Title

Factors Underpinning Numeracy Skill Development: A Pupil Voice Project (2018)

What did we ask? (Research Questions)

Raising attainment levels in maths continues to be a key challenge across Scotland. This research explores the views and experiences of National 5 maths pupils across West Lothian in relation to their experiences of numeracy skill development to help inform improving standards of numeracy and mathematics within secondary schools. This was done by addressing the following research question:

- According to National 5 Maths pupils, what are the key factors affecting their numeracy and mathematics skill development in school?

What is the evidence base? (link to your definition of the poverty gap)

Mathematical attainment continues to be a challenge for the Scottish education system. With a strong focus on 'closing the attainment gap' (Scottish Government, 2014) the "Raising Attainment for All" initiative encourages schools to work collaboratively to promote effective learning communities in order to improve the ability of all young people to learn and progress to their maximum potential, and to subsequently improve their life chances. The attainment gap refers to the difference in academic attainment reported between pupils who come from households with higher versus lower incomes (Bradshaw, 2011).

West Lothian is committed to delivering the best possible outcomes for their children and young people by ensuring they are supported to maximise their potential through effective learning. The "Raising Attainment Strategy" (West Lothian Council, 2018/23) focuses on effective collaborative working to support teaching practices in line with key national policies such as GIRFEC (Scottish Government, 2008) and the Curriculum for Excellence (Scottish Executive, 2004) with the overarching aim of raising attainment for all.

Research shows that students who are more confident about their learning ability will learn faster, be more motivated, embrace challenges and generally find learning more enjoyable (Claxton,

2002). Key teaching practices identified as having a positive impact on student's learning include formative feedback and effective questioning, but the most influential factor is the student themselves and what they bring to the classroom in terms of their attributes, levels of knowledge and motivation to learn (Hattie, 2015; 2009). Creating an effective and supportive learning environment can therefore provide students with the tools they need to become better learners (Claxton, 2002).

Within West Lothian the secondary schools are working to raise attainment in numeracy through targeted research based interventions, reviewing curriculum design and numeracy learning communities, with the long term goal of improving standards of numeracy across the authority.

What did we do?

This research represents one of four distinct EPS projects aimed at improving numeracy as part of the Forth Valley and West Lothian Regional Collaborative.

The current research is part of the West Lothian initiative to raise attainment in numeracy and explored the views and experiences of National 5 maths pupils to help inform improving standards of numeracy and mathematics within our schools.

The research was carried out in 8 secondary schools. Participants were selected through consultation with each Maths department and comprised of 56 pupils currently studying towards their National 5 Maths qualification. Forty percent of participants were from Scottish Index of Multiple Deprivation Deciles 1-4. Participants represented a range of abilities within National 5 level, however the majority of pupils had not passed their prelim or were recorded as being 'amber' in their school monitoring and tracking system for maths, meaning they were at risk of failing the final exam.

Focus groups (4-10 pupils per group) were conducted in each school, to explore the participants' views and experiences of maths; namely what was working well, what they were struggling with and what they would change. Key themes were identified to help explain why some pupils struggle with numeracy skill development and what can be done to address these barriers.

What have we found?

The focus group findings identified 4 key factors underpinning the success of numeracy development:

- Pupils reported enjoying maths lessons more when a constructivist approach was taken, rather than more "traditional" textbook learning. They felt lessons were easier to understand when concepts were linked to real examples and when classes were conducted at a relaxed pace. They felt group working also facilitated their learning.
- Teaching environments which lacked positive praise and process-based feedback resulted in pupils lacking the self-belief that they could develop a sense of mastery in their learning. Positive relationships with teachers enabled pupils to ask questions and gain constructive feedback, as opposed to feeling de-motivated and not listened to.
- Most pupils reported feeling under pressure to be "good" at maths. They felt there was an implicit assumption you were only good at maths if you were in the top set. Many pupils felt they did not receive effective feedback which could provide an opportunity to learn from mistakes, which is key in helping pupils develop a growth mindset (Dweck, 2000).
- In terms of pedagogy, the pupils also felt that many lessons were too fast paced and that many National 5 concepts could have been introduced to them earlier.

What do we plan to do next?

These results were fed back to all the West Lothian secondary schools and will be used in conjunction with their own practitioner enquiries to inform and improve their practice further. The Maths departments plan to collaboratively use this information to challenge and change the way maths is approached, taught and learned across all the secondary schools.

Within the Forth Valley and West Lothian Regional Collaborative, the four Educational Psychology Services plan to pull together key findings from each of the four projects to identify common factors and make recommendations for implementing further improvements in numeracy attainment at a National level.

References

For Full Collaborative report go to:
www.westlothian.gov.uk/educationpsychologyservice
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