Beyond the learning objectives: a reflection on what we teach and how we teach it

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Three other UCL colleagues participated in the discussion. One of whom was from the Department of Physics and Astronomy. For context, ARC designs and delivers CPD offerings in digital research practices to colleagues and students across UCL, in addition to credit bearing modules for MSc level students.

Introduction

Each term ARC hosts a community event for those that teach code and related skills across UCL and beyond. This usually takes for the form of a seminar with networking opportunities.

Due to unexpected unavailability of the term 2 event speaker, there was an opportunity to take time to reflect on what it is that we do.

Over the course of an hour, some pre-prepared prompts guided a reflective discussion.

What do we actually teach?

Every course has predefined learning outcomes, but there is also a hidden curriculum. Things that are taught, developed and enabled that are not part of that explicit curriculum. Some you would term as graduate attributes, others as key skills.

Two of the attributes or skills that coding develops are problem solving and resilience, especially when there is an error that needs to be identified and resolved. Associated with this self-regulation and meta-cognition, as our learners develop as coders, they also develop an awareness of when, where and how they need to gain a deeper understanding of a topic area, change their approach or experiment with a new tool.

By its nature what we teach is interdisciplinary. There are the Computer Science skills of coding itself, but then there is the contextual knowledge from other discipline areas to be able to develop effective code to meet a specified need. Code is also an abstraction; it requires creativity and imagination to reimagine concrete items and concepts as data structures.

Some of this does appear in the QAA Subject Benchmark statements for Computing, but only in the Excellent descriptors for undergraduate students. What are the implications for students who are note “Excellent”?

How have we developed as educators?

Developing as an educator is an ongoing process. Although many in the group were experienced educators, very few were formally trained, some had started their educator journeys with no training, delivering lectures or leading modules across undergraduate and master’s level courses.

Some had undertaken generic pedagogical training provided by their institution, either as part of an induction requirement or as ongoing continuing professional development. Although this was found to be generally useful, it was also seen as a little too generic at times. The teaching of coding and related skills can require quite a different pedagogic approach to some other discipline areas.

Most development was informal. Observations and feedback were found to be helpful as were courses in skills such as use of voice and presentation skills. Training, such as The Carpentries Instructor training was noted to be quite impactful and introduced concepts that may not previously been considered.

Do we walk the talk?

Although many of us teach using open-source tools, and actively promote open and reproducible practices this not always replicated in our approach to teaching resources.

The Carpentries materials are well used by some discussion participants and will form the basis of some modified learning that is shared as open educational resources (OER).

However, many were not making use of OER and felt that it was difficult to find and evaluate the quality of suitable resources. Additionally, time and a sense of niche-ness were barriers to the sharing of their materials as OER.

What tools do we use for teaching and materials creation?

One point of discussion was how do we define a “teaching platform”? There are several platforms that are used that facilitate different parts of a learning journey.

Some of these include:

- Mentimeter
- Jupyter notebooks and hub
- Docker
- HackMD

Our institution uses Moodle as its virtual learning environment, Moodle courses exist for all taught modules across the institution. These act as a “sat nav” for courses, guiding students’ learning journeys, but is it a teaching platform? Interaction is often asynchronous and outside of contact hours. However, it has at time proven difficult to have tools such as the CodeRunner plugin added to the Moodle environment.

Platforms such as CoCalc provide a more inclusive environment, provisioning a compute environment alongside learning tasks. However, this is not a real-world environment.

In some courses students are encouraged to use tools and platforms that they would experience outside of the classroom such as GitHub and VSCode, and in some instances cloud compute.

There were a range of approaches taken to learning materials creation, including in some cases the use of The Carpentries lesson infrastructure.

Overall, it was widely acknowledged that adding or developing onto new platforms was not always possible (or available when needed), and that there are trade-offs when cohort need relies on using ‘in-house’ tools/platforms

Conclusion

“Were all instructors to realize that the quality of mental process, not the production of correct answers, is the measure of educative growth something hardly less than a revolution in teaching would be worked.”
― John Dewey, Democracy and Education

As a group of educators from various disciplines we value process over product, however do our students?

The importance of these mental processes and associated graduate attributes are not always clearly articulated to students, forming a hidden curriculum, and some tactical approaches to study being undertaken may ultimately limit their learning. How do we make that hidden curricular more transparent?

Equally, how do we identify and make space for meaningful development opportunities for both new and experienced educators? Are the Teach and Code Social events a contribution to peer learning and the start or a burgeoning community of practice?

Being able to reflect upon both what it is we are teaching, but also ourselves as educators is an important part of continuing professional development. I would like to thank the colleagues who took part in this discussion for their openness and honesty.