Video Transcript: Writing a dissertation for science and technical degrees

Slide 1 – Writing a dissertation for science and technical degrees (00:00):

In this video I will take you through the basics of how to write a dissertation for those undertaking a science or technical undergraduate degree. Writing a dissertation as your final year project is a task which may feel daunting, but your degree so far has been preparing you for this moment.

Slide 2 – Lab reports and dissertations (00:16):

To start, what are the differences between a lab report and your final year dissertation? In truth, not much. Compared to a lab report, dissertations are usually longer pieces of work which cover a more comprehensive research area and therefore will likely involve more experiments and literature reviewing, and finally one of the most important skills is that they involve more independent study. The same skills and techniques used in writing lab reports and essays can and should be applied to writing your dissertation. When it comes to the length of your dissertation always refer to any dissertation guidelines and/or your supervisor if you are uncertain.

Slide 3 – Planning a dissertation (00:53):

Often at undergraduate level the research area is chosen for you, but that doesn't mean you don't have a say. Don't be afraid to speak up and offer suggestions: you are bringing a new perspective which your supervisors may not have thought of before. An important step to carrying out your dissertation project is planning the project and communicating with your supervisor. A useful tool to aid with this is the research proposal planning tool which is part of the Library Academic Skills Kit and can be found at the QR code on screen. Importantly, this step defines the aims of your research and the methods you use to investigate them.

Slide 4 – Structuring a dissertation (1:30):

This is a general structure for a dissertation which can differ depending upon project and research area. In brief, a dissertation can be split into five main sections. The abstract, the introduction, methods and materials, results, and discussions and conclusions. When writing your dissertation always refer to any guidelines first and foremost.

Slide 5 – Abstract (1:50):

While the abstract is the first piece of work an examiner will see, it is usually the final part written. It is recommended to write the abstract last because you will have a comprehensive understanding of your work to reflect on.

The abstract is a summary of the dissertation in 200 to 300 words and all information included in the abstract should also be found in the main text. In summary, an abstract should:

- Provide a brief introduction to the research area and what is missing. This can be done in just a few lines and usually would not include references
- The abstract should mention the aims of the research project before
- Briefly detailing the methods taken to address these aims – for example if you were quantifying protein levels you could state 'proteins were quantified using X method' but you do not need to go into further details.
- Next, what were the main results? It is likely not every finding will fit in your abstract and you will have to be selective and choose the most important ones.
- Finally, conclude. What are the implications of your research? Why are they important to the research field?

Slide 6 – Introduction (2:53):

In the main body of the dissertation, the first section will be the introduction which introduces the reader to the research field. You will need to read around the area to gather content for this through lecture notes, textbooks, and published papers. None of your results should be mentioned in this introduction, this is all background information to set the scene for your dissertation. The aims should be at the end of the introduction or as its own section following the introduction, and they should be clear and concise.

Slide 7 – Methods and materials (3:22):

The methods and materials are often the easiest section to begin writing because it is just factually detailing how you carried out your research. But what should you include? If it is a well used method such as Western blotting, you can reference the method but specify any unique parameters such as antibodies used. However, if you have developed and optimised your own method, include all the details and steps for this to ensure the experiment can be replicated. The point of your methods and materials section is that anyone should be able to repeat the experiment by just following your instructions. Swap your methods and materials section with a friend to see if they could follow along. Following this advice will make for a methods section which promotes robustness and reproducibility.

Slide 8 - Results (4:08):

Sometimes results and discussion sections can be combined, but typically for a dissertation these are kept separate. Splitting the results into subsections can help in guiding the narrative of your dissertation which can improve the readability and flow of your work.
In the results you describe the data. For example, if you have a graph: what are on the axis and what are the units? Are there any observable trends in the data? Unless you are combining results and discussion, don't infer or discuss how this relates to the current thinking in the research area. Often people can worry if their results don't show what was expected and they don't think these are worth including in their dissertation. But unexpected results are still results. You will not be marked on what your research specifically shows, but on how you present your work. Therefore, unexpected results should still be included if they are relevant to your research.

Slide 9 – Discussion and conclusions (5:02):

In the discussion and conclusions, subsections can be used similar to in the results section. As obvious as it sounds, the discussion is where you discuss the results. This is where you will make inferences, compare the results to one another, and to the current research field.
It is worth mentioning the limitations of your work and what future work could be conducted to demonstrate the depth of your understanding. Critical thinking such as this will help towards improving your mark. The conclusion can be combined or kept separate to the discussion, but

that is down to personal preference. Although you should always refer to your dissertation guidelines to see if there is a specified structure. In the conclusion you always should link back to your aims – does this work support them or not?

Slide 10 – Reference/bibliography (5:47):

Various referencing styles exist, with some disciplines and journals requiring a specific style. The most common are Harvard, IEEE and APA. It is best practice to use a referencing tool to keep track of your references A This will help to prevent losing any papers you have read and would like to reference at a later date. Additionally, using a referencing tool is handy because it will correctly format your in-text references and automatically generate a list of the references at the end of your work. For additional details and resources regarding referencing, scan the QR code on screen to access the Library Academic Skills Kit referencing resource.

Slide 11 – top tops for writing a dissertation (6:27):

These are our additional top tips for anyone writing a dissertation for a science or technical degree:

- When planning your project, use the research proposal planning tool. Not only will this help give you an outline of what your project should look like at the beginning of it, you can refer back to it when writing up
- Always use appropriate font and font sizes
- Avoid using contractions – for example use ‘did not’ instead of ‘didn’t’
- Refer to your aims in your conclusions. You don’t want the examiner having to go back to the beginning to check your aims. Make it as simple as possible for them.
- Don’t be afraid to ask questions, even when you feel they may be irrelevant or unimportant. Your supervisor and others are there to help you.
- If you haven’t already, download our Writing a Science or Technical Dissertation checklist to ensure you’ve completed everything before submitting!

And finally, although others on your course are likely investigating a completely different topic to you, speaking to them may answer questions you have!

Slide 12 – Remember... (7:25):

Remember: the first draft will not be perfect. Writing a dissertation is a skill like any other and requires time and practice to perfect. Sometimes it can help to write it all in bullet point form first, or to write it out as notes to fill it in as you go. The method which works for you is the best method. And with practice, guidance from resources such as this, and feedback on your drafts, your dissertation will be in submission-shape in no time.

Slide 13 – Help resources (7:51):

For more resources to help with writing your dissertation, access the Academic Skills Kit and the Your Skills page to explore Your Skills sessions. Alternatively send any questions to the email address on screen.