



Economic
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Research Council



A Game-based Approach to Improving the Learning of Arithmetic ESRC DTP Collaborative Studentship

Loughborough University and Sunflower Learning Limited

The Midlands Graduate School is an accredited Economic and Social Research Council (ESRC) Doctoral Training Partnership (DTP). One of 14 such partnerships in the UK, the Midlands Graduate School is a collaboration between the University of Warwick, Aston University, University of Birmingham, University of Leicester, Loughborough University and the University of Nottingham.

Loughborough University as part of Midlands Graduate School is now inviting applications for an ESRC Doctoral Studentship in association with our collaborative partner Sunflower Learning Limited to commence in October 2021.

This project will be based in Mathematics Education Centre at Loughborough University. The aim of the project is to identify how children's learning of arithmetic is developed and sustained through an app made by the industrial partner Sunflower Learning Limited. The app, called *Stick and Split*, is a deceptively simple game that was seven years in development. The research student will evaluate what mathematical learning takes place when primary school children interact with the app, using an integrated methodology based on participant observation, interaction logs and controlled experiments. This will enable the research student to address the following research questions.

- How is arithmetic practised and learned when children interact with *Stick and Split*?
- How does the arithmetic learned within *Stick and Split* transfer to more traditional symbolic contexts?
- What general principles can be applied to designing computer games for learning in other areas of mathematics?

Over the course of their research, the student will be trained by Loughborough and Sunflower Learning in educational app development, interpreting interaction logs, and research methods including participant observation, experimental design, and qualitative and quantitative analysis. They will develop expertise in theories of mathematical practice, learning and transfer. A key practical outcome of the project will be designing a new app based on the principles learned from studying *Stick and Split*, and evaluating the new app's initial success.

The project will suit a research student who is

- interested in how young children learn fundamental mathematical concepts;
- confident about learning sophisticated data analysis techniques;
- excited about working as part of a team to assist in the designing of new software for primary mathematics;

- comfortable working with primary school children and interacting with teachers;
- patient and creative.

The project will be supervised by Dr Dave Hewitt and Dr Ian Jones, based at Loughborough University, and by David Tymms, Sunflower Learning Limited's founding Director.

Application Process

To be considered for this PhD, please complete the Collaborative Studentship application form [available online here](#), a one-page cover letter and a CV, and email this to esrcdtp@lboro.ac.uk. Shortlisted applicants will also be required to provide two references.

Application deadline: Friday 5th March at 5pm

Midlands Graduate School ESRC DTP

Our ESRC studentships cover fees at the home rate, a maintenance stipend, and extensive support for research training, as well as research activity support grants. Support is available to both home and international applicants. For further details, visit: www.mgsdtp.ac.uk/studentships/eligibility/.

Informal enquiries about the research or the Mathematics Education Centre at Loughborough University prior to application can be directed to Dr Dave Hewitt at D.P.Hewitt@lboro.ac.uk.