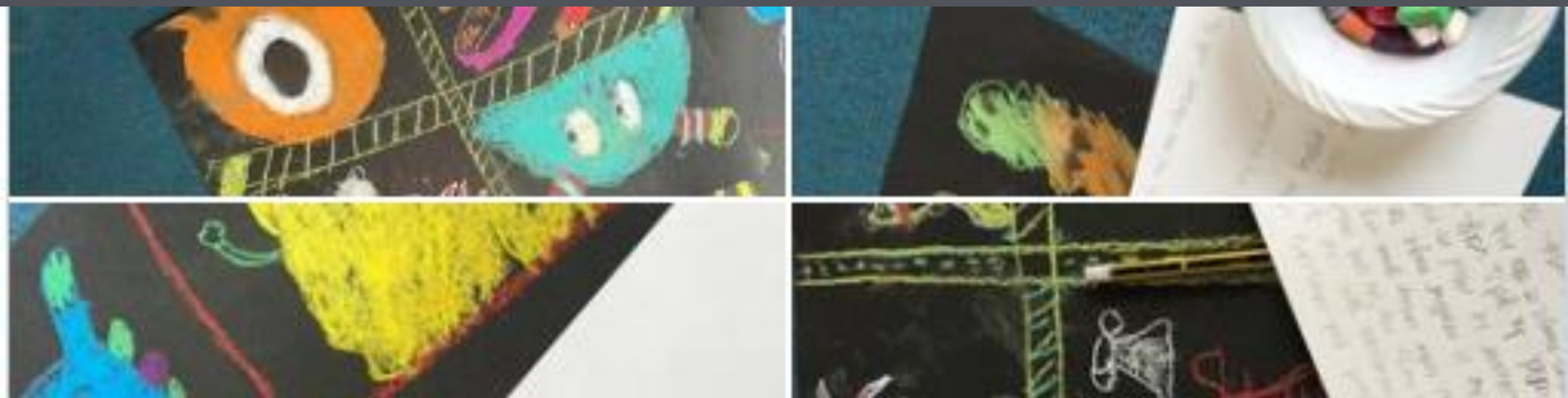


Transferable vocabulary



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TRANSFERABLE VOCABULARY

A research project funded by Creative Multilingualism (AHRC, OWRI and CeLM)



ABOUT US



PUBLICATIONS

We are currently analysing the data collected in this project. New publications will appear here soon.

Introduction

"Transferable Vocabulary" is a research collaboration between Oxford Brookes and Reading University funded by Creative Multilingualism and Centre for Literacy and Multilingualism (CeLM) at the University of Reading. Creative Multilingualism is a research programme led by the University of Oxford and funded by the Arts and Humanities Research Council as part of the Open World Research Initiative.

We aim to explore teaching of mathematical vocabulary to Year 4 and Year 5 pupils through arts and storytelling.

Browse our website, see our events and contact us to learn more and get involved.



The project

A collaboration between academics and artists aiming to explore teaching of mathematical vocabulary to Year 4 and Year 5 pupils through arts and storytelling.

Where is mathematical vocabulary needed?

Word-based problem

The scale on a map indicates that 1 centimeter on the map represents 4 kilometers on the land. The distance between two towns on the map is 8 centimeters. How many kilometers apart are the two towns?

- Ⓐ 2
- Ⓑ 8
- Ⓒ 16
- Ⓓ 32

Wordless arithmetic problem

$$5,631 + 286 = ?$$

Where is mathematical vocabulary needed?

word	Common use in literacy	Mathematical use
odd	Something strange or abnormal (e.g. <i>The neighbours thought him very odd</i>)	Any integer that cannot be divided exactly by 2 (e.g. 3, 5, 7 etc.)
volume	Loudness of a sound (e.g. <i>Can you turn down the volume on the tv please?</i>)	Measure of the amount of space inside of a solid figure, like a cube, ball, cylinder or pyramid. (measured in cubic centimeters, or meters)
root	Part of a plant that attaches it to the ground (<i>the fungus attacked the roots of the plant</i>) Or: Cause of something (e.g. <i>money is the root of all evil</i>)	The root of a number x is another number, which when multiplied by itself a given number of times, equals x . For example the square root of 9 is 3, because $3 \times 3 = 9$.

The practice

- Linguistic diversity in the classroom

There are more than a million children between 5–18 years old in UK schools who speak in excess of 360 languages between them (NALDIC website)

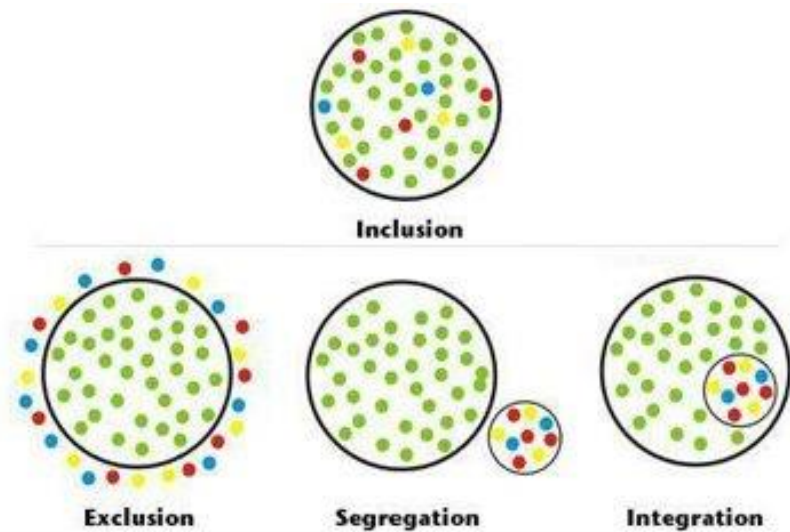
- Language immersion (borrowed from MFL, see Hummel, 2013)

In many schools:

- Maths terminology is introduced to all children together with the concept in English,
- Children with EAL are supported on a one-to-one basis (EAL teacher, TA) for vocabulary learning.

The practice

Integration versus inclusion



The research background

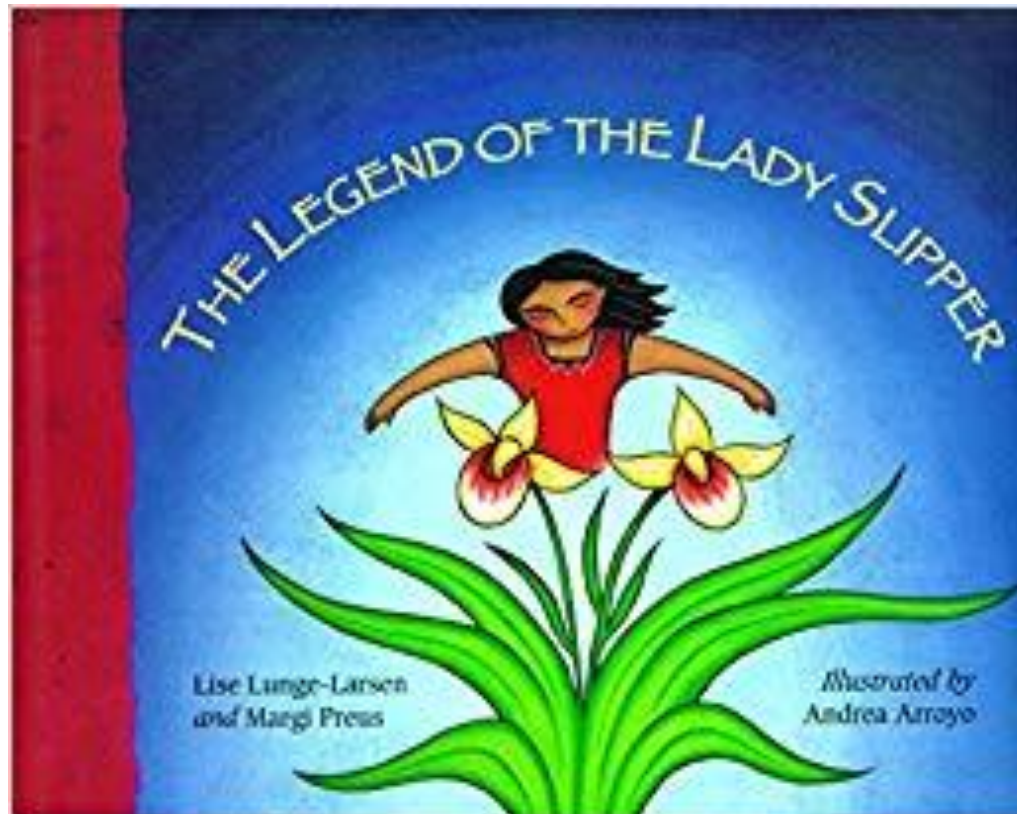
This project builds on Trakuphaldektraï et al. (2017) that found:

- EAL and non-EAL Y5 pupils similar on wordless mathematics problems.
- EAL lower scores for word-based mathematics problems, reading comprehension and general language ability.
- The reading comprehension test was the strongest predictor of word-based problem solving performance for EAL, while general language ability was the strongest predictor for non-EAL.

The goal

- To promote inclusion & creativity by:
 - teaching maths-specific vocabulary to all to boost performance in word-based problems,
 - using home languages to acknowledge linguistic diversity,
 - using cross-curricular activities for more fun and accessible learning.

The inspiration



The inspiration



A neighboring village had the *mash-ki-ki* the healing herbs, they needed, but the journey was too dangerous to make in winter. It was too cold, the snow was too heavy, and between the villages lay a deep, dark lake covered with groaning ice. Such journeys were not made in *Gichi-Manidoo Gilzis* the Great Spirit Moon. Still, her brother said, yes, he would make the trip.



She found her *ma-ki-sins* the beautifully beaded moccasins her mother had made out of deerskin, and tucked warm rabbit fur inside them. Then she slipped them on and stepped out into a raging storm.

The team

2 researchers

4 artists

3 research assistants

<https://research.reading.ac.uk/transferrable-vocabulary>

Methods

- Qualitative data: Interviews - questionnaires
- Quantitative data: Maths and Vocabulary test before and after intervention

The sample

- 250 children (EAL and non-EAL) from 5 primary schools
- Y4 and Y5
- 12 teachers (including 2 EAL leads and 3 Maths leads) – 20 EAL children

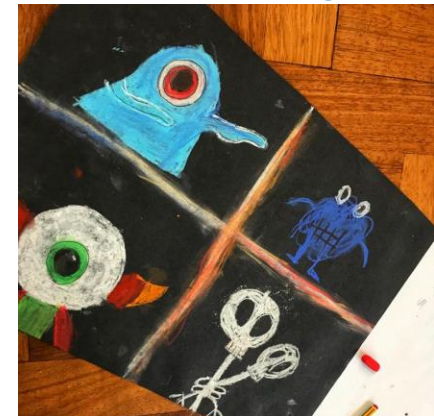
The delivery

We offered 2 workshops to whole Year groups in:

Storytelling & singing



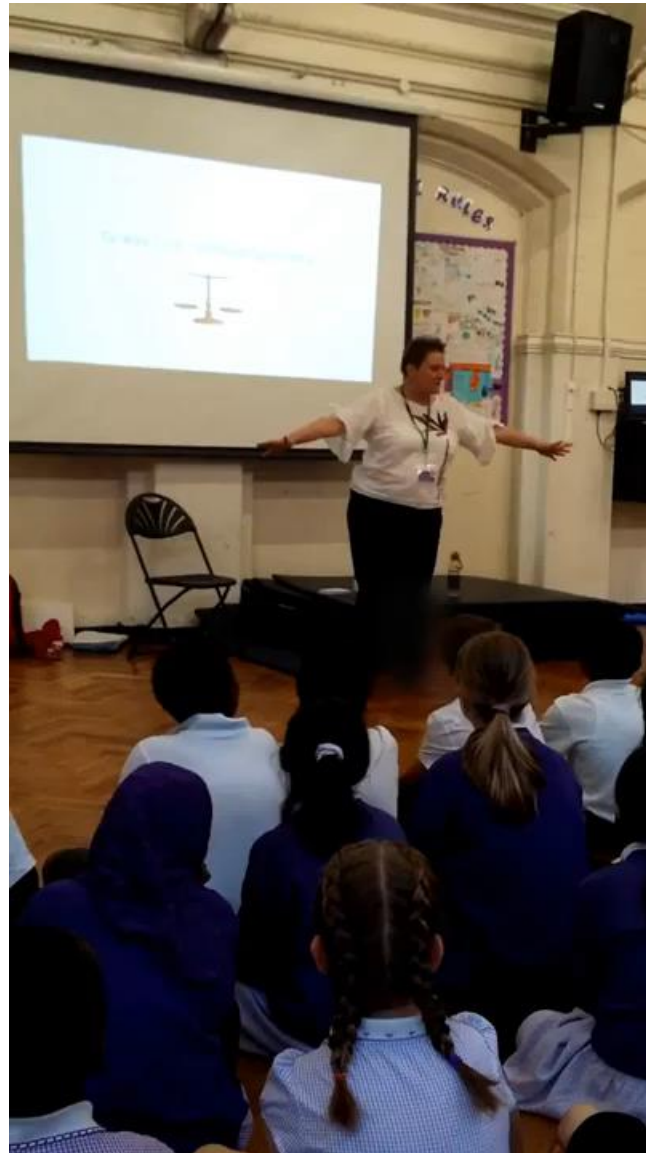
Drawing & creative writing



Principles

- Make it cross-curricular: Combine subjects and where possible teach new skills
- Make it inclusive: Introduce a home language that makes sense to the group, use stories from all over the world
- Make it stick: Reinforce learning of the concept by using multiple ways: language, visuals, gestures
- Make it fun and creative: No guidance!

A taste of the storytelling



A taste of the storytelling



The drawing/creative writing



Results

- Qualitative data: Interviews - questionnaires
- Quantitative data: Maths and Vocabulary test before and after intervention

Linguistic diversity & Inclusion

Teachers said:

We have to present what languages are spoken in our classrooms on the front of every door to sort of celebrate that

We had the European Day. Didn't we?

I want to boost their confidence by saying, you know, "It's fantastic, why are you so clever? You speak another language"

We just want to make sure that there are no children standing against the wall, you know, with no friends because they don't know the language.

Linguistic diversity & Inclusion

Children said:

I do like when we do Art and our topic as well, but I also would like to learn some new ways, like learn some new tricks, for like drawings and to make your drawings better and painting.

Like maths, if you just added like English or something else to it, it would be way more fun than just doing maths, because it wouldn't get, like boring after a while.

The answer's just in my head and it's not in my head really that quickly, so when people tell me the story then it gets in my head much more easy.

Linguistic diversity & Inclusion

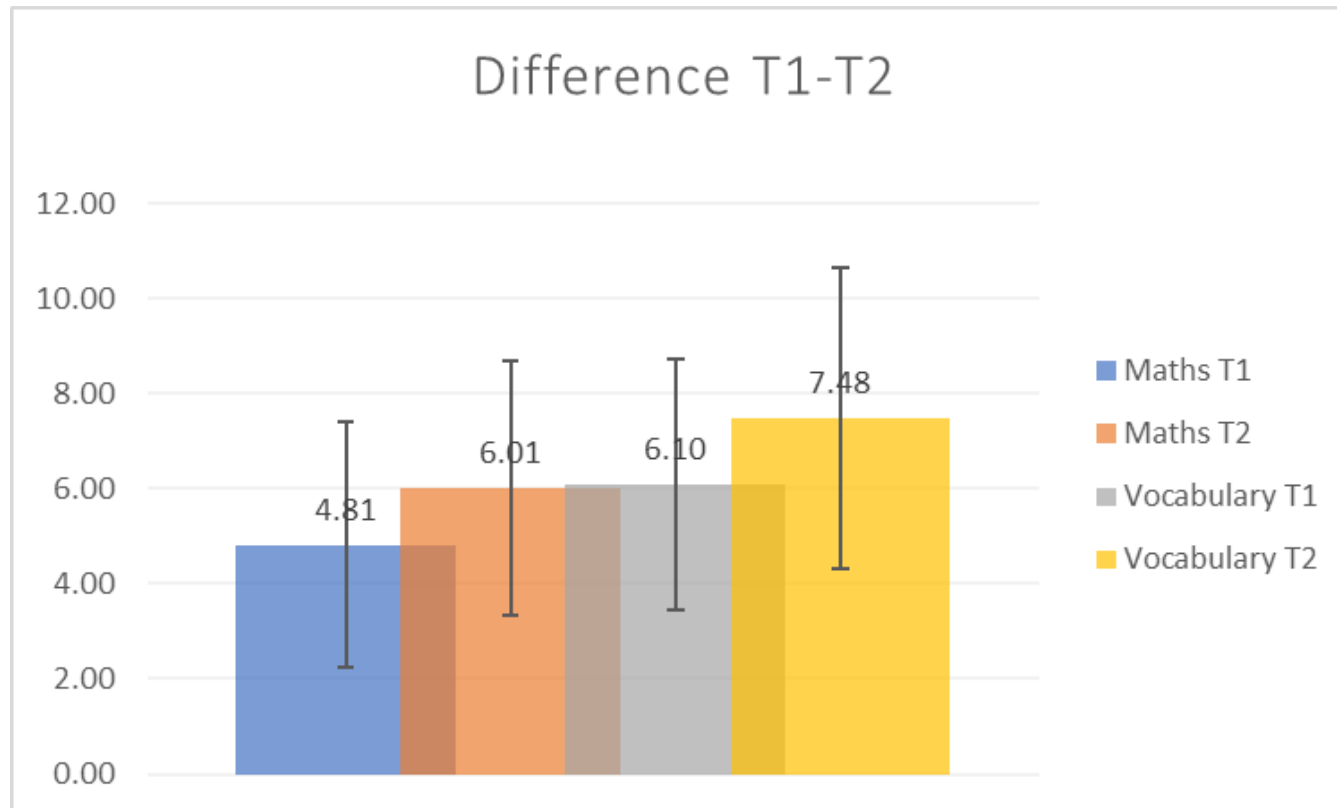
Children said:

Some people might just know one language, so it's a really good privilege that we have more languages that we can learn from...

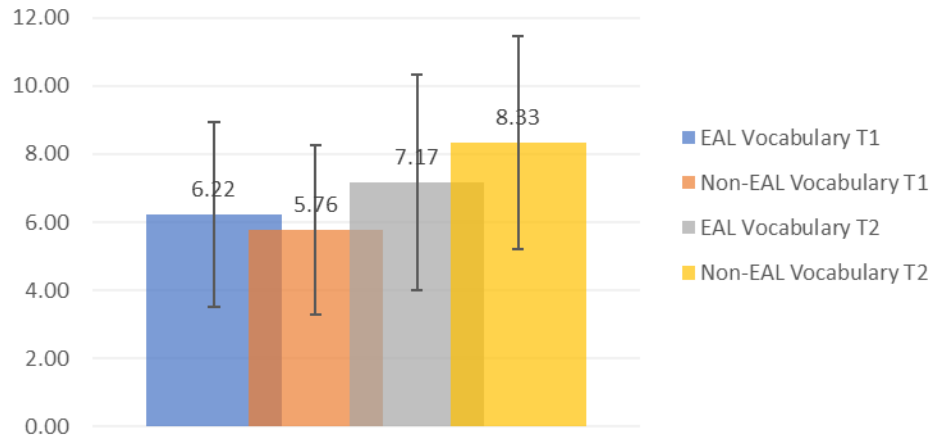
I think that they might have brought the language into the words as maybe because a lot of people speak, like, a lot of English and not a lot of other languages in the school. So, maybe bringing in different languages, because they've spoken so much English they might forget (their mother tongue).

Did it work?

Results analysed from 78 participants in Y5



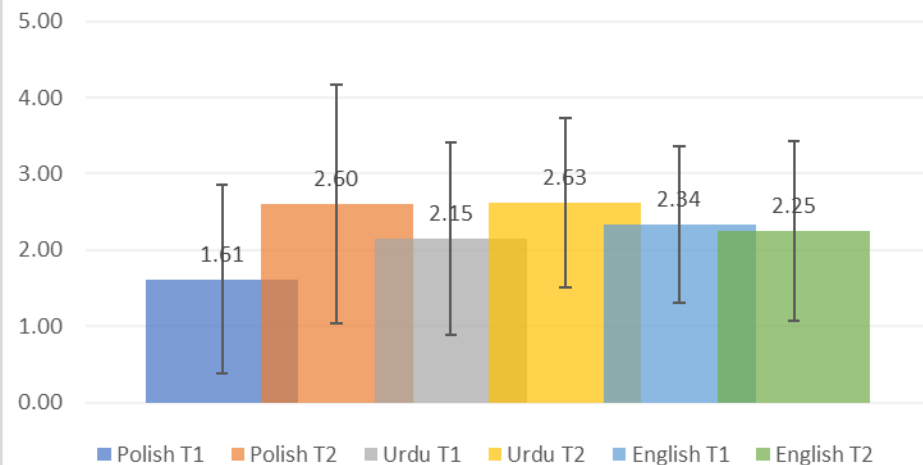
EAL vs non EAL - Vocabulary

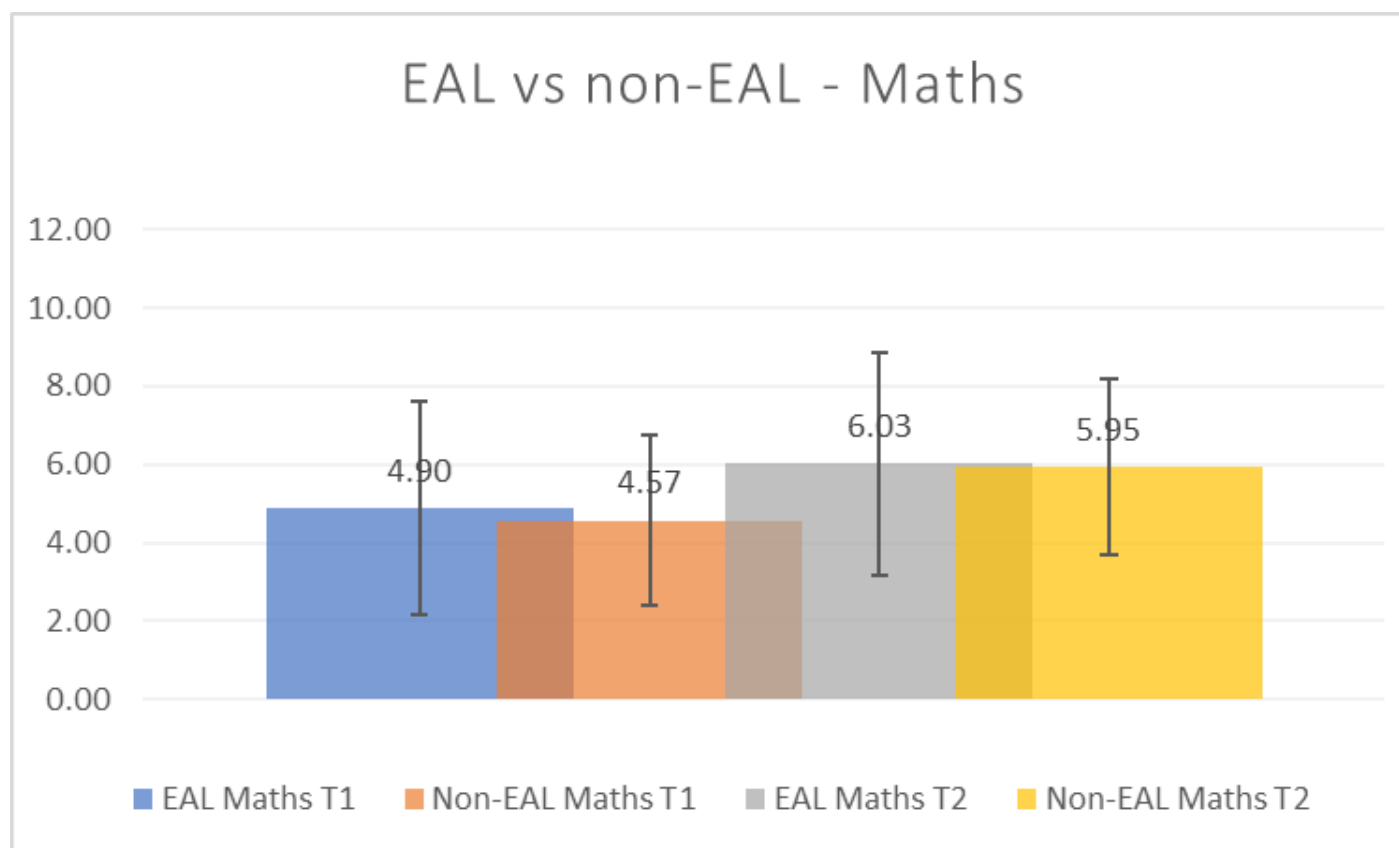


58 EAL vs 20 non-EAL

All 78 children

Vocabulary by Language





Learn more and follow our work

<https://research.reading.ac.uk/transferrable-vocabulary>

Collaborate in follow-up project

Future project to create resources for teachers and families to use based on the principles of this project:

- App
- Online resources

If interested, e-mail a.tsakalaki@reading.ac.uk

References

- Hummel, K. M. (2013). *Linguistics in the World : Introducing Second Language Acquisition : Perspectives and Practices*. Somerset, US: Wiley-Blackwell. pp. 41–50. ISBN 9780470658031.
- Trakulphadetkrai, N. V., Courtney, L., Clenton, J., Treffers-Daller, J. and Tsakalaki, A. (2017) The contribution of general language ability, reading comprehension and working memory to mathematics achievement among children with English as additional language (EAL): an exploratory study. *International Journal of Bilingual Education and Bilingualism*. ISSN 1367-0050 doi: <https://doi.org/10.1080/13670050.2017.1373742>