UKRI AI CDT Meeting Key Outputs

14 July 2022

Introduction

UKRI invited representatives from the [16 UKRI Centres for Doctoral Training (CDTs) in artificial intelligence (AI)](#) to a meeting in person on 14 July 2022. The objectives of the meeting were to:

- provide an opportunity for UKRI AI CDT representatives to network
- consider the strategic need for future skills training in AI and the role of CDTs
- reflect on lessons learnt from current UKRI AI CDTs
- seek input to the upcoming UKRI AI CDT call

Session 1: Strategic need

The first discussion considered the strategic need for AI skills in the UK and how this might evolve over 5/10/15 years. Key themes from the discussion included:

- multidisciplinary skills, including being sufficiently knowledgeable in both AI and the application area to understand the challenges
- building AI systems
- making AI usable – user experience and engagement
- human-AI collaboration and human in the loop
- data engineering
- ethics and responsible innovation
- transferable skills included entrepreneurship, innovation and creativity

There was discussion about the need for training to be delivered by experts, potentially through, for example, a national academy. The need for high quality research software engineers (RSEs) was also noted.

In future areas the UK will need skills in include:

- a broad range of AI methods
- energy efficient AI
- understanding and implementing regulation and standards
- quantum AI

Session 2: CDT scheme

During this session, participants discussed key conducive elements of a CDT. Elements discussed included:

- early cohort integration, for example through cohort building activities (specific examples included journal club and retreats)
- support from other members of the cohort
- diverse supervisory teams

- running training in conjunction with industrial partners and group projects/hackathons which are influenced by industrial partners.

Participants discussed how having two supervisors for students works well if both supervisors understand the true nature of a CDT regarding cohort training. Participants also discussed the possibility of holding a supervisor induction programme to ensure this.

With some CDTs being run by multiple institutions, participants considered ways to create well integrated cohorts where individuals can seek guidance and support from others; the value of CDT retreats and other early cohort integration opportunities, both in person and online, were discussed in relation to this.

Session 3: Lessons learnt

This session focused on challenges faced by CDTs and how these have been dealt with. Key points from the discussion included:

- the CDT manager role is busy and requires a lot of skill and knowledge. The role can lack career progression leading to high turnover and loss of knowledge
- '1 + 3' model meant some students remain in MSc mindset, and some see the '1' as a top-up to their education rather than the first year of their PhD. The taught elements reinforce this, for example, going to lectures. Some CDTs managed this this by making research group activities assessed modules, for example assessed journal clubs, reducing taught modules.
- students have a focus on publications, leading them to lose enthusiasm for training aspects and 'soft skill' development. CDTs need to emphasise the importance more, or be more creative in the training.
- post-pandemic has led to students requesting to work from home, or not being located near the CDT. This led to difficulties establishing a cohort ethos.
- CDT aligned academics often not familiar or buying into the CDT mindset, therefore important to ensure they are aware of the expectations.

Specifically, attendees were asked to comment on challenges face when working with industry:

- companies commit at the start, then do not see this through with no mechanism to pull them back
- internships and placements are particularly hard to put into place due to IP issues and students not wanting to lose momentum in their PhD. International students have visa replacement challenges
- Intellectual property is a continual issue, it is hard to keep on top of without specialised internal support
- UKRI rules on what to do with student training/stipend during internships is unclear. Some students suspend their stipend, some don't. The rules are hard to follow.
- students are now starting to be interested in entrepreneurship, how can this be maximised via training?

The session finished with a reflection on what works well for bringing together different disciplines within an AI CDT. Example ideas were:

- dual supervisors (who are both actively involved) is an effective mechanism for ensuring multidisciplinary skills

- students often find more opportunities for innovation when presented with an application project, and in turn offer innovative solutions to non-AI groups leading to lasting collaborations
- more 'team building' activities lead to students who collaborate and form their own multidisciplinary projects and ideas
- it is key to maintain students learning in core AI skills, there is a risk of these being lost with push towards multidisciplinary research 'for the sake of it'
- engagement outside of own department helps draw in potential CDT supervisors, need to effectively explain the worth of getting involved

Session 4: Lessons learnt

This session first focused on the lessons learnt by the leadership teams since the start of the grants. Key things arising include:

- building in flexibility at the outset and have routes to adapt with time
- robust plans to enhance student engagement and commitment, for example through comprehensive induction programmes and regular away days
- recruit a centre manager of the highest calibre
- set very clear roles for the management team incorporating additional figures to support the centre manager, such as industry liaison and student pastoral support

The discussion then moved to discussing actions UKRI could take to evolve the AI CDTs in preparation for the second phase of the investment:

- reflect on the expectations of a cohort, what it's meant by this and how it is to operate in practise, as it's likely this has evolved significantly in the last years
- ensure a critical mass portfolio is created with good connectivity across AI CDTs and with other existing large investments (not necessarily training ones)
- simplify the UKRI/aligned/incorporated student policy
- explore options for 'federated' budget accessible to the centres after the start
- UKRI to be active in promoting students available to industry (especially SMEs) for placements/internships, for example a glossy brochure of CDTs and projects
- set commensurate expectations for industry leverage, considering this is now more difficult than ever

Session 5: Summary and Reflections

It was discussed that it may be beneficial to have recorded expectations of support for staff who will work with centre managers. Focus was brought to the limitations some staff may feel in terms of grading and career progression, the group discussed the possibility of universities being able to employ centre managers and other staff on a range of different grades.

Further discussion brought the group to consider the opportunity to implement a centre managers cohort, where managers from different centres could meet and share best practice/expertise.

CDT representatives considered the possibility of scaling some cross-cutting training and skills across all 16 CDTs to ensure that students benefit from the relevant training opportunities without significantly increasing workload of individual CDT boards.

Free Parking

Only a couple of points were raised, included below for their relevance to current ongoing discussions:

- "How to manage very different experiences of CDT and non-CDT students?"
- "Given inflation, if the amount of money is fixed, the number of students must come down. Hoping universities can leverage the extra funding is false optimism"