2015 VCE Extended Investigation: written report

General comments

The written reports produced by students in the 2015 VCE Extended Investigation were typically of a high standard. Most students engaged enthusiastically with the opportunity provided by this study and developed investigations of complexity and significance.

Students' reports demonstrated a consistent understanding of the demands of research and the study design. High-scoring reports illustrated real and enthusiastic engagement with the student's investigation area, an earnest desire to do something significant and to clearly communicate their understanding to their audience. This suggested that students were writing from a place of interest, having selected a research area they were passionate about. In essence, there seemed to be more questions chosen with a wide variety of research areas and methodological approaches, and students achieved at a variety of levels across a wide range of disciplines.

Specific information

Key observations

This year's written reports reflected good control and understanding of the expectations of the study and the purpose of the final report, in particular:

- written reports logically and clearly structured, tracing the path the student had taken throughout their investigation
- generally strong adoption of objective perspective on a clearly phrased question
- generally strong efforts to adopt formal language style and conventions
- generally good efforts to link the literature, methodology and research area together in terms of relevance
- extraneous and irrelevant factors for the scope of the written report were minimised
- increased understanding of the work undertaken as holistic research, rather than 'a subject'.

The majority of written reports were of an appropriate length. Most students wrote to the 4000 word limit and were within the 10% tolerance range. Those written reports that were shorter than the 3600 lower word limit often did not demonstrate sufficient knowledge and detail, and needed to engage in greater depth with certain areas of the report (where there was an unnecessary imbalance between sections) or with respect to their investigation overall.

Reports that were longer than the 4400 upper word limit demonstrated difficulties focusing on the key ideas, issues and arguments with respect to the investigation, and needed to develop a more focused and controlled exploration of the research.

The importance of the question

One of the most essential features of a successful investigation was the development of a refined and focused question, and most reports consisted of considered, focused and carefully worded questions that provided a clear direction for the investigation. The scope of the question is central to the success of the investigation, and students needed to illustrate that they understood the dimensions of their research (in terms of Criteria 3 and 4). Questions that were clumsily worded, or that contained multiple focuses, undermined the student's ability to succeed. For example, 'How will the captivity of exotic bird species in Europe affect animal mental wellbeing and populations of such birds in the wild?' is a question that contains two focus ideas; in trying to meet both of them, the student would not be able to demonstrate sufficient depth of understanding. A question with only one focus idea would be sufficient.

Understanding the demands of the project

Overall, there was a good understanding of the demands of research generally and the demands of the study specifically throughout the year. However, some reports discussed (often in detail) how the student conducted their research in terms of what they were **not** allowed to do, and at times framed this as justification for deficiencies in the investigative design. While there was scope to address the restraining features of their research and how these influenced the direction of the research, extended discussions of what they were not allowed to do and why were unnecessary. If such discussions occur, they should be framed as structuring the direction of the investigation and should be brief. The investigation should have been developed for the study framework and with careful consideration of what was practical and achievable for the student.

Claims about and descriptions of how an investigation was conducted ethically, without bias or in a measured fashion were typically seen as unnecessary. While it was important to include details about how ethical processes were followed, higher-level written reports integrated this discussion into the methodological outline, rather than titling a separate part for ethics. Similarly, higher-level reports simply demonstrated a lack of bias throughout the process of their investigation. Students are reminded that objectivity is expected in this study and lengthy discussion of how bias was avoided or objectivity achieved was unnecessary.

Audience

The need to consider the educated, non-specialist audience is a key feature of this study. An important feature of any research investigation is the ability to communicate the results meaningfully to a specific audience. This requires not just careful and considered use of language, but a more extensive consideration of the ideas, concepts, arguments, relationships, processes and such, that the audience is capable of understanding. There are certain things that the writer may assume about an educated audience and their knowledge. When writing for an educated audience, the writer needs to consider what this means with respect for their research: what ideas and depth of knowledge can they cover appropriately and clearly for this audience within the 4000 word limit? Some reports described concepts that the audience could be reasonably considered to know or understand. Providing definitions for 'quantitative' and 'qualitative', for instance, was a feature of a number of reports, but this was unnecessary.

Esoteric and technical written reports

Some research questions were very specific, detailed and complex. Sometimes the question posed was impenetrable for the audience. While some degree of subject-specific language is expected in a research question, it should still be accessible for a non-specialist reader.

Some students appeared to confuse the need for demonstrating critical thinking with the inherent complexity of certain ideas or disciplines; the two are not necessarily the same. Presenting an inherently complex research question was not a guarantee that a student was able to adequately

demonstrate critical thinking. Alternatively, students undertaking research areas that were not technical or esoteric were able to demonstrate critical thinking around the concepts, ideas and issues involved. There seems to be a belief that mathematic and scientific research questions in particular – because of often inherent technical complexity – must equal critical thinking. This was not necessarily the case.

This also extended to reports that presented information and ideas of a technical or esoteric nature. While such investigations were appreciated for the clear work students had put into them and the complex knowledge they demonstrated, the study design clearly indicates that the investigation is to be conducted with an educated, non-specialist audience in mind. There are also the limits of the duration of the study, the student's level of expertise, their access to resources and the audience to consider. Students undertaking highly technical research should spend time researching and learning about, then developing effective communication strategies for non-specialists in their field of investigation. Seeking out popular texts – documentaries, popular articles, fiction – that address their discipline area for a non-specialist audience is a good way for students to explore communication strategies that may aide the clarity of their reporting. Students should also explore the use of non-verbal communication strategies – diagrams, flow charts, schematics – and how they can be used in conjunction with written language to improve audience comprehension. Students are reminded to think of the audience throughout the investigative process, not just as an endpoint when reporting. Therefore, some highly technical investigations may have performed better if the research question had been reframed in light of this.

An example of this is mathematical equations/concepts, as used in a number of written reports. Mathematical equations or formulas must be elaborated on in a way the audience can understand; simply presenting a formula with a 'textbook' or academic explanation of how it works was often not enough. Metaphors, allegories or figurative language can often be helpful in this respect. A number of reports presented equations and calculations that required specialist or technical knowledge to understand; while this demonstrated sophisticated thinking on the part of the student, because the content was not appropriately adapted to the target audience, there was an extent to which the true depth and extent of this knowledge could not be accurately demonstrated. As such, unexplained equations and calculations were a detriment to the quality of a final report.

Methodology and methods

The development of a methodology suited to answering the research question was an important part of a successful investigation (concerning Criteria 3 and 4 particularly). The method and methodology must match the question. With respect to this, students need to understand the distinction between methodology (overall approach and strategy; for example, action research, ethnography, text analysis, statistical analysis, experimental design) and methods (the tools used to collect the data; for example, survey, interviews, specific experiments, focus groups, artefact collection).

The majority of students undertaking the Extended Investigation in 2015 completed empirical studies, where they collected their own primary data from the 'real world' in order to assess the validity of a certain idea or problem.

The use of surveys was a particularly popular method for many investigations. However, some use of online surveys as a research method seemed ill-suited for the research question. Careful consideration of the research design and any survey questions is needed, so that they appropriately reflect the purpose and aims of the investigation; that is, that the methodology and methods contribute to helping the student answer their research question.

At times students explained far too much detail about method processes: how the survey was written, how participants recruited, how ICT was used to collect data. While such discussions had a

place in the final report, generally they needed to be brief. Discussions of method needed to be far more focused on explaining the meaning and rigour of particular methods for the investigation.

Literature reviews as methodology

It is acceptable to do a literature review as the investigation methodology, but the methodology is generally not about how the student found the articles or the process gone through to find research or readings for the project. The methodology/methods for literature review-based research is about how the student worked with the literature they found – how they have compared, categorised and sequenced the information, identifying a central metaphor from a source, tracing its representations or manifestations throughout a range of literature or research reports, or bringing together two generally non-convergent literature groups and exploring the connections and commonalities around a range of factors (for example, political discourses, media representations, statistical studies, etc.). Students undertaking investigations that are wholly literature review-based need to be able to articulate the organisational and analytical methodology that has guided their reading and its synthesis in answering the research question.

Unnecessary exposition

The following elements are expected parts of any high-scoring Extended Investigation report, but some students wrote overly long, detailed discussions of qualities of their research process, particularly in the methodology section. These were at times unnecessary, did not help to advance the argument/ideas and could often have been dealt with just as effectively in a couple of sentences. In particular, this included discussions:

- that the investigation was conducted ethically
- that plagiarism and bias were avoided, and how
- definitions of basic terms about methods or methodology (e.g. defining a ‘survey’, ‘Likert scale’, ‘quantitative data’ and ‘qualitative data’)
- that they adjusted content or ideas, and how, for the audience or form
- that the length and detail of the investigation was limited by the time frame and their level of expertise.

There were cases and situations where detailed explanations of some of these elements were warranted, dictated by the particular research question and methods of the investigation (where ethics, bias or content were particularly problematic or impactful for interpreting the findings); however, these were not frequent. Far more important in the methodology was to explain how the selected approach and methods would allow the researcher to collect data in order to enable them to address their research question.

Clear and logical structures

A clear structure, typically with subtitles, was an essential part of a high-scoring written report. A logical organisation not only helped the reader to understand the progression of the argument, the relationship between concepts and the different aspects of the investigation, but demonstrated that the student could think logically and organise the information (secondary and primary) in logical ways that were meaningful for answering their research question.

The standard structure adopted was: abstract, introduction, literature review, methodology, data analysis, discussion, conclusion, references and appendices. While there was some variation, this conventional structure worked well for the majority of reports and allowed students to demonstrate how they met each of the criteria.

A number of investigations that were based wholly upon a literature review (i.e. no empirical or experimental methodology) presented their methodology immediately after the introduction and before the literature review. The typical structure of such a report was: introduction, methodology,

literature review, discussion and conclusion. In such cases, because the review of research and literature was the main data set, the altered structure was not seen as detrimental; indeed, it was effectively and logically used in a number of reports. This was in part because the expectation of a student conducting a research investigation based wholly upon an examination of secondary sources was that they would read more widely than an investigation where primary data was also being collected and analysed. It seemed logical to set the scene for the research in the introduction, explain the process whereby the literature would be unpacked and analysed (methodology), then analyse the literature (literature review/analysis: the bulk of the report), discuss the results (discussion) and provide some concluding observations (conclusion). As such, this reordering of the conventional structure used by some students was appropriate and did not bear a relationship with how the report was assessed, that is, each report was assessed on its merits.

Representations of data

There were some concerns with how students chose to represent relevant data in their written report (Criterion 6). Summaries of data typically occurred after a discussion of the methodology and methods as a way of indicating what the findings of the data collection were. They were often presented in graphs, tables or other visual representations. It was generally not helpful for students to present large amounts of data (sometimes many pages worth) represented in graphs, tables or charts. Careful decisions must be made about which data is most important and which is best represented in visual form. A large number of reports presented simple data sets (e.g. the gender of participants, or yes/no responses) as pie charts or graphs. For a data set containing only two measures, this was often unnecessary. Visual (and other) representations of data should be used to add clarity and aid the reader to understand the complexities or issues within data sets. Tables that consolidated a range of data sets meaningfully together were typically under-utilised, though there were a wide range of reports where such representations (and the thinking involved) would have been beneficial for the audience to understand.

Raw data should not be included, even in an appendix. It is the responsibility of the student conducting the research, not the assessor, to analyse and interpret their raw data in ways productive for answering their research question. Students also need to be careful about having data in the analysis section without explanation. There must be a meaningful explanation – data representations must be carefully selected and represented, and linked purposefully within the body of the report.

Other observations and advice

Voice

Students must be careful that they maintain a consistent voice and tone throughout. There is a temptation when reading widely and attempting to synthesise different pieces of research together to adopt phrases and concepts without due attribution (often unintentionally).

Bias

All reports should have been written in an objective tone and from a balanced perspective. Some reports presented convincing arguments drawn from relevant evidence, but lacked an adequate balance in the examination of source materials and appeared to suffer from bias. Such writing was more akin to investigative journalism rather than a rigorous piece of investigative research.

Style and fonts

Students are required to use 1.5 line spacing and 12-point type in a standard font. This may be Times New Roman or Arial font, but it should be consistent. The type should also always be in black, unless highlighted for a reason or relevant meaning.

Unsupported and opinionative claims

Students should not make unsupported claims or assertions. They must keep in mind that the non-specialist audience is educated, has knowledge of general concepts and can assess the truth of many statements or claims of fact. There were a few reports where students made statements and claims that did not flow from their arguments, were not supported by evidence (primary or secondary) and that the assessors were able to assess as false, untruthful, unlikely or inaccurate.

Reference lists and bibliographies

Reference lists should occur after the report body but before the appendices. Students are reminded that reference lists should be in alphabetical order by first author surname as this is the most logically organised and helpful for readers of research. While some written reports used endnotes or a numbered system to organise references (referring to the order in which they were used in the report), this made it difficult and time consuming for the reader to locate, or come back to, a report that was referred to. While there was no preference in citation style, the style should have been consistent, and the majority of reports achieved this quite well.

Glossaries

Glossaries were often not used well; they were often too basic, too conceptual, too long or not used in the report. Glossaries should not be used as a substitute for clear communication; some reports used them almost as a translation key for unlocking the meaning of the report. Glossaries should be used to define central concepts and/or acronyms/initialisms with respect to the research area. Glossaries should also be brief and only contain a collection of the most important concepts. They should not contain general, known terms that the non-specialist audience could be reasonably expected to know. Nor should they contain a complete list of all the technical terminology used in the report. The meaning of certain technical terms should be explained in the body of the report, or be clear from the context of its use.

Section weighting

Students need to consider the allocation of words in each section. There were reports where some sections were either underdeveloped or overdeveloped. Much time was often wasted in lengthy introductions and methodology sections, with sections such as discussions and conclusions being far too short or sometimes gestural. More careful weighting and consideration of the purpose and role of each section within the report was often needed.

Assessment criteria

Criterion 1 – Knowledge and understanding of the research area

This criterion focused on the student's knowledge of their research area. This was demonstrated in a careful balance between depth and breadth, along with a confident, accurate and judicious use of technical language associated with their discipline. Students needed to select and use authoritative, reliable and relevant research and academic writing to lay the groundwork for their own investigation. It was important for the rigour of their investigation that students were careful and purposeful in their reading, and sought to work with key papers, pieces of knowledge and concepts relevant to their research area.

Criterion 2 – Analysis and evaluation of argument and evidence

To address this criterion, students needed to work with the research and knowledge in their field in a way that was productive for illustrating the relevance and value of their research question. It was not enough to simply summarise the research of others; research needed to be used in a way that demonstrated the value of their chosen area of research. Identifying key arguments, debates, connections, correlations, categorisations, disagreements, disjunctures, etc., allowed students to make room for and connections with their own investigation; this was an important demonstration of critical thinking. Students who scored highly on the analysis and synthesis sections of the written report (Criteria 2 and 4) were clearly able to identify arguments in the literature and engage with these arguments in the context of their own research and findings.

Criterion 3 – Response to the research question

Criterion 3 concerns the focus and strategy that the student developed for investigating their research area. This related to the conceptualisation of the question, as well as the methodological approach used to explore this problem, and the student's understandings of the implications of their research approach (ethically, pragmatically, ideologically, etc.). It was important that there was an articulated link between the methodology and methods, and how these would allow the research question to be addressed. It was also important that students demonstrated a reflective understanding of their own role within this process as researcher, understanding how their own intervention in the field (particularly for empirical studies) had the capacity to structure findings.

Criterion 4 – Synthesis of findings and evaluation of the investigation

The student's report needed to build towards attempting to answer their research question: how they drew together the various strands of their research with the knowledge of others. This criterion related to students drawing together the works and ideas of others (usually elaborated on and analysed in a literature review), along with their own investigative process, and the meaning of this for answering their research question. This often meant that key concepts, arguments, formulas or ideas raised earlier in the report were used as part of the analysis and discussion, drawing clear relationships between the student's own research and that conducted by others relevant to their field of investigation. A student could not achieve high scores on Criterion 4 if the discussion section of their report was limited and brief. This occurred in quite a number of cases, where synthesis was often the lowest-scoring criteria.

Criterion 5 – Clarity and effectiveness of writing

The majority of reports were very well written and scored well on Criterion 5. There was a delicate balance to be struck between clear communication and technical language that demonstrated knowledge and understanding of their research. It was important that students adopted a formal writing style in order to give their report authority. This is also the criteria where writing for the non-specialist audience was considered.

Students are reminded not to rely solely on spellcheck in order to proofread their final report. Students should use planning, drafting and editing processes – including manual reading and re-reading – to edit their final submission, not just for spelling and punctuation errors, but with a focus on meaning. Minor, but at times significant, errors can appear in a report if a student relies only on spellcheck.

Criterion 6 – Observance of report writing conventions, including citations and bibliographic referencing of sources

Criterion 6 related to the student's observance of academic and report writing conventions. Many students made basic errors or submitted responses that seemed to lack care in how the report was put together. This is not a document to be unduly creative with as this could unnecessarily detract

from the quality of the research. Formal conventions should be adopted. Adopting any creative aspect should have a clear and meaningful purpose within the scope of the research, but was generally not advised.

Students are encouraged to think of how they present the report as guiding the reader, who is unfamiliar with their work, through the different parts of their investigation. Titles, labelling, paragraphing, signposting, captioning, sectioning and including page numbers were all means whereby the student could assist the reader in understanding their research.

Criterion 6 was also concerned with how students presented and used representations of their own data to answer their research question. Students needed to be careful and judicious in this selection. The highest-scoring students chose key pieces of data from their investigation to represent as part of their analysis and discussion; other, less central data, was often presented in appendices. Important data should be explained, then analysed, then linked to the question.

Levels of achievement

60–50 marks

The highest-achieving reports displayed a tone of control and professionalism. Although minor errors may have featured (across a range of criteria), the student clearly understood the research process that they had gone through and what was expected in the final report. The question was clear and had a focus and direction. The case was then made for the need for this research and knowledge of key research relevant to the field explored. Such written reports struck a balance between breadth and depth, often by drawing out key references or ideas, categories or relationships, and exploring the connections between different arguments and ideas. A methodology was framed that was clearly relevant for answering the research question, and then developed into a workable and well-deployed data collection strategy. Key findings from data were then clearly presented, analysed and discussed with respect to answering the research question. A conclusion often then raised further implications or questions.

Throughout such written reports was also a reflective awareness of the position of the researcher and their role. While there were some reports that featured a ‘limitations’ or ‘reflections’ section towards the end, higher-level reports tended to include observations about the limitations of the project at other relevant points when analysing the data or discussing findings.

50–40 marks

Reports that achieved at this level generally demonstrated strong to sound understanding of their research area, developed from reading a wide range of sources. Often, such reports achieved higher on Criterion 1 than on Criterion 2, meaning that while the student had read widely and meaningfully, how they dealt with the references and the research was an area in need of improvement. A methodology was often then developed that bore a clear relationship to answering the research question. Appropriate methods were used competently, and relevant findings were outlined and analysed with respect to answering the research question. High-level written reports sometimes featured indirectness or vagueness in connecting content to their research question throughout, which undermined the clarity of the report. The presentation of the final document illustrated an awareness of academic conventions, but this may have been undercut by a lack of competency in deploying such understanding.

Highly technical or esoteric reports that developed a clear, authoritative piece of research, but that did not adequately consider the non-specialist audience in their reporting, often fell within this range.

40–30 marks

Reports that achieved at this level typically demonstrated sound knowledge of a research area. The research question often required some degree of refinement or reworking, and lacked a degree of detail or focus. The literature reviewed was adequate for the investigation area, but may have been undermined by a lack of detail, breadth, complexity or clarity in dealing with ideas relevant to this field of study. Reports at this level at times tended to lack a degree of control and featured discussions of questionable or unclear relevance, verbose discussions or overly simple discussions. Such reports sometimes presented data representations as part of their analysis, discussion or findings, but these were not always carefully selected or used clearly and meaningfully. Such reports therefore demonstrated some knowledge of academic conventions, though this was at times inaccurate or incomplete.

Such reports presented much information, though did not effectively control this. Other reports featured a high degree of control or focus, but were undermined by a lack of breadth and depth in the understanding of the research area.

30–20 marks

Reports at this level were typically marked by a lack of control, knowledge or critical thinking. A number of references were read, though not enough to demonstrate real knowledge or give the investigation real authority. Such reports were also undermined by being based on research or literature that was not rigorous or reliable, not analysed or used carefully, or where bias was clearly evident. The selection of the method/methodologies was often arbitrary or underpinned by simplistic thinking; they did not really connect with enabling the student to answer their research question. Synthesis was simplistic or straightforward, and was not linked to evidence from the student's readings. Understanding and adherence to academic report writing conventions was often incomplete or uncontrolled, meaning that the written report often did not read like a formal, polished report.

20–10 marks

Reports at this level were characterised by a significant lack of control and/or complexity, and demonstration of a lack of comprehension of the purpose and structure of good research. Superficial knowledge of a research area and a vague or confusing research question were often the hallmark of such reports. The selection of methodology/methods was typically arbitrary, without a clear reason for why the approach taken was the most suitable for the investigation, and often lacked real complexity and depth. Where data was presented as evidence it was not thoughtful, and any discussion or conclusion did not adequately draw together elements to answer the research question. Writing was typically straightforward and lacking formality, and adherence to academic conventions was either clumsy or inadequate.

Below 10 marks

The very few written reports that fell within this range demonstrated limited to no understanding of the research process and reported on a research area in an extremely brief fashion. Reports of just a couple of pages, with limited ideas or extended writing, often with no research literature detailed or any indication an investigation had been conducted, fell into this range. Such reports did not reflect a year's worth of study, and often seemed to be in plan or draft form.