

## Laidlaw Programme Final Report – Matthew Blakeney

### Leadership-in-Action impact report:

I undertook my Leadership-in-Action experience in IdeaSquare, the innovation space at CERN. Using the skills and knowledge I acquired during my Summer 1 research project on machine learning symmetries of physical systems, my Leadership-in-Action experience involved developing a website (now available at [www.simulatetomorrow.com](http://www.simulatetomorrow.com)) with self-directed tutorials to demonstrate the applicability of computer simulations to working on UN Sustainable Development Goals (SDGs).

I decided to work on this project specifically because I became aware during research that computer simulations and data science techniques are used by some non-profits to maximise their impact, but I found no online resources on the topic. This seemed to be a pity to me because there are plenty of resources available on applying the same techniques for goals that are less beneficial to humanity. Therefore, the intended impact of this project is to enable other technically inclined people to apply their talents to problems that they feel passionate about.

CERN is a collaborative European research centre just outside Geneva primarily focused on elementary particle physics. CERN has been a leading institute for global particle research since its inception seventy years ago - the Large Hadron Collider (currently the largest particle collider in the world) is in CERN. Part of the vision behind the foundation of CERN was to unite the European physics community in the 1950s, after a period of war and exodus from influential scientists. It also aimed to bring together people to work on something positive rather than the weapons of mass destruction that had become associated with physics research – in CERN, all data is made publicly available, and no military research may be carried out.

IdeaSquare was set up as an ‘innovation space’ in CERN ten years ago, aiming to facilitate collaboration between students, scientists, and other organisations, with particular attention given to UN SDGs in the collaborations they facilitate and cultivate. The IdeaSquare facilities include technical workshops to facilitate prototyping, group workspaces

to encourage collaboration and an open area to allow for the delivery of workshops and hackathons. Because IdeaSquare focuses on the application of world-leading research and technology to UN SDGs, my Leadership-in-Action project was well aligned with their values and the IdeaSquare team were very receptive when I pitched my project.

Day to day during my LiA experience, I worked amongst the IdeaSquare team on my project. The staff in IdeaSquare are from a variety of different backgrounds – from behavioural psychology to communications, science anthropology and engineering. There's just one physicist as a permanent member of the IdeaSquare staff, but the space is used by many others to prototype new technology for experiments. Part of the IdeaSquare philosophy is to have the kitchen as a place where people working on completely different projects in the space naturally mingle and converse. To ensure the kitchen became the heart of the space in this way it was equipped with lots of space, stools around a kitchen island, plenty of appliances and utensils, and free coffee. The desired effect certainly was achieved. I met people from many different parts of CERN and visitors from other places in the kitchen and had the chance to discuss their work and the work I was doing with them.

Working in this environment day to day allowed me to get non-physicists' perspectives on the work I was doing. Even though I didn't show my work to everyone I discussed it with, figuring out the best way to frame my project to make its intended purpose as clear as possible was essentially a process of trial and error that was carried out in the kitchen at IdeaSquare. I learned that the best 'elevator pitch' would be different depending on whether I was talking to physicists or non-physicists. This presented a challenge when putting together the home page of the website as it cannot be tailored to the background of the reader in the same way that an in-person pitch can, but it is required to carry out essentially the same function – to tell people why the tutorials are interesting and worthwhile.

This was where the diversity of professional backgrounds in the IdeaSquare team was particularly helpful to me. As one colleague had a degree in behavioural psychology, he was forthcoming with suggestions of ways to keep the attention of a variety of readers and most efficiently convey the point of the website to all. His suggestions centred around

interactivity. If readers can be shown the information or ideas you're trying to convey through interactive elements on the website rather than being told it in a block of text, less of an attention-span is required on behalf of the reader and their experience of taking in the information is more engaging so more likely to stick with them. This basic but effective concept is familiar from workshops on public speaking – it seems to apply in any field where you want to connect with an audience.

Interacting with people from a plethora of professional backgrounds also inspired me to make 'non-coder' versions of the tutorials, which is the reason why I ended up wanting the homepage of the website to appeal to a wide audience. Many people who I spoke to in the IdeaSquare kitchen and had no coding experience expressed an interest in the notion of applying simulation methods from far-removed disciplines in non-profit settings, but had I executed the project exactly as I had originally envisioned it, I would have had no resource for them to see the concept in action. I'm happy I decided to do this in the end and the experience taught me that when receiving feedback, listening only for suggestions or points to work on is not enough – thinking about how the work can be extended to deliver more of the type of work that is positively received is also beneficial.

My colleagues in IdeaSquare also come from diverse cultural backgrounds. As CERN is the major European nuclear research laboratory, the atmosphere is multicultural, with many nationalities from both Europe and further afield represented in the IdeaSquare team. For this reason, cultural differences were often a topic of conversation, with everybody comparing their respective cultures' approach to different things. This created an atmosphere of cultural celebration, with everybody proudly offering their perspective and comparing it with others. I felt that this atmosphere was exactly what was intended when CERN was set up in part to bring together scientists in Europe into a united community. I think that from a leadership perspective, the lesson to be learned from this experience is that cultural differences within a team should not be treated as taboo but rather as a topic of conversation which can bring people together and remind us of our common human experiences.

Overall, I enjoyed my LiA experience in IdeaSquare and successfully completed the project I set out to do. From my work environment, I particularly learned the importance of cultural and professional diversity in work environments – values which I will aim to foster in future leadership environments.

### **Reflection on the Laidlaw Leadership & Research Programme as a whole:**

My initial interest in the Laidlaw Programme was from a research point of view – having started learning some theoretical physics, I was excited at the opportunity to ‘get my hands dirty’ working with some of the ideas I had learned so far and to work on a project in a self-defined direction. Initially, the leadership element of the programme was something that interested me from a general desire for self-improvement, but it was not what I was focusing on. However, through the workshops in the leadership development training days, I learned the variety of forms that leadership can take, and the widespread applicability of the skillset involved with good leadership.

Further, over the past year and a half I believe I have gained a new interest to which the leadership skills I’ve been developing could be well applied. The idea that I worked on conveying during my LiA experience – the idea of computational simulations being applied for social and environmental good – is one that I am passionate about communicating. While I am proud of what I have put together so far, I feel that the resources I made during my LiA experience cover only the tip of the iceberg when it comes to applications of this idea. For this reason, I would like to build on the resources on [www.simulatetomorrow.com](http://www.simulatetomorrow.com) in future and I believe that the leadership skills I learned during the Laidlaw programme could help me work with other people with an interest in the topic to achieve this.

During both summers I found I had a tendency to get caught in a ‘tunnel vision’ mindset – last summer when working through conceptual problems without considering the overall importance of the efforts I was making to the research goals of the project, and this summer when I initially intended to target the resources I was putting together only at STEM students with prior coding experience. While I learned from my first summer research experience to look out for this way of thinking when I find myself in a rut over the course of

a project by reminding myself of the original plan for the project, this summer I learned that sometimes I must also be open to expanding the aims of the original plan when the feedback I receive suggests it may be beneficial.

The Laidlaw Programme also gave me the chance to make connections with students in a wide range of different fields in my university, who I likely wouldn't have met otherwise. The diversity of cultural and academic backgrounds always enhanced the discussions both during the organised workshops during leadership development training days and when getting together with the other Laidlaw Scholars outside of organised events. As I mentioned in reference to the diversity of professional and cultural backgrounds that I experienced in the IdeaSquare team, the programme overall has instilled a greater appreciation for the power of interdisciplinary thinking and collaboration for generating innovative ideas. Being in social environments where a variety of perspectives are represented has also shaped the way I think about things, because when I am preparing to put forward a suggestion to a group, the reaction I expect from them is in the forefront of my mind. Thus, I am more mindful of perspectives that may not be typical of physicists thanks to the interdisciplinary settings I have had the opportunity to work in.

Through the leadership development training involved in the Laidlaw Programme, I realised that the qualities that were being encouraged and taught for good leadership are the same qualities that I would associate with a generally well-rounded character. This is the philosophy of the Oxford Character Project, who organised the Oxford Ethical Leadership Programme which I completed as part of the Laidlaw Programme. Soft skills such as emotional regulation, empathy, integrity, and a growth mindset were all discussed and some techniques to develop these elements of one's character were presented and practiced. Further, in the leadership development training days at Trinity, some practical skills such as public speaking were also covered. All these skills are not specific to leadership, but rather pertain to the fulfilment of roles where one collaborates with one's team. The fact that the relevant skills are essentially the same in both roles highlights the leadership philosophy taught through the Laidlaw Programme – that leadership done right does not involve a dictatorship dynamic. The difference between a leader and any other team member is more subtle and really should only become apparent at pivotal decision making

and crisis aversion moments. With that said, I've learned that at those moments, as with any other time, the leader's goal should be to create an environment which allows team members to prosper.

Overall, I've had a positive experience with the Laidlaw Programme. The programme has given me the opportunity to develop research and project management skills and has prompted me to pursue new directions in my continuous effort of personal growth. As a result of the programme, I am a better researcher than I was a year and a half ago and I am better prepared for potential leadership positions in the future.