**Argumentation in science and religion:
match and/or mismatch when applied in teaching and learning?**

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[Abstract](#)

The article raises questions about how argumentation is situated in science and religious education. Argumentation is about the justification of claims with reasons and evidence. It is a way of reasoning in both science and religious studies. A current 3-year research and development project entitled *Oxford Argumentation in Religion and Science* (OARS), lasting from 2018-2021 and based in England, aims to develop, implement and evaluate a teacher's professional development programme in order to nurture teachers' pedagogical skills in teaching argumentation in both science and religious education. The particular interest is in understanding complex judgments, especially where they integrate judgments from the sciences and religion. Hence, a key component of the project is to compare arguments from the sciences with arguments made in religion drawing out implications for teaching and learning. The setting of the project is in secondary schools in and focuses on Key Stage 3 (or 11-14 years-old pupils). Thirty teachers from 15 schools, including a range of faith/maintained,

religiously plural/religiously uniform, as well as secular state schools are participating in the project. Overall the project highlights the need for teachers' professional development to deal with complex argumentation that concern both science and religious education content.

How and why did life originate on earth? What is the universe? How do we know? Such fundamental questions are relevant for education generally and for education of teachers in particular. Typically, children ask such questions that have relevance to both science and religion. While in religious education lessons children tend to have the opportunity to pose and discuss such questions, science lessons often discourage the exploration of big ideas that have philosophical undertones. In fact, school curriculum standards often compartmentalize disciplinary knowledge into separate subjects such as religious education and science, not providing opportunities for pupils to explore interdisciplinary links. Furthermore, high stakes assessment regiments often place great demands both on teachers and pupils to demonstrate fairly narrow outputs of disciplinary knowledge. In schooling, children are repeatedly enculturated into science as a collection of hard facts devoid of any values. Yet, studies on the nature of science illustrate that science is not devoid of values (McDonald, & McRobbie, 2012). In fact, science operates through a process where claims are justified with values and assumptions as well as reasons (Sampson, & Blanchard, 2012). For example, the scientific commitment to evidence is a value that scientists need to possess (Author, 2014). Characterisation of science as being devoid of values essentially amounts to a misrepresentation of how scientists actually operate. Professional scientists are expected to possess particular social values such as honesty, and they are meant to conform to certain cultural norms such as respect for intellectual property rights. As limited as school science education might be in incorporating values in science lessons, it is inevitable that big and often controversial questions will find their way into classroom conversations.

As a consequence, teachers as well as pupils often face difficult judgments that demand understanding of various kinds of information, opinions, values and religious principles (Dawson, & Venville, 2010). For example, in the context of biology lessons teachers might be questioned about whether or not genes should be cloned or edited, appealing not only to scientific knowledge about genes but also to religious values about people being special creations by God. Some teaching and learning scenarios might require teachers and pupils to consider both scientific and religious issues together. For instance, an end-of-life decision may need to consider scientific evidence as well as religious principles about the sanctity of life. However, many teachers and their pupils are insufficiently equipped to understand how judgments are made through justification of claims with reasons.

How, then, can teachers and pupils be supported in understanding the content and process of justifying scientific and religious claims? The justification of claims with reasons and values is often referred to as ‘argumentation’. Argumentation so defined does not necessarily denote conflict, but rather points to how judgments are made through a process of negotiating claims and reasons (Erduran & Jimenez-Aleixandre, 2007; Schwartz & Baker, 2017). Argumentation related themes are part of science curricula (e.g. DfE, 2014) and religious education syllabi (e.g. LCC, 2016). It can be situated within a particular domain of science such as chemistry (e.g. Erduran, 2019). Although the interface of science and religion has been extensively studied in the educational research literature, for example in the context of evolution versus creationism debate (e.g. Lawson & Worsnop, 1992), research on the context of teaching and learning of argumentation in each subject is virtually non-existent. There are potential avenues of research to understand how argumentation works in science and religion, both in terms of the nature and development of arguments and also in terms of how the teaching and learning of argumentation can be supported in science and religious education.

A current 3-year research and development project entitled *Oxford Argumentation in Religion and Science* (OARS), lasting from 2018-2021 and based in England, aims to develop, implement and evaluate a teacher's professional development programme in order to nurture teachers' pedagogical skills in teaching argumentation in both science and religious education. The particular interest is in understanding complex judgments, especially where they integrate judgments from the sciences and religion. Hence, a key component of the project is to compare arguments from the sciences with arguments made in religion drawing out implications for teaching and learning. While there appear to be many, perhaps superficial, differences (e.g. fact versus value), we explore these in detail, and ask whether there are equally significant commonalities (e.g. the use of analogical reasoning) as well.

The setting of the project is in secondary schools in England teaching 11-14 years-old pupils. (The age group is referred to as Key Stage 3, or KS3, in England.) Thirty KS3 teachers from 15 schools, including a range of faith/maintained, religiously plural/religious uniform, as well as secular state schools are participating in the project. These science and religious education teachers have been working in pairs to ensure cross-curricular collaboration. Data are being gathered from teaching practice as well as from individual teachers and pupils through interviews and questionnaires to assess the impact of the professional development intervention. Lessons of each teacher are targeted for data collection, resulting in quantitative data from 1800 pupils and qualitative data from 180 pupils. The analyses of the data will point to teachers' and pupils' understanding of argumentation, and the impact of the intervention. There will be a series of dissemination activities involving stakeholders including policy makers, teacher educators, teachers and representatives of learned bodies and government departments. Ultimately, the project will create exemplary practices, and benchmarks for how teachers' and pupils' learning of argumentation in science and religious education can be enhanced.

Acknowledgements

The author, the Principal Investigator of OARS Project acknowledges and thanks the Templeton World Charity Foundation (Grant Number TWCF0238) for funding support.

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