



# DEVELOPING RESILIENCE IN GRADE 8 BOYS THROUGH PROBLEM-SOLVING

Eugene Stolk  
St Stithians Boys' College

## Further Information

This poster and further information is available at <http://www.theibsc.org/>

Researcher's Email: [estolk@stithian.com](mailto:estolk@stithian.com)



Am I preparing my students for a changing world? This action research topic offered me the opportunity to explore this question and observe how my action could develop adaptability skills through problem-solving activities in my subject.

As the chair of the Mathematics department it had been an intentional goal of mine and the Mathematics staff to developing problem-solving skills and critical thinking as part of our teaching practice. This skill, we felt, was not only useful for our students to obtain a richer understanding in our subject, but it also equipped them with lifelong skills.

Guided by the work of Dweck (2017), Hmelo-Silver (2004), and Martin (2013), I explored how we could prepare our boys.



St Stithians Boys' College is an independent Methodist day and boarding school situated in northern Johannesburg, South Africa, with an enrolment of approximately 770 boys.

My research group comprised 26 of the 160 Grade 8 students.



The blend of structured and unstructured, qualitative and quantitative data collection methods gave me a spectrum of data that I could analyse as part of the research. I looked for patterns in terms of words the boys used to describe their approach to problems and how they perceived their abilities to solve problems they had never seen before. I used the Likert-scale data to measure how individual boys tracked their own participation and resilience.

Data collection tools included:

- Note-taking in a journal
- Video recording of lessons
- Recorded interviews of participants
- Student self-reflections sheets
- Ongoing discussions with core teacher



How might participation in a mathematics problem-solving challenge develop academic resilience in Grade 8 boys?



Using the literature and content applicable to Grade 8s the following action took place:

- ▶ Developed a **6 week problem solving course**
- ▶ Presented **1 lesson per week**
- ▶ Taught to a group of boys that were **not a class I generally taught**
- ▶ Additional assistance by **team teaching with their core teacher in the room**
- ▶ It was made clear that **answers were not the important part**
- ▶ Importantly, **showing thinking was rewarded**



The course:

- ▶ Week 1: Draw me a Picture
- ▶ Week 2: Look for a Pattern
- ▶ Week 3: Logical Deductions
- ▶ Week 4: Introduce Notation
- ▶ Week 5: Using Polya - A Useful Framework
- ▶ Week 6: Application of Strategy



Four themes emerged from my analysis of the data:

1. The effects of a mixed ability group of learners
2. The boys own accuracy of self-analysis and reflection on their own abilities
3. The students' intrinsic love of Mathematics versus Mathematics for marks
4. How strong of a Mathematics base the boys had coming into the challenge



In order for resilience to be developed, the findings suggest:

- ▶ **Retain mixed ability context**
- ▶ **Redesign structure of the lessons (differentiated abilities in differentiated groups)**
- ▶ Plan the **timing** of the course
- ▶ Be **more flexible** with how long boys need to problem-solve

Key Readings:

Dweck, C.S. (2017) *Mindset. Changing the way you think to fulfil your potential* (revised ed.) London: Robinson.

Hmelo-Silver (2004). Problem-based learning: What and how do students learn?, *Educational Psychology Review*, Vol 16 (3), 235-266.

Martin, A. J., Nejad, H. G., Colmar, S., & Liem, G. A. (Vol 105(3), August 2013). Adaptability: How students' responses to uncertainty and novelty predict their academic and non-academic outcomes. *Journal of Educational Psychology*, 728-746.

