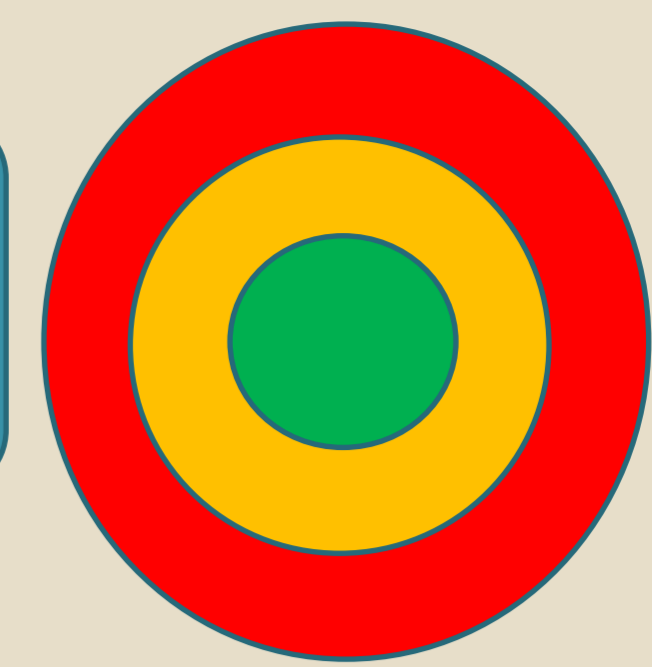


# A course for Coaches of Mathematical Resilience

By Sue Johnston-Wilder, Clare Lee, Kate Mackrell



Safe Zone

Growth Zone

Panic Zone

## Introduction

### Definition: Mathematical Resilience

“a positive approach to mathematics that allows *learners* to overcome affective barriers presented when learning mathematics.”

(Lee & Johnston-Wilder, 2014).

Components of Mathematical Resilience include:

- Value
- Inclusion
- Struggle
- Growth mindset
- Conjoint agency
- Resources

### The study

Small scale, design research study to develop a course for Coaches in Mathematical Resilience. Coaches support learners rather than teach.

### Research questions

- Would the course enable personal mathematical resilience?
- Would participants be positioned to help others develop resilience when learning mathematics?’

### Participants

12 women trainers for apprentices, mainly hairdressers and health care workers.

- These apprentices are required to increase their knowledge of mathematics.

Participants self-identified as anxious about mathematics.

## Approach

### The course

- used known good practice in teaching mathematics, such as inclusion, discussion and investigation
- used Egan’s skilled helper coaching model (Egan, 2013)
- consisted of ten sessions

Each session focused on an aspect of coaching and an aspect of learning mathematics.

Two leaders, one identified specifically with coaching and one with mathematics.

### The growth zone model

Emotional aspects of learning mathematics were discussed using a growth-zone model (Lugalia et al, 2013), which fostered explicit awareness of feelings when in the growth zone and management of panic when in the danger zone.

The course focused on

- creating an effective, safe learning environment with explicit ground-rules
- learning mathematics where the participants practised their own growing resilience
- learning to support others’ mathematical learning
- understanding how to enable learners to remain longer in their own growth zones

### Data gathered from

- Initial and final quantitative survey
- Field notes
- Appreciative inquiry interviews
- Participants’ portfolios

## Results

### At the start , when asked to do maths, participants felt:

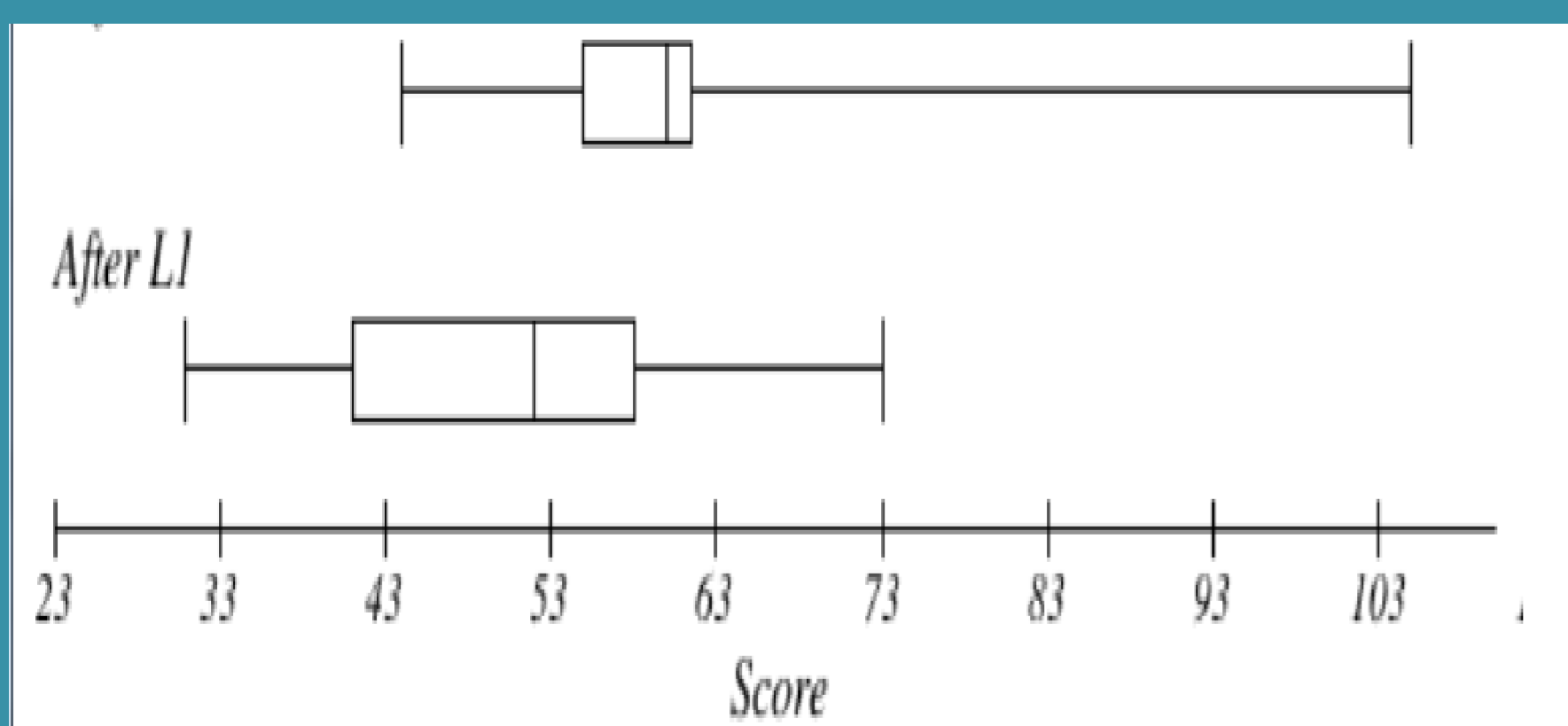
- anxious and panicky
- confused and frustrated
- empathy for their own learners

### Participants appreciated peers who:

- Listened and took a back seat
- Asked questions
- Developed confidence in others
- Gave constructive feedback
- Showed respect and inclusion
- Calmed and reassured
- Made suggestions
- Used useful strategies
- Worked together, supported each other and shared

### Participants:

- gained personal mathematical resilience (
- learned to manage their own anxiety,
- developed resilient ways of learning
- learned to support each other in managing anxiety



### At the end, they valued:

- Using the Growth Zone model
- A safe learning environment conducive to learning
- Getting and giving feedback
- Getting support and encouragement from tutors
- Having fun
- Being challenged, confident, and comfortable
- Learning coaching and maths resilience skills
- Being aware of using maths in every day life
- Working together as a team, supporting and accommodating each other,
- Sharing ideas, and feelings, and valuing each other’s contribution,
- Being non-judgemental
- Having time for reflection
- Doing something ‘for me’.

### References:

Lee, C. & Johnston-Wilder, S. (2014, in press). The Construct “Mathematical Resilience”. In S. Chinn (Ed.) *The international handbook for mathematical difficulties and dyscalculia*, Routledge.

Lugalia, M., Johnston-Wilder, S. & Goodall, J. (2013). The role of ICT in developing mathematical resilience in learners. In *7th INTED Conference Proceedings (4-5 March) Valencia, Spain*, pp 4096-4105

Egan, G. (2013). *The Skilled Helper: A problem-management and opportunity-development approach to helping. (10th Edition)*. Belmont, CA: Brooks/Cole.

## Conclusion

*This study shows that it is possible, within a 30 hour course, for mathematically anxious adults to learn how to manage and overcome their own anxiety to become effective supporters of peers learning mathematics.*

There are plans to offer courses to larger groups and at more advanced levels.

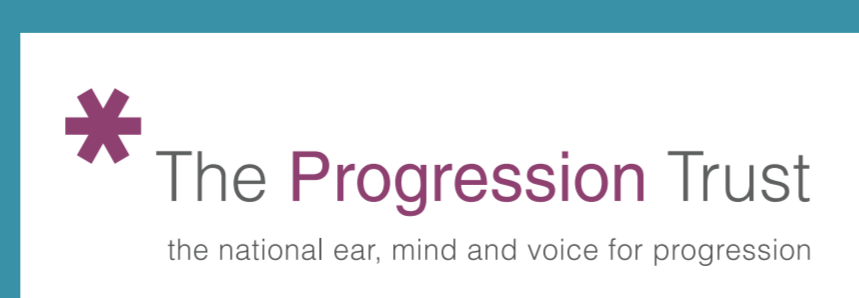
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## Acknowledgments



Coaches identified with the image of a swan, apparently serenely curious, with all the paddling out of sight.

Painting by Audrey Johnston.

