All-purpose tool for research writing

This resource aims to help you write your research, regardless of the genre you are writing in – you may use it to help you write a paper, presentation, poster, report, chapter, or thesis. And you may use it at any stage of the process: you may use it:

- before you write, as a planning tool;
- as you write, as a drafting tool;
- as you revise your writing, as an editing tool;
- after you have written, as an evaluation tool.

To use the tool you will have to write a total of eleven sentences.

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This guide forms part of a series of guides for early-career researchers in the School of Technology. It was commissioned by the Department of Chemical Engineering and Biotechnology. Each guide in the series may be downloaded from the Write Your Research website (please see below for the URL).

Anthony Haynes
Step I

Start with a blank page. Insert a box the width of the page:

In the box, identify the problem that motivates your research.

Note:

1. keep it simple and precise: write a single sentence;
2. ensure the sentence is a statement (not a question), with a main verb (you will find that much hangs on selecting the best verb);
3. ensure your sentence identifies a single problem (so resist any temptation to use words such as ‘and’ or ‘also’ to add a second problem);
4. use a word like ‘problem’ or ‘challenge’;
5. use a phrase such as ‘The problem that motivates this research is…’, ‘The challenge that this research seeks to…’;
6. phrase your sentence as carefully as possible. Take your time over it. You may well find that you need to write several versions until you have a sentence you’re happy with;
7. it can be helpful to seek other people’s assistance and to ‘think aloud’ with them as you try to write the sentence.

Once you’ve done this, move on to the next step…
Step II

Now insert a second box below the first. Make the box a little narrower. So:

[problem box]

In the new box, identify the your research question.

Note:
1. keep it simple and precise: write a single sentence;
2. ensure the sentence is a question and that it ends with a question mark. Begin with an interrogative (e.g. ‘what’, ‘which’, ‘how’, ‘why’);
3. this box is less broad than the first box to signify that the research question may well be narrower than the problem that motivates it. This is because it may be that the question concerns an aspect of the problem, rather than the total problem.

Once you’ve done this, move on to the next step…
Step III

Between the two boxes insert an arrow leading from the first box to the second. So:

[problem box]

[question box]

Next to the arrow, write a sentence explaining how the problem leads to the question.

Note:
1. keep it simple and precise: write a single sentence;
2. begin with a phrase such as ‘This problem raises the following question because...’ or ‘The following question arises from the problem because...’;
3. if you find it difficult to write this sentence, that may well be an indication that the problem (or the way you have stated it) is not aligned with your question (or the way you have framed it). In this case, the solution is likely to lie in rewriting the problem statement, the research question, or both.

Once you’ve done this, move on to the next step...
Step IV

Between the two boxes insert a second arrow leading from the second box back the first. So:

Next to the arrow, write a sentence explaining how answering the research question will help deal with the research problem.

Note:
1. keep it simple and precise: write a single sentence;
2. resist any temptation to think, ‘Oh, this is just a repetition of the previous step’;
3. begin with a phrase such as ‘By answering this question…’;
4. if you find it difficult to write this sentence, that may well be an indication that the problem (or the way you have stated it) is not aligned with your question (or the way you have framed it).
   In this case, the solution is likely to lie in rewriting the problem statement, the research question, or both.

Once you’ve done this, move on to the next step…

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Step V

Insert a third box below the second. Make it slightly narrower again. So:

In the box, state the aim of this piece of writing.

Note:
1. keep it simple and precise: write a single sentence;
2. note that, whereas the sentences in the previous two boxes have been about research, this one should be about the piece of writing – the text you are working on;
3. begin with a phrase such as ‘The aim of this paper…’ or ‘The goal of this thesis is…’ or ‘This chapter is designed to…’

Once you’ve done this, move on to the next step…
Step VI

Now insert another arrow, this time leading from the question box to the aim box.

Next to the arrow, write an explanation of how the research question leads to the aim.

Note:
1. keep it simple and precise: write a single sentence;
2. the aim box is less broad than the question box to signify that the aim may deal with one aspect of the question, rather than the whole question;
3. begin with a phrase such as ‘This question leads me to the formulate the following aim because…’;
4. if you find it difficult to write this sentence, that may well be an indication that the aim (or the way you have stated it) is not aligned with your question (or the way you have framed it). In this case, the solution is likely to lie in rewriting the research question, or the statement of the aim of your piece, or both.

Once you’ve done this, move on to the next step…

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Step VII

Now insert another arrow, this time leading from the aim box back to the question box.

Next to the arrow, write an explanation of how achieving the aim will help you deal with your research question.

Note:

1. keep it simple and precise: write a single sentence;
2. resist any temptation to think, ‘Oh, this is just a repetition of the previous step!’;
3. begin with a phrase such as ‘By achieving the aim I will be able to deal with question by...’ or ‘Achieving the goal will help me to deal with the question because...’;
4. if you find it difficult to write this sentence, that may well be an indication that the aim (or the way you have stated it) is not aligned with your question (or the way you have framed it). In this case, the solution is likely to lie in rewriting the research question, or the statement of the aim of your piece, or both

Once you’ve done this, move on to the next step...

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Step VIII

Now insert another box.

In the box, write a sentence to state your main conclusion.

Note:

1. keep it simple and precise: write a single sentence;
2. if you don’t yet know your conclusion, because you have yet to obtain or analyse your results, write about either (a) the conclusion you expect to arrive or (b) the kind of conclusion you expect to arrive at.

Once you’ve done this, move on to the next step…
Step IX

Now insert an arrow leading from the conclusion back to your aim. So:

Next to the arrow, write a sentence to explain how (or how far) the conclusion enables you to achieve your aim. Keep it simple and precise: write a single sentence.

If you find it difficult to write this sentence, that may well be an indication that your conclusion (or the way you have stated it) is not aligned with your aim (or the way you have framed it). In this case, the solution is likely to lie in rewriting your aim, or your conclusion, or both.

Once you’ve done this, move on to the next step…

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Step X

Now insert an arrow leading from the conclusion back to the research question. So:

Next to the arrow, write a sentence to explain how (or how far) the conclusion enables you to answer your question. Keep it simple and precise: write a single sentence.

If you find it difficult to write this sentence, that may well be an indication that your conclusion (or the way you have stated it) is not aligned with your research question (or the way you have framed it). In this case, the solution is likely to lie in rewriting your question, or your conclusion, or both.

Once you’ve done this, move on to the next step…

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Step XI

Now insert an arrow leading from the conclusion back to the research problem. So:

![Diagram showing arrow from conclusion to research problem]

Next to the arrow, write a sentence to explain how (or how far) the conclusion enables you to answer your question. Keep it simple and precise: write a single sentence.

If you find it difficult to write this sentence, that may well be an indication that your conclusion (or the way you have stated it) is not aligned with your research problem (or the way you have framed it). In this case, the solution is likely to lie in rewriting the problem, or your conclusion, or both.

When you’ve done this, you’ve finished.

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Postscript on hypotheses

If your piece of writing involves a hypothesis, you may add three extra steps between Steps VII and VIII above. The three steps are:

- insert an extra box and write inside it your hypothesis, which should be in the form of a testable proposition;
- insert an arrow leading from the question box to the hypothesis box; next to arrow write an explanation of how your question leads you to formulating the hypothesis;
- insert an arrow leading back from the hypothesis box to the aim box (so your diagram will now be asymmetrical); next to the arrow, write an explanation of how (or how far) testing the hypothesis enables you to achieve your aim.

You can then, after Step XI, add an arrow leading back from your conclusion to your hypothesis and write next to the arrow an explanation of whether (or to what extent) your hypothesis stands.

Case studies

Two case studies have been written to illustrate the application of this tool. They are by Ms Antonia Symeonidou and Mr Wenrong Lu, both of the Department of Engineering, University of Cambridge:

- Antonia’s case study is available here: http://writeyourresearch.files.wordpress.com/2013/01/case-study-antonia-symeondou.pdf.
• Wenrong’s is available here:

Further reading

The resource that dovetails with this resource most happily is that known as Brown’s eight questions – see ‘Write right first time’, *Literati Newsline*, Special Issue, 1-8.

Citing this tool

If you cite this tool, please refer to it as *Haynes’s all-purpose tool for research writing.*