity of data, security, ease of retrieval and currency of files’. |
| **18** | 7 | 86 | 3 | 5 | |
| **19** | 16 | 11 | 28 | 45 | Option A, send an email to all members, is the most efficient. All the other options were about creating something that takes more time and effort. |
| **20** | 12 | 2 | 2 | 84 | |

# Section B

**Question 1a.**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 48 | 34 | 18 | **0.7** |

Students who obtained full marks explained that the website data was not encrypted; therefore, unauthorised access can occur during transmission/exchange. Students who received only one mark mentioned TSL/SSL encryption, that the data was not secure or that it was valuable to deliberate threats; there was no explanation as to why it was needed.

**Question 1b.**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 26 | 48 | 26 | **1** |

The most common responses that gained marks were:

- could violate privacy laws
- could lose trust of clients or similar, for example, loss of reputation
- could lose clients as a result of data breach
- risk to client if their data is lost.

Students who mentioned the *Spam Act 2003* did not gain marks as this Act is not directly related to the *VCE Informatics Study Design*.

**Question 2a.**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 16 | 50 | 34 | **1.2** |

Magnitude: numeric (decimal or floating point) but not integer

Location: string or text

Many students selected number as a data type for Magnitude. The study design clearly states the data types and number is not included; the data type is numeric.

**Question 2b.**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 49 | 33 | 18 | **0.7** |

Student responses that gained full marks included:

- A flat file database is much easier to set up; much less training is needed because of the flat files' relative simplicity compared to a relational database management system (RDBMS).
- For simple data, flat file databases are quick to search, filter and sort compared to an RDBMS because there is no linking of tables.
- A flat file database's data is all in one place.

To gain full marks, responses needed to identify an advantage and explain why it is an advantage by comparing the flat file database to the RDBMS.

**Question 3**

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|---|---|---|---|---|---|---|
| % | 14 | 8 | 20 | 21 | 37 | **2.6** |

Students were asked to identify two concerns that affected the integrity of the given data and suggest a technique that could have been applied to address the concern.

Accuracy was the only concern that was accepted.

Any of the following were accepted:

- Concern: Inconsistent date format
  Technique: An input mask or date-picker on BirthDate field would allow all dates to be entered in the same format, for example, DD-MM-YYYY (1)
- Concern: Completeness for gender field
  Technique: A required field on the Gender field would ensure that all records are complete and have no blank fields or use of radio button choices.
- Concern: Consistency of suburb spelling
  Technique: A drop-down list on Suburb tied to Postcode field would ensure that suburb name is entered in a consistent form, rather than have the spelling of Mount, Mt and Mt.
- Concern: Correctness of birth date
  Technique: A check (validation rule) could be applied to the BirthDate field to ensure that data is correct and eliminate the year 2020, which is not correct.

**Question 4**

| Marks | 0 | 1 | Average |
|---|---|---|---|
| % | 56 | 44 | **0.5** |

Acceptable responses were:

- The patients' records chosen for archiving have not been accessed for 12 months (or similar).
- The patients' records need to be kept, but quick access to them is no longer needed.
- The patient has passed away.
- The patient has left the medical centre.

The statement of 'not very often' was not accepted. Students' responses needed to indicate a length of time.

**Question 5**

| Marks | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Average |
|---|---|---|---|---|---|---|---|---|---|---|---|
| % | 3 | 2 | 6 | 10 | 13 | 17 | 24 | 9 | 7 | 9 | **5.2** |

Students were asked to identify three different concerns about Freya's file management practices. For each concern students needed to:

- suggest what Freya should do to correct it
- briefly describe how this suggestion will help Freya.

Responses that gained full marks were:

- Poor folder structure. Create more folders, sort all files into them and then make sure the folder structure is used. This will help Freya quickly locate the file she wants.
- Poor/no file naming (e.g. doc, doc2). Use names that clearly identify the content of the file. This will help Freya quickly locate the file she wants.
- No apparent version control. Use a naming convention that includes a version number or date and store it in the same place as the previous versions. Or, store older versions in an archive

folder so that only the most current is in the primary folder. This will help ensure that Freya only updates the most recent version.

Other concerns were possible, but each concern needed to be different. For example, various versions of 'poor file naming' (e.g. doc1, doc2 versus sub176.pdf) only counted as one answer.

**Question 6a.**

| Marks | 0 | 1 | Average |
|---|---|---|---|
| % | 60 | 40 | 0.4 |

Students who obtained the mark included a question about deception or dishonesty; for example, 'Is it right to make people secretly pay more just because they earn more money?'

**Question 6b.**

| Marks | 0 | 1 | Average |
|---|---|---|---|
| % | 74 | 26 | 0.3 |

Students who obtained the mark included a question about fairness of ordering or bullying an employee to create an alternative pricing scheme; for example, 'Is it right to make a junior employee do something that is morally wrong when you are in the position to fire them?'

**Question 6c.**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 69 | 25 | 6 | 0.4 |

Students were asked to suggest two actions to take. There were many possible suggestions. For example:

- Publish (or some other way of getting info to staff) a contact list of people to ask when unsure, a code of conduct, standards of practice or company values.
- Make sure staff are aware of relevant legislative requirements regarding the use of data.
- Consult with stakeholders (staff) before future decisions are made.

**Question 7a.**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 30 | 57 | 13 | 0.8 |

Reponses that gained full marks were:

- Readers can look up the original source and find more detailed information for further research.
- It acknowledges that you are using another author's material and ideas (intellectual property), and you are not claiming it as your own. (Be a responsible and ethical researcher by giving due credit and ensure academic integrity).
- Protects Dion from claims of plagiarism.
- Attribute (give credit to) the creator and respect their 'moral rights' as per the *Copyright Act 1968*.
- Ensures 'fair dealing' with copyright material is observed as per the *Copyright Act 1968*.

Marks were not awarded if the students mentioned the Copyright Act without including the year.

**Question 7b.**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 29 | 66 | 4 | 0.8 |

Students were asked to use their preferred referencing method to write the reference that would be included in Dion's reference list.

The most commonly used referencing methods were American Psychological Association (APA) and Harvard.

Marks awarded for the correct referencing method and for the correct order of the reference, for example, author, date, title, retrieved (APA) or viewed (Harvard) and URL.

# Section C

### Question 1

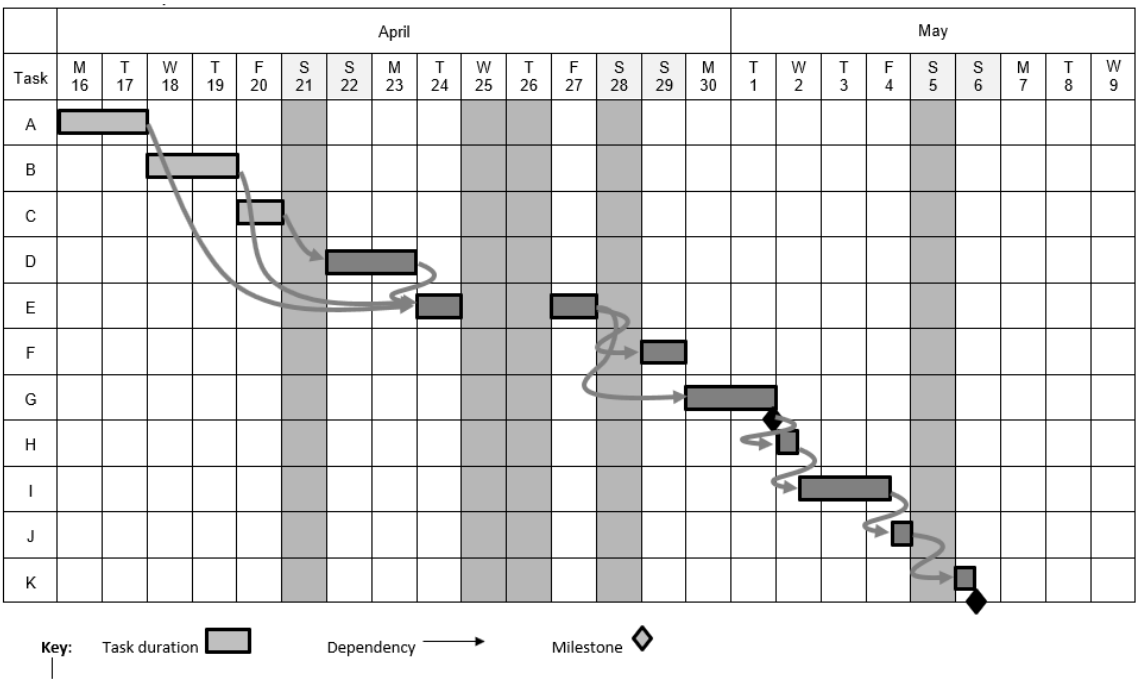
| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 31 | 23 | 46 | **1.2** |

Variable 1: parents' engagement level, participation or involvement

Variable 2: student learning

### Question 2

| Marks | 0 | 1 | 2 | 3 | 4 | 5 | 6 | Average |
|---|---|---|---|---|---|---|---|---|
| % | 6 | 5 | 9 | 16 | 23 | 25 | 16 | **3.9** |




Marks were awarded for:

- not including the holidays in the durations
- not including Saturdays in the durations
- correct durations and placement
- correct dependencies
- correct milestones.

Many students did not include the dependencies or the milestones and were unable to obtain full marks.

**Question 3**

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|---|---|---|---|---|---|---|
| % | 45 | 22 | 23 | 7 | 3 | 1.1 |

Students were asked to define the terms 'scope' and 'constraint', and provide an example of each that was related to the project. Examples needed to relate directly to the case study to gain full marks.

Acceptable answers included:

- Scope: what the solution will or will not include (or similar)
- Example: limit to six country schools in Victoria (or schools similar to Datarook)
- Constraint: limiting factors that need to be taken into account when designing the solution (or similar).
- Example, the Principal has requested the findings for the June meeting or Jasmin and Joseph must not breach any copyright or data privacy laws when collecting data (just stating 'copyright' was not enough, students needed to state what it applied to).

High-scoring responses made mention of the different factors that affect the constraints, for example, economic, technical, social, legal and useability.

**Question 4**

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|---|---|---|---|---|---|---|
| % | 42 | 16 | 26 | 8 | 8 | 1.3 |

Students were asked to describe two techniques that Jasmin and Joseph could use to organise and manipulate the data in Data set 2 and identify the kind of pattern from each technique that could be used to help them develop a conclusion.

Many students could only identify the techniques and struggled to identify the pattern generated from the technique.

Responses that gained full marks were:

- For each year, determine the average median examination scores and average the number of community activities, then compare the averages to see if there is a difference (growth) from 2013 to 2017.
- Sort data for each year by the median examination scores and see if there is a correlation (the number of community activities also goes up).
- Create a scatterplot of median examination scores versus number of community activities to see if there is a correlation.
- Calculate differences for each school between 2013 and 2017 to see if a growth in the number of community activities matches growth in examination scores.

**Question 5a.**

| Marks | 0 | 1 | Average |
|---|---|---|---|
| % | 48 | 52 | 0.5 |

Any criterion that related to navigation, ease of use, communication of message or easily finding information was accepted, although the criterion needed to include a statement about measurement. Stating navigation only did not gain a mark, whereas a mark was awarded for a statement including ease of navigation.

Responses that gained a mark were criteria such as: 'How easy is it to navigate through and reach all of the pages/find/locate information?' or 'Can you get to all information in three clicks?'

**Question 5b.**

| Marks | 0 | 1 | 2 | 3 | Average |
|---|---|---|---|---|---|
| % | 29 | 26 | 35 | 10 | 1.3 |

Students could choose any of the available designs and marks were awarded for the justification of that choice. The justification needed to relate to the criterion given in Question 5a. Students needed to give a statement that indicated how the selected design met that criterion and why the other two designs did not satisfy that criterion with the same degree of success.

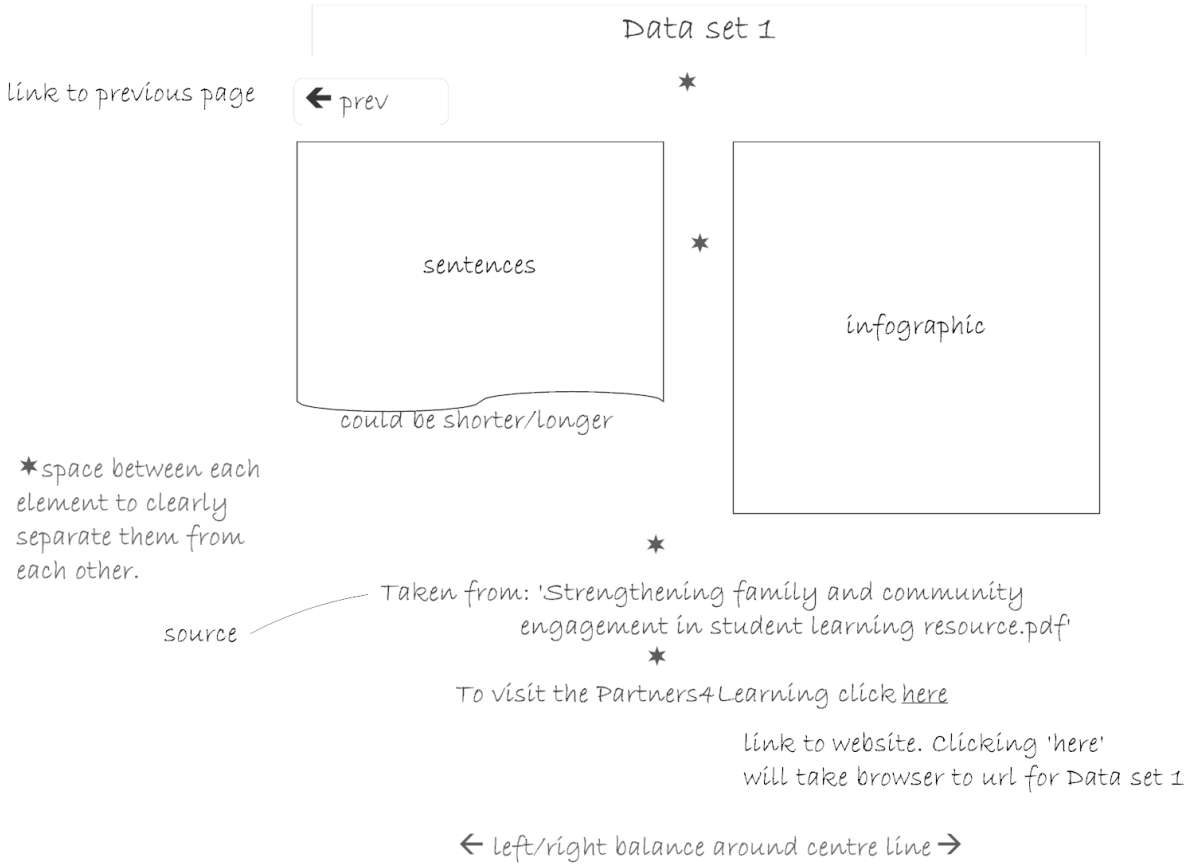
Many students did not indicate how the other two designs did not meet the criteria and therefore did not gain full marks. The answer needed to state why the student did not choose the other two designs.

For example, Design 1, Jasmin and Joseph are presenting their findings to the College Council; therefore, they need to be able to click through from page to page. Designs 2 and 3 require going back and forth between pages, which is not useful for a presentation.

**Question 6**

| Marks | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Average |
|---|---|---|---|---|---|---|---|---|---|---|
| % | 10 | 2 | 3 | 6 | 11 | 17 | 21 | 18 | 12 | 5 |

There were many possible responses. The following is an example of a possible response.



Many students did not receive full marks because they either did not read what was required or did not understand the fundamentals of drawing a mock-up of an MMOS. A large number of students did not annotate the solution or state how the mock-up met the two design principles stated.

Marks were awarded for:

- all features included and annotated
- diagram showing an awareness of space and balance
- links being present and annotated.

**Question 7a.**

| Marks | 0 | 1 | Average |
|---|---|---|---|
| % | 23 | 77 | **0.8** |

Data flow B

**Question 7b.**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 9 | 20 | 71 | **1.6** |

The most common acceptable responses were:

- entering an invalid email address
- entering two different passwords
- entering a user name that exists
- leaving fields blank.

This question was well answered. Most students could list at least one type of validation error that could occur.

**Question 8a.**

| Marks | 0 | 1 | Average |
|---|---|---|---|
| % | 25 | 75 | **0.8** |

The most common acceptable response for not using a text box as a data entry method was: The course names are long and a single typing error means there is no matching course.

Students needed to refer to the reason being about validation. A number of students stated that it was for efficiency of data entry but this response did not receive a mark.

**Question 8b.**

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|---|---|---|---|---|---|---|
| % | 16 | 3 | 17 | 43 | 22 | **2.5** |

The most popular correct response to this question was:

Method: drop-down list populated with course names (or similar)

Explanation: user can just select from a list by clicking and list contains only valid course names

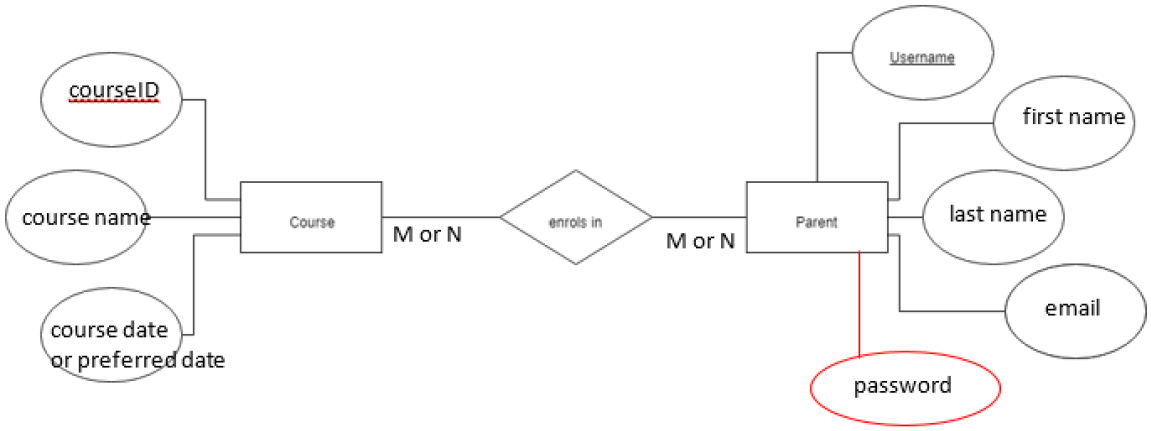
To gain full marks, students needed to expand on the method. A response such as ‘drop-down list’ was not complete; students needed to state what the drop-down list had in it.

**Question 9**

| Marks | 0 | 1 | 2 | 3 | 4 | Average |
|---|---|---|---|---|---|---|
| % | 36 | 42 | 19 | 3 | 0 | **0.9** |

This question required students to fill in the gaps of an entity-relationship diagram, using the structure provided. Many students interpreted this to be only fill in the attributes provided and as a result did not gain full marks.

Students were expected to indicate the attributes for both the course and parent/guardian, label the primary key for both entities and indicate the cardinality of the two entities.




Marks were allocated to:

- course attributes correctly completed (in any order). Students needed to indicate Primary Key on CourseID (underlined, *, PK or key icon)
- parent/guardian attributes correctly completed, with any three of the four attributes shown in the ovals supplied (in any order)
- for the fourth attribute being added, students needed to draw an attribute oval and add the attribute name
- adding both cardinalities.

Students who used the infinity symbol as an indication of the many cardinality were not awarded marks for that component. The VCE Computing: Informatics Entity-relationship (ER) conventions stipulate the use of M or N for a many cardinality. It is recommended students should not use this symbol for any indication of a relationship, either for an ER diagram or a data structure diagram.

**Question 10**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 47 | 31 | 22 | **0.8** |

The problem that students needed to address was that according to the UFD any visitor to the site can register. Students needed to outline a way that only Datarook parents/guardians are able to enrol in courses.

Acceptable responses included:

- Tristan could remove the registration page and issue parents with a username and initial password so that they are the only ones who can log in.

- Tristan could have a checking process that verifies that the new user is a parent of the school by comparing their name with a school database.
- Have a closed section with a username and password.
- Link parents to student enrolment.
- Unique key to enrol.
- Sent an invitation link.

To gain full marks, students needed to give some detail as to how only Datarook parents/guardians would be able to enrol in courses.

**Question 11**

| Marks | 0 | 1 | 2 | 3 | Average |
|---|---|---|---|---|---|
| % | 21 | 37 | 34 | 8 | **1.3** |

Students needed to clearly state, with justification, whether they agreed with Tristan or not. Students then needed to make a statement that justified their decision, either by comparing one option to the other or making two clear positive statements about their choice.

Responses that gained marks were:

- Yes, Tristan is correct because that allows for easier recovery in case of disaster (and cheaper than upgrading the existing system). The Datarook IT department is small, and management of local back-up could be difficult.
- No, onsite data storage is a lot safer than the cloud as you are never sure who can access your data in the cloud, and Datarook College can implement security protocols more easily.

**Question 12**

| Marks | 0 | 1 | 2 | 3 | Average |
|---|---|---|---|---|---|
| % | 60 | 24 | 9 | 6 | **0.6** |

Students were asked to discuss any key legislation that Sandra needs to be aware of when using the email addresses for promoting the Country Town Fair. Many students struggled to identify which key legislation the College should be aware of.

To gain full marks, students needed to include the *Privacy and Data Protection Act 2014* (written in full) (as the College is a Victorian state school), why it is relevant and how it applied to this case.

Some students incorrectly referred to the Privacy Act (incomplete reference) or referred to an irrelevant one (for example, the *Spam Act 2003*).

The year of the Act was not needed to gain full marks.

**Question 13**

| Marks | 0 | 1 | 2 | Average |
|---|---|---|---|---|
| % | 76 | 16 | 9 | **0.4** |

It was clear from responses that students do not know the difference between effectiveness and efficiency, with a large number of students stating evaluation criteria that related to time, cost or effort.

Students needed to make a statement that related to the effectiveness of an information management strategy (from the study design: data integrity, security, ease of use and currency of files) and then describe how this applies to the College.

Responses that gained marks included:

- Are students and parents able to retrieve the data when required? Fewer than 200 complaints from the students and teachers with regard to accessing the data.
- Does the cloud provide more security than the previous method? There are fewer security threats because there is better protection from viruses.
- How easy is it to retrieve the data from the cloud? The college will need to see (via customer satisfaction survey) how easy it is to retrieve the data from the cloud. It should not be a complicated procedure to access.