



Exciting PhD opportunity at University College Dublin to develop Transformative Learning Experiences and Educational Technology to Upskill the Future Generation of Scientists

Institutions: University College Dublin (UCD)

Supervisor: Asst. Prof. Fun Man Fung (UCD)

Project title: Digital Futures of Training Next-Generation Scientists

Stipend: €22,000 per year (fees are also fully covered and this stipend is tax exempt), with additional funding available for travel, consumables, and training opportunities.

Start date: from 01/09/2025

Duration: Fully funded for 4 years from start date

Project description

Broader context

The rapid advancement of digital technologies has revolutionized the science of learning. In the field of science, digital tools hold the potential to transform the current training and development methods, enhancing student engagement, critical thinking, and problem-solving skills in the 21st-century. However, the optimal integration of digital technologies into tertiary education remains an ongoing challenge. This research project aims to address this global challenge by developing innovative digital tools and investigating their impact on lifelong learning and scientific training practice.

Furthermore, this research seeks to understand and address critical questions such as how variations in individuals and contextual factors influence learning and development, how to design for learner variability at scale to enable all learners to reach their potential, how to produce interventions that reduce growing inequalities in citizens' learning and overcome disparities in the impacts of digital technologies, and how to address the role of data to help citizen learners and trainers make informed decisions about their lifelong learning strategies.

Research question

To achieve the project's objectives, the research will investigate how digital tools can be effectively integrated into education to enhance learner engagement and motivation, while considering individual differences and contextual factors. It will also explore the impact of digital technologies on learning outcomes in science, particularly for marginalized and underrepresented groups. Additionally, the research will focus on designing and implementing scalable digital interventions to reduce learning inequalities and promote equitable access to quality education through digital enablement and upskilling of learners and educators. Finally, the project will investigate how learning analytics can be used to inform personalized learning experiences and improve training and development practices.

Scientific aims

The initial aim is to design and develop innovative digital tools that are inclusive and accessible to learners of diverse backgrounds and abilities. The project aims to conduct rigorous evaluations to assess the effectiveness of the developed tools on learner engagement, learning outcomes, and scientific practice. The research aims to develop guidelines and recommendations for policymakers, educators and researchers on the optimal use of digital tools in tertiary education, considering individual differences and contextual factors. Furthermore, the project aim to foster a community of practice to share knowledge, collaborate on future projects, and advocate for equitable access to digital technologies in science education. Finally, the research aims to explore the ethical implications of data use in education, investigating the potential benefits and risks of data-driven approaches to the science of learning, and developing guidelines for responsible data practices. The project will aim to publish findings in high quality scientific journals, alongside the dissemination of results via international conferences.

Eligibility:

Applications are welcome from highly motivated individuals who are interested in solving real-world challenges in delivering transformative learning using evidence-based research. The candidate should have or be close to completing a bachelors or master's degree in Chemistry, Materials Science, Chemical Physics, or a related STEM discipline. The candidate should have excellent written and oral English and communication skills. Programming and statistical skills are highly desirable. The desired candidate should have interest in an understanding of the methods and principles of science education, educational psychology, and cognitive science. The project will require dissemination of results both nationally and internationally, so the candidate will have opportunities to travel both nationally and internationally. The highly collaborative nature of the project would also require the candidate to have good interpersonal skills and a cooperative work ethic.

The successful candidate will work on several projects with clear goals, deliverables, and schedules, and will be based at University College Dublin at the School of Chemistry.

Supplementary information:

The University:	https://www.ucd.ie/
UCD Strategy 2030: Breaking Boundaries	https://strategy.ucd.ie/
UCD College of Science:	https://www.ucd.ie/science/
UCD School of Chemistry:	https://www.ucd.ie/chem/
Equality Diversity and Inclusion at UCD	https://www.ucd.ie/workatucd/diversity/

Informal Enquiries to:

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