The Beginning Teacher and the Science Religion Encounter in the Classroom

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The Beginning Teacher in the Science/Religion Encounter: Building Confidence for an Integrated Vision of Knowledge

This project, which is being undertaken by the National Institute for Christian Education Research (NICER) under the leadership of Professor Bob Bowie, is being funded by Templeton World Charity Foundation as part of a wider scheme of research titled Big Questions in Classrooms.

Although studies have explored school pupils' attitudes concerning science and religion, there has been little research on beginning teachers' experiences in their development and formation and not much is known about how big questions are framed in classrooms or the extent of teachers' experiences of the science/religion encounter. This project seeks to address this gap, develop informed responses for teacher education and find some preliminary understandings of the impact of the use of that knowledge in teacher education programmes.

The project comprises three sub-projects two of which are researching specific gaps in knowledge of teacher development and how big questions are framed in science and RE classrooms and a third which seeks to implement some changes.

Sub-project 1, which is being led by Dr Lynn Revell and Dr John-Paul Riordan, is researching the encounter between science and religion in primary and secondary science and RE classrooms, using a video research technique that uses clips of recorded interactions in the classroom as catalysts for talking about and making sense of the encounter.

Ms Caroline Thomas and Dr Mary Woolley are leading Sub-project 2 which is researching the science/religion understanding and classroom experience of student teachers of RE and science at universities across the country with teacher training programmes. This sub-project will use group interviews and quantitative surveys to generate a comprehensive understanding of where student teachers find themselves at the beginning of their school professional lives. If you would like to make an application for your university to participate in this aspect of the research please read the Participation Agreement and complete and return an application form. If you are a 'beginning teacher' (in your training year or a NQT for primary or secondary science and RE) and would like to take part in the online survey please register your interest with Gill Harrison, Project Administrator: gill.harrison@canterbury.ac.uk

Research questions

- **How do teachers perceive and engage their students**
  with knowledge about how science and religion can relate to one another, in the context of science lessons and RE lessons? [sub-project 1]

  a) **How do beginning science and RE teachers address pupil questions when teaching about evolution and religious creation stories?**

- How can we understand the extent and nature of the experience of beginning teachers as to how knowledge works in 'science/religion encounters' in the classroom and how this impacts their confidence and competence? [sub-project 2]

- How can changes in the teacher education programs develop more confident and rich outcomes around how knowledge works in science/religion encounters in the classroom? [sub-project 3]

Big Picture

Researchers

- *NICER research team*
- *Tutors from 5/6 Universities*

Advisors

Participants

1. Video Study of SRE in primary and secondary lessons – perception and engagement

- Pedagogy
- Conceptualisation
- Interpretation

2a. Focus groups to design a survey out about beginning teacher experiences

- 50 -70 student teachers
- To help design a survey

2b. Survey to find out about beginning teacher experiences

- 1000 student teachers (primary and secondary)

3. Understand findings and then apply to teacher education

- Working with universities through AULRE members universities and Cathedrals Group Universities

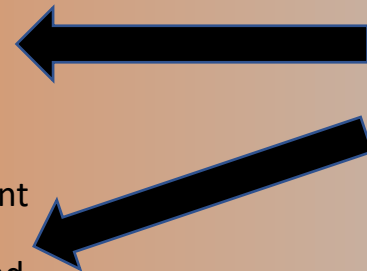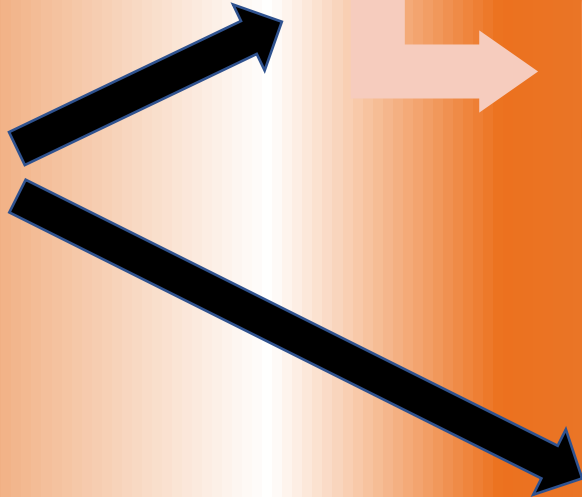**Helping the education of teachers to support better science religion encounters**

Year 1   Year 2   Year 3

2. Literature (known) (from John-Paul Riordan's presentation)

- Public understandings of religion are changing, and census information and social attitudes surveys indicate a downturn in religious practice among young people (Voas and Crockett, 2005; Lee, 2017).

- Several studies explored pupil attitudes concerning science and religion whilst at school (e.g. Astley and Francis, 2010; Southerland and Scharmann, 2013; Bennett and Ratcliffe, 2014; Billingsley, Brock, Taber, and Riga, 2016).

- Beginning teachers are not well prepared for classroom science/religion encounters (literature?).

3. Literature (gap)

- There is a lack of research focussed on what occurs in the classroom when pupil and teacher thoughts and feelings about science/religion are expressed and what pedagogy school teachers use in such situations.

- Research designs exploring science and RE pedagogy when the two domains interact should investigate teachers' complicated thinking processes (Limón, 2001) and should include researcher and pupil interpretations (Riordan, 2020).

SP1 Research design (overview)

- Epistemology: social constructionism
- Theoretical perspective: interpretivism (symbolic interactionism)
- Methodology: grounded theory (Strassian)
- Methods:
  a) lesson video analysis
  b) teacher verbal protocols
  c) pupil group verbal protocols
  d) teacher/researcher group interviews

5b. Research design (methods)

a) Lesson video analysis (1 hr x 4; topics evolution and 'creation stories')
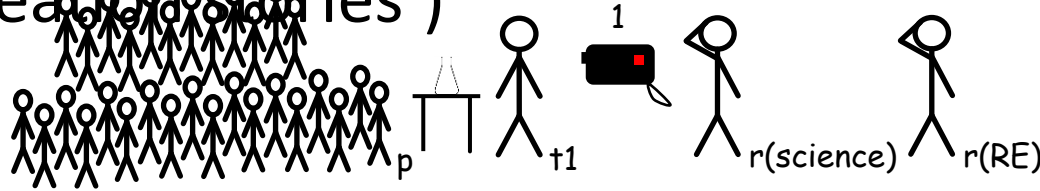
b) Teacher verbal protocols (2 hrs x 4) *
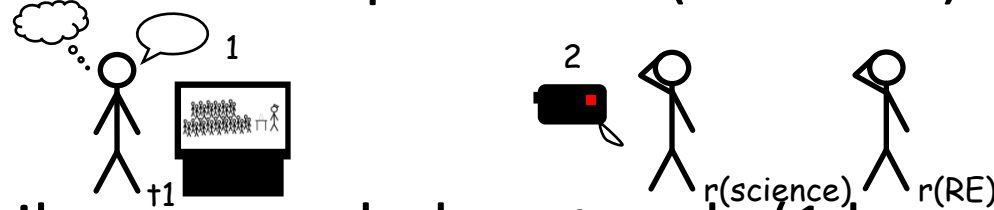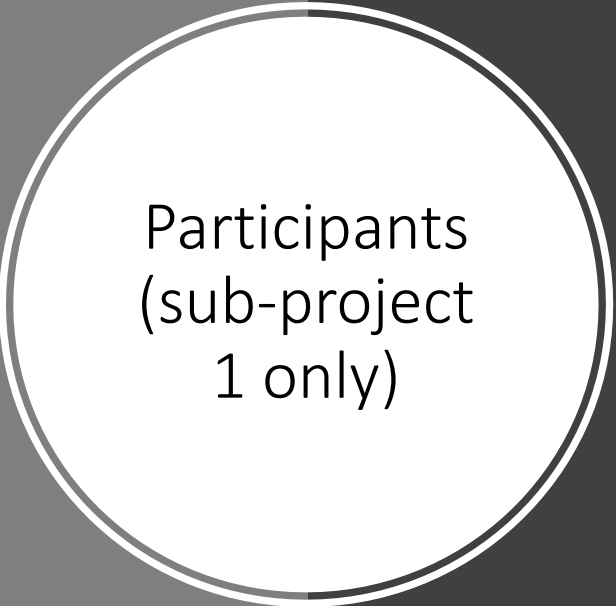
c) Pupil group verbal protocols (1 hr x 4)

d) Teacher/researcher group interviews (1 hr)   ∴ 17 hours of video in total
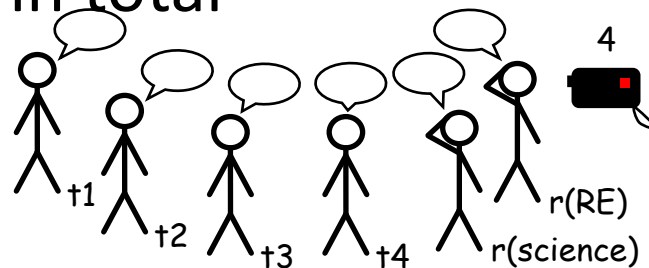
Participants (sub-project 1 only)

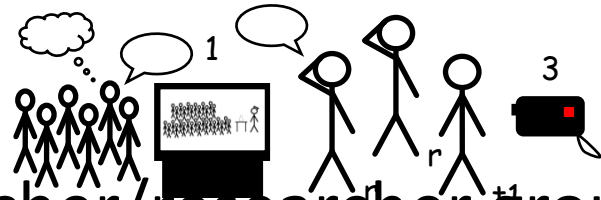- Four experienced teachers, each with their own class of pupils, participated. Two of these teachers work in primary schools (year 3 and year 6) and the other two in secondary schools (year ? and year ?) in Kent, and two educational researchers (one science and one RE specialist).

- Pupil Group Verbal Protocol interviews are with six volunteers from the class (three girls and three boys).

- Videos were analysed by the class teachers (if they wish), the pupils who took part in the Pupil Group Verbal Protocol interviews and two researchers.

- Therefore, four teachers, approximately 120 pupils and two researchers will participate altogether.

7a. Preliminary findings (sub-project 1)
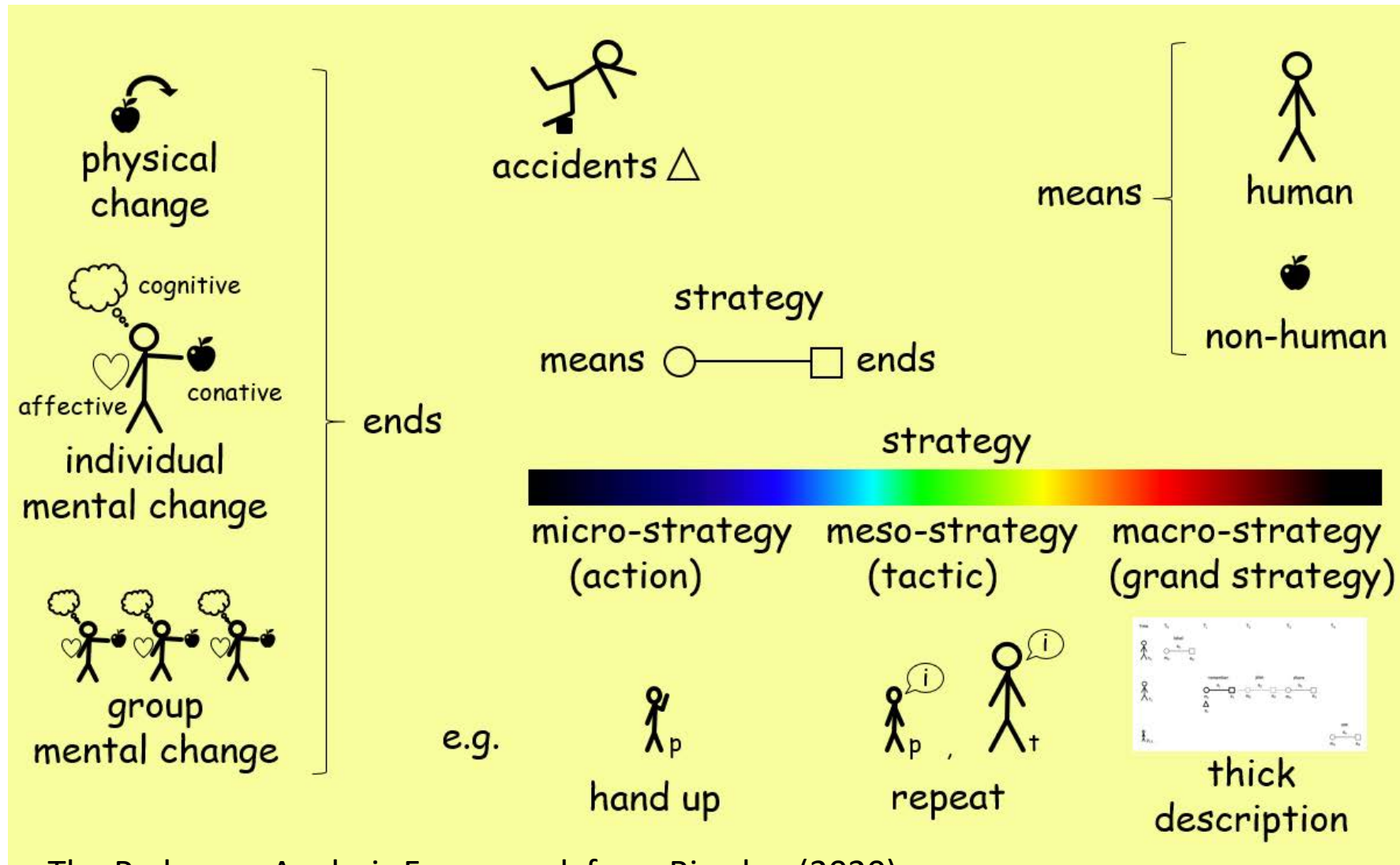
- The Pedagogy Analysis Framework from Riordan (2020)

SP2 Research question
(Mary Woolley's presentation)

1. How do teachers perceive and engage their students with knowledge about how science and religion can relate to one another, in the context of science lessons and RE lessons? [sub-project 1]

a) How do beginning science and RE teachers address pupil questions when teaching about evolution and religious creation stories?

2. How can we understand the extent and nature of the experience of beginning teachers as to how knowledge works in 'science/religion encounters' in the classroom and how this impacts their confidence and competence? [sub-project 2]

3. How can changes in the teacher education programs develop more confident and rich outcomes around how knowledge works in science/religion encounters in the classroom? [sub-project 3]

Tasks for 2019-21

Major Project Activities - Itemise important project milestones (including outputs and outcomes). Indent 3-6 project activities you will track to reach each milestone.		Sep-Nov Months 1-3	Dec-Feb Months 4-6	Mar-May Months 7-9	Jun-Aug Months 10-12	Sep-Nov Months 13-15	Dec-Feb Months 16-18	Mar-May Months 19-21	Jun-Aug Months 22-24
Sub-project 2									
Ethics approval			x						
Recruit 6 universities		x	x	x					
Plan pilot focus groups (initial planning meeting)			x						
Pilot focus groups				x					
Evaluate pilot				x	x				
Qualitative interviews in universities					x	x	x	x	
Transcription, coding and analysis					x	x	x	x	
Design online survey from thematic analysis							x	x	
Conduct online survey								x	
Online survey data analysis								x	x
Technical report writing from findings									x
Network event									x
Conference disseminations + blog									x
Research support visits						x	x	x	x
Journal article writing									

Focus group protocol

1. Current teaching/ educational experience
2. Purpose of RE/ purpose of science education?
3. Experience of science/ religion encounters in the classroom?
4. Your ideal teaching in this area?
5. Confidence/ preparation in teaching in this area?

6. Where might you go for support? New knowledge?

7. Particularly sensitive issues within the area of science and religion?

8. Personal beliefs or educational experiences that might impact your planning

9. Why did you decide to sign up for the focus group?

Perceived difference in purpose/ nature of subjects

RE

Changing pupil perceptions

Definitions

Humanising effect

RE is about opinions

Religions adapting over time

Take familiar beliefs/ practices and making it unfamiliar/ comparing to others' beliefs

Encourage flexible thinking

Exploring differences in systems of belief

Science

Teaching principles of science

Investigation

"teaching the facts"

Develop elastic way of thinking – hold that until more evidence comes along

Empirical/ mathematical evidence

Perceived/ possible relationships between RE and Science

- Comparison

- Dialogue

- Dichotomy

- Historical example

- collaboration

Topics emerging from focus group discussion

Evolution

Big Bang

Death

Creation stories

Stewardship

Controversial issues

Climate change

History of scientific discovery

Stem cell research

Historic conflict between science and religion

Monoclonal antibodies

Design argument

Abortions

Ethics

Philosophical arguments for existence of God

Religious scientists

Polkinghorne

Sex education

Collective responsibility

Constraints acting on beginning teachers

- Culture of assessment

- Culture of the school

- Danger of confusion

- Lack of confidence

- Lack of religious or scientific knowledge

- Lack of time

- Negative views of religion

- Concerns over parent's reactions

- "experienced teachers limit pupils' questions"

It does relate back to S's idea of not being a scientist… if the kids have a different question that's more scientific related so they might want to know more than we've prepared as RE teachers. It's difficult almost having the kids respect you for being this source of knowledge in the room and then saying "I don't know." So if it's the once it's fine. But it's when they're really interested about how science and religion does work, you get 6 hands up and if you say to all 6 of them "I don't know", "I don't know."

Early stage conclusions and questions

- Different approaches emerge from science, RE and primary teachers and more could be done to challenge perceptions of the 'other' subject.
- There are significant constraints acting on innovation in this area.
- Where subject knowledge and confidence are strong, there is some excellent practice in evidence.
- There are questions over the language beginning teachers use and their understanding of terms such as science and religion.
- What would we like to see emerge from the large-scale online survey?

Discussion

- What is your experience of science/religion encounters?

- What assumptions are brought to classroom teaching when there is a science/religion encounter?

- How are (newer) teachers supported in handling science/religion encounters?