

Exploring scientific resilience with KS3 students

Mufleha Ahmad

Study 1a
15 students: year 7

Use of diary like entries each science lesson and interviewing

Scientific resilience traits identified by a thematic analysis:

- The language of science - use of scientific terminology measure students' competencies
- Links with other subjects like mathematics can increase difficulties
- The appreciation of science - value of science
- Science is difficult thought approached very differently by each student
- Getting stuck and seeking help
- Getting it wrong, trying and not giving up
- Making mistakes

Study 1b
13 students: year 8

Use of diary like entries each science lesson and interviewing

Other factors that may impact scientific resilience:

- Impacts of teaching
 - Teacher - highly significant to students as it was mentioned 50 times
 - The pedagogy of teaching - the method of teaching adopted by teachers was mentioned 114 times
 - Science topic being studied, personal preference impacted engagement and therefore learning
- Student view on learning
 - Understanding identified by students when they made little mistakes or achieved high marks
 - Success in science
 - Learning and knowledge - too much content
 - Encountering knowledge for the first time - naturally difficult

Scientific resilience is 'a positive stance towards science and being able to recover from difficulties' constructed from the mathematical resilience construct developed by Johnston-Wilder et al, 2013) 'a positive stance towards mathematics'

Study 2
3 students: year 8

5 different science topic tasks given to the triad to collaboratively produce answers whilst thinking out loud

How scientifically resilient students talk and write science?

- Majority of the learning interaction were cognitive information (Kempa and Ayob, 1991)
- Expressing disapproval and seeking guidance were the most prevalent types of interpersonal talk (Kempa and Ayob, 1991)
- Using De Andrade, Freire and Baptista's (2019) system of analysing written work it was clear the students mostly wrote down non explanations, and secondly gave macro descriptive answers. Both of which were not explanations.
- It was concluded that students at this age did not have the vocabulary, or the articulation skills required to explain their knowledge. This is taught at GCSE level over 3 years.
- Resulting in a debate of whether I need to analyse their answers as a teacher or as a researcher.