The Scientific Research Report

The Title

A title is a stand-alone statement that is specific, precise and informative, and provides the aim of the investigation.

The Abstract

The abstract is a one paragraph (approximately 100–200 words) summary of the scientific research investigation. It contains the question, the methods, key results and conclusions.

Literature Review

This section is designed to inform the reader of the relevance of the scientific research and includes background information enabling the reader to understand the key areas involved. It is usual to start the review with a broad scope and become more specific. Sources used are to be current and, where possible, original articles referenced rather than reviews of the articles.

Scientific Research Question

The scientific research question addresses a single independent variable. The Scientific Research Project should have a single major focus and subsequently only one main scientific research question. The question should be clear, precise and specific; written in scientific language, and be developed from the review of the literature.

Scientific Hypothesis

Once the scientific research question has been chosen, a hypothesis is then formulated. A hypothesis is a statement that relates an independent variable to a dependent variable in a causal relationship that can be tested.

Methodology

The methodology is usually written first and is refined as the scientific research progresses. The methodology should be written in passive voice, simple past tense and contain enough specific and detailed information so that it can be repeated by another scientist to obtain the same results.

Results

The results are based upon the facts. This section describes what was observed, calculated or the trends discovered. It is not an explanation of the results. The order of the results can either follow the order of the methodology or, maybe, in order of most important to least important. Results may include tables, graphs and/or other visual representations to highlight important features. It may be relevant to comment on the degree of uncertainty stated for each set of data collected. All visual displays should be labelled with a number, concise name and a stand-alone description of how the result was obtained. It is useful to integrate visual displays with text so that the reader is guided through the research.

Discussion

The discussion forms the argument and provides an explanation of the phenomenon that was investigated. Other peer-reviewed scientific research should be used and referenced to discuss findings and to form an academic argument. The discussion includes an evaluation of the data-analysis and an explanation of the results, why they occurred, key limitations and further implications with suggestions for future directions of scientific research.

Conclusion

The conclusion is a summary of the scientific research findings and is usually one or two paragraphs in length and should not introduce new information.

Reference List

All sources of information and data that are used to inform the scientific research should be cited using an appropriate footnoting and referencing style.

The Scientific Research Portfolio

The Scientific Research Portfolio supports and guides the development of the Scientific Research Report. It provides a record of the processes and documents the information gathered, the analysis of data and the development of the report.

The portfolio is an active, working, purpose-built set of documents that facilitates organisation and ensures that students reflect on their work and maintain information and records of their actions and findings. It is used to evidence students' original work and maintain records of teacher feedback, comments and observations. The portfolio may be maintained in digital format.

The following information is provides the key structural elements of the portfolio. Each element may be revisited a number of times and the order of engagement with each element may vary.

Section 1

Planning may include:

- an action plan with milestones and a timeframe for each stage of the Scientific Research Project
- a log of the sequential development of the scientific research process
- summaries and annotated extracts of peer-reviewed scientific research and statements of applicability to the Scientific Research Project
- a developing reference list using correct formatting from the chosen format
- a referenced literature review appropriate to the scientific research question
- a concept map or alternative strategy for generating ideas for the scientific research, including references to literature and justification for their selection
- a refined and justified scientific research question
- a refined and justified scientific hypothesis.

Section 2

Evidence of data collection and analysis may include:

- work samples of various methods for obtaining qualitative and quantitative scientific research including relevant publicly available data sets
- criteria for the choice of a variety of relevant data sets pertaining to the scientific research
- work samples demonstrating skills of recording, processing, organising and storing data
- work samples demonstrating proficiency in gathering small data sets and applying appropriate scientific skills
- manipulation, presentation and analysis of data in a variety of forms.

Section 3

Reflections of the research process may include:

- extracts of students' drafts with reasons for changes and critical questions from peers and/or teachers
- revisions of the scientific research with justifying statements
- examples of final edits, including use of scientific language, plausibility and logical progression of scientific arguments
- suggestions for improvements to the Scientific Research Project, including its methods
- suggestions for future directions to further the scientific research.

Student Scaffold for Learning

The Title

A specific, precise and informative statement and provides the aim of the investigation.

The Abstract

The abstract is a one paragraph summary of the investigation. It contains the question, the methods, key results and conclusions. (Done after you have finished your investigation)

Literature Review

This section is the scientific research and includes background information to understand the key areas involved in your investigation. Start broad and become more specific. Sources used are to be current and, where possible, use original articles.

Article/Information 1

Article/Information 2

Article/Information 3

Scientific Research Question

The scientific research question addresses a single independent variable. The Scientific Research Project should have a single major focus. The question should be clear, precise and specific; written in scientific language, and be developed from the review of the literature.

Scientific Hypothesis

A hypothesis is a statement that relates an independent variable to a dependent variable in a causal relationship that can be tested. It can be written as an ‘ If …….then ……’ Statement

Methodology (Method)

The method is usually written first and is refined as your scientific research progresses. (the first draft could go into your portfolio). The methodology should be written in passive voice, simple past tense and contain enough specific and detailed information so that it can be repeated by another scientist to obtain the same results.

Results

This section describes what was observed, calculated or the trends discovered. It is not an explanation of the results. The order of the presented results should be sequential. Results may include tables, graphs and/or other visual representations to highlight important features. It may be relevant to comment on the degree of uncertainty stated for each set of data collected. All visual displays should be labelled with a number, concise name and a stand-alone description of how the result was obtained. It is useful to integrate visual displays with text so that the reader is guided through the research.

Discussion

The discussion provides an explanation of the scientific question that was investigated. The discussion includes an evaluation of the data-analysis and an explanation of the results, why they occurred, key limitations and further implications with suggestions for future directions of scientific research.

Conclusion

The conclusion is a summary of the scientific research findings and is usually one or two paragraphs in length and should not introduce new information.

Reference List

All sources of information and data that are used to inform the scientific research should be cited using an appropriate footnoting and referencing style.

The Scientific Research Portfolio

This is a documentation of all the information and investigations that you have completed as part of your investigation. In your books create a section that you can develop your portfolio.

Section 1

Planning should include:

- an action plan and a timeframe for each stage of the Scientific Research Project
- a log of the development of the scientific research process
- summaries and annotated extracts of peer-reviewed scientific research (stuff that you have read) and how it applies to your project
- a developing reference list
- a concept map or alternative strategy for generating ideas for project, including references to literature and justification for their selection
- a refined and justified scientific research question
- a refined and justified scientific hypothesis.

Section 2

Evidence of data collection and analysis may include:

- your work samples of various methods for obtaining results
- your choice for obtaining data for your scientific project (why are you collecting the data this way?)
- work samples demonstrating skills of recording, processing, organising and storing your data
- work samples demonstrating proficiency in gathering small data sets and applying appropriate scientific skills. How well did you do each part of the practical?
- manipulation, presentation and analysis of data in a variety of forms. Draft of a table, graph or picture.

Section 3

Reflections of the research process may include:

- reasons for changes in your project and critical questions from peers and/or teachers
- revision of the scientific project with justifying statements, how did your research go and why?
- examples of final edits, including use of scientific language, plausibility and logical progression of scientific arguments. Did you change parts of the project, describe why that happened.
- suggestions for improvements to the Scientific Research Project, including its methods
- suggestions for future directions to further the scientific research.