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Dundee EPS: Title

Making learning conversations count: Using video reflection to enhance Teaching Assistants' impact on attainment in numeracy.

What did we ask? (Research Questions)

1. Does the use of video as a coaching tool increase the quality of learning conversations between target children and Teaching Assistants (TAs)?
2. Does an increase in the quality of learning conversations have an impact on numeracy attainment for the targeted children?

What is the evidence base?

Learning mathematics is important for everyday life. It equips us with the skills needed to interpret and analyse information, solve problems, assess risk and make informed decisions (Scottish Government, 2009).

Local data suggests that Dundee follows a current trend in Scotland for low attainment in numeracy. The ambition of the Numeracy Strategy within Dundee is to deliver a consistent and effective partnership approach to raising attainment and achievement in numeracy. One desired outcome from Dundee City Council's bid for Scottish Attainment Challenge (SAC) funding was to improve numeracy outcomes.

Self-regulation is a key skill for mathematical learning, enabling a person to become aware of their progress and the strategies they need to achieve their goals (De Corte, Verschaffel, & Op't Eynde, 2000). Unfortunately pupils can struggle to develop self-regulation skills. Furthermore, progress in mathematics can also be hampered by mathematics-related anxiety (Chinn, 2012).

Effective interventions to support the development of self-regulated learning (SRL) through learning conversations include teaching:

- teaching how and why to use learning strategies
- teaching how to plan a learning task
- explaining the relevance and importance of a task (De Boer, Donker-Bergstram, Kostons, Korpershoek & van der Werf, 2013).

Such interventions have shown consistently high levels of impact on academic progress (Hattie, 2009; Higgins, Katsipataki, Kokotsaki, Coleman, Major & Coe, 2013). Targeted interventions have found that these skills can be taught in mathematics; for example providing appropriate scaffolding of strategic behaviour, including explicit support such as scripts if necessary, enabling learners to select from a range of mathematical strategies (Darr & Fisher, 2004; Pape, Bell & Yetkin, 2003).

TAs have an important role in providing scaffolding for learning tasks (Bosanquet, Radford, and Webster, 2016), and improving the quality of learning conversations between TAs and pupils has been found to support the development of independent learning (Radford, Bosanquet, Webster & Blatchford, 2015). The current research builds on this, focusing on two of the recommendations set out by the Education Endowment Foundation (Sharples, Webster & Blatchford, 2015) on how to make the best use of TAs in schools:

- Recommendation 3 - Use TAs to help pupils develop independent learning skills and manage their own learning and,
- Recommendation 5 - Use TAs to deliver high quality one-to-one and small group support using structured interventions.

Hence our SAC bid included funding for Teaching Assistants (TA) and a role for the Educational Psychology Service to use video-enhanced reflective practice (VERP) to enhance the effectiveness of learning conversations between TAs and pupils identified as requiring additional support for numeracy.

The hypothesis was that this would develop children's SRL in relation to numeracy and increase attainment in numeracy for the target children over time.

VERP was used by EPs as it has been evidenced as a method to support critical reflection and learning among professionals (Ferguson, 2015) and is an effective model for continued lifelong professional learning (CLPL) (Cordingley & Bell, 2012), linking directly to the National Improvement Framework 'Teacher Professionalism' driver (Scottish Government, 2016). Furthermore, training carried out over time which combines collaboration and experimentation has been found to be more likely to change practice (Cordingley, Bell, Thomason & Firth, 2005) and improve pupil outcomes (Cordingley & Bell, 2012).

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What did we do?

Participants

Eight TAs from four primary schools took part. Each was working with a child/group of children who are in SIMD deciles 1/2 and who had been identified by their school as requiring targeted support for numeracy.

Assessment Tools

- Adapted *Addressing Barriers to Learning* (ABLe) 'Taking a Closer Look At' checklists for numeracy – completed by class teachers pre- and post-training.
- VERP target monitoring form – completed pre-training and at the end of each shared review of video. TAs rated their confidence on a scale (1-10) for each of their chosen targets, identified positives and what they wished to focus on next.
- Ranking activity administered pre- and post-training to gather TAs' views on good practice when supporting independent learning.
- Post-training focus groups with TAs and EPs to gather their views of the impact of the training/effectiveness of the training model.
- Survey administered to Head Teachers to determine their views of the impact of the training and the effectiveness of the training model.

Procedure

1. Consent for filming and data collection obtained from parents of target children.
2. Initial input delivered to TAs and numeracy leads in the schools. This covered the rationale, the evidence-base for SRL, strategies to support the development of SRL, and key principles of attuned communication. TAs chose specific communication targets to work towards based on VERP attuned principles and techniques that support SRL.
3. TAs brought three separate films of their learning conversations to share in a group facilitated by the EP over a three month period; this allowed TAs time to work on personally-identified targets between sessions.
4. Post-training focus groups held with TAs and EPs, surveys distributed to Head Teachers.

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What have we found so far?

1. *Does the use of video as a coaching tool increase the quality of learning conversations between target children and TAs?*

TAs reported a better understanding of learning conversations, were more attuned to the target children during relevant activities and were more confident in supporting the children with numeracy. Evidence from all measures suggested the training had a positive impact on TAs' skills, knowledge and attitudes. Notwithstanding evidence that suggested TAs were aware of scaffolding pre-training, they reported a fuller understanding of the stages at the end. EPs and HTs feedback supported this.

This project demonstrated that video as a tool to encourage reflection and collaborative working was an effective way to advance practitioner skills in learning conversations. Feedback from TAs indicated that the current research created conditions to learn with, and from, others through critical enquiry, features endorsed as good practice for CLPL (Cordingley et al., 2005). These views were shared by EPs and HTs, who also commented on the value of building on existing strengths.

Concurring with research evidence (Cordingley & Bell, 2012), TAs noted that having the training over time helped embed change in their practice. They reported greater awareness and understanding of theory about learning conversations and how it related to their practice and were able to actively engage in learning; this promotes a positive benefit on pupil outcomes (Cordingley & Bell, 2012).

2. *Does an increase in the quality of learning conversations have an impact on SRL to promote numeracy attainment for the targeted children?*

Results indicated that the increase in TAs' skills in leading learning conversations had a positive impact on the target children's numeracy skills, knowledge and attitude. The ability to choose appropriate numeracy strategies increased for the majority of children, as did their confidence and understanding of the language of mathematics. Chinn (2012) asserted that an increase in pupil confidence can lead to a more positive attributional style, which is fundamental in supporting numeracy development. This indicates that the study may have a positive impact on numeracy development, although measurement was outwith the scope of the present report.

What do we plan to do next?

The skills gained in learning conversations could be extended into other areas of the curriculum. Specific to this project, individual EPs are engaging with their schools to identify ways to take this work forward, for example, repeating the ABLe checklists next term to gauge whether there has been a better than expected positive shift in target children's numeracy attainment. One project school reported increased use of video as a reflective tool amongst staff generally so there seems to be an opening here for promoting this more widely in relation to other areas not just numeracy.

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Further information and materials

Denise Martin
Dundee Educational Psychology Service, Dochart Terrace, Dundee. DD2 4HB.
- denise.martin@dundeecity.gcsx.gov.uk
- 01382 432980

You can find training materials and assessment tools on the following link:
https://www.dundeecity.gov.uk/deps
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Appendix: ADDRESSING BARRIERS TO LEARNING (ABLe)

Taking a Closer Look at Numeracy

Pupil's Name	
Date of Birth	
School	
Class	
Date	

Names of those involved in ABLe conversation

Key: Highlight statements using "traffic light" system
Red   - area of concern/difficulty
Orange   - emerging skill/some difficulty
Green   - fine
Leave blank - not known/not relevant at this time

Comments

General	Date	Date	Date	Comments
For general guidance in the knowledge and understanding children should have before moving on to their next stage of learning, see the National Numeracy progression Framework from Education Scotland.				
Language				
• Understands language used in a mathematical context (e.g. understanding concepts in a word problem)				
• Understands key mathematical vocabulary (e.g. 'take away' or 'corner', etc				
Problem solving/ knowledge and application of rules and strategies				
• Uses a systematic step-by-step approach in finding answers				

• Knows how and when to make use of mathematical rules				
• Understands and can apply formal rules				
• Able to choose appropriate strategies				
Attitudes and Expectations				
• Demonstrates a belief that their mathematics ability is fixed and that they either can or can't do maths				
• Demonstrates a belief that their ability can develop through learning and teaching				
• Displays feelings of panic, tension and helplessness when faced with anything mathematics related				
• Avoids or disengages in situations where they may be faced with mathematically related problems				
• Performs worse when tasks are completed under timed conditions or during assessments				

• Completes tasks in a very sequential, formulaic way, documenting every step				
• Takes a holistic and intuitive view when completing tasks, resisting documentation				