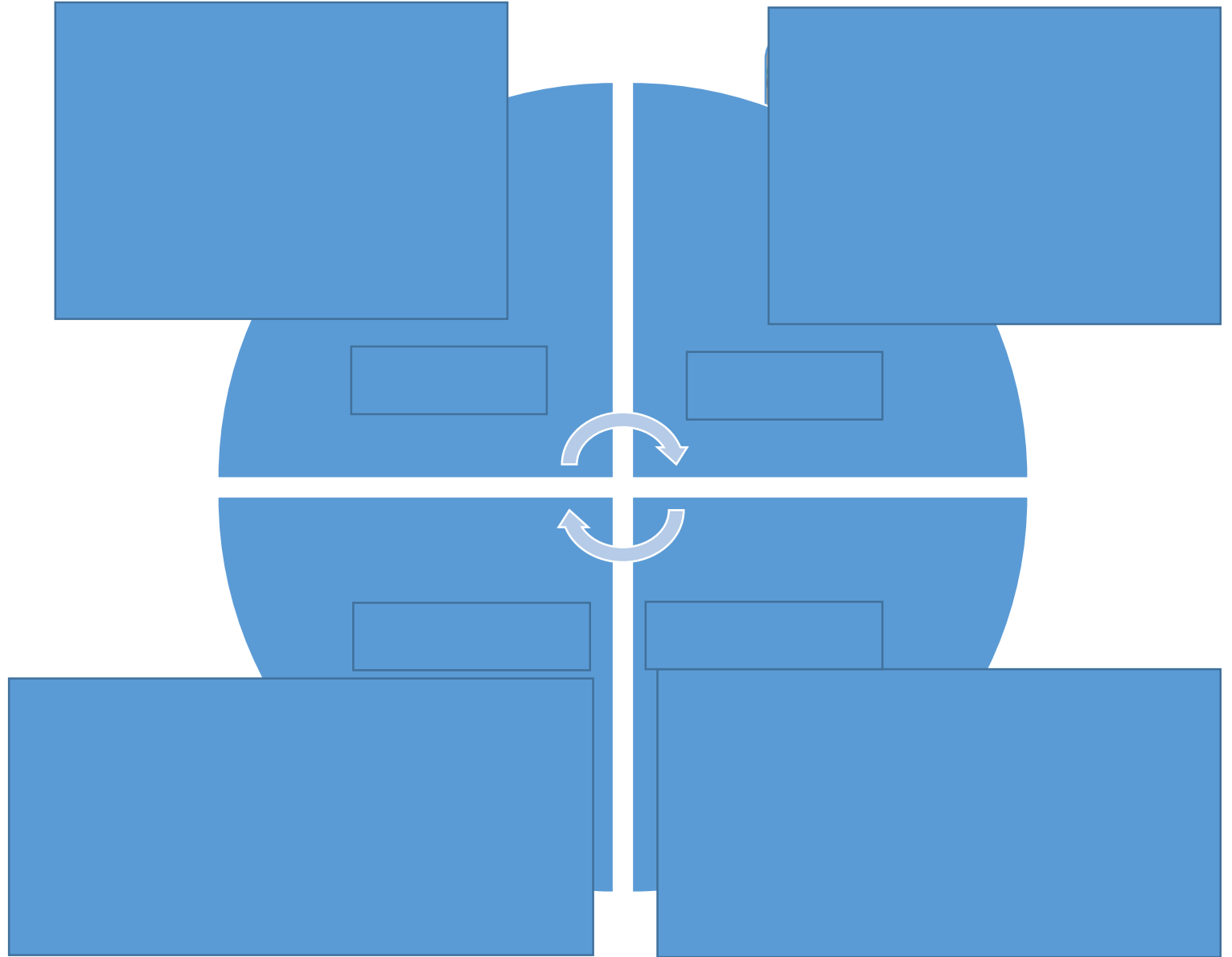


Stories of adults (not)taming mathematics

Using the d3B model to embrace
identity work

Tracy Part (PhD) SFHEA

D3B model



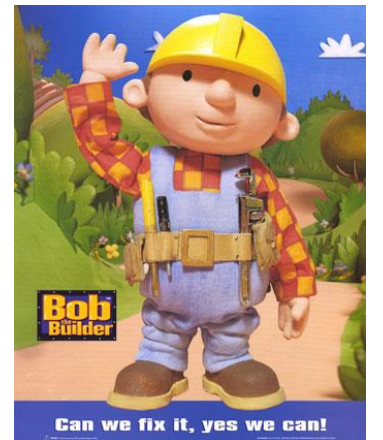
Framing mathematics education

Can we fix it? Yes we can!

We are a nation quite happy to admit to being 'bad at maths'... almost wearing it as a badge of honour, in a way that they would never admit to not be able to read and write.

NIACE (2011: 3)

Being bad at maths shouldn't be a badge of honour'
Do we have a generation that is weak in mathematics,
or is society's attitude to the subject to blame, asks
Roshan Doug (TES, 2019)



What do we mean by mathematical 'success'

Mathematics 1 ... exploring mathematics, making **connections, seeing structure and pattern** and the teacher's task is ... **facilitating** learning ... emphasizes **process ... and applying mathematics** ... Assessment is ... **articulating** their perspective;



Mathematics 2 ... mathematical achievement ... in terms of **performances** of **prescribed mathematical procedures**. ... **diagnostic testing**, ... around **test indicators** ... describable as a list of mathematical content **topics**, ... a **transmission** approach ... **precise** content



Stories of fish finding their kind of water

Framing the research

small scale qualitative research

Sample

- 11 adult learners;
- 26 hours of interview data;
- 5 hours classroom observations

Methods

- Life history account, semi-structured interviews and classroom observations

Provision

- FE, Foundation, WBL, Adult, discrete and embedded

Multiple forms of mathematical knowledge

- GCSE, functional skills, numeracy, portfolio-based



Steve's Identity work

I mean ... it was just where do you get it from? What is n ? And they would go no, there is $2n$ there. I would go two n what? And I just couldn't click, and ... I just had to take it literally and say yes, there are $2n$ there. Get over it. Get on with it ...

I just forced myself, I mean forced myself ... it was ... after work, and I was like a zombie. So we would all eat lots of chocolate, get really hyper and then crash about 8 o'clock ... I skipped a couple of classes, didn't do any homework, the bare minimum to get through. ... And then once I realised that they like it that way, I was not losing marks ... At the last minute I said 'Oh give me the foundation paper' ... (it was) ridiculously easy and I was thinking what was I doing? Seriously, and erm, I got a C ... total top marks for the lower foundation paper.

Steve's Identity work



For me [doing mathematics] it's kind of like jumping off a building and thinking am I going to land ... if something's gone wrong then it's back, back and there's the mistake ... it's like satisfying



I mean if I could plug in a USB and have all of the formulas ... I would just be away ... I would love maths

Kath's identity work

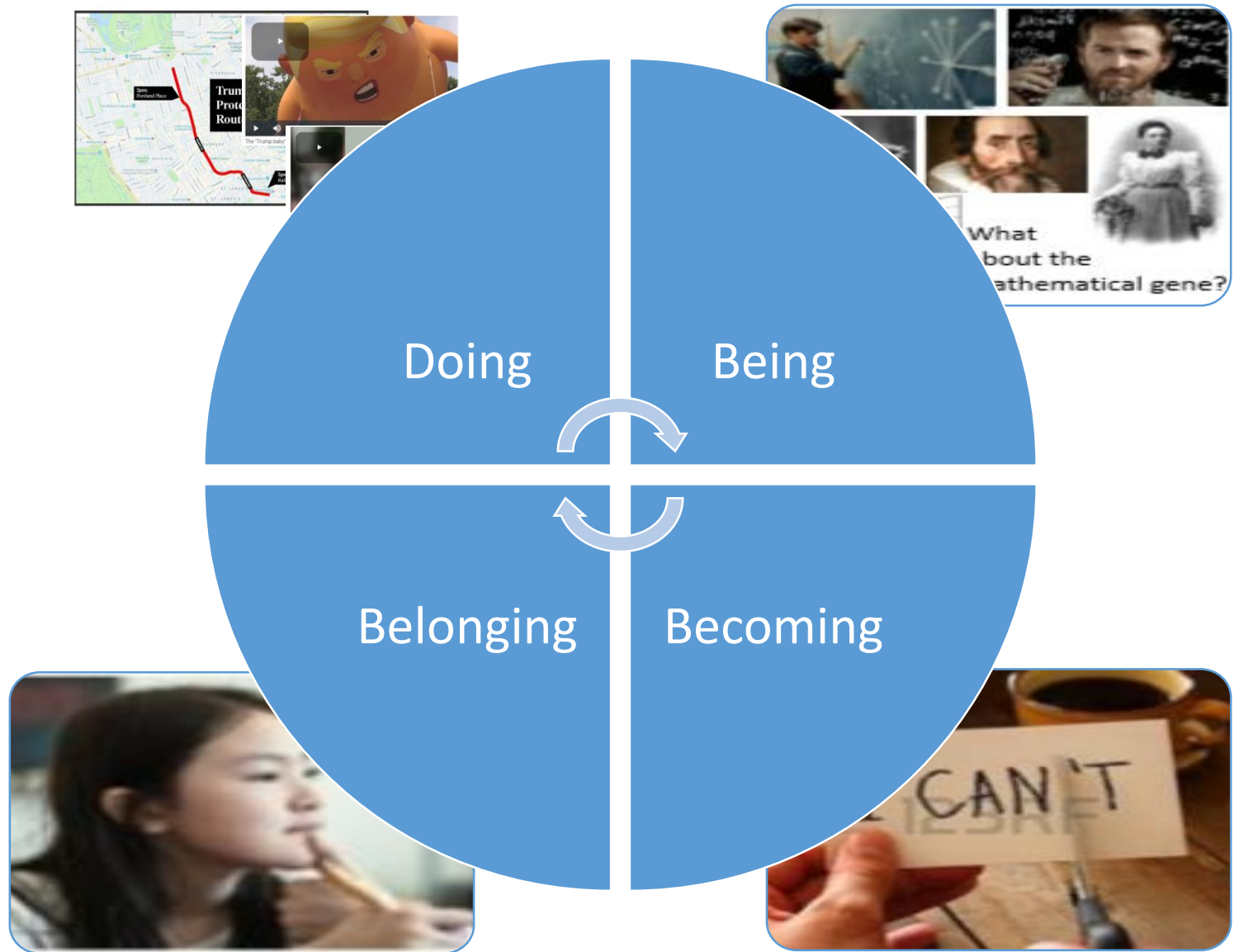


But still there are some things like circle theorems that I will never understand why someone might have sat down and worked that out ... But you know, I think that's the same for other things. I mean coke cleans off the grease from the oven, but why would someone ever put coke over their oven in the first place? I mean it's just one of those funny things.

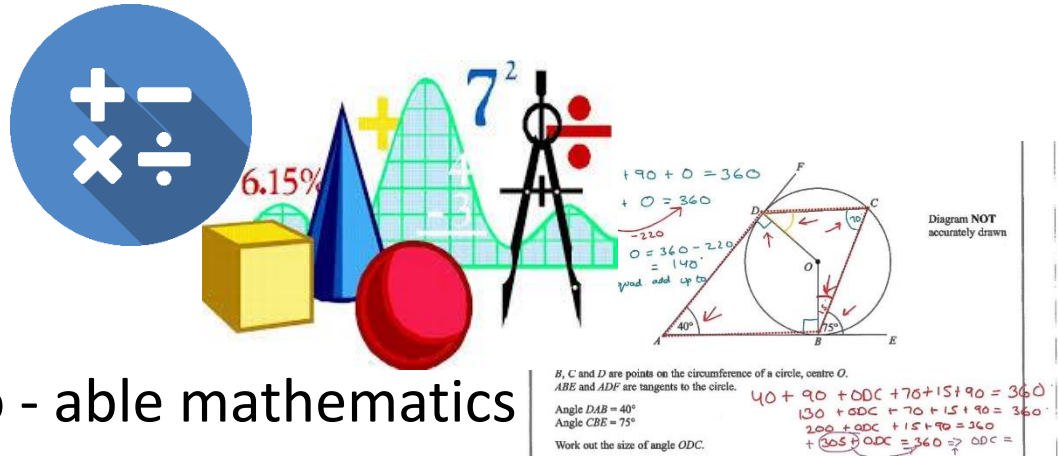


I messed about at school ... taken out of the maths lesson and made to do like work by myself ... you haven't got the teacher to explain it and I was in that frame of mind, oh well ill just do it myself and I didn't do any course work

D3B model



Do-ing mathematics



When I am in the shops I think like maths, but
when I am in maths I don't think about in the
shops
Susan

Un - do- able mathematics

The maths I imagine to be maths is x and beta
and p and all this stuff ... it was just like for me
signs you know. It was like some kind of magic
Jalal

Long formulas like trigonometry or like what
the algebra stuff is

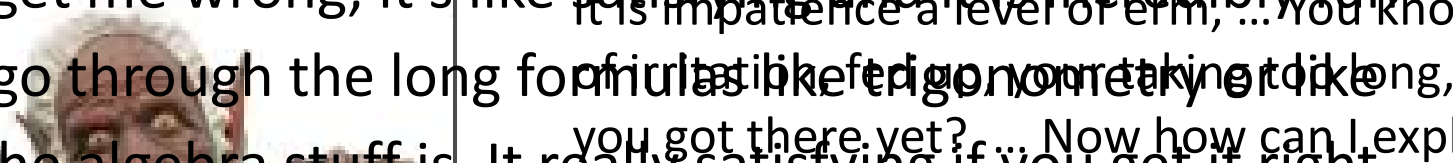
Steve



'being' a mathematician

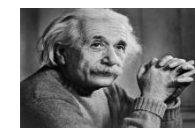
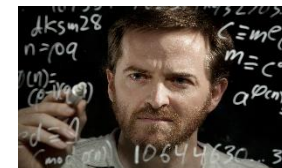
... but still there are some things like circle theorems that I will never understand and why someone might have sat down and worked it out is closed to me. You know, not going to get the same for other things. I see this is just fascinating ... plus I saw the movie where the mathematician, a professor from Princeton University, and he had some mental problems and he invented the new way of financing things. I messed about - it was in that frame of mind, so stupidly. I didn't do it (course work)

Kath



Don't get me wrong, it's like satisfying and it is incredibly fun if you go through the long formulae like trigonometry or like what the algebra stuff is. It really satisfying if you get it right to her. I mean that's OK, that's fine ... but sometimes there's a second bit ... how can I explain that to someone like you Philly

reading problems?
 maths not adding up?
 writing difficulties?



Ok my dad, he's erm ... almost tyrant, dictator ... his father was taken, you know the Stalin depression ... (he was) put in jail in Siberia ... and his mum ... she died from hard work ... he was starving and living on the streets and ... and my mum she is the very nice lady. ... she put me in a music school and she wanted me to learn art and all this stuff ... but my father he told me how to play chess.

Kari

I went to his [his father's] office and oh dear. He was working you know, and all this maths and all this stuff, and all these things that he keeps in his head. ... with water ... the electricity, and it was a big amount of money ... and this man, there was no switching.

Jalal

I mean as he was a work-study engineer that's all we saw puffing away on cigarette ... puffing away and up until all hours sometimes with his graph paper and it all seemed very boring and too much out of my scope and I couldn't even begin to know what it was all about.

Philly

Being is something about:

Male

Valorised knowledge

Autonomous

self-sufficient

unyielding

orientated towards public society

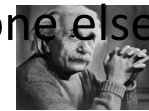
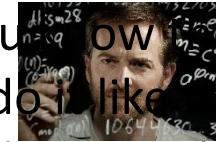
the participants polarised their own sense of self, in different ways, as 'non-mathematicians'

Becoming mathematical

The worst-case scenario is (laughs) answering a question ... and saying the most ridiculous answer. Or just getting it wrong. It's alright if you are a bit wrong ... everyone gets where you went most of us sit there with a load of crap in our heads, then you can think well, I had the right idea, how on earth does other stuff we really need to get on, but if you've got ... where did I get that from? I stay in our head with all this other stuff going on? ... I am totally lost (shrugs and looks down). As much as Steve is able to at that particular time, on that particular issue ... but I close down. Close down, yeah.

Tracy: Can you tell me why you stopped with your work and decided to help him [the learner next to her struggling with the ac reading problems?
Sum maths not adding up?
writing difficulties?
like that. Obviously if someone needs help, you just help them.
Mary

Most of the time it's remembering it ... drilling it into my head ... Yeah you know those things you do naturally? I want to do like that ... to be able to do things fluently without, without thinking twice as hard as everyone else ...
Mary



Belonging

Well, doing mathematics is like going on a journey. By the end of it, you get there. But it depends on where you want to follow. You are coming from Lewisham and you want to get to Kennington. Well, you might decide to go through Camberwell, but maybe you decide to come through Elephant. It's the same in the end, it's just how you get there.

I am sat with a bunch of teachers ... you have to have patience and we are a good group. We work well together ... else I wouldn't bloody sit in that group. I would move to another group.

Susan: ... when you don't get something and you have to do it by yourself, it's worse ... but when you really, really, really don't get something and you do it in maths and you do it together ... it kind of takes the burden off. Everyone's kinda thinking at the same time

When I first came I thought 'God, you know, I know nothing ... but actually, I surprised myself ... you know it's interesting and it's good to know and it's amazing when it all comes together and I think the whole maths thing is really exciting and Paula [peer] seems to be on the same sort of wave length ... she can do some stuff that I you know, I just can't get, 'I still don't get it tell me again' and the same thing for her with me ... just sort of helping each other out.

I'm trying to keep up to help these ladies because they are behind ... so I always keep in mind that they might need my help So I am keeping an eye on them and doing my own work ... I can sacrifice just a little bit of my time right and then I can catch up at home

I am not teacher ... but I am smart. I think and I can work it out. Yesterday, I was with this man. He was not happy, but he understood everything ... he doesn't want to stop ... I think that he should get a naughty, to understand ... you shouldn't do it this, because ... he humiliate him ... (about 20 minutes later talking about the curriculum) ... I find it a very bad way to learn. You are going to end with disabilities in your mind ... It doesn't help me, he (the curriculum) destroy me little bit.

Using d3B model for 'doing' mathematics at a curriculum level

- Planning for learning knowing that for students it is rarely a case of a linear transition from fear to affection.
- Questioning the assumption that 'Do-able' mathematics is only really common sense, 'real' mathematics only 'natural' mathematicians can solve.
- 'Doing' collaborative work has gendered, classed and raced trajectories. Student's will often undergo compulsory identity work so as not to be interpreted as impolite, or to be revelling in their new found 'success'

d3B model for critical reflection about 'being' mathematical

- Understand manifestations of power and/or the psychic risks of engaging in mathematics and 'blog' about the resulting turmoil
- Encourage reflection about site of self and 'being' mathematical. Limit strength of fears that be able to solve problems could, at any point, simply stop clicking
- Challenge inferences of an innate mathematical gene

Implications for belonging

- Understanding that identity work is complex - jostle with peers
- Secret, seductive and dangerous power attached to 'being' judged as mathematical

And for lecturers

- Careful of chunking and assuming that 'unruly' mathematical can be tamed
- Careful to assume that with 'good' practice and diligence, learning can inspire and motivate each and every individual
 - Guard against falling into narratives of normal and assumed typical behaviours

Thank you for listening