

PhD Opportunity

Application of Universal Design for Learning (UDL) and Artificial Intelligence (AI) in post compulsory education

Supervisory team

Dr Darren Cooper and Dr Sean Bracken

Director of Studies

Dr Darren Cooper, Inclusion by Design, School of Sports and Exercise Science, University of Worcester

Supervisors

Dr Seán Bracken, Inclusion by Design, Institute of Education, University of Worcester

[Inclusion by Design Research Group](#)

The PhD Opportunity

Investigating the impact for Inclusive Education of Universal Design for Learning with the application of Artificial Intelligence tools in Higher Education Institutions (HEIs).

Traditional educational curricula, pedagogies, and assessment design, whether in Higher Education Institutions (HEIs) or in the maintained sector, often create barriers for 'learners on the margins', and this is especially so for learners with disabilities. This is due to several factors, including the use of inaccessible materials, a lack of flexible learning options, and a focus on one-size-fits-all teaching and assessment. The Universal Design for Learning (UDL) framework can be used to design learning experiences that are mindful of the diverse learners' requirements. The framework is enabling because it empowers educators to anticipate some of the challenges diverse learners may face and thereby facilitates the design of learning and assessment pathways that are accessible to all.

The framework provides a targeted scaffolding of learning design incorporating three main areas:

1. Multiple means of engagement: This involves providing learners with different ways to be motivated and interested in learning, such as through choice, challenge, collaboration and, where possible, encouraging co-production.
2. Multiple means of representation: This includes, for example, involving learners with different ways to access information, such as through text, images, audio, and video. Increasingly, this aspect of representation involves the use of artificial intelligence (AI) tools.

3. Multiple means of action and expression: This strand provides learners with different ways to demonstrate their learning, such as through writing, speaking, drawing, and problem-solving. This approach recognises potential assets that all learners take to the learning space.

While there is a growing body of research about the use of AI to support education, no current studies in this field take specific cognisance of how a UDL approach may add value to accessibility and enable diverse learners to best demonstrate their learning. AI tools have the potential to provide learners with a variety of benefits, such as increased access to learning, improved learning outcomes, and reduced barriers to learning. The research will augment existing research tenders and doctoral lines of inquiry aligned to the Inclusion by Design (IBD) Research Group and help strengthen our ambition to become a Research Centre.

Project aims and objectives

Ultimately, the proposed PhD project aims to enhance educational experiences for all learners by identifying the affordance of AI by applying a UDL approach. Specific research objectives include:

Investigating how AI can be used in educational settings while simultaneously applying the three facilitating strands of UDL, focusing on multiple means of representation (as identified in strand 2 above).

Identifying the challenges and opportunities for using AI to support the inclusion of all learners, especially those who may be marginalised, for example, disabled learners.

Garnering the views of learners and educators regarding the enabling and challenging features of adopting a UDL approach to applying AI in learning environments.

Revealing aspects of accessible pedagogical design and assessment to inform policy and practice in these fields.

Suggesting additional lines of inquiry that may be followed through using UDL to inform the application of AI further.

Indicative research method

The nature of the methodological approach will depend on the research candidate's aspirations and experiences. However, as indicated on the Inclusion by Design website, suggested research methods might include Participatory Action Research, Design-Based Research and/or the use of mixed methods approaches involving a combination of qualitative and quantitative methods. The research methodology will be jointly agreed upon by the research team and the PhD candidate concerned.

Application Process

To begin the application process please go to:

<https://www.worc.ac.uk/research/research-degrees/applying-for-a-phd/>.

The Interview

All successful applicants will be offered an interview with the proposed Supervisory Team. You will be contacted by a member of the Doctoral School Team to find a suitable date. Interviews can be conducted in person or over Microsoft Teams.

Funding your PhD

For information about Doctoral Loans please visit: <https://www.worc.ac.uk/study/fees-and-finance/doctoral-loans.aspx>

During your PhD you can access the Research Conference Support Scheme to support the costs of presenting your research at an external conference.

Research at the University of Worcester

Research is central to the University's mission to make a difference in everything that we do. We are committed to delivering excellent research which extends the boundaries of human knowledge but which also improves people's lives by enabling better health outcomes, improving food security, developing environmentally sustainable solutions for crop production and socially sustainable solutions to our ageing population, enhancing public knowledge and understanding of the past and present.

The University hence focuses its research around five high-level challenges facing society, locally, nationally and globally:

- [Human Health and Wellbeing](#)
- [Sustainable Futures](#)
- [Digital Innovation](#)
- [Culture, Identity and Social Exclusion](#)
- [Professional Education](#)

The success of our research is reflected in our continuous improvement in external research assessment processes. In the most recent Research Excellence Framework, REF 2021, the University saw a near 50% increase in the scale of its research and 12% increase in quality, building on its performance in REF 2014 when it was the UK's most improved university in terms of Research Power, a combination of scale and quality.

Research Degrees at Worcester

Our research students are central to our overall mission for research. They are working at the cutting edge of their disciplines and driving forward the quality of our research whilst enriching our research culture. We are looking to increase our research student numbers as a strategic imperative.

Our commitment to our students is reflected in the results of the Postgraduate Research Experience Survey 2023 in which we ranked 3rd for overall research student satisfaction nationally. Key to our success in this area is the Doctoral School, a focal point for all our research students.

It provides:

- day-to-day support for our students, both administrative and practical, through our dedicated team
- a Research Student Study Space with both PCs and laptop docking station
- a comprehensive Researcher Development Programme for students and their supervisors
- a programme of student-led conferences and seminars

Widening Participation

As part of its mission statement the University is committed to widening participation for its higher degrees. Although most candidates will have an undergraduate and/or a Masters degree, the University is happy to accept applications from candidates with relevant professional qualifications and work related experience.

For further information or an informal discussion on this project, please contact Dr Darren Cooper (Director of Studies) via email at d.cooper@worc.ac.uk

