

Research Space

Online educational resource

Science religion encounters toolkit 12: science and religion in the classroom

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SCIENCE AND RELIGION IN THE CLASSROOM



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The National Institute for Christian Education Research

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This project 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 addresses the gap, develops informed responses for teacher education and finds some preliminary understandings of the impact of the use of that knowledge in teacher education programmes.

Find out more at: **www.nicer.org.uk/science-religion-encounters**



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BIG QUESTIONS
in CLASSROOMS

SCIENCE AND RELIGION IN THE CLASSROOM

Science Religion Encounters Toolkit 12

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Context

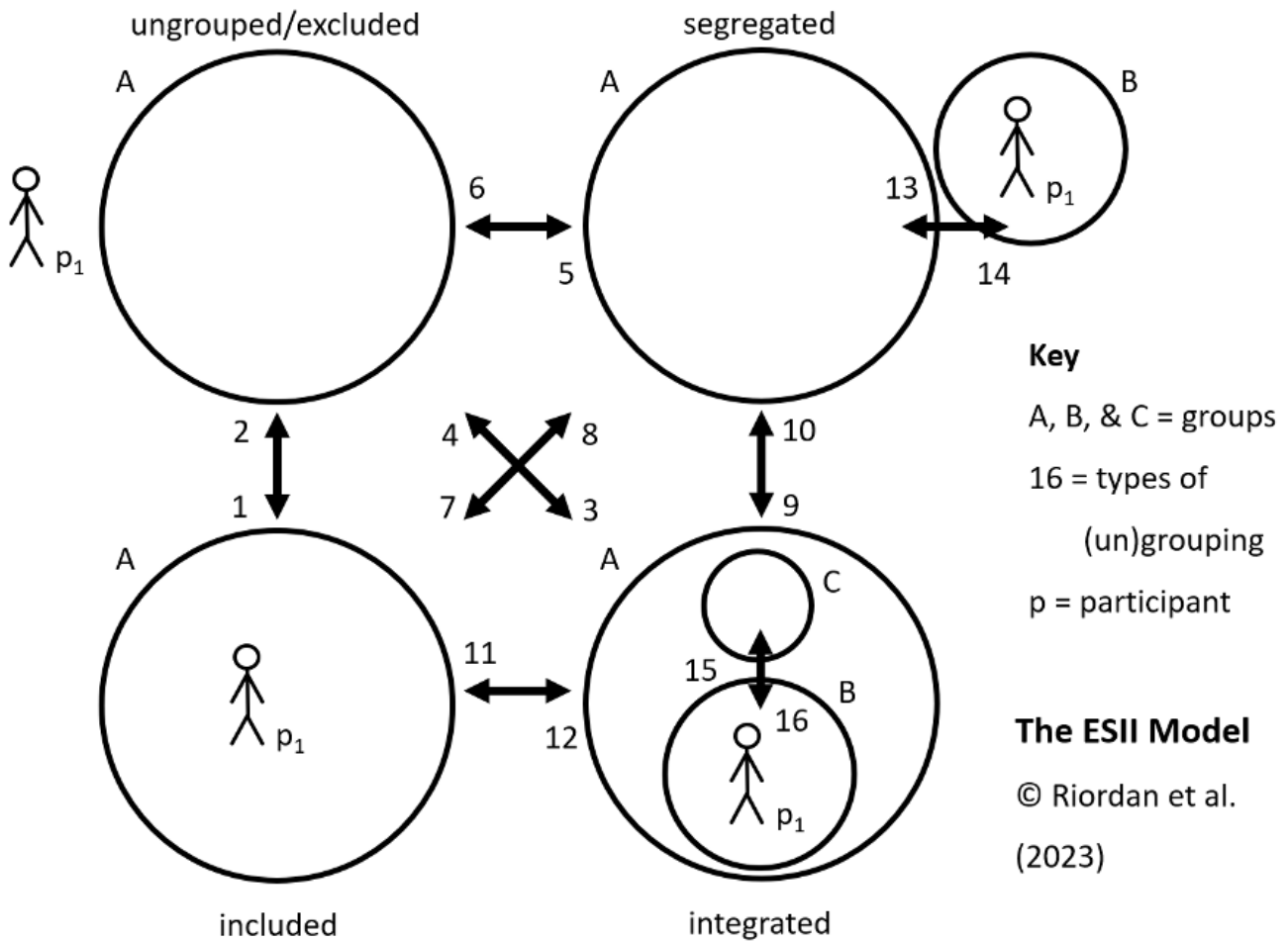
I was a classroom science teacher for 17 years (I now work in Initial Teacher Education). Many years ago, I was welcoming year 9 pupils (13-year-olds) at the door of my classroom for a physics lesson. One pupil stopped in the doorway with a puzzled expression on his face. They all knew I was religious as it was a Catholic school, and I was a Eucharistic Minister at the school Mass. He said, "I thought scientists weren't allowed to be religious." I don't remember what I did and/or said in response, but that incident struck me at the time and now as interesting. How can I make my classroom an inclusive place for people of diverse religious beliefs, the unsure, and those without religious beliefs?

I've taught many science lessons during my career where religious ideas have come up spontaneously. For example, when teaching about Evolution I think it is important to be aware that learners may have very varied thoughts and feelings about that topic. For some learners it is a highly controversial topic, perhaps even something they feel should not be taught in school. The child's family religious, or non-religious, culture is likely to impact what happens in the classroom. Furthermore, some teachers may find it hard to know if it is appropriate to tell children what they think about religious ideas, and if they think it is proper to share about their religious faith, agnosticism, or atheism, how to do that in a suitable way (Bryan & Revell, 2011). How to teach about science when religion comes up in the classroom can be, I think, a difficult pedagogical problem (for more on defining what a pedagogical problem can mean, please see Riordan et al., 2021; no cost).

Similarly, I've taught a bit of Religious Education (RE) in school, and sometimes during these lessons science spontaneously comes up. For example, when teaching about 'creation stories' some pupils (and teachers) might be wondering how to square that with ideas about the Big Bang. There are many theories about how science and religion relate (Barbour, 2002) and helping children move beyond a simple binary of 'compatible or conflict' is important, I think. For example, Barbour (2000) in a very readable introduction to this topic uses four categories: conflict, independence, dialogue, and integration.

These days I teach teachers in Canterbury (mostly about science education) and do video-based educational research in classrooms with primary and secondary teachers, and pupils, trying to understand and explain pedagogy (e.g., Riordan, 2020; Riordan, Hardman and Cumbers, 2021; Hardman, Riordan and Heatherington, 2022; no costs). Working with primary and secondary colleagues in school, with pupils, and with specialists in science education and RE, we're currently exploring science lessons where religion comes up, and RE lessons where science emerges. We do this by video recording the lessons, then asking the teacher to watch that video back while they 'think aloud' (and we record that commentary on video too). We then do something similar with small groups of pupils from the class (three girls and three boys who volunteer). This research is part of a much bigger project. We're publishing our work as we go along, but to find out more please see Riordan et al., 2021 (no cost). The videos are available (at no cost) for educators and researchers at the UK Data Service on ReShare (search for 'Video-based study of classroom pedagogy 2019-2021'). More videos will follow. I think being able to watch and analyse video of how other teachers deal with these sorts of difficult pedagogical problem, and to have that accompanied by analysis of those lessons by the class teacher, pupils from that lesson, and educational researchers, may be useful.

A theory we call the Exclusion, Segregation, Integration and Inclusion (ESII) model, extending a simpler idea from Hehir et al. (2016) emerged during this research and it can help teachers untangle interactions like the one described earlier between a pupil and me at the classroom door. The ESII model uses circles to represent groups of people (and/or things), and a participant (i.e., a teacher or pupil; labelled 'p1') can be outside the main group (excluded), inside (included), in a separate group (segregated), or in a subgroup (integrated). The numbers and arrows represent the sixteen ways in which grouping can change. The ESII model is illustrated below:



So, for example, the child at the door was outside the classroom and came in (i.e., transition 1 in the ESII model), and he described his understanding that humans cannot be simultaneously scientists and religious (i.e., these are segregated groups according to his understanding at that stage of the interaction). His interaction with me (a scientist who he knew to be religious) perhaps prompted him to change his understanding. To find out how exactly it changed, if at all, would need further investigation (using the ESII model the options are transitions 6, 7, 9, or 13). For more about the ESII model see our forthcoming paper (Riordan et al., in press; (un)grouping).

In brief, I don't think there is an easy answer to the question of how to address issues to do with religion in science lessons, or what to do when science comes up in RE (sorry about that!). I think we as teachers need to first try and understand and then try and solve these pedagogical problems with learners in the classroom (with the support of colleagues in school and outside of course). I don't think all pedagogical problems that occur in classrooms are solvable, and that 'expecting the unexpected' (Douglas Adams) is wise in teaching. I think educating ourselves as teachers about the ways science and religion can interact can help (hence the [Barbour, 2000](#), reading recommendation). I think listening carefully to our learners and giving them space in science lessons to talk about religion, and in RE lessons to talk about science, can sometimes help (I know that's probably obvious). I think some good quality resources for teachers to use with learners in the classroom can sometimes be useful (we're working on some of these as part of our research; see nicer.org.uk to download those for free).

I welcome feedback on these thoughts and questions john-paul.riordan@canterbury.ac.uk

DILEMMA

How can I include learners who have diverse views about religion in science lessons, and about science in RE lessons?

CHOICES

1. Discuss religion in science lessons, and science in RE lessons, with pupils in class when appropriate.
2. Allow diverse views about science and religion to coexist in the classroom. Where some see black and white, others see grey areas.
3. Help pupils to understand that it is OK to disagree, and that disagreeing isn't the same thing as conflict (perhaps see our forthcoming paper on 'Disagreement (including conflict) in the classroom').
4. Explore free resources to support teachers and/or pupils with 'science and religion encounters in the classroom' at nicer.org.uk.
5. Consider providing opportunities for parents/carers, and perhaps other members of the school and local community, to talk with you and your class about their views concerning how science and religion can relate. Obviously, this needs to be done cautiously.

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