



Sustaining Research and Innovation Group (RIWG)

Subject Leaders as Researchers (SLasR)

Professor Jenny Field

The Danger of Becoming '*Stepford Teachers*'!

'Stepford Wives' Definition:

Compliant, Conformist, Unquestioning, Submissive
... it turned out they had all been replaced with cyborgs!

Ok, this is a bit extreme 😊 ... but we do need to increase our professional identity and ownership of our curriculum



'For teachers to develop as professionals there must be a process of reshaping teachers existing knowledge, beliefs and practices rather than simply imposing new theories, methods or materials on teachers'

Johnson and Golombek, 2002: 2

Taking More Control of Your Own Journey as a Subject Leader

How can Subject Leaders best be supported to act as agents for change in their own research; identifying needs and designing an *'inquiry based action research cycle'* which positively impacts and sustains Mastery Mathematics within their setting?

What Makes a RIWG Successful?



According to the British Education and Research Association (BERA, 2014) the most effective forms of CPD involves:

- use of specialist advisors and external experts
- collaborative enquiry and structured peer support
- opportunity to explore why things do and don't 'work'
- exploration and challenging of teachers own beliefs, values and assumptions

In addition, this particular RIWG was bespoke to the needs of each Subject Leader, which was a highly innovative approach.

References:

1. BERA (2014) *Research and the Teaching Profession*. British Educational Research Association. Available at: <http://www.bera.ac.uk/wp-content/uploads/2013/12/BERA-RSA-Research-Teaching-Profession-FULL-REPORT-for-web.pdf>

What is Inquiry-based Action Research?



Inquiry-based Action Research is a small-scale intervention, set up to address **practitioners' own issues**, and a close examination of the effects of such an intervention

We undertake it for ...

- the improvement of practice
- the improvement of the understanding of practice
- the improvement of the situation in which the practice takes place

Our Research Journey:

Action Research: Steps 1-10

1. Pause and critically reflect on a specific area of teaching and learning you feel needs improvement within your setting? **DONE** 😊
2. Review your current practice in this specific area **DONE** 😊
3. Consider what others have already found out – *engage in relevant research* **DONE** 😊
4. Formulate your research question **DONE** 😊
5. Design your research actions and methodology - small, measurable steps **DONE** 😊
6. Undertake a cycle of 6-8 weeks ethical inquiry-based action research **DONE** 😊
7. Monitor and gather data at specified points **DONE** 😊
- 8. Analysis and Evaluation** of Outcomes and **Impact** – key themes, strengths, limitations **DONE** 😊
9. Disseminate these findings to others
10. Modify action from this pilot study (if needed); Replicate and Upscale



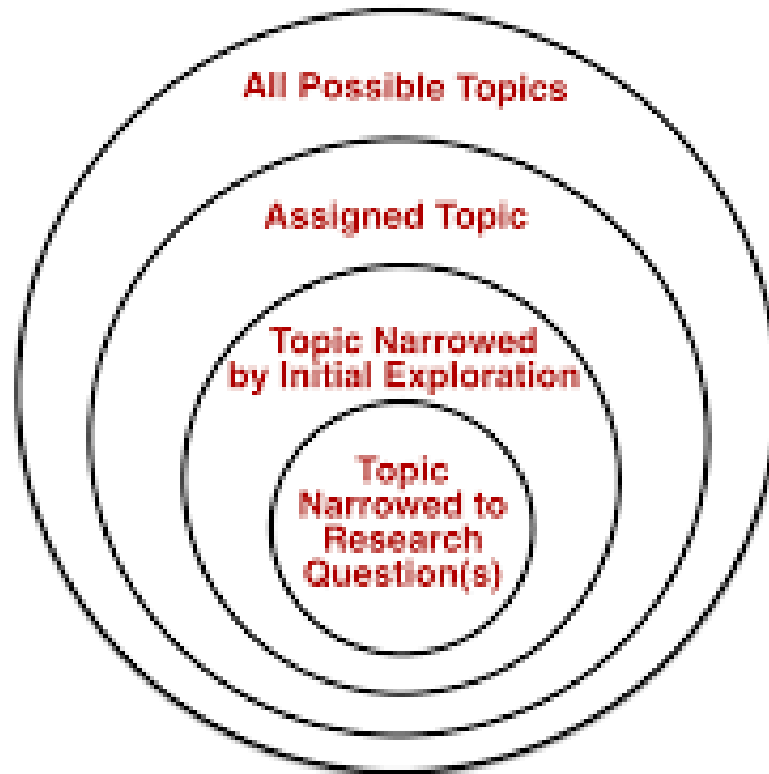
What do
you want to
research?

**Small scale curriculum
research could take place with:**

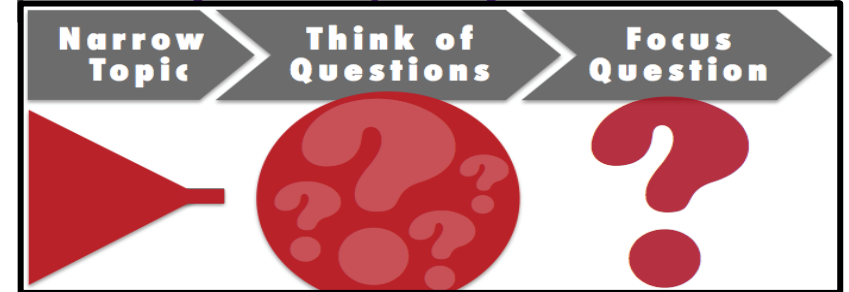
- One group of children
- One classroom
- A Year Group
- A Key Stage
- School Level

What is a priority issue
within your school?

What aspect of this issue
do you want to explore?



Stay small, stay focussed

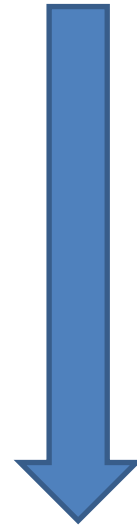




Focusing our Research Question

Broad idea ... do pets make us happier?

Consider this progression:

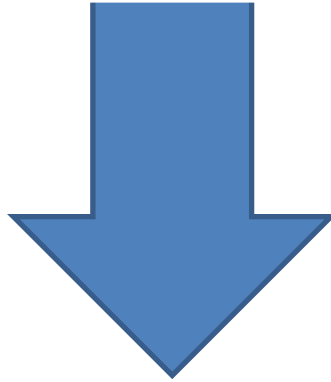


- Does owning a pet improve happiness?
- In what ways does owning a pet improve wellbeing for people?
- What is the impact of dog ownership on the perceived wellbeing for octogenarians who live alone?

Can you apply this to an education based question?

Tightening the focus of a research question?

How can I motivate a group of very reluctant six-year-old children with SEND to start learning mathematics?



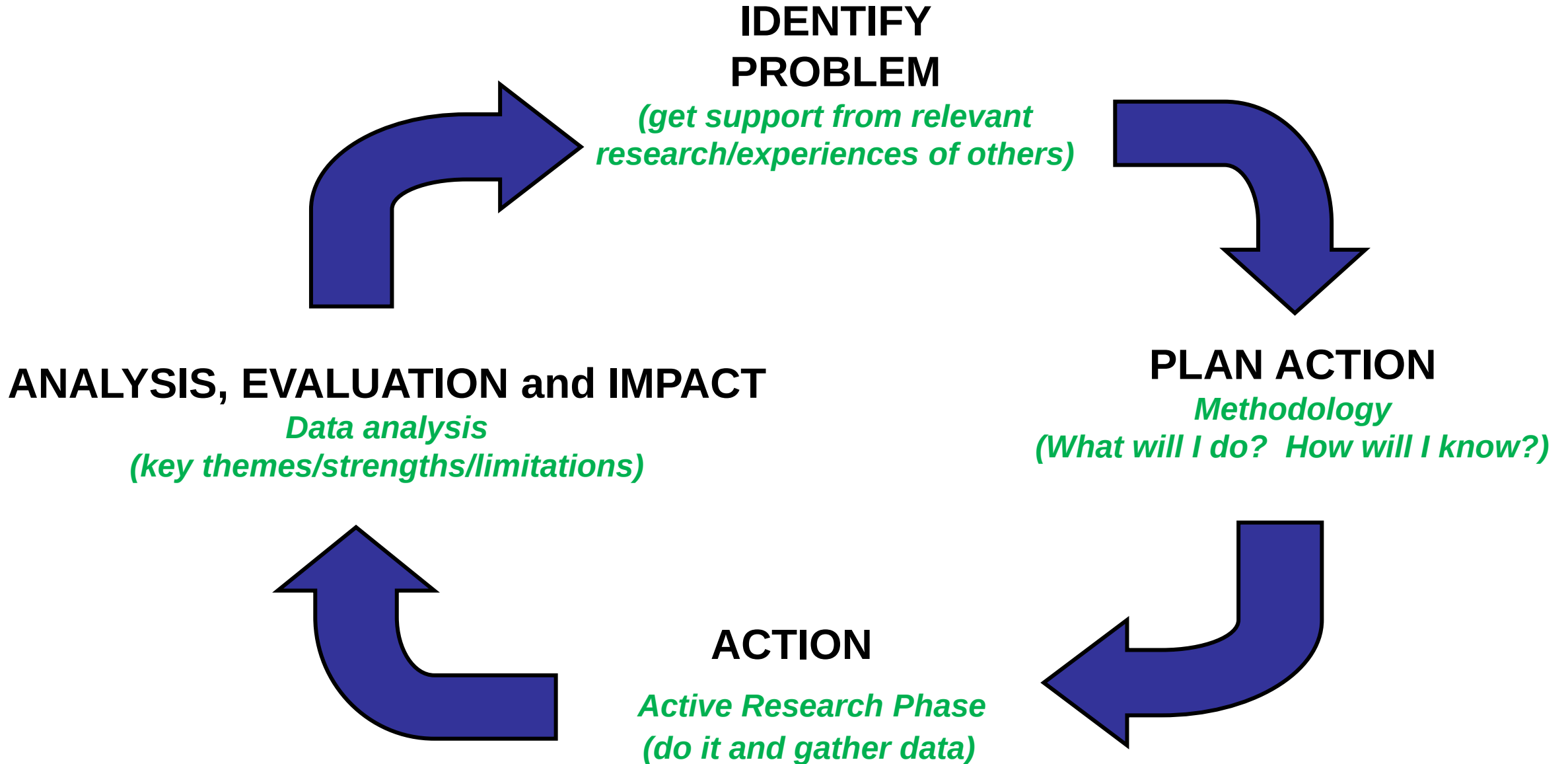
What is the impact of a structured 6-week teaching intervention, using the Numberblocks TV Programmes alongside the NCETM Numberblocks Support Materials, on the engagement and attainment of a group of Year 2 children with SEND?

Your Methodology



Research Question What do you want to find out?	Action and Strategy How do you intend to do it?	Gathering Impact Evidence How do you intend to collect data about your actions and monitor outcomes?
	What do you intend to do? What is the activity? Who is it with? Over how long? Who will monitor?	For example: <i>Observations</i> <i>Field Notes</i> <i>Interviews</i> <i>Questionnaires</i> Triangulation of data

Action Research Cycle





Analysis and Evaluation

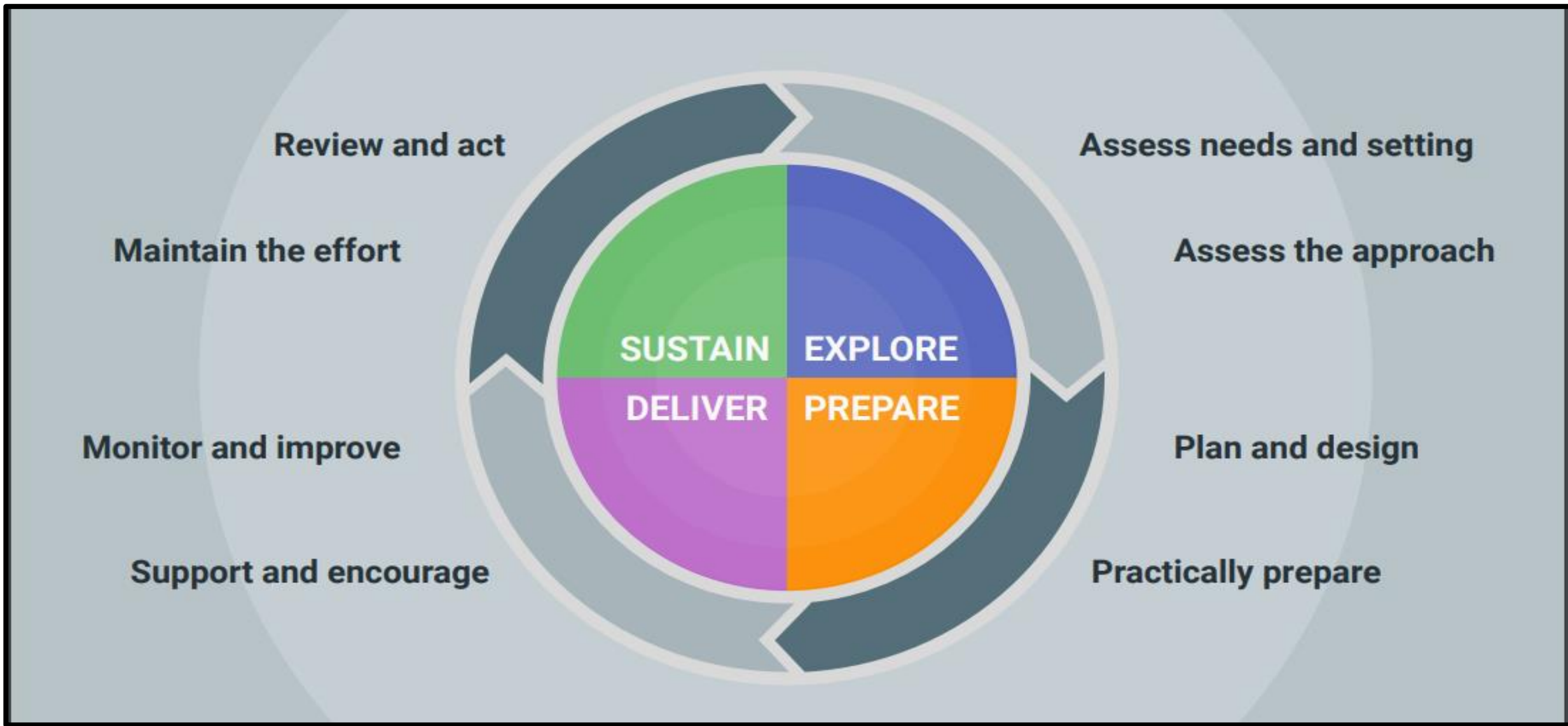
What is the difference?

What is IMPACT?

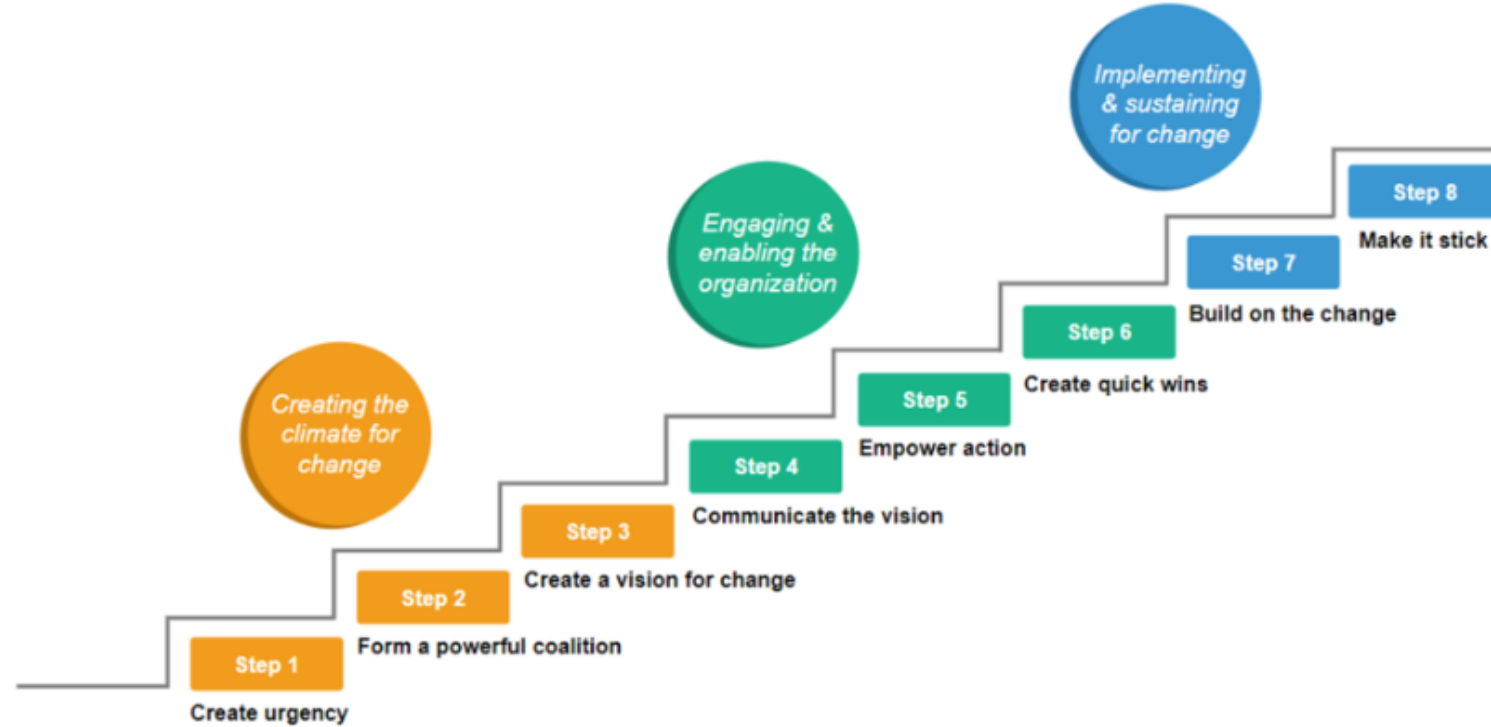


Impact is not the same as a testimonial!

- Impact is defined as an effect, a change or a benefit
- Educational impact includes, but is not limited to, **an effect, change or benefit** to: *ability, confidence, attitudes, awareness, behaviour, capacity, opportunity, performance, policy, practice, process or understanding*
- Impact can include the reduction or prevention of negative effects
- Qualitative or quantitative evidence is needed to measure and/or define impact
- The best impact data comes from tightly defined and planned activity



Kotter's 8 Step Change Model



Participants Research Presentations



Subject Leaders as Researchers (SLasR)

My Research Journey



Sarah Murrell

Deputy Headteacher

Mathematics Leader

Baldwins Hill Primary School

Baldwins Hill is a one form entry Primary School situated in East Grinstead, West Sussex. 180 pupils on roll.



Subject Leaders as Researchers (SLasR)

My Research Journey

My Identified Area for Development

We identified the area for development was the use of subject specific vocabulary as we found an obvious lack of clarity and use of specific vocabulary being used. There was a need to support teachers to weave and include specific vocabulary as much as about children using as needs to be part of the planning process.

Staff were not proactively and intentionally using specific vocabulary and as a result the children did not have the ability to use language in pairs in responses in the classroom.

What the literature said:

Steve Chinn stated in Fluency and the 12-times tables, Primary Mathematics Magazine 2014 *“The vocabulary around multiplication is quite diverse. There is not one consistent word for this operation. Inconsistency, which is prevalent in early maths, can confuse learners...The anxiety level, which can have a negative effect on the working memory and could result in a sense of helplessness is reduced.”*

This made me reflect that if we are not working to a common definition and reducing the learners cognitive load, as well as not explicitly modelling correct subject specific vocabulary, we are in fact increasing anxiety levels and creating barriers to correctly use vocabulary especially if it is not fully commonly understood or modelled.

Subject Leaders as Researchers (SLasR)

My Research Journey



Research shows that language is a pivotal component of mathematics success (Seethaler, Fuchs, Star, & Bryant, 2011), and a student's general knowledge of mathematical vocabulary can predict mathematical performance (van der Walt, 2009).

Effectively designing and delivering vocabulary instruction is a needed course of action. Although a common belief with many teachers is that simply exposing students to new vocabulary words through rich context-specific interactions is the best way to teach vocabulary, many students will require more systematic and explicit instructional techniques and purposeful instructional activities to facilitate their learning (Marzano, 2004).

Paul J. Riccomini, Gregory W. Smith, Elizabeth M. Hughes & Karen M. Fries (2015)



My 'Research Question' and 'Classroom Based Research Activity'

The research question started as... *How does teaching disadvantaged learners, and intentionally modelling, specific language for multiplicative reasoning, using the definitions and images in the vocabulary progression document, enable them to explain their thinking clearly and precisely, both verbally and in writing?*

On reflection it was very open for questioning so I looked at what I meant and what we were doing and it ended up as...

What is the impact of an enhanced, sustained and rigorous approach to specific mathematical vocabulary over a half term, in Years 4 and 5, enabling them to explain their thinking clearly and precisely, both verbally and in writing?

Methods of Data Collection:

- Initial baseline assessment followed by weekly updates and a final assessment. – data analysis of these findings
- Learner voice to gauge opinions on the trials.
- Teacher survey to understand their views and impact on their classes.

What happened?

Looking at lesson plans and ahead of time making sure vocabulary was pre chosen.

Looked at various word banks to create to ensure a commonly agreed definition, which we weaved into all lessons- very much planned vocabulary at the centre as opposed to as an add on. Including games, explicit teaching and opportunities to use vocabulary daily.

Initial surprise at the low ability to explain the meaning of vocabulary, even from the most rapid graspers.

Key Impact:

Improved attainment:

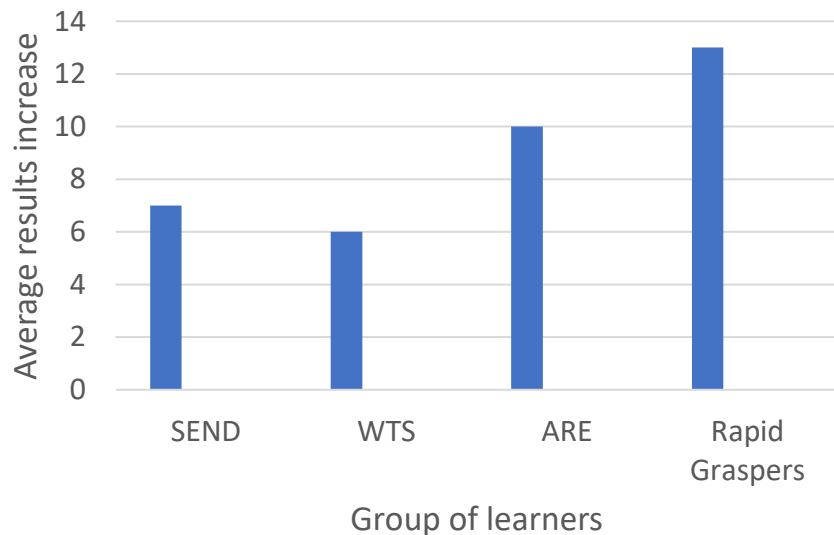
There is some evidence that attainment is improved using baseline testing pre teaching the vocabulary and final assessments to gauge progress.

I took a cross section to analyse- 4 SENd, 4 Lower attainers, 4 Age related learners, 4 Rapid graspers (28% of learners participating in research activities). Based on 20 words relating to Perimeter and Area.

100% of those learners improved on their outcomes

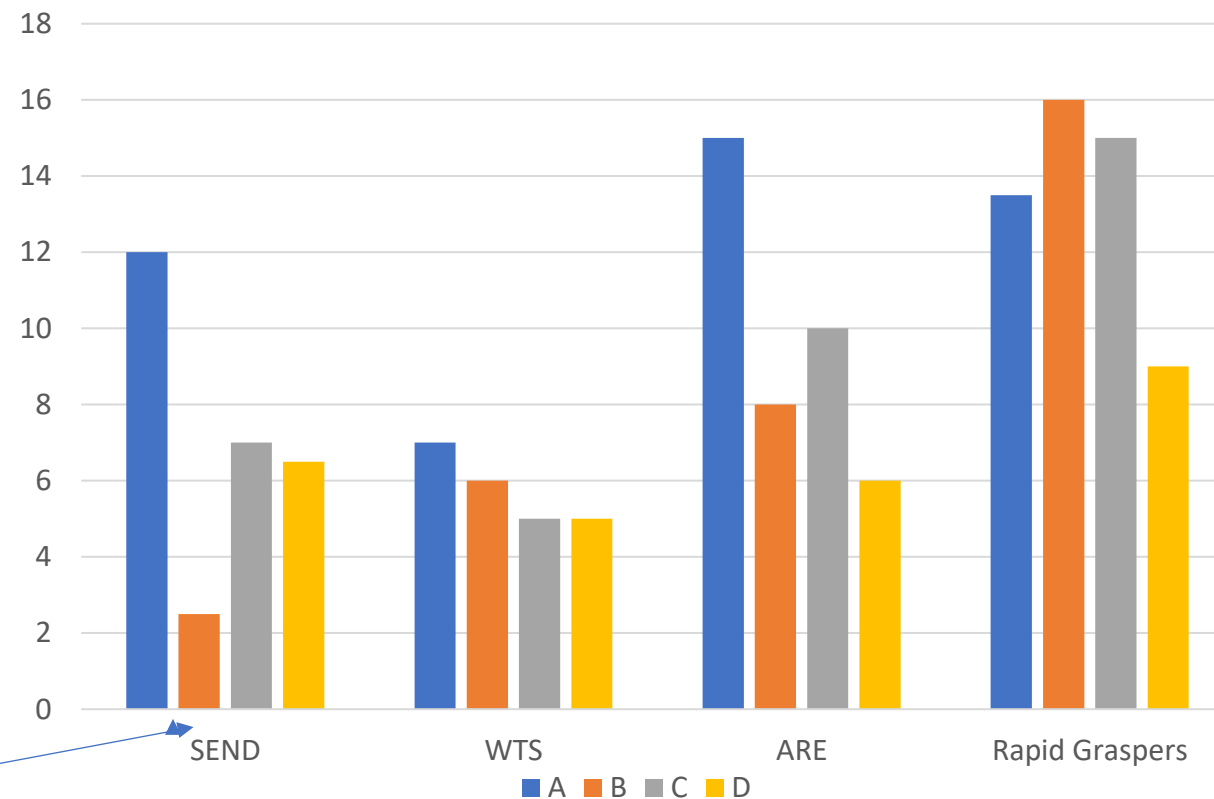
They improved by an average of 8 marks (lowest being 2 ½ and highest being 16)

Average results increase for different learners



This learner who shows evidence of suffering from Maths anxiety, went from attempting 3 to 9. The last 2 sessions they got a different 2 correct showing retention as an issue but a growth in self confidence.

Focus Learners progress from baseline assessment to review after 4 weeks



Continue the sequences.

4, 3, 2, 1, 0, -1, -2 ✓

20, 15, 10, 5, 0, -5, -10

10, 7, 4, 1, -2, -5

What do you notice is different about one of these sequences?

That the bottom one doesn't go through zero and it isn't a multiple of 3 because a multiple of 3 has a digit sum of 3 when it decreases ✓

NB: Red is self assessment/correction

Some evidence of year 4 and 5 learners beginning to use more specific written vocabulary, however their confidence to reason and this to be consistent is not evident and will need further development.

Use the number line to compare the numbers.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10

-5 $\leftarrow$ 2 ✓ 3 $\rightarrow$ -8 ✓ -1 $\leftarrow$ 1 ✓

What do you notice?

positive numbers are always greater than negative numbers ✓

© White Rose Maths 2022

whole number

a) $\boxed{1.8} \boxed{2}$ b) $\boxed{9.1} \boxed{9}$

1.8 rounded to the nearest integer is 2 ✓

c) $\boxed{0.9} \boxed{1}$

0.9 rounded to the nearest integer is 1 ✓

d) $\boxed{3.7} \boxed{4}$

3.7 rounded to the nearest integer is 4 ✓

Subject Leaders as Researchers (SLasR)

My Research Journey

Learners' views

Key Impact:

Improved Self-Reflection:

From Learner interviews there is some evidence to say that students are reflecting on the importance of vocabulary in their own learning and as a tool to improve their ability to reason. They could identify their own improvements and were rightly proud of these.

I can explain the things
I can see better
(patterns) in Mastering
Number now.

It helped me to make my answers more
mathematical, I get more reasoning answers
right now because I use the right vocabulary.

Talking in lessons about the
words more, gives me more
understanding and I can use
them in reasoning
sentences.

You now know what words
mean when you come to it
and the lesson starts quicker
because you practice every
day not learn new words.

It was exciting to see
how much I improved. I
could do all of them by
the end but only about 4
at the start. It was
actually fun!

Improved Self-Confidence and enjoyment:

Learner feedback showed clearly that they were happier to answer questions and explain their thinking using subject specific vocabulary. When learners were not confident of their answers, observations showed teachers were more confident to challenge learners for the correct use of vocabulary..

Learning the vocab and how to
use it when learning/in a test
means I can understand the
questions better and am
confident to use it better.

I like the matching game as it
helps me investigate and
remember the meanings.

KEY IMPACT

My learners have improved in their ability to record findings in writing using the mathematical vocabulary that we have focused on. **100% agree**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
0	0	0	100%	0

My learners have improved in their ability to verbally use the mathematical vocabulary that we have focused on.

100% strongly agree

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
0	0	0	0	100%

When asked “ What is the biggest success from this focus?” One teachers said:

Children answering question and including the correct vocabulary, even if they forgot at first. Hopefully this will feed into end of unit assessments as the last one we did got much better results.

Gaps & Limitations

- Teacher time
 - Potential of lack of subject knowledge creating a barrier
 - Learners lack of understanding & knowledge about the meaning of key vocabulary.
 - Need to ensure clear progression.
 - Not all learners pick it up as easily- what then?
- Pre-teaching/interventions/additional exposure.

Subject Leaders as Researchers (SLasR)

My Research Journey



What I have learnt as a researcher

Embedded impact takes time and whilst these findings come immediately after implementation, early indications show that if this works with yr 4 & 5 with such a rapid impact, I believe this will work for all- not only in Maths but across the curriculum.

100% of participating teachers and I, as well as 87.5% of learners asked, do feel the model is effective as a core model of development for mathematical vocabulary. However, it is essential that it is in a manageable way and that teachers have the secure subject knowledge to ensure the correct vocabulary is being chosen and taught. In turn this raises confidence and lowers anxiety.

I concur with the research by **Paul J. Riccomini, Gregory W. Smith, Elizabeth M. Hughes & Karen M. Fries** that states children need to understand the meaning of words and how to use them, not just have exposure to them. This has been evident in my findings.

Where next?

We have already shared this with the wider teaching at this point to trial and experience as they find beneficial and manageable with a view to ensure a consistent approach from September. Teachers have voiced success in Maths and Grammar so far with elements being shown in wider curriculum areas such as R.E and computing. Working walls will show more precise vocabulary that has been intentionally chosen and explicitly taught.

In addition, I have shared this with our wider trust of 5 other schools who are also looking at whether all or some of this approach is appropriate for them to adopt following the successes. It does however need to be fine tuned to be a manageable process for all.



How can Subject Leaders best be supported to act as agents for change; identifying their own needs and designing an *'inquiry based action research cycle'* which positively impacts and sustains Mastery Mathematics within their setting?

Jenny Field

Sussex Maths Hub

23C Subject Leaders as Researchers (SLasR)

What we've noticed

- It was really beneficial to be able to identify and target our own priority area of need, within our setting
- It was insightful to engage with some relevant literature in our bespoke area of research
- It was crucial to go from *'Broad to Narrow'*, to learn how to tightly focus our pedagogical research question
- 1:1 support for designing our active classroom based research activity was very important
- This overall approach is highly applicable to Subject Leadership – allowing us to focus, act, monitor, analyse and evidence impact
- Once we evidenced positive change, we felt in a strong position to share, replicate and upscale within our setting, and create a model for growth and sustainability.
- Collaborating and disseminating our personal research journey to the group was valuable
- A step by step approach made it practical, accessible and achievable and this built our confidence as researchers – research isn't just about academics!

Why is this significant?

'It enabled us to address a pressing need in our own setting and improve our knowledge in this area'

'It has improved my Subject Leadership'

'It will benefit my school and other educators'

'I have really progressed in my understanding of the process of pedagogical action research'

'We learnt about the best ways to gathering evidence and analysing impact data, which I can now apply'

'We focussed on the importance of 'where next?' And on growing and sustaining impact'

'We had opportunities to disseminate to others, and now feel confident to work with staff in our schools'

'Innovative; it will help me sustain mastery maths'

'I had a real sense of satisfaction and achievement – I could see the impact!'

'It helps me to learn more quicker and be smarter in maths'.

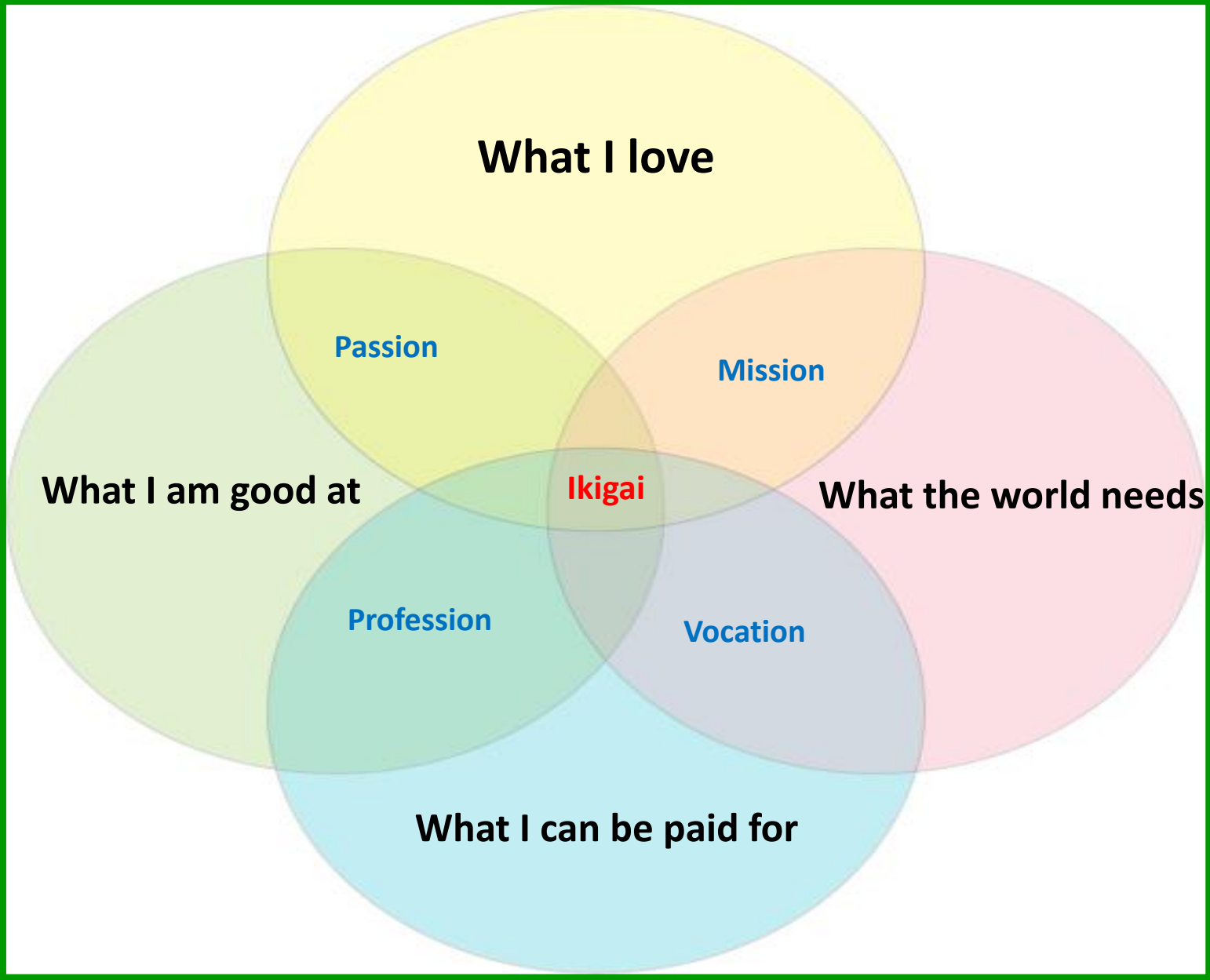


Next steps

We are disseminating our individual research findings at the Sussex LLME Conference in June

We are planning to extend and expand this model within our settings

Some of us are writing up our journey and findings, for publication in 2025, alongside *'Subject Leaders as Researchers: Best Practice Guidelines'*



Japanese word “**ikigai**” means a “**life purpose**” in relation to your talents, passions, and profession, as well as what you can give to the wider world.

*Nurturing
integrity, values, compassion,
authenticity and pedagogical rectitude
in how you lead yourself and others*



What are your
priorities as a
Subject Leader?

Are you doing this currently?



Without enough specific
evidence of impact





Celebrating your
development as a
Pedagogical Action
Researcher



Certificate of Attendance and Completion

Awarded to:

Date: July 2024

In recognition of your active engagement in the Year-Long Action Research Project:

Subject Leaders as Researchers (SLasR)

Jenny Field

Jenny Field

Professor of Mathematics Education

University of Greenwich in Partnership with NCETM and Sussex Maths Hub



UNIVERSITY of
GREENWICH