

Invited Talk: Reflections on educating and engaging new communities of practice with high performance computing through the integration of teaching and research

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In my role as UCL lead for CompBioMed, a H2020 Centre of Excellence in Computational Biomedicine (compbio.med.ucl.ac.uk), and as Head of Teaching for Molecular Biosciences at UCL, I have integrated research and teaching to lead the development of HPC-based education targeting medical students and undergraduate students studying biosciences in a way that has explicitly designed to be integrated into their existing university programmes as credit bearing courses. This innovation has not been replicated in any other university in the world. One version of the taught course has been designed for medical students in Years 1 and 2 of study (SSC334) and one of the unique features of the course is the integration of experimental and computational aspects, with students obtaining and processing biological samples, using state of the art Next Generation Sequencing and then interrogating the DNA sequences computationally using code that was ported to high performance computing (HPC) facilities of CompBioMed's HPC Facility core partners (EPCC (UK), SURFsara (Netherlands) and the Barcelona Supercomputing Centre (Spain)). Another version of the taught course (BIOC0023) replaces the final year research project course for undergraduate biomedical science students, providing them with the opportunity to design and complete an entire research project from developing experimental hypotheses to investigating these in a way that involves the integration of experimental and computational methodologies. In the past 18 months, these UCL courses have successfully run with a total of ~250 students participating (60 medical students and 195 biomedical science students). Our experience developing and running these two university modules has enabled us to distil our methodology into an educational template that can be delivered at other universities in Europe and worldwide. This educational approach to training has enabled us to create new communities of practice (medical students, biological science and biomedical engineering students, women) able to effectively engage with high performance computing and computational biology methods. In this talk, I will our experiences in designing and delivering these modules and in identifying how best to teach HPC-based education to students from different areas of the biomedical sciences.