Scientific Literature

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by

Professor Steven A. Jones

Exercise

Research Idea:

You are interested in targeting drugs so that they will release tissue-destroying agents only at the site of a certain type of cancerous tumor.

Write down 20 questions that

- Relate to your research project
- You really want to know the answer to

State of the Art

If I have made any progress at all, it is because I have stood on the shoulders of giants.

Sir Isaac Newton

It may not be obvious where to find a giant to stand on in a literal sense, but in a figurative sense, they live at the library.

Reasons for Literature Searches

You wish your work to be original.

You can design research on questions that have been raised by other people's work.

- Don't be afraid that someone has already answered your best question.
- Borrow new (probably more relevant) questions from others.

Continual reference to the vast ocean of information available will stimulate new ideas.

Learn new techniques.

Even for the most novel experiment, 99% of the experimental methods you will need will have already been developed by other people.

The Student's Greatest Fear

What if I find out that someone has already done my research – and …

- It's the only thing I know how to do.
- It's the only good question I can think of.
- I've been working on the problem for 4 years!
- Their experiments are better than mine.
- Their results are different from mine.

It’s the only thing I know how to do

- It’s never the only thing you know how to do.
- You need to use your imagination to come up with other ideas.
- Looking through the literature will give you ideas for other (better) problems.
- You can probably still do the same thing, only you will do it in a more focused manner.
- Look for the questions that the author left unanswered.

It’s the only good question I can think of

You will think of other things as you go through the literature.

Your questions will be more focused as a result of knowing more about what has been done.

I've been working on the problem for 4 years!

The odds of you working for 4 years on the same problem that someone else is doing are miniscule – if you keep up with the literature in your field.

Even if their overall question seems the same as yours, there will be differences that are important and that justify publication of your results.

Their experiments are better than mine

Maybe they are. The important thing is that the experiments are different.

If you do your experiments carefully and design them so that they are meaningful, you will make a contribution.

Merely having better equipment does not make for a better experiment.

Their results are different from mine

Maybe you are right and they are wrong.

More likely, you have asked a different question.

You need to determine the difference between what you did and what they did.

Hierarchy of Literature