

Successful additions

From the tips of your fingers, to the tips of your tongue. Michael Jones examines a project that has successfully used sign language to help young children understand and use mathematical vocabulary.

IT BECAME apparent to me very early on in my teaching career that every child has to learn a second language in their early years, and in school. Not French or Spanish, but something that can be much more complex and potentially unfathomable – maths.

Practitioners often get frustrated because teaching certain concepts in maths seems to present children with a huge barrier – a barrier created largely by language. This may be because the ideas are abstract and intangible – they are literally difficult to grasp hold of and remember. There may also be two meanings to the words or phrases we use when teaching a concept (for example, ‘take away’), or the words may be unfamiliar and relate only to maths (for example, ‘add’).

The problem may be compounded for children with additional language learning needs or those learning English as an additional language (EAL). What is doubly frustrating for practitioners is that they know that many children understand maths concepts, but that the children are unable to explain what they know. As a result, practitioners are unable to attribute to children the *Early Years Foundation Stage* (EYFS) profile points that they deserve.

However, help is at hand, literally. Practitioners in Luton have been experimenting with a scheme that is successfully using British Sign Language (BSL), to enhance maths teaching. The project, called Sign4Maths, was created by Sue Thomas, a senior early years consultant in Luton, and Katja O’Neill, director of Sign2Learn.

They had already worked closely with Luton settings and schools to develop the language skills of hearing children by using BSL. This particular project, called Sign a Story, had successfully enhanced children’s narrative ability – their understanding and use of language to tell a story. This had been shown to provide a great boost for all children’s communication skills, and particularly those at risk of language delay or with EAL.

But why use sign language with children who can hear perfectly well? Katja O’Neill explains: ‘Recent research suggests that when children use their voices to say a word, and their hands to sign it, they activate both sides of their brains, which can make learning far more effective. If a child forgets a new item of vocabulary, he can generally remember the sign, which prompts his brain to remember the word. So

instead of the word being on the tip of his tongue, he has it at his fingertips!’

Sue Thomas is in no doubt that the use of BSL was important. ‘We chose BSL to ensure consistency with the signs that were being used throughout the settings, and to have a sign language that would be accessible to children who are using a signing system as part of their communication, such as those with hearing impairment.

‘We made absolutely sure that any adults involved in the project understood the need to talk as they signed. Using signs was not a substitute for talking, but to enhance speech. As a result, children were using key storytelling phrases, such as ‘once upon a time’, sequencing language (first, next and finally) and connectives (such as so, but, unfortunately and suddenly), within the context of traditional tales, and later in any story that they told or wrote.’

Practitioners found that children who had previously ignored abstract words, such as ‘unfortunately’ and small connectives like ‘but’ were now not only noticing and understanding them, but using them spontaneously. Katja O’Neill is convinced that the reason for this is concrete. ‘Some words and ideas are so abstract, that children literally cannot visualise them, and adults can’t explain what they mean either.

‘When you are teaching a new word, and encourage children to sign and say the word at the same time, you are not only making the word visible, but enhancing the way that children will be able to link an idea to the word we use to express it. This makes it easier to understand concepts, recall the word associated with it and eventually talk about what you know.’

After the success of Sign a Story, it seemed a natural next step to look at using BSL in maths teaching. Katja and Sue had originally introduced Sign a Story over an eight-week period with ongoing support, but by the end of the project they found that settings only needed a 90-minute initial training session. ‘We had learnt that to introduce signing in a setting, practitioners do not need a huge amount of support, and we were determined to ensure that what became known as Sign4Maths would take only 90 minutes to explain,’ says Katja, ‘although it is important to emphasise that we were only focusing on a small vocabulary and not introducing the whole of BSL!’

Their first action was to select the target vocabulary. They began by looking at the EYFS



Michael Jones

is an early years trainer and writer www.talk4meaning.co.uk and formerly the early language consultant for Every Child a Talker projects in Luton, Bedford and Thurrock

Profile data for Luton that showed areas where children's underachievement could be explained by a lack of vocabulary to express what they knew. Eighty percent of these vocabulary items were related to maths, particularly in the areas of shape and space, and measures and calculating. These findings are not just an issue for Luton, but are reflected nationally.

Sue describes the problem thus: 'We were particularly interested in making a difference for children who were at risk of language delay, or underachievement, due to language impoverishment or learning English as an additional language.'

'Typically, these children can do the maths, but can't talk about it. A classic example is sorting by shape, size and colour. The children can do this easily, but are failing because they can't describe what they have done. Children need to be able to articulate their thoughts – this is especially important for areas that involve higher level thinking, such as problem solving.'

Their research in settings and schools had shown that five areas were problematic, both in terms of children learning new ideas and by showing through language that they understood them (see figure 1). Sue and Katja developed a series of songs and activities that can be used to introduce the concepts

and signs, and linked these to familiar children's storybooks. *Pardon? Said the Giraffe* by Colin West [Walker Books; ISBN: 9781406321043], for example, was recommended to illustrate the use of 'long' and 'tall'; the words we use in English to describe vertical and horizontal objects. The songs are sung to familiar tunes, such as *The wheels on the bus*, but with new words and associated signs.

Having developed a booklet, containing illustrations of signs, activities and songs, and a DVD showing how the signs should be accurately performed, Sue and Katja launched a series of 90-minute training events. During these events the pair both underline the importance of adults talking as they sign, and the need to focus only on those vocabulary items that are causing children difficulties. They also want practitioners to see Sign4Maths as a tool that can be dipped into for use with all children, and not as an intervention or scheme that has to be worked through page-by-page.

Is a 90-minute training session enough to stimulate, educate and inspire busy practitioners? I was invited to Greenside Nursery and Children's Centre in Luton to see for myself. Emma Collins, an Early Years Professional, attended a course and was so enthused that the next day she set about convincing



Saying and signing 'on' as part of a fun game, will help children to understand concepts and to remember the words associated with them

her colleagues that signing and maths not only go together, but have advantages for every child in the setting: ‘I was already convinced of the value of using signing, as we had implemented this with our very youngest children. Many of our children are learning English as an additional language, and we wanted to see if signing could support their development of maths language in English. For English children too, it helps them fix the words in their minds, and to use them regularly and appropriately.’

The staff used the simple interactive games from the booklet, which the children can play either in small groups or in a large circle. On the day I visited, Emma and her colleague Lysette Shaw were leading a large circle to promote the use of prepositional language. It was a very simple game, where they had to guess where a frog puppet was hiding (in, on, under or behind a box) and then say and sign their answer together. The children loved it. Daina, from Lithuania, was very keen to say and sign words she already knew, and to learn new ones.

I watched three-and-a-half-year-old Rizwan very closely. He joined in enthusiastically, but while he made the correct sign for ‘in’, he said, ‘on’. Emma and I discussed this, and she thought that this would not be a problem for Rizwan in the long term.

‘Normally, if you asked Rizwan where something was, he would just point or say, “there”. By introducing signing and speaking he is working out for himself what the correct words are. “On” and “in” sound very similar, but the signs are quite different, so it is not surprising that he gets the sign right first. With time and practice he will get them both right. It’s enhancing his maths and language at the same time.’

Manager, Beverley Thompson, was caught up in Emma’s enthusiasm. ‘Language is at the heart of everything we do here. We had already taken on board Katja’s ideas about signing and talking with our youngest children, so it seemed a natural progression to focus on signing and talking with the older ones.’

‘In order to make Greenside a “speaking and signing setting”, the first thing we needed to do was to engage all the staff and parents. We never do things by halves here, so during a staff meeting to launch talking and signing we planned a “talk and sign quiz night”. We had a hilarious evening where all the staff, including the site agent, took part in mad games that involved developing our knowledge of signing.’

‘It was essential to involve the children’s parents, because there can be misconceptions that by using signing we might be inhibiting their children’s verbal communication. Parents were fascinated to find out about the advantages of using signing and talking. As it turned out, many of them have prior knowledge of the value of signing, because one of the most popular television programmes on CBeebies, *Something Special*, involves adults and children talking and signing together.’

Sally Goodwin, from Little People’s Nursery in Luton, contacted Sue Thomas with enthusiastic

Figure 1: Five maths vocabulary problem areas

- Positional language: On, over, between, behind, in front, under, in, next to.
- Descriptive language: Flat, curved, straight, corner, pointy, side.
- Addition and subtraction: Add, take away, altogether, one more, one less (fewer), how many left?
- Problem solving: Double, halve, group, compare, estimate, share.
- Comparative language: Same, different, long, short, tall, small, big, heavy,

praise for Sign4Maths: ‘During lunch yesterday I was delighted to observe that one table of children started to talk about and use the signs for the shape of the curved table they were sitting at. Then they looked around them at the other tables that had corners.’

‘This inspired all of the children to start to look at their own table and other shapes in the environment. They then noticed that their sandwiches had corners. One little boy had a bread roll and was very excited that he was the only child to have “curves” in his lunch. They then spent some time nibbling away at their lunch to create curves and corners. It showed us that they have really taken Sign4Maths to heart!’

Following the local success of both Sign a Story and Sign4Maths, Sue and Katja are keen to explore the use of the projects at a national level. They are also currently exploring the potential of developing a third project to support children’s behaviour and a deeper understanding of their emotions, called Sign4Wellbeing.

eye

Useful resources

- For a detailed account of this research, please contact Sue Thomas, senior consultant, Early Years and Childcare in Luton at susan.thomas@luton.gov.uk or Katja O’Neill of Sign2Learn at info@sign2learn.co.uk.
 - *Dancing with words: Signing for hearing children’s literacy* by Marilyn Daniels. Published by Greenwood Press (ISBN: 9780897897921).
 - *Let’s all sign! Enhancing language development in an inclusive preschool* by Irma Heller et al. Published in *Teaching Exceptional Children* 30 (3) pp 50-53
 - *Signing success* by Michael Jones. Published in *Special Children*. June/July 2009.
 - *Sign Posting* by Michael Jones. Published in *Nursery World*. August 2010.
 - *Interesting vocabulary* by Michael Jones. Published in *Early Years Educator* 12 (1) pp 38-40
- Please note: Children’s names have been changed to ensure safeguarding

Key points

- Practitioners often find that young children struggle to express mathematical concepts, whether they fully understand them or not
- Using sign language to teach mathematical vocabulary and concepts can help children to overcome this barrier of expression