SELF FUNDED PhD OPPORTUNITY
School of Education, University of Worcester

Primary Identities in Science and Mathematics (PrISM) project

A recent longitudinal Government study (DfE, 2019) has shown that girls' attitudes to studying Science, Technology, Engineering and Mathematics (STEM) are substantially less positive than those of boys. This is of particular concern given that, in the current politico-economic conditions, it is arguably vital that there continues to be a significant commitment to understand and increase the supply of STEM workers. At a time when scientific and technological innovations push ethical and societal boundaries it is preferential to educate a more scientifically literate and numerate citizenry (UKCES, 2013). The proposed project will explore the emergence of children's learning identities in mathematics and science in the critically important, formative years of upper primary school. It will build understanding of how systems (policies, school cultures, curricula, pedagogies) and people (teachers and peers) interact to influence learner trajectories, with a particular interest in any divergence between boys' and girls' attitudes to science and mathematics. Three research questions will guide the project:

1. How do children's experiences shape their learning trajectories in mathematics and science in primary school?
2. What classroom/school climate factors best support children's engagement and progression in mathematics and science learning?
3. What are the relationships between children's identities, attitudes and engagement in mathematics and science?

The successful candidate will be required to consolidate their methodological approach derived from a review of existing literature, along with discussions with supervisors. However, it is proposed that the most effective way of addressing the research will be by adopting an integrated mixed methods design, utilizing a combination of data collection tools. Through a range of innovative methods (including but not restricted to questionnaire surveys, classroom observations, a range of interviewing techniques and photographic narratives), the PrISM project will investigate how pupils' learning trajectories get diffracted ('split') and refracted ('bent') between the ages of 7 and 11. The intention behind this combined approach of data collection tools is to generate differing sources of data that could then be used to analyse and provide insights into children's identities in science and mathematics.

The PrISM project has the potential to make significant theoretical and methodological contributions to the study of pupil identities in primary science and mathematics, including the development of new instruments and a photographic archive. For this reason, findings will be of interest to policymakers, advisors and think tanks, charities and researchers engaged in STEM education, school teachers and CPD providers.

References

DfE (2019) Attitudes towards STEM subjects by gender at KS4: Evidence from LSYPE2 (Research brief, February 2019):

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file /777458/Attitudes_towards_STEM_subjects_by_gender_at_KS4.pdf
UKCES (2013) The Supply of and Demand for High-Level STEM Skills: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/302973/evidencereport-77-high-level-stem-skills_1_.pdf

Supervisory team

The supervisors for this research would be Professor Alison Kington and Dr Karen Blackmore, both of whom have extensive experience of conducting mixed methods research utilising narrative, observational, and repertory grid techniques. Alison's research, which is cross-disciplinary in its theoretical and methodological approaches, focuses on the nature, quality and dynamics of educational relationships and identities. She has a particular focus on the experiences and perceptions of children and staff in schools, with an emphasis on the utilisation and application of research to improve professional practice. Karen has taught in a range of schools and university academic departments as a science educator for the past 20 years and this is reflected in her research into science pedagogy and identity.

Links to current areas of research

This research would fit within the Social Psychology of Education Research Group, which is undertaking an ongoing programme of activity. Members are involved in a wide variety of projects covering issues such as professional identity, career phase, teacher-pupil relationships, and peer/friendship interactions.

Further information

If you would like to discuss this opportunity, please contact Professor Alison Kington (a.kington@worc.ac.uk).