

# Laidlaw Reflective Report 2021

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When I consider my Laidlaw experience thus far, I am extremely grateful for how much I have gotten out of the programme, the huge leaps and bounds I have made in my personal development since the beginning of the summer, and the truly fantastic global and Irish networks of young people of which I am now a part.

Firstly I would like to discuss my experience of undertaking and completing the six-week summer research project. One of the biggest lessons I learned from this was the importance of good planning and organisation - I was very happy when I realised around week 5 or 6 that I was exactly at the stage in the project that I should have been according to my original proposal, despite feeling like I was very behind. Initially before beginning the research I had thought that I might actually end up ahead of schedule, as when written down the jobs and tasks involved didn't look like they would take that long, but - as I soon discovered - these things always end up taking much longer than expected! So, despite feeling both ahead of myself and like I needed to catch up at different times throughout the six weeks, as a result of my original week-by-week plan I ended up getting the balance just right.

My experience of completing the research was at times tough, but ultimately very rewarding. As I had never before used the software (VASP) that I needed to conduct my calculations, I found it very challenging and intimidating at the start of the six weeks. VASP is accessed through a Linux terminal, the commands and code for which I had only seen once or twice before, and had never really used myself. Through working with Dr. Sumanta Bhandary, a member of the O'Regan Group in TCD, by the end of the first week I finally felt that I was getting to grips with the software. Although it was a steep learning curve, once I was more comfortable with navigating the system I found myself excited to continue, as I knew I finally had the skills necessary to run calculations on the software. Throughout the remainder of the project, I really built on the knowledge of VASP that I gained during that first week, and having completed the research I am very confident and comfortable with using the terminal now.

Originally I had planned to research three different metals and to attempt to magnetise all three. However, in consultation with my supervisor (Prof. David O'Regan), I decided shortly into the project to reassess and to focus only on magnetising copper. This ultimately proved to be the right decision, as instead of half-doing three separate sets of calculations I was able to fully focus on thoroughly investigating the properties of copper only. I am happy that I decided to narrow my focus in this way, as I believe that my research was all the better for it - had I attempted what I had originally intended to do it wouldn't have been possible for me to complete my project to a high standard in six weeks, and I think that it would have overall made for a less enjoyable research experience. The fact that I was able to make this decision was an achievement for me, as in the past there have been times when I have tried to do too much in too short an amount of time (with less than ideal results), and so I felt that my choosing quality over quantity of work was progress for me.

Around three weeks in I had completed grid calculations on VASP for all of the possible combinations of three N-values (0.7, 0.8, and 0.9 - the amount of electrons depleted from the copper atoms), and five A-values (-0.4, -0.2, 0.0, 0.2 and 0.4, the lattice constant or the value by which the lattice of atoms is 'stretched' - meaning that the atoms can be closer to or farther away from each other). This left me with three points to be plotted on five separate graphs, so for example the plot of "A = -0.4" had three points, the coordinates of which I obtained from further calculations on the three values of N: 0.7, 0.8 and 0.9. I also did this for the four other values of A. My aim in doing this was to find the slope of this graph, which I needed to use in a calculation called 'Stoner's criterion', the result of which would let me know if the copper had successfully been magnetised. I felt once I had done this that the graph - only containing three points - didn't paint a full picture of what was happening to the copper, and so I decided to repeat the full set of calculations, but this time adding in extra points between N = 0.7 and N = 0.8, and also between N = 0.8 and N = 0.9. I ran the calculations again but this time using eleven N-values: 0.7, 0.72, 0.74, 0.76, 0.78, 0.8, 0.82, 0.84, 0.86, 0.88 and 0.9. This gave five much more accurate graphs, and it was very worth the extra time it took to compute and analyse these points.

The single greatest leadership attribute that I developed over the summer was becoming much more secure in my sense of my own confidence. In my Personal Development Plan I had identified "Public speaking about academic work" as an area that I really wanted to work on. Although I would consider myself to be confident in other areas, before beginning the project this summer I knew that I struggled specifically with discussing my research and academic findings in a way that showed confidence in my own work. However, as I went through the summer, I took every opportunity to discuss my project with my supervisor, other scholars, friends, and family, and I found that through this repeated practice of speaking to people my own understanding of the material deepened and became more intuitive as time went on. When people had questions about the project, I was then able to confidently answer them from a place of genuine understanding about what I was doing, knowing that I was getting better every time at explaining the difficult and oftentimes complex concepts of my project in a clear and understandable way. All of this helped me immensely in achieving my goal of becoming better at speaking with confidence about my academic research.

One other area that I felt I really developed in particular over the course of the project was my ability to speak up and ask for help and support when I needed it. Although this may have been easier for me to do had it been possible for my research to have been conducted entirely on-campus (my project was completed virtually over MS Teams), in a way completing the project remotely meant that I had no option but to actively reach out more via email or Teams message when I needed more help understanding concepts or was confused about something. In the past I have definitely struggled with doing this, but going into the project I knew that this was a skill I wanted to work on, and I feel that I successfully did. Although I got a lot better at this throughout the course of my research, I am aware that this is still something I can improve and work on in the future - understanding that there are people there to support me and that I am able to lean on them for help when I need to.

Throughout the entire process of completing my research project, and indeed engaging with the programme as a whole, I have found that my ALS group was an invaluable resource for me. Sometimes if I found that I was worried or stressed about a particular aspect of my research, if something wasn't going as planned or I had to make changes to my original plan, it was a great relief to be able to discuss this with my group and to see that others were having similar experiences and going through the same things with their own research. Especially as I did my project online early on in the summer when lockdown measures (and the isolation they brought) were still in place, to have a group of peers with whom I was able to discuss the challenges and successes involved in completing my project was so important. It was also really interesting to hear about the areas and topics they were investigating, especially as it gave me an insight into how research is conducted in different non-STEM fields.

I really enjoyed all of the leadership sessions and talks that we have had so far in the programme, but especially the end of the LEAD 1 session in May 2021, when Prof. (now Provost!) Linda Doyle spoke to us. I found myself genuinely inspired by the ease and comfort with which Prof. Doyle answered our questions and discussed her experience of running for Provost - I thought she was a fabulous public speaker and very genuine, and I left the session with a sense of great hope for the future of Trinity over the next ten years under her leadership.

More recently I had the amazing opportunity to be a Laidlaw scholar at just the right time to experience Lord Laidlaw himself and Susanna Kempe, CEO of the Laidlaw Foundation, visit the Trinity campus. I attended the afternoon event in the Business School and really enjoyed seeing the presentations made by other scholars in both my own cohort and in the years above - it was really interesting to hear about all of the types of research in different fields that they had carried out, and to hear about the programme from the perspective of some of their supervisors as well.

I can't end this report without mentioning the Lír workshop that the programme facilitated. As the first in-person event of the programme it was fantastic to be finally able to meet other scholars and the Trinity Laidlaw team in real life - people that I had known over Zoom for several months at that stage. At the end of the workshop (when we were all invited to make a presentation to the group) I found that the anticipation of waiting to stand up and speak without notes or visual aids in front of my peers was so much worse than when I was actually standing there about to speak - good knowledge to have going forward. Throughout the whole workshop everyone was so supportive and encouraging of each other as we all learned different techniques to improve our public speaking - I felt very lucky to be among such a lovely group of people.

To conclude this reflective report, it's safe to say that through my experience of the Laidlaw programme so far I have gained immense amounts of confidence in both my personal and professional/academic life. I really feel like a leader now, and I have found that skills I gained or improved on throughout the sessions have helped me in many areas of my life - for example I have regularly used the public speaking advice from the Lír workshop in my role as Auditor of the TCD Physics Society this year.

I truly can't wait for the rest of the programme - I have enjoyed it so much up to this point and I am so excited to complete my Leadership in Action experience next summer, continue learning from and engaging with the upcoming leadership sessions over the next couple of months, and of course spend more time with my fellow scholars and get to know them better!