Developing mature views about the nature of science (NOS) is necessary for developing scientific literacy. Mature NOS views are important for science teachers (many of whom enter the profession after a career or degree in science), as their beliefs and values about NOS influence their teaching (Deniz & Adibelli, 2015). Understanding where and how NOS views develop can influence tertiary education and science degree teaching curriculum.

This research reports on education and biomedical science students' views about the nature of observations and inferences (OI), important aspects of NOS. The SUSSI survey instrument (Liang et al., 2008) was used to measure OI views of education degree (n=185) and biomedical science degree (n=71) students. Views were categorised as naïve, semi-naïve, semi-informed and informed. Thematic analysis of qualitative survey data identified key characteristics of each category. Further analysis of characteristics across categories led to development of three board themes about the nature of OI: nature and processes of science (such as accuracy, complexity and certainty); individuality (such as prior knowledge and experience), and; generalised statements about science/scientific knowledge (e.g. change over time). Views about the nature of observation and inference increased in complexity and specificity as views became more informed.

References:

Deniz, H., & Adibelli, E. (2015). Exploring How Second Grade Elementary Teachers Translate Their Nature of Science Views into Classroom Practice After a Graduate Level Nature of Science Course. Research in Science Education, 45(6), 867-888. doi:10.1007/s11165-014-9447-5

Liang, L. L., Chen, S., Chen, X., Kaya, O. N., Adams, A. D., Macklin, M., & Ebenezer, J. (2008). Assessing preservice elementary teachers' views on the nature of scientific knowledge: A dual-response instrument. Asia-Pacific Forum on Science Learning and Teaching, 9(1), 1-20.

Science news stories in the media – old issues, new challenges and new opportunities for science preservice teacher education!

Karen Marangio, Richard Gunstone - Monash University

Social media channels today are major (sometimes sole) sources of information for people The escalating amount and access of science news stories is clearly significant for science education, as is the numbers of "fake science" reports. This creates challenges for school science, but also opens new opportunities. This paper offers starting points for future development of science preservice teacher education.

Media distortions of science have a long-term problem for science education, for example we briefly consider 1980s secondary school students' views of fake science prominent at that time. Our prime focus is on contemporary secondary science preservice teachers' views about/ experiences with sourcing and using science news stories during school placements. In 2018, 47 preservice teachers completed an online survey. Almost half had observed or taught with science news stories on placement, but only 3 observed critiquing of a science news story. They were interested in why we are all susceptible to making quick decisions about news headlines. Preservice teachers strongly advocated the use of science news stories in teaching but also wanted to be more up to date about the issues, especially if they are controversial, and ways to help both them and their students to critique the stories.

Link to RISE paper:
Fensham, P. (1972). Prior knowledge: A source of negative factors for subsequent learning. Research in Science Education, 2, 50-57.

Recent Evidence of New Zealand Students' Engagement with Science

Kaitlyn Martin, Lloyd Davis, Susan Sandretto - University of Otago

Students' engagement with science encompasses their motivations, interests, and attitudes toward science and is a predictor of choosing to pursue science in their future. While large-scale assessments of engagement frequently suggest strategies to promote science, many provide narrow bands of insight for determining when and why students lose engagement. We review studies in this area from Aotearoa New Zealand – a nation concerned with a large spread in science achievement. We draw on peer-reviewed research, longitudinal studies, and national and international assessments to give a comprehensive report on student engagement with science. The comparison shows that while engagement levels are frequently reported as positive, there are three consistent issues which go unresolved. Our analysis found contradictions in results between studies, a lack of research from non-governmental bodies, and a failure to capture engagement changes across the middle year-levels where, internationally, students have been found to make decisions about staying in science. Understanding how students lose their engagement in the national context can help target successful strategies to improve student engagement with science in the future. We discourage sole reliance on large-scale assessments, and call for empirical research into student engagement with science, especially across the primary and secondary transition.

Link to RISE paper:

Logan, M., & Skamp, K. (2008). Engaging Students in Science Across the Primary Secondary Interface: Listening to the Students' Voice. Research in Science Education, 38(4), 501-527. doi:10.1007/s11165-007-9063-8

Venville, G., Rennie, L., Hanbury, C., & Longnecker, N. (2013). Scientists Reflect on Why They Chose to Study Science. Research in Science Education, 43(6), 2207-2233. doi:10.1007/s11165-013-9352-3

Ward, G., & Haigh, M. (2017). Challenges and Changes: Developing Teachers' and Initial Teacher Education Students' Understandings of the Nature of Science. Research in Science Education, 47(6), 1233-1254. doi:10.1007/s11165-016-9543-9

Woods-McConney, A., Oliver, M. C., McConney, A., Maor, D., & Schibeci, R. (2013). Science Engagement and Literacy: A Retrospective Analysis for Indigenous and Non-Indigenous Students in Aotearoa New Zealand and Australia. Research in Science Education, 43(1), 233-252. doi:10.1007/s11165-011-9265-y

Building creativity: Communicating scientific understanding of chemistry through student-generated conceptual drawings in a gifted primary program

Felicity McLure, Mihye Won - Curtin University

An essential part of creativity is the ability to communicate ideas persuasively to an