

Preparation for a MSc/PhD Defense

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For those of you who plan on defending your MSc or PhD over the next few months, or in the near future, you will have to be prepared to conduct a virtual defense, either through Zoom or another online platform. I was part of a cohort of graduate students that recently defended their PhD in a virtual setting and wanted to share my experiences and tips for preparation. These tips are based on a combination of articles I've read, advice from others who have defended in the past, and from my own experience with a virtual defense. When I first heard I had to switch to a virtual defense, like many others, I was a bit disappointed because I had spent several years of my life leading up to this moment. The most important thing to remember is that this is still a special occasion for you, your family, friends, and colleagues, regardless if it is done at home or not. Despite the virtual nature, this is your momentous opportunity to showcase your passion for your area of research, while having a fun and interactive conversation with your examiners. Your supervisor and examiners are eager for you to pass, and they will want to hear your ideas on the implications and applications of your research and how you would further advance this project.

One of the first things to do is read up on your department's policies on scheduling the online defense which can differ between graduate departments within your institution. My department was the Institute of Medical Science (IMS) which chose to facilitate the virtual meeting using the Zoom platform. The IMS Thesis Coordinator set-up the Zoom meeting and relinquished control to the designated Chair once they joined. My department did a great job in coordinating the defense and ensuring all examiners received protocol information for the defense which alleviated any stress regarding the set-up of the meeting. I was required to email copies of my thesis to all defense members ~1 month before the defense, but I know of some examiners preferring a hardcopy. I joined the Zoom meeting ~15 minutes before the defense start time to ensure my PowerPoint presentation could be effectively shared and that my camera/background were properly set-up. I used an external monitor connected to my laptop which allows you to use presenter view on Zoom (need to enable dual monitor usage in Zoom general settings). Your attire is entirely up to you, however, my attire reflected what I would have worn if the defense was in-person, a dress shirt and blazer, but with sweatpants as I planned to present sitting down. Dressing professionally helped keep this memorable moment special, while taking advantage of the comfort of having a virtual defense at home.

For the defense, I used plugged-in earphones with a built-in microphone but was notified within a few minutes that my microphone was making contact with my shirt resulting in additional noise. I adjusted the microphone to resolve this issue but may have benefited from an alternative wireless headphone/microphone option or if sensitive enough, your computer microphone should be sufficient. During the question period, each member had an allotted time to ask their questions (~8-10 minutes) and this occurred over two rounds. I was advised to keep my PowerPoint presentation in outline mode so I could view multiple slides at once, which is much easier to navigate than individual slides. I printed a hardcopy of my thesis just in case the examiners wanted to refer to a specific section in the thesis. However, I mainly used my PowerPoint slides to answer the questions throughout the defense. I was able to practice my defense presentation several times with my lab which gave me confidence that my computer, internet, and camera were fully functional and optimized. I also informed everyone in my house that this meeting was happening to avoid any unpredictable requests or incidents (e.g. fire alarm from cooking, etc). At the end of the question period and the start of the deliberation period, I was requested to leave my room and to wait for a text message from my supervisor to re-enter. An alternative approach to this would be to leave the meeting entirely and join the Zoom meeting again once I got the approval. This process will ultimately depend on your department's best practices. Overall, the defense went smoothly with no glitches, the committee members were all supportive and interested in the research, and I passed!

Here are some tips and lessons I believe helped me prepare for my defense:

- 1) **Practice, practice, practice:** I received invaluable feedback from my lab and people who have previously defended. Even presenting to people outside your field is a great way to get unique perspectives on your work, which will prepare you for the defense in which you have experts from wide-ranging fields.
- 2) **Anticipating questions:** There are many articles online regarding what questions you can expect at your defense which will help prepare you for the “big picture” questions or even questions related to your future goals (<https://medium.com/advice-and-help-in-authoring-a-phd-or-non-fiction/top-ten-questions-for-the-phd-oral-exam-c3687cc75962#cy3zab9ty>). During my PhD defense, I noticed two main question types: i) how does your research contribute to the broader area of research? ii) how would you advance your current work as a scientist? what would be your hypothesis and experimental strategy to address this hypothesis?
- 3) **Body language and backdrop:** It is obvious that presenting in-person is quite different than presenting through a webcam, but many aspects are similar. Mark Bowden, a body language expert, provided some great advice on establishing a “personal connection” with your audience (<https://www.youtube.com/watch?v=vYwN2LFDeFA>). He provides several key points for virtual meetings in general which include positioning your laptop/webcam to eye level which promotes a better personal connection with people, compared to looking up or looking down at the audience. Lighting is also important and can include a lamp behind your computer to shine light towards your face or even a window to allow natural light to illuminate your face.
- 4) **Climbing the thesis mountain:** Read your thesis a few times (which can be exhausting) and with extended breaks in between to get a fresh perspective on your thesis. I would recommend waiting between 1-3 weeks (depending on defense date) to take a deep dive into your thesis. It helped me perform a less biased critical appraisal of my own work and formulate new questions.
- 5) **External perspectives:** Review 2-3 recent papers from your examiners. Your examiners are the leading experts in their own field and will have differing perspectives than yours. I would recommend reading some of their research to anticipate how their work could relate or apply to your research. For example, if one of your examiners is developing a new technology to deliver drugs within the human body, you could come up with ideas on how your research could benefit with this technology or at the very least, have an idea about other similar technologies. This will demonstrate to your examiners that you possess the ability to apply external concepts to your own work and research objectives.
- 6) **Keep the application in mind:** Often times in biomedical research, we delve deep into testing research questions that require a razor-sharp focus on specific biological pathways, the interaction between two chemicals, or algorithms that analyze diverse datasets. In order to appreciate the impact of your research, you will need to keep the real-life application (e.g. patient for medical research, communities for epidemiological research) in mind and be able to communicate how your research will provide a future benefit. This can be non-trivial sometimes but can be addressed with further research and conversations with other researchers in your respective fields.
- 7) **Endgame:** After the defense, I knew I could not have a big celebration with my family and friends or go on the dream vacation as I envisioned for many years – this was disheartening. However, I was still able to connect with the people I care about and enjoyed the moment! My lab planned a virtual Zoom party where we had some drinks and played online games. They even surprised me with a cake delivery which was heartwarming! I caught up with my family and friends and ordered an enormous amount of food from our favourite local restaurant. During these times, it is the simple things that matter more. Within a few days, an anti-climactic feeling does sort of set in, but I took solace in the fact that my next chapter will be a more exciting and fulfilling adventure. With the current COVID-19 situation, we must acknowledge that patience is not only a virtue, but a necessity.

You have spent more time on your research project than anyone else so you should feel confident that you know your data and conclusions. It is impossible to know all aspects of your research area and it is very common that there are conflicting reports in your field. You should accept these imperfections as it is inherent in all disciplines of research. The key skills to take away from this include being able to use your data to come up with your own hypotheses and to understand the methodological approaches that are used in your field. Make sure you have fun, acknowledge the limitations of your research, and continuously highlight the impact of your data. The purpose of the defense is not to get a grilling, but for the examiners to see your perspectives and understanding of the implications of your work in the broader scientific realm. Good luck with your upcoming defenses! Feel free to reach out to me or the RTC if you have any further questions or other suggestions to improve the virtual experience.