

## **Bath Spa University School of Education**

### **Application for Research Centre Funding – Centre for Research in Early Scientific Learning (CRESL)**

#### **Title of proposed activity**

Joint bid for a Leverhulme Research Project Grant with the Centre for Science Education, Sheffield Hallam University

#### **A summary of the proposed activity**

Members of CRESL will travel to Sheffield Hallam University for a three-day period in July 2009 for the following purposes:

1. To work with colleagues from the Centre for Science Education, including Ken Manion (Director), Farhana Zaman (associate member of CRESL) and Gareth Price (collaborator on current project), together with their specialist funding bid writer, to develop a substantial proposal (up to £250K) for consideration by the Leverhulme Trust.
3. To give a joint research seminar on our research into ‘dialogic teaching’ in primary science teacher education
4. To visit primary schools in North Yorkshire LA involved in the ‘Talk for Learning’ project, derived from Alexander’s Dialogic Talk principles.
5. To visit the Science Learning Centre North East (based within the Centre for Science Education at Sheffield Hallam University) to explore recruitment of teachers for the proposed project using their extensive network. We would also aim to take Allie Beaumont from Science Learning Centre South West (an associate member of CRESL) to co-ordinate the work with teachers as part of the proposed project.

#### **A list of the staff involved in the proposed activity and their roles**

Professor Dan Davies – Establishing contact with Centre for Science Education, arranging research seminar and joint application writing workshop. Visiting two schools in N. Yorks ‘Talk for Learning’ Project.

Kendra McMahon – Establishing contact with N. Yorks ‘Talk for Learning’ Project. Setting up school visits. Visiting two schools. Participating in research seminar and joint application writing workshop.

Alan Howe – Preparing research seminar and associated paper. Visiting two schools. Participating in research seminar and joint application writing workshop.

Christopher Collier – Liaison with Science Learning Centres in Bristol and Sheffield as part of the process. Visiting two schools. Participating in research seminar and joint application writing workshop.

#### **A detailed rationale for the proposed activity**

The proposed bid for funding from Leverhulme Trust would build on our existing work on dialogic talk (e.g. Davies *et al* 2008), together with our proposed ESRC-

funded project 'Dialogic Teaching in Primary Science Teacher Education', undertaken in collaboration with Farhana Zaman (formerly of Nottingham Trent University but recently moved to Sheffield Hallam University). The application to ESRC will be submitted shortly, for a project to run May 2009-Dec 2010. The overall objective of the project proposed to ESRC is to identify strategies to support pre-service teachers in their developing practice and understanding of 'dialogic' teaching in primary science education. In the event that ESRC choose not to fund this project, the proposed bid to Leverhulme would respond to ESRC feedback and scale up the original £70K proposal to a £250K project. However, if the application to ESRC is successful, the bid to Leverhulme would seek to build on the expected outcome from the ESRC-funded project - a tested pedagogical model for supporting pre-service teachers' use of dialogic teaching in their teaching of primary science – by applying it to primary teachers at different stages of their careers. This would include newly-qualified teachers (NQTs) and science subject leaders (SSLs). The project would also seek to examine how SSLs could support other staff within their schools in building up a repertoire of dialogic strategies. To reach these constituencies we would need to draw upon the networks of the Science Learning Centres (both that located within CSE at Sheffield Hallam, and the South West Centre in Bristol, with which we have close links).

Members of CRESL have been successful in securing small and medium-sized grants over recent years (£90K, £60K and £46K from AstraZeneca, £25K and £20K from NESTA, £45K from BECTA) but have not yet bid for a substantial award, such as the £250K potentially on offer as Leverhulme Research Project Grants. We need to work with an established player in the field – such as the Centre for Science Education (CSE) at Sheffield Hallam University which is entirely funded from research grants (over £3M in 2007-8. Dan Davies visited CSE in January 2008 whilst working on the 'E-scape' project with Gareth Price from CSE, and met with the director Ken Manion who indicated a willingness to consider joint bids. CSE have dedicated funding application writers and significant infrastructure to support this process.

The North Yorkshire LA 'Talk for Learning' Project was established by Professor Robin Alexander of Cambridge University to put into practice his principles of 'dialogic teaching'. The term 'dialogic' is used by Alexander (2004) to express a 'genuinely reciprocal' process of communication between teacher and pupil in which ideas are developed cumulatively over sustained sequences of interactions. In Alexander's cross-cultural study of primary classrooms (2000), Russian classrooms were characterized by an understanding that children's ideas would be publicly challenged within a whole class context, and he describes extended dialogues with one child in which the teacher's questions scaffolded their developing understanding. Alexander makes a distinction between dialogic talk that is 'discussion' which involves shared problem solving and dialogic talk that is 'scaffolded dialogue' in which structured, cumulative questioning leads to 'handover' of concepts. He has gone on to develop a set of indicators for dialogic teaching in the classroom (2006), currently being trialled in projects in North Yorkshire and Barking and Dagenham. In the field of science education, Mortimer and Scott (2003) have developed a framework for analysing the 'communicative approach' of teachers on two dimensions: contrasting dialogic with 'authoritative' and 'interactive' with 'non-interactive'. A study by Rojas-Drummond and Mercer (2004) found that Mexican primary teachers employing more 'dialogic-interactive' approaches were more

effective in developing pupils' learning, and that their communicative approach was strongly influenced by their training. Mercer and Scott's ESRC-funded 'Dialogic Teaching in Science Education' project (2005-7) found relatively few instances of dialogic-interactive approaches in UK primary science teaching; a finding they related to a lack of input on talk in general and questioning in particular in UK teacher education (Mercer and Littleton 2007).

### **A breakdown of resources required and their cost**

<b>Item</b>	<b>Cost</b>
Return rail fares Bath to Sheffield x 4 @ £114	<b>£456</b>
Accommodation at Sheffield Travelodge x 4 people x 2 nights @ £55	<b>£440</b>
Subsistence x 4 people x 3 days @£30	<b>£360</b>
Car hire to visit schools in North Yorks 'Talk for Learning' project x 1 day x 4 people @ £45	<b>£180</b>
Administrative support to complete Leverhulme bid x 6 days @£150	<b>£900</b>
<b>Total</b>	<b>£2336</b>

### **Statement of expected outcomes from the activity**

The expected outcomes from this activity are as follows:

1. A substantial research project proposal to Leverhulme Trust (up to £250K) submitted by their December deadline 2009.
2. Closer academic and strategic links between CRESL and the Centre for Science Education at Sheffield Hallam university, enabling us to bid jointly for future research and consultancy work.
3. Enhanced understanding within the members of CRESL of the dimensions of dialogic talk in primary science, through our research seminar discussions and visits to schools in the 'Talk for Learning' project, enabling us to pursue our research in this area with greater confidence.
4. Closer relationships with the DCSF/Wellcome Trust funded Science Learning Centres, opening up potential for further research funding, recruitment of teacher participants in research activity and opportunities for dissemination.

### **A statement on how the activity will promote future activities of the centre(s) and enhance the reputation of research at the university.**

The proposed activity will promote the future activities of the centre in the following ways:

1. If the Leverhulme Trust application is successful, the centre will expand to take on paid research staff and will be fully engaged in a major collaborative research project likely to generate considerable publicity and several academic publications.
2. It will strengthen CRESLs links with other research centres (CSE) and Science Learning Centres, enabling us to tap into future research and consultancy work which we would normally be unable to contemplate, owing to our small scale.

The activity will enhance the reputation of CRESL as follows:

1. Presenting a research seminar at Sheffield Hallam University will raise awareness within the Centre for Science Education and other faculty staff at Sheffield Hallam of CRESL's expertise and range of activities. This will reflect well upon the status of research at BSU.
2. If the Leverhulme Trust application is successful, the publicity generated will benefit CRESL and BSU both locally and nationally.

**A statement of support from the head of the centre indicating how the bid will contribute to the aims and aspirations of the centre.**

As head of centre I wholeheartedly support this initiative, which builds upon our growing body of research in the field of 'dialogic talk' and would help to forge stronger strategic links with the Centre for Science Education, which is a major player in the science education research community.

**A statement of support from the relevant Head of School**