

## Glasgow City Council

### Title Glasgow City Council Educational Psychology Service

Glasgow Counts (GC): Evaluation of a numeracy intervention and its effectiveness on closing the attainment gap.

#### What did we ask?

- Is GC an effective way of raising attainment in numeracy?
- Is GC effective in closing the poverty-related attainment gap in numeracy?
- Is GC effective in changing teacher and pupil attitudes towards numeracy?

#### What is the evidence base?

- The Growing up in Scotland survey (Bradshaw, 2011) identified a poverty-related attainment gap beginning in the early years. Evidence gathered of performance in mathematics in the Scottish education system show that this gap is pervasive and widens as young people move through the education system (Sosu & Ellis, 2014).
- Sosu & Ellis (2014) recommend that schools and local authorities monitor and analyse the attainment gap and implement research informed interventions to raise attainment among economically disadvantaged groups.
- Pre-Birth to Three National Guidance (Learning and Teaching Scotland (LTS), 2010) states that from the moment babies are born, they develop an awareness of numeracy and mathematical concepts and that the earliest years lay the most important foundations for maths, however, there is a distinct lack of national/international research on the development of maths skills.
- A common theme in the existing research indicates that practitioners often report a lack of confidence in mathematics. Ashcraft & Krause (2007) found that the highest levels of maths anxiety were found in those training to be primary teachers. Practitioners who lack confidence when it comes to their own mathematical ability can have a negative effect on the development of children's mathematical thinking. They can avoid training opportunities and are likely to fall back on their own negative experiences of learning maths at school (Montague-Smith & Price, 2012).
- Teacher self-efficacy refers to teachers' belief in their ability to influence valued student outcomes' (Skaalvik & Skaalvik, 2007, p. 612). Studies have consistently found that there is a strong relationship between teacher efficacy and student achievement (Kurz & Knight, 2004). Teachers that have a higher sense of self-efficacy are more likely to provide challenging, activity-based tasks that promote the cognitive development of their students. This would suggest that teachers who have a high sense of self-efficacy when it comes to teaching maths will positively affect pupils' engagement and attainment.

#### What did we do?

Glasgow Counts is a framework which aims to equip practitioners with the mathematical and pedagogical knowledge to help young people develop a conceptual understanding of

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mathematics through a programme of CPD. Links were made with the co-ordinators of the GC initiative and Glasgow Psychological Service's role in supporting the evaluation of the intervention agreed. Elements of evaluation were built into the framework already; however, it was felt that a more in-depth analysis of a smaller group of the schools participating would be useful. Four schools were selected, on the basis that they had a mix of children from different SIMD backgrounds and were all intending to use the same attainment measure.

The following measures were used:

- Attainment measure – MALT (Mathematics Assessment for Learning and Teaching). This is a standardised mathematics assessment for tracking the progress of children aged 5-14 (Williams, Wo & Lewis, 2005). This tool was already being used by each school as part of their ongoing assessment of children.
- Teacher attitude/confidence – Teachers' Sense of Efficacy Scale. This questionnaire measures the respondents' sense of efficacy in teaching and was completed by teachers involved in the focus schools (Tschannen-Moran & Woolfolk-Hoy, 2001).
- Pupil attitudes - Questionnaire and focus groups. The questionnaire was designed by GC to be used by all schools in the initiative. The focus group questions were designed and conducted by the researchers and focus groups were run in the focus schools only.

### What have we found so far?

It has not been possible to draw conclusions regarding the GC programme based on our current findings. This is not to say that it is not an effective programme, however, the evaluation has faced a number of challenges from a research perspective. These include:

- Difficulties in the gathering of data due to a variation in measures that schools had opted to use alongside a variation in the implementation of Glasgow Counts. This made comparisons between schools challenging.
- Definitions of terms not being clarified at start of project leading to variations in understanding of e.g. how is SIMD defined, use of quintiles, percentiles etc.
- Some of the schools involved had very transient pupil populations. This led to high numbers of missing data.
- Some of the schools selected also had a high proportion of children with EAL. This had implications in terms of the use of the MALT and other measure e.g. could be underestimating their ability, language barrier renders outcomes from an English based assessment tool invalid etc.

Based on our research the following hypothesis have been formed:

- Using an evidence based framework such as Implementation Science would support the planning, gathering and analysis of data.
- Evaluation measures should be standardised across schools and built into the planning stages of programme roll out.
- The concept of 'the gap' and related terms should be discussed and agreed with both programme organisers and those involved in roll out/research.
- Further discussion around whether Glasgow Counts closes the attainment gap or whether it supports the raising of attainment overall.

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### What do we plan to do next?

Next steps include the feedback of findings to the schools involved and to the GC team. It is hoped that the findings and reflections from this evaluation will support the planning and roll out of the next phase of GC.

### References

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