

MICRO:BIT PRIMARY SCHOOL EVALUATION

DEVELOPMENT (PHASE 1): SUMMARY REPORT
JANUARY 2022

BACKGROUND & THE RESEARCH NEED

The BBC micro:bit is aimed at children aged 8-14 (roughly Years 4-9), yet the vast majority of devices are used in secondary schools (Years 7+). This is partly due to the original focus of the BBC project on Year 7 students, but there could also be other contributory factors such as primary teachers not being subject specialists and who may not have the time or confidence to dedicate to unfamiliar technologies.

This first stage of this research programme is to establish a benchmark and set the scene amongst primary school teachers - to understand their needs and behaviours of teaching both digital skills and computing in the classroom and beyond (particularly understanding their views and behaviours on utilising micro:bit in lessons)

The Micro:bit Foundation knows that where primary teachers have taught with the micro:bit, the results have been impressive. As such the foundation is undertaking a 3-year programme to support use in primary schools.

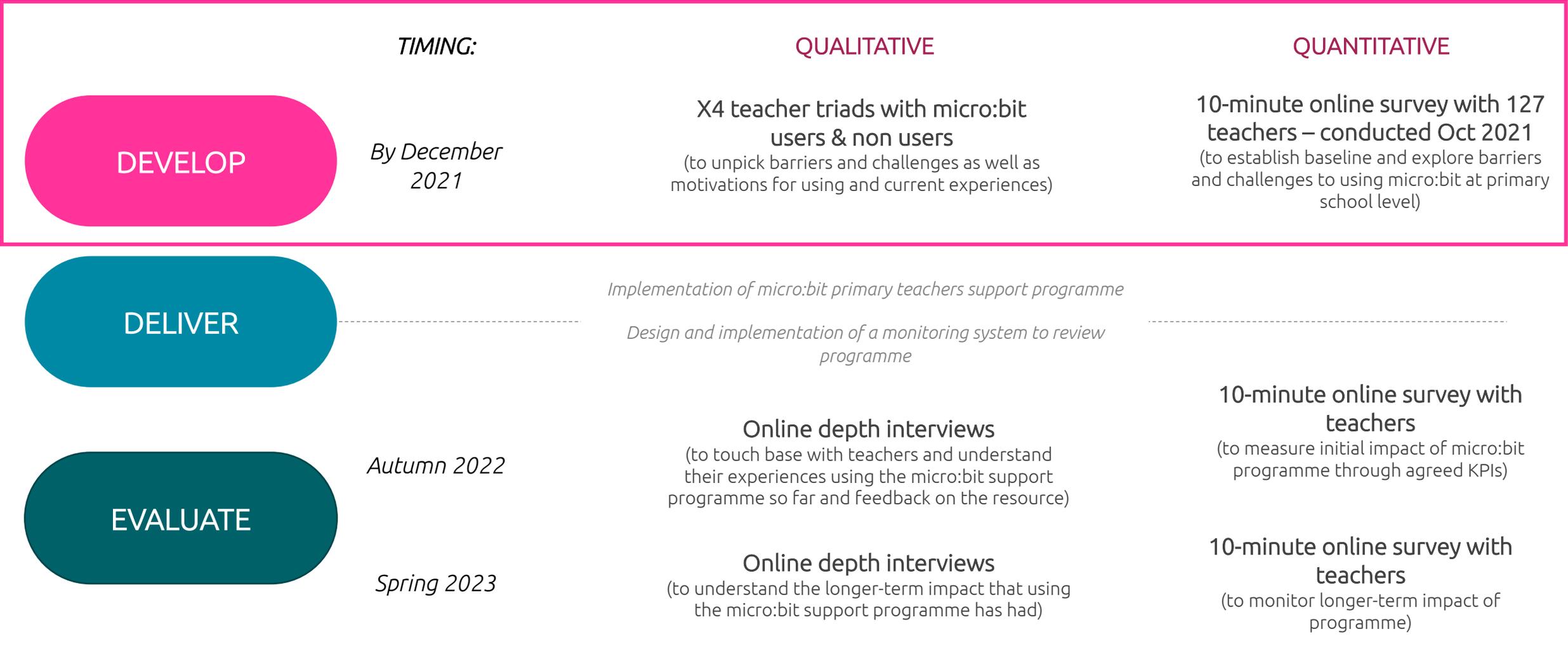
RESEARCH IS NEEDED TO SUPPORT:

Firstly, to establish an understanding of the challenges and benefits of use. This will feed the subsequent programme of activity to properly support primary school teachers to integrate the BBC micro:bit into their planning and delivery of lessons.

Secondly, to monitor and understand the success of this programme over three years - to alter as required for better impact.

METHODOLOGY & APPROACH OVERVIEW

A longitudinal approach to establish a baseline understanding of teachers' views and monitor the impact of the foundation's programme:



Continued internal evaluation by Foundation during 2023

DESPITE FEW TEACHERS HAVING A BACKGROUND/QUALIFICATION IN COMPUTING, MOST HAVE EXPERIENCE AND RESPONSIBILITY FOR TEACHING THE SUBJECT

Very few teachers we spoke to had a training background or qualification in computing

14%

- England 21% / Wales 5% / Scotland 23% / Northern Ireland 16%

However a high proportion of teachers are responsible for computing in their school

73%

- England 93% / Wales 84% / Scotland 65% / Northern Ireland 58%

Almost all teachers have had experience of teaching computing (98%) and digital skills (100%) and confidence levels are fairly high (81% & 91% respectively)

YET A LARGE PROPORTION OF TEACHERS WHO ARE RESPONSIBLE FOR TEACHING COMPUTING DO NOT HAVE A BACKGROUND IN THE SUBJECT

61% of our sample are responsible for computing but have no background in the subject

More likely to be....

Females - 66% (vs 50%* females who are responsible and have computing background)

Under 35s - 23% (vs 13%* Under 35 who are responsible and have computing background)

Not confident in computing - 14% (vs 0% who are responsible and have computing background)

Teaching in a local authority school 79% (vs 63% who are responsible and have a computing background)

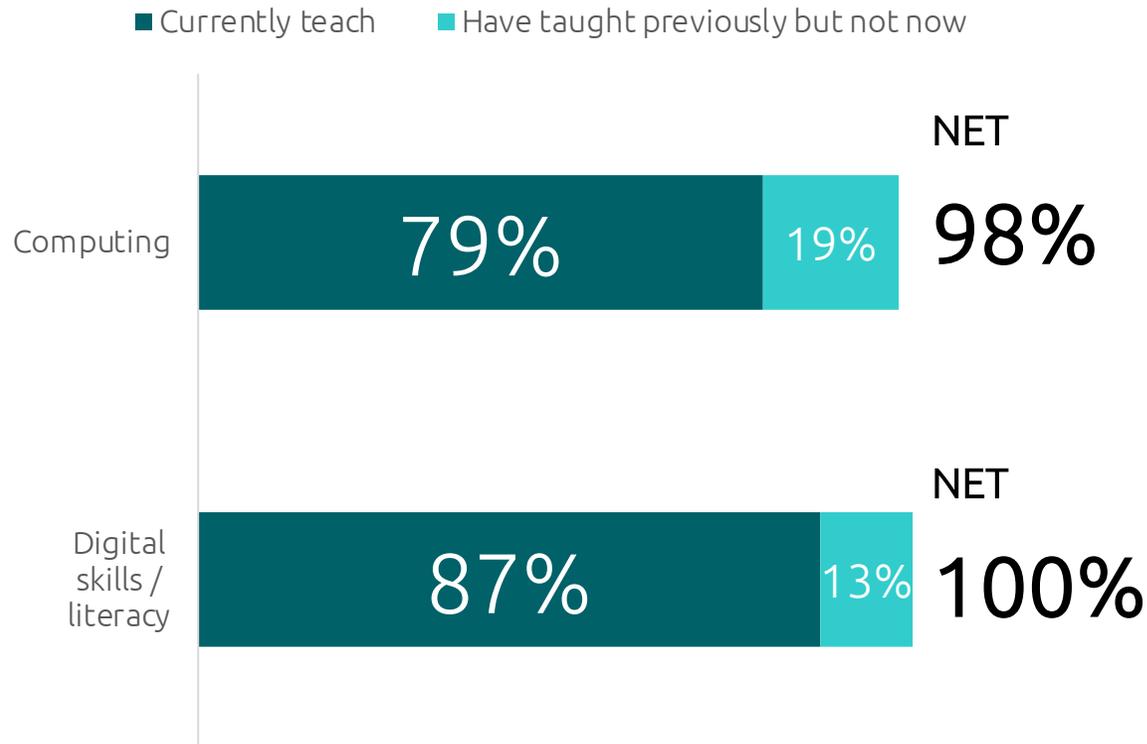
QS7: Do you have a training background or qualifications (i.e. above Key Stage 4 in England, Wales and Northern Ireland and Scottish Nationals in Scotland), in any of the following subjects?

QS7a: Are you responsible for any of the following subjects at your school? Base: Responsible for computing with no background in computing n=77, Responsible for computing with a background in computing n=16*

***CAUTION: SMALL BASE SIZE, TREAT WITH CAUTION**

THE MAJORITY OF TEACHERS SURVEYED ARE CURRENTLY TEACHING COMPUTING OR DIGITAL SKILLS, WITH A GOOD NUMBER OF YEARS' EXPERIENCE UNDER THEIR BELT

A high percentage of teachers we spoke to are currently teaching computing or digital skills/literacy:



On average, teachers tend to have more experience teaching digital skills/literacy than computing:

Average no. years teaching computing:

6 years

England 7 years / Wales 5 years / Scotland 6 years / Northern Ireland 8 years

Average no. years teaching digital skills/literacies:

9 years

England 8 years / Wales 8 years / Scotland 9 years / Northern Ireland 11 years



Qualitatively, the teachers we spoke to have a mixed level of experience - in computing specifically, but all are teaching digital skills/computing

CONFIDENCE LEVELS ARE HIGHER FOR TEACHING DIGITAL SKILLS/LITERACY, REFLECTING THE GREATER LEVEL OF EXPERIENCE SPENT TEACHING THIS, COMPARED WITH COMPUTING

91% of teachers are CONFIDENT with their digital skills / literacy subject knowledge

43% Very confident vs. 49% Confident

- ↑ Have training background / qualification in computing 100% (vs No computing background 90%)
- ↑ Have computing specific responsibility at school 96% (vs No responsibility 79%)

83% agree with the statement: "I feel very confident about teaching digital skills / literacy"

- ↑ Have training background / qualification in computing 89% (vs No computing background 82%)
- ↑ Have computing specific responsibility at school 86% (vs No responsibility 74%)

81% of teachers are CONFIDENT with their computing subject knowledge

21% Very confident vs. 60% Confident

- ↑ Males 90% (vs Females 76%)
- ↑ Under 35 90% (vs 35-44yrs 89% / 45-54yrs 69% / 55yrs+ 67%)
- ↑ Member of a SLT 95% (vs Not a member 75%)
- ↑ Have training background / qualification in computing 94% (vs no background 79%)
- ↑ Have computing specific responsibility at school 88% (vs No responsibility 62%)

76% agree with the statement: "I feel very confident about teaching computing"

- ↑ Males 88% (vs Females 69%)
- ↑ Have training background / qualification in computing 83% (vs No computing background 74%)
- ↑ Have computing specific responsibility at school 80% (vs No responsibility 65%)

QUALITATIVELY, CURRICULUM STRUCTURES IMPACT THE WAY DIGITAL SKILLS/ COMPUTING IS TAUGHT ACROSS NATIONS



There are 3 emerging areas in relation to teaching digital skills/computing, that school curriculums can impact:

1. THE TIME TEACHERS HAVE FOR THIS AREA



- **England** reported to have a more rigid curriculum – 50min / 1hr lesson timetabled
- Less time dedicated to the area than teachers from the other nations reported
- Not always enough time for exploration and creative thinking within lessons
- Restricts flexibility

2. THE EFFICACY OF TEACHING ON STUDENTS



- **N.Ireland, Wales and Scotland** reported much more integration of computing/digital skills into subject teaching (cross curricular)
- Allowing for more application of digital skills / computing to 'real world' and a more joined up teaching of how digital skills / computing apply within subjects' aids understanding
- They feel students engage more as a result
- But it is not perfect! They still have their challenges, particularly the lack of specialists or teachers with a passion for the subject areas

3. LEVEL OF STUDENT ENGAGEMENT IN THE AREA



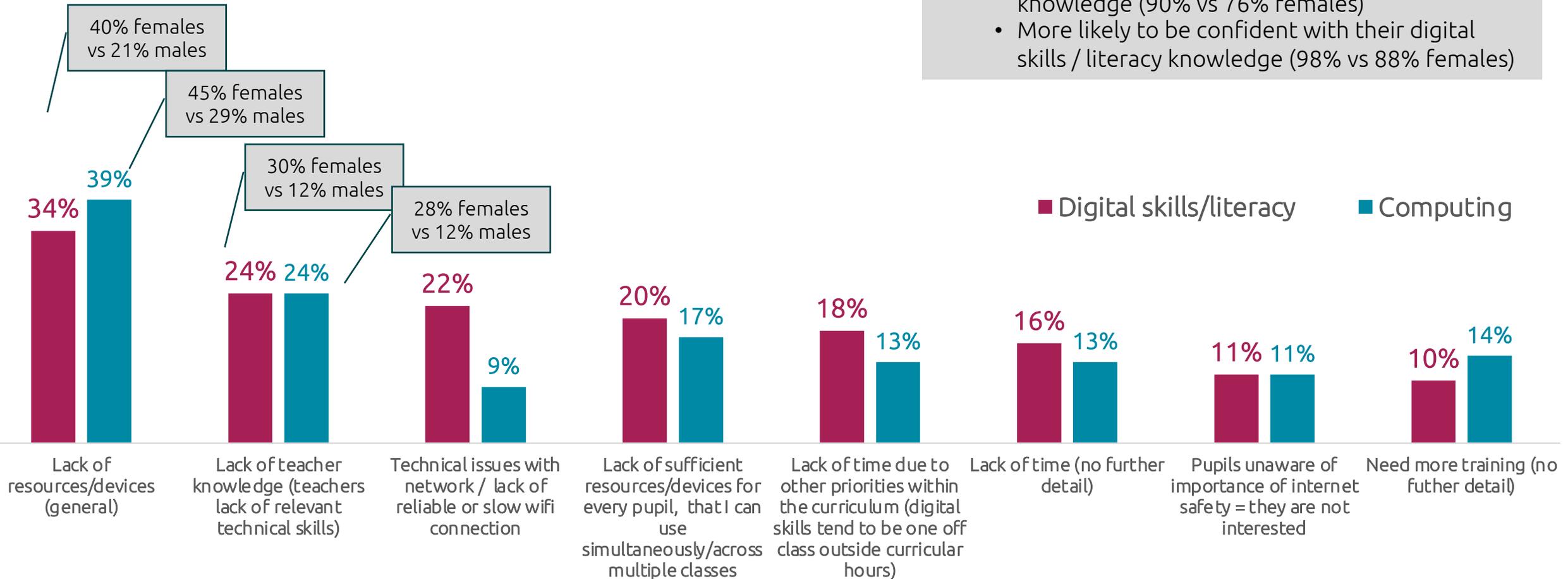
Users and non-users of micro:bit are using a range of other tools for computing/coding at key stage 2

... with the tools / resources being used often adapted to different year groups (i.e. Years 3-6)

However, coding/programming specifically is just one area teachers need to find time for in lessons

THE MAIN BARRIERS TO TEACHING DIGITAL SKILLS AND COMPUTING CENTRE AROUND A GENERAL LACK OF RESOURCES. THIS – AND LACK OF RELEVANT TEACHER KNOWLEDGE - ARE PARTICULARLY PERTINENT AMONG FEMALE TEACHERS

Barriers to digital skills/literacy vs. computing (Top 8 barriers)



- Male teachers are also :
 - More likely to be confident with their computing knowledge (90% vs 76% females)
 - More likely to be confident with their digital skills / literacy knowledge (98% vs 88% females)

DESPITE VERY HIGH LEVELS OF AWARENESS RECORDED FROM OUR SAMPLE OF TEACHERS, 1 IN 3 DON'T HAVE ACCESS TO THE MICRO:BIT DEVICE, AND OVER 2 IN 5 HAVE NEVER USED IT

NB: Due to the nature of teacher recruitment, these figures may be higher than in reality

88% have heard of
micro:bit device (spontaneous)

90% have heard of
micro:bit (spontaneous &
prompted)

65% have access
to any micro:bit device

57% have ever
used the micro:bit device
as part of teaching
computing to students

A HIGH PROPORTION HAVE HEARD OF MICRO:BIT - BUT TEACHERS LACKING IN CONFIDENCE OR WITHOUT A RESPONSIBILITY FOR TEACHING COMPUTING – HAVE LESS AWARENESS

90% have heard of micro:bit (spontaneous & prompted)

More likely to be....



Confident in teaching computing, 92% (vs teachers lacking computing confidence 79%)



Teachers with computing specific responsibility at school, 94% (vs no responsibility 79%)



Male teachers, 93% (vs. female teachers 88%)

65% have access to any micro:bit device

However, micro:bit access varies by UK nation, with highest access in Scotland (73%) and lowest in Northern Ireland (42%*)

Q10. Does your school currently have access to any micro:bit devices?
Base: All teachers n=127; England n=29; Wales n=19*; Scotland n=60; Northern Ireland n=19*

***NB: SMALL BASE SIZE, TREAT WITH CAUTION**

QUALITATIVELY, THERE ARE TWO KEY INITIAL BARRIERS, WITH DIFFERENCES BY NATION. AWARENESS COMES FROM A RANGE OF DIFFERENT MEANS



AWARENESS

- Non-users of micro:bit in England and Wales (to a lesser extent) are *at least* aware the product exists, even if it is just a name they have heard and know little about it
- Non-users in NI and Scotland more likely to have never heard of micro:bit
- Users in NI and Scotland comment that awareness of micro:bit in their teacher circles is low too



ACCESS

- Accessing the physical micro:bit a barrier to using more often – one teacher in NI is teaching micro:bit but only using the web resource
- Some users only have a handful of micro:bit devices in the school
- Cost and justification to spend school budget on the micro:bit device is a barrier to users and non-users
 - For users – it limits teaching as students have to share / have to manage a booking system
 - Non-users – needing to justify expense is difficult without trying first (although micro:bit not considered over priced)

Among users, awareness comes from events, training courses and the initial micro:bit roll-out to schools



WHILST THE MAJORITY OF MICRO:BIT DEVICES WERE RECEIVED MORE THAN A YEAR AGO, THE GOOD NEWS IS THAT MOST OF THEM (19 OF 21 ON AVERAGE) ARE STILL IN USE

Of all those teachers who have access to micro:bit, the mean number of devices received per school = **21**

(England 34* / Wales 13* / Scotland 19 / Northern Ireland 10*)

Of these on average...

2 were received within the last 2 months

3 were received within the last 3-12 months

14 were received within the last 1-5 years

19 = mean number of micro: bit devices still in use at schools

(England 33* / Wales 10* / Scotland 17 / Northern Ireland 9*)

And whilst just over half of students have previously - or are currently - being taught with the micro:bit, the large majority are used in the classroom (89% in 2020-21 academic year)

MOST TEACHERS WITH ACCESS TO MICRO:BIT HAVE USED IT AS PART OF TEACHING COMPUTING. LACK OF CONFIDENCE CAN BE A KEY BARRIER

87% of teachers who have access to micro: bit have used as part of teaching computing

... which means **13%** of teachers who have access to micro:bit have not used it to teach, as part of teaching computing to students

Tends to be



Teachers who lack confidence in both digital skills and computing



.... And teachers in Northern Ireland are again more likely to not have used micro: bit to teach computing despite having access (25%*) versus England 6%*, Wales 15%*, Scotland 14%)

THE MAIN REASONS CITED FOR NON-USE ARE LARGELY DUE TO THE IMPACT OF COVID, FOLLOWED BY LACK OF KNOWLEDGE AND TRAINING

Reasons why haven't taught with micro:bit

46% Covid – limited mixing and resources



62% among those who haven't taught with micro:bit recently

Lock downs meant that the curriculum was severely disrupted and we didn't cover as much of anything as we would have hoped. Wales

24% Lack of knowledge & training / don't know how to use

19% Not enough micro:bit devices to go round

8% My school doesn't have direct access to micro:bit devices

8% We use alternative programs (e.g. Scratch)

5% Is not a school priority

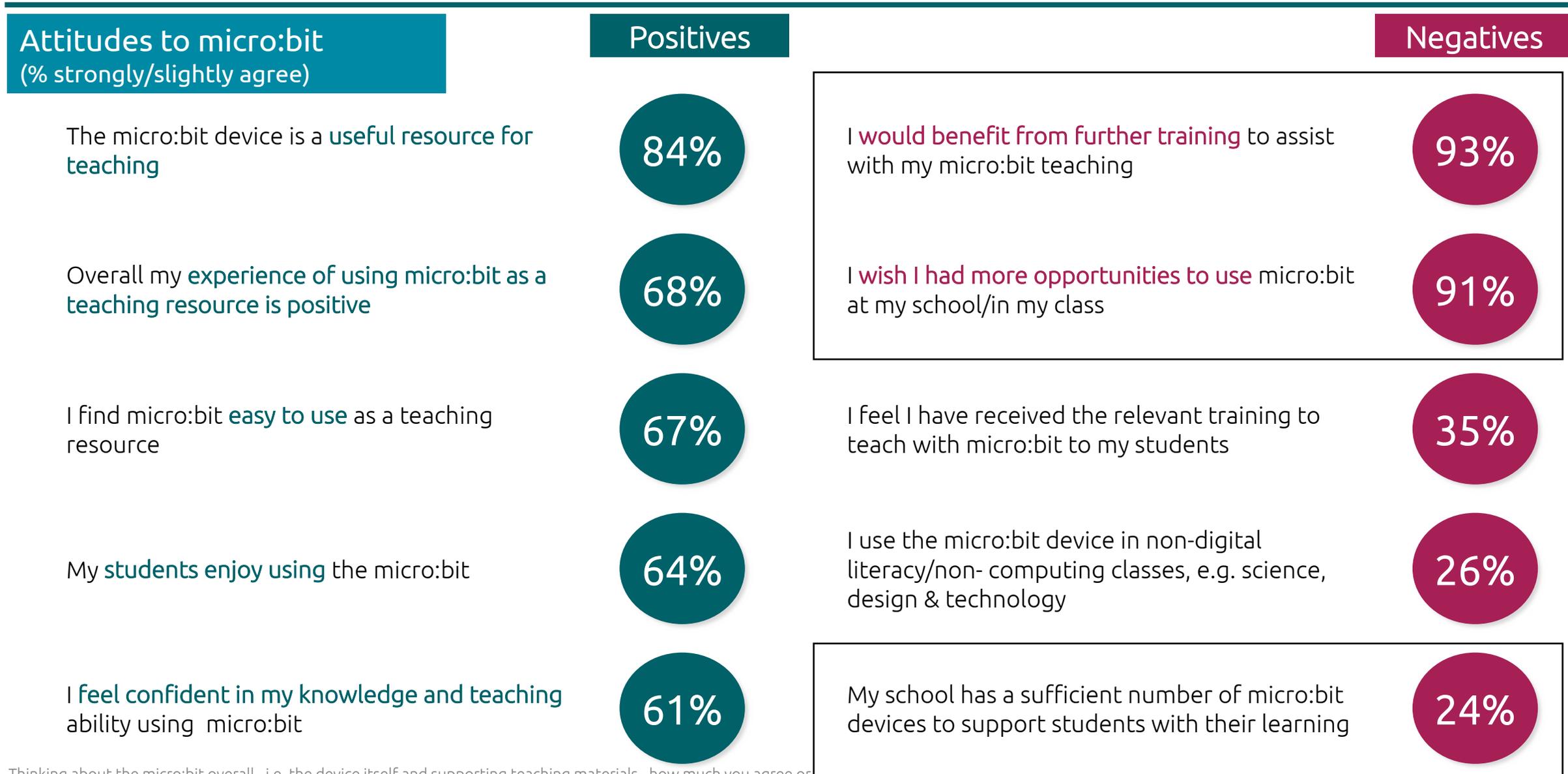
3% Lack of computers to use micro:bit with

Haven't had the appropriate training. However I am receiving micro bit training next week and look forward to implementing it into my classroom. Northern Ireland

Did not teach any physical computing over the last 2 years due to covid, we had to concentrate on teaching children how to access online learning. England

We have focussed mainly on using Scratch. Having only 4 devices makes the micro:bit challenging. I feel they are fragile and worry about children squabbling over them. We have limited timetabled time for computing. Scotland

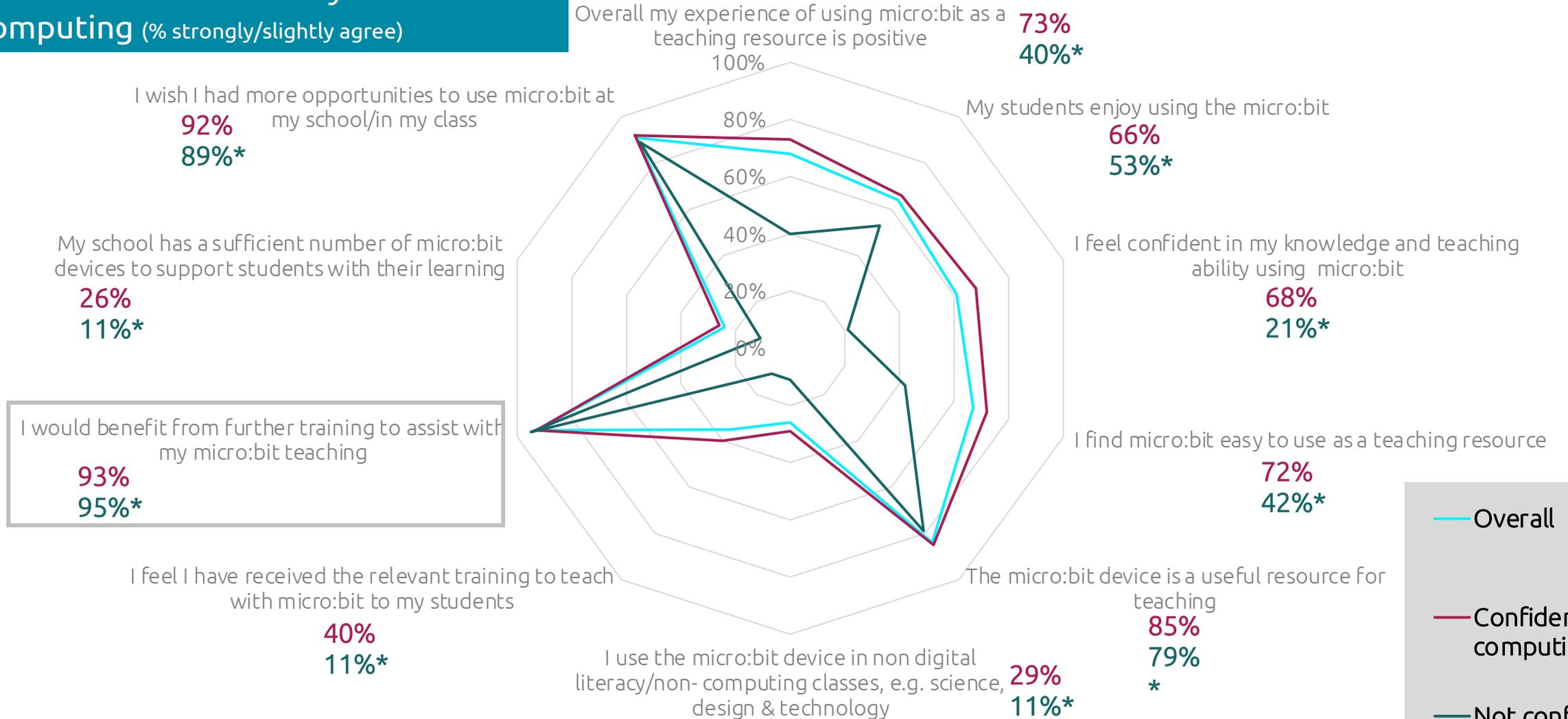
WHILST TEACHERS RECOGNISE THE USEFULNESS OF MICRO:BIT AS A TEACHING RESOURCE, THE VAST MAJORITY WOULD LIKE MORE TRAINING AND OPPORTUNITY TO USE



Q11. Thinking about the micro:bit overall - i.e. the device itself and supporting teaching materials - how much you agree or disagree with each of the following?? Base: All teachers who have heard of micro:bit, n=114

THOSE MORE CONFIDENT IN TEACHING COMPUTING ARE MORE POSITIVE IN THEIR VIEWS. BUT REGARDLESS OF THIS, ALL TEACHERS WOULD LIKE MORE TRAINING / OPPORTUNITIES TO USE

Attitudes to micro:bit: by confidence in computing (% strongly/slightly agree)



— Overall

— Confident in computing

— Not confident in computing

Q11. Thinking about the micro:bit overall - i.e. the device itself and supporting teaching materials - how much you agree or disagree with each of the following?? Base: All teachers who have heard of micro:bit, n=114; Those confident with computing, n=95; Not confident, n=19*

*CAUTION: SMALL BASE SIZE, TREAT WITH CAUTION

QUALITATIVELY, USERS OF MICRO:BIT HAVE VERY LITTLE TO FAULT – NON-USERS ARE EXCITED TO TRY BUT NEED TO EXPERIENCE ITS VALUE BEFORE INVESTING



Words they use to describe micro:bit include “innovative”, “eye-opening”, “inspiring”, “clever”, “responsive”, “intuitive”, “responsive”

The overarching sentiments of USERS:

- ✓ Easy to use
- ✓ Engaging
- ✓ Feel innovative – breadth of capability and opportunities
- ✓ Accessible – for a range of abilities
- ✓ Block code is familiar
- ✓ Web resource helpful – fun and relevant lesson plans/projects
- ✓ Web resource – content is linked to the curriculum (a very important aspect for teachers)

BUT, ensuring the continued use of micro:bit within their schools is the main threat reported – non-specialist teachers lack of confidence and reluctance to use + finding time to train, are barriers.

NON-USERS initial reactions mirror that of users and are very positive HOWEVER, to encourage use, there are 3 key aspects they desire:

- The opportunity to ‘try before you buy’ + training (not just ‘how to guides’)
- Projects that link very clearly to the curriculum across year groups in all nations
- A map of pathways to follow by year group - indicating the projects to do, progression requirements & outcomes

Moving forwards, a training and support + awareness building will benefit users and potential users

- A training programme organised by micro:bit in primary schools – with non-specialist teachers in mind...ideally free introduction for non-users
- Provide a micro:bit support network for teachers – somewhere to go to for help/advice/guidance
- Help specialists to help other teachers within their schools
- More focus on projects that incorporate other subjects i.e. science, design, maths, music etc
- N.Ireland provide dedicated curriculum links on the web resource
- Send out comms & highlight the benefits for students and dispel any known fears



CONCLUSIONS

1. WHAT IS THE CURRENT PRIMARY SCHOOL LANDSCAPE, FOR TEACHING DIGITAL SKILLS AND COMPUTING?

- ▶ Very few teachers have had a training background or qualification in computing, yet the majority – 3 in 4 – are responsible for teaching computing at their school, with virtually all teachers either currently – or at some point in their career – having taught digital skills/literacy or computing
 - ▶ Qualitatively, a few micro:bit users have undertaken training to develop their skills in the area of computing/digital skills with a couple responsible for co-ordinating a number of primary schools' ICT programmes. All have a passion for the area and a desire to hone their knowledge and skills
- ▶ Overall teachers understand the importance of computing and digital skills in the primary school setting and student enjoyment has been noted
- ▶ Whilst levels of confidence in teaching both digital skills and computing are high, confidence is higher in digital skills / literacy subject knowledge and teaching ability, than computing
- ▶ However, those teachers from a computer science background – who are responsible for computing at school - are unsurprisingly more confident teaching both digital skills and computing. Male teachers also show a stronger level of confidence than their female counterparts (although this was not reflected qualitatively, but may be an aspect to explore further in the next stages)

2. WHAT ARE THE FACTORS BEHIND LOWER CONFIDENCE LEVELS IN TEACHING COMPUTING AND DIGITAL SKILLS?

- ▶ **Lack of resources** - whilst teachers do often have resources to help guide lessons, resources to specifically support computing are often lacking in comparison to digital skills resources. This lack of resources often driven by out of date tech and lack of finance to replace, and also manifests itself in a lack of resources to support every pupil
- ▶ **Lack of teacher knowledge and need for training** - teachers feel they lack training and the majority quantitatively feel they could benefit from further (in particular for computing) – this desire spans all experience and confidence levels.
 - ▶ **This is supported qualitatively**, with non-micro:bit users (who tend to be less confident in computing overall), desiring more dedicated support and training. Micro:bit users, are more confident but training would help them realise their full potential
- ▶ **Time** is also a key issue mentioned by teachers. An already full curriculum makes it hard to fit computing in, yet a large proportion of teachers wish they had more opportunities to teach both digital skills and computing in their classroom
 - ▶ **Qualitatively, this is particularly apparent in England** who report a more inflexible curriculum, and thus opportunity to incorporate computing/digital skills into their teaching overall is more challenging)

3. HOW IS MICRO:BIT PERFORMING AMONG PRIMARY SCHOOL TEACHERS?

Awareness

- High awareness and understanding of micro:bit exists among of our sample of teachers, especially among those teachers who are responsible for computing at school and those who are confident in their computing skills
 - Some regional differences in awareness: teachers in Northern Ireland are least aware (and thus also least likely to have access to micro:bit)
 - Qualitatively, there were non-users in NI, Wales and Scotland had never heard of the micro:bit at all
 - But awareness is in fact the main initial barrier for non-users, something that could be addressed in a number of ways, including free introductory training, support for non-specialist teachers, and wider comms
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Usage

- Almost 9 in 10 of those teachers with access to micro:bit say they have used it as part of teaching computing, with 1 in 4 students being taught with micro:bit in 2020-21 coming from an under-represented background
 - micro:bit is viewed very positively on the whole, but one of the most common challenges is ensuring continuation of usage in school, especially where physical resources are limited and where confidence/specialist skills of teachers is also limited
 - Covid has been a key barrier to (recent) usage, with restrictions on mixing / use of shared resources; lack of knowledge and training is another major factor
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Attitudes

- Confidence has a big influence on micro:bit usage and attitudes towards the device
- Less confident teachers feel they need further support and training to teach with the micro:bit effectively
- Teachers lacking in confidence are inevitably less able to engage their students, reducing the impact of micro:bit
- Further training regarding micro:bit usage would benefit all teachers, regardless of their confidence levels

4. HOW CAN WE BEST COMMUNICATE OUR OFFER TO NON-USERS – AS WELL AS EXISTING USERS – OF MICRO:BIT?

HOW DO WE APPEAL TO NON-USERS?

HOW DO WE ENCOURAGE
USERS TO CONTINUE TO
USE MICRO:BIT?

INITIAL AWARENESS

Ensure teachers know that the micro:bit resource exists and is being used successfully by other teachers - communication in the right places to highlight and explain its use is vital

AS A RESOURCE

Demonstrate the benefits of how the Foundation provides quality micro:bit resources for teachers to be able to teach their students coding/computing - in an engaging & applicable way and how it aligns to their curriculum

INITIAL TRAINING & TRIALING

Develop and promote a training offer that is accessible and flexible enough to fit around teacher schedules – empowering teachers to use and continue to use micro:bit in lessons
Set up a process to enable schools to 'try before you buy'

APPROPRIATE SUPPORT

Highlight the types of support available – from training to 'how to videos', aimed at building confidence in non-specialist teachers to giving specialist teachers the tools to develop their skills further

CONTINUED SUPPORT

Show how the Foundation will be on hand to address the continued training and support needs of current users, always inspiring users to get the most out of the micro:bit and change up their activities
Highlight that resources are continuously updated to fit with ever changing curriculum needs & relevant topics

CONSIDERATIONS FOR NEXT PHASE OF RESEARCH (AUTUMN 2022)

Overall what areas do we want to delve into in more detail in the first 'evaluate stage' with teachers?

- What motivates teachers in each UK nation, in terms of teaching digital skills and computing and teaching overall?
- How can the Foundation raise initial awareness of micro:bit?
- How can the Foundation assist teachers more effectively so that they get the most out of micro:bit resources?
- What types of further training would teachers like to have more of, specifically for micro:bit, but also more widely for digital skills and computing? And how can the Foundation best support this?
- What types of further opportunities do teachers want, to be able to use micro:bit in lessons?
- Why do teachers in Northern Ireland have less access and usage of micro:bit?

For the quantitative survey there are a number of KPIs/benchmarks we recommend monitoring going forwards:

- Overall confidence in teaching Digital Skills and Computing
- Awareness, access and usage of micro:bit
- Track barriers to teaching Digital Skills and computing, and barriers to using micro:bit
- Attitudes to digital skills, computing and micro:bit
- Number / proportion of micro:bit devices still in use
- Addressing the gender divide – why are female teachers less confident in teaching digital skills/computing?

And qualitatively, we will want to explore the following new areas

- Capture experiences of the micro:bit programme of support amongst non-users and users over time
- Understand how the programme of support is / has impacted previous barriers and improvement areas – has it helped teachers to overcome issues? Delivered on needs?
- Unpick what aspects of the programme of support are being used and which aspects are not and why
- Unpick what the programme of support can do *better* to assist teachers in delivering micro:bit lessons, drawing on their feedback
- **note – micro:bit devices will need to be sent out to all 12 participating teachers*

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