

PhD Scholarship 2016-2019

The PhD is offered through sponsorship by the Primary Science Teaching Trust. It is to be aligned with the work of the Science & Engineering Education Research and Innovation Hub (SEERIH).

A. SEERIH

Established within the Faculty of Engineering & Physical Sciences in 2014 this hub marks the creation of a new centre focused on enhancing the quality of science and engineering education in Greater Manchester schools. The Hub is co-funded by two external partners - The Primary Science Teaching Trust and the Comino Foundation. Dr Lynne Bianchi's role as Head of SEERIH will focus on developing strategic partnerships with UoM Schools across all four Faculties, the UoM Cultural Assets and by acting in a supporting role to Widening Participation, Public Engagement and Outreach teams.

SEERIH's work (www.fascinate.manchester.ac.uk) champions innovative curriculum development and related research in the area of primary and secondary school science, technology and engineering. Its main mission is to engage children, their schools and their local communities in real and relevant science experiences from an early age. The Hub is distinctive in its approach to working with in-service teachers on short, medium and long term research and innovation curriculum development projects related to science and engineering education.

SEERIH specialises in enhancing the profile of research and researchers within the University within schools. Many projects involve research scientists and engineers as co-creators of experiences and learning activities for children. By establishing partnerships with teachers and school clusters, the Hub's work focuses on enlivening the opportunities for teachers' continuous professional development (CPD) and stimulating a positive culture-shift in attitudes and practice.

Indeed the benefits to University students and staff are many, sharing the outcomes of key aspects of contemporary research, raising aspirations and developing the Science Capital within our local communities, and raising awareness of educational policy and implementation etc. Such activity continues to be grounded in academic research and aims to contribute towards the University's achievement in the Research Excellence Framework.

B. SEERIH's Research Interests

SEERIH, in partnership with the Primary Science Teaching Trust, has a core mission of developing the science education professionalism of primary teachers. SEERIH's work is underpinned by a working model of professional development that brokers and facilitates teachers' development through 4 areas of activity: participation, collaboration, co-creation and connection.

To date this model has been developed in response to the need to formalise a range of activity that was being undertaken and to give a rationale for particular activities, projects or events. It has been successful in supporting teachers' choices of the CPD that best suits their needs – this could relate to their personal 'readiness', the level of school support offered to them or their willingness to challenge themselves.

It has enabled a language to describe the way in which teachers engage with learning or the way a trainer/consultant plans for teacher engagement. It has provided a tool for reflection by teachers and senior leaders and a prompt for action planning and discussion about next steps in a

professional learning culture. What is now of interest to explore in more depth is what is happening when a teacher identifies with the model, and indeed the process of transformation that takes place as they engage with professional learning opportunities. Interests lie in the relevance of the model for i) planning professional development for in-service teachers, ii) teachers personal/self-reflective exercises on/about their progress and identity as a science leader, iii) exposing the learning/professional needs of teachers, iv) designing CPD opportunities, v) evaluating CPD opportunities.

In-service teacher continuous professional development (CPD) opportunities for the enhancement of personal skills, knowledge and understanding of primary science are limited. Access is hindered or prohibited by funding and the value placed on the subject within the curriculum. Despite this teachers adopting the role of science subject leader are tasked with developing the subject across the school – by way of upskilling themselves, leading the development of others, having clear understanding of pupil need and progress and resourcing. Models of support often rely on courses delivered by a consultant, training organisation or via teacher-to-teacher support within school and between schools. Teachers can choose from courses to develop science subject knowledge and/or pedagogical knowledge and skills. Emphasis on teachers as action researchers has also become increasingly popular within Teaching School Alliances, leadership programmes and as part of further academic study.

SEERIH's model is based on professional development focused on enhancing teacher's ownership and personal empowerment as a curriculum designer and cultural change agent. It is distinctive in the way that it is aimed to provide targeted CPD opportunities for teachers that are matched to *their* personal needs – 'the right CPD for the right teachers at the right time'. The model embraces a peer-assisted learning culture and champions shared and collaborative learning between in-service teachers and professional groups – e.g. scientists, engineers, creative professionals, etc. It focuses on increasing the capability and confidence of a teacher to take on and embrace professional learning and to 'own' it. It promotes learning about one's profession and professionalism as opposed to developing specific science subject knowledge, although this may be encompassed within the journey a teacher takes. Where space and time for thinking of oneself as a professional learner of science education allows, the SEERIH model provides structure/stimulus to support dialogue between professionals, to access interventions with professionals and to reflect on learning as a professional.

SEERIH aims to:

- research the range, scope, access to and purpose of CPD opportunities for in-service teachers of primary science
- explore how SEERIH practice affects teachers' relationships/identifications with primary science and with professional leadership of primary science
- explain the nature of professional development and the factors/features that influence its impact on teachers

PhD Areas of Interest

The PhD is expected to contribute to the Primary Science Education aspects of the stated research programme, including continued professional development of in-service teachers. By the end of Year 1 the students' research plan and progress in training/development must be agreeable to the team, including representation from the Primary Science Teaching Trust. The plan could develop from one or more of the following themes or related areas of interest:

- 1) How professional dialogue mediates a transformational process for in-service primary teachers' developing a science teacher identity and 'science capital'.
- 2) Developing measures of science education 'know-how' (pedagogical content knowledge) and 'science capital' related to primary school science teaching.
- 3) The development of social networks and 'communities of practice' in relation to teacher identity as a primary science educator and leader.
- 4) The identification of cultural resources that resource or mediate primary science teacher's narratives of identity and professional development.

FIRST ACADEMIC SUPERVISOR

Research Organisation: UoM

Name: Prof Julian Williams

SECOND ACADEMIC SUPERVISOR

Research Organisation: UoM

Name: Dr Lynne Bianchi

ADVISOR

Research Organisation: UoM

Name: Patricia Goreham

CRITICAL FRIENDS

Research Organisation: Oxford Brookes

Name: Prof Debra McGregor

Research Organisation: The Primary Science Teaching Trust

Name: Prof Dudley Shallcross (The University of Bristol)