

**Action Research Title:**

The influence of academic self-concept on attitudes to learning among top set secondary school science students by Beth Cook  
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for the full research or for more details.

**School, Context and Rationale:**

- This research was undertaken for as part of a Master of Education course. I was interested in why top set double science students were not achieving their target grades at GCSE, and specifically whether it was linked to their perception of their ability and their attitude towards school science.
- The aims of the research were to address the following research questions:
  - To what extent do students have a low academic self-concept for science?
  - To what extent do students have a poor attitude towards school science?
  - Do co-operative learning strategies have a positive influence on academic self-concept and attitudes towards school science?
- The expectancy / value theory of motivation posits that a student's level of motivation is a result of the value that student places on the task or subject, and whether they expect to achieve success. The construct of value can be linked to the attitudes a student has, and expectancy to academic self-concept. Studies have shown that self-concept of ability and subjective task value follow similar patterns of decline over time. Self-concept can be influenced by ability grouping, teacher expectations, the learning environment, and teaching strategies. The influence of co-operative learning strategies on academic self-concept have been researched, with results suggesting that students with a low academic self-concept feel more competent when working collaboratively with peers.

**Action:**

- To allow for an in-depth analysis of the problem, a mixed methods approach was used. Quantitative data was collected using questionnaires to gauge student's academic self-concept and attitudes towards school science. Findings from these quantitative questionnaires were further probed in qualitative semi-structured interviews. The questionnaires and interviews were conducted pre, mid, and post intervention. In addition to this, after the second cycle students were told whether the questionnaires had shown their ASC and attitude had increased, stayed the same, or decreased and given an opportunity to comment on this.
- Intervention consisted of two cycles of six lessons. Cycle one included activities designed to challenge student's perceptions of intelligence and to allow them to identify areas of strength and ways to increase success. These were incorporated into co-operative learning lessons using the jigsaw technique, TASC, precision teaching, paired problem solving and think-pair-share. In cycle two, students worked

- collaboratively to produce a presentation on evolution and natural selection with an accompanying individual report.
- The final presentations were given scores for teamwork as well as content. Impact was assessed with post-intervention questionnaires and follow-up interviews. Students were also given an opportunity to give written feedback on their academic self-concept and attitude scores.

### **Impact:**

- Findings from this research indicate that co-operative learning strategies, if incorporated into schemes of work so that students could build up their teamwork skills, could have a positive impact on academic self-concept. This could have a positive impact on attitude towards school science.
- Quantitative data gathered from the questionnaires showed a significant positive correlation between academic self-concept and attitudes towards school science. Although the quantitative data showed a statistically significant negative change in academic self-concept and attitude, follow-up interviews suggested otherwise. Students reported that their or other's teamwork skills would improve with continued co-operative learning strategies, and once these skills were refined they would get more out of the activities.
- Findings support current research that there is a correlation between academic self-concept and attitude. Current research suggests that the strategies employed in this research will increase academic self-concept.

### **Learning:**

- To successfully use co-operative learning strategies requires students to have good team working skills and they need to be used to working co-operatively.
- Further questions:
  - What is the long-term impact of co-operative learning on academic self-concept and attitude?
  - To what extent does class composition affect an individual's academic self-concept?
  - Do strategies designed to encourage an 'untapped potential' view of intelligence have a positive impact on academic self-concept?
- Build more opportunities for co-operative learning into schemes of work, starting with small scale activities that have a high chance of student's being successful.

- Three top tips:
  - Do encourage students to work collaboratively
  - Don't give up on co-operative learning if students are unsuccessful at first – allow them to build up their teamwork skills.
  - Do give students opportunity to identify their strengths and what they have done well. Follow this up with meritocratic praise and encouragement.