

Patterning interventions with disadvantaged children in the community

Saila R. Kazmi

University of Leeds, UK; edsrk@leeds.ac.uk

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The proposed aims of my PhD are to explore the impact of patterning interventions, outside of school time, on the self-efficacy and perceptions of disadvantaged children. My project fits with both number sense and flexibility but I would like to introduce it under the theme of number flexibility on the New Researcher's Day.

Mathematics has often been categorised as the study of patterns (Sawyer, 1955; Hardy, 1992) and the understanding of pattern can be inferred as the building blocks of all mathematics. Hence, an intervention in patterning should improve understanding of number sense and flexibility as well as mathematics in general. Pattern appears in geometry and algebra but is also abundant in number, such as counting on and counting backwards, counting in steps, and times tables.

Many studies have trialled, implemented, and evaluated interventions on different strands of mathematics within schools and during school time. Sometimes these are at the detriment of other learning as children are withdrawn from lessons for mathematics intervention.

Clark (2002) suggests how children spend their time outside of school can impact their academic achievements, especially for disadvantaged children. This study aims to explore the use of community venues to deliver a meaningful intervention, so that time outside school can be utilised effectively, with a qualified adult. Another expected benefit of this will be to improve the self-efficacy of the children that are participating, allowing them to learn in a different setting.

The intervention will be based on the Pattern and Structure Mathematics Awareness Programme (PASMAPP) (Mulligan and Mitchelmore, 2016) as there is much evidence to show that this is a meaningful intervention

(Mulligan et al., 2006; Mulligan and Mitchelmore, 2009; Mulligan et al., 2020). One of the interventions investigates the base ten number structure. Children are encouraged to notice and understand how the number ten features in their addition and subtraction of numbers in our number system.

Children will be assessed before and after the interventions using a Mathematics Attitudes and Ability Questionnaire as well as a test battery. I am expecting to see an improvement in both the attitudes and self-efficacy described on the questionnaire as well as the test battery after the interventions have taken place.

References

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