Deliberate and repeated practice is also essential – initially guided and then independent, as is the process of reflection before, during and after the event. What approach should we take as a class to learn this topic? How is our learning going? What could be have done better? Self-questioning has so much power, as does summarisation: The Week in Review activity (Ellis 2014) asks students to summarise what they have learned over the course of a week. Along with thinking about approaches to note making, summarising develops analytical and interpretive skills in selection, re-presentation, reorganisation and synthesis.

This year, we plan to introduce more opportunity for teachers and departments to develop reflective thinking about their practice. And we also plan to bring learning talk into the foreground with our students: a Middle School learning skills programme will address typical study skills but ask students to reflect on themselves as learners and acquire knowledge and understanding

what learning actually is; learning sites for both staff and students have been developed, which summarise important ideas about how learning happens and provide students with resources to help them to work independently; a staff and student learning committee will help us to evaluate the efficacy of our interventions and develop resources for the benefit of each other, as well as learners in contexts outside Sevenoaks School.

Daniel Willingham concludes his book, 'Why don't students like school' (2021) with the observation that student flourishing can be nurtured considerably through understanding of cognitive scientific principles. If the notion of flourishing is to exist as a core aim of the education we offer our students, finding opportunity to think and reflect, discuss and share principles and practices that can bring about this state – which is one of both thought and feeling – is surely a self-evident need.



# "Can't I just look it up?" The triumphs and pitfalls of tablets in classrooms.

*James Tate, Head of Physics*

Whether specifically asked, or just implied, all teachers have been faced with the question "Can't I just look it up?" before. Students are often required to learn something but simply cannot understand why. Their day-to-day life is almost permanently connected to the internet; they can access all their music remotely, ask their virtual assistant about the weather or their to-do list, they constantly communicate with friends and family via instant messaging services and when they want to know something, they "google it". With so much available at their fingertips, it's easy to see how they feel that recalled knowledge is unnecessary. This may be largely true for their social lives, but when learning skills or methods, looking up each piece of required information is problematic as their working memory cannot usually handle it. We need to help them reduce the load.

 "Working memory is the retention of a small amount of information in a readily accessible form. It facilitates planning, comprehension, reasoning, and problem solving" (Cowan, 2016). This is what we need our students to use while they are learning, whether

analysing a text or solving an engineering problem. But the average human's working memory will not allow an international phone number to be memorised in one attempt. If this was briefly shown to you, it is unlikely you would be able to recall it accurately later:

### +447362 9551408

However, if we're able to utilise our long-term memory, the task becomes much easier. Let's say you know that "+44" is the country code for the UK and the mobile operator prefix "7362" is the same as a friend of yours has. They are now available from your long-term memory as single pieces of information. This leaves just seven pieces of information for your working memory. If you pair them and realise that the second of each pair is four fewer than the first, you have reduced the working memory requirements even further:

| +44 | 7362 | 95 | 51 | 40 | 8 |
|---|---|---|---|---|---|
| long-term | long-term | 1st item | 2nd item | 3rd item | 4th item |

Each human's working memory can handle an average of seven pieces of information, rarely fewer than five or more than nine (Miller, 1956). During the process of solving an IB or A-level Science problem, this capacity is likely to be exhausted. A student may need to know: two equations that can later be algebraically amalgamated, a couple of constants required for the calculation, values from the previous sub-questions, three numbers from the diagram at the top of the page and an accurate knowledge of the "principle of moments" in order to structure the answer (which has not been learnt beforehand because the student thought "Can't I just look it up?").

## Surely this is where technology can help?

The number of students using tablets during lessons has increased drastically over the past few years, partly exacerbated but the periods of remote learning. Surely, we should find that these technologically-superior students are progressing best as they can outsource their working memory requirements to a machine? Unfortunately, it is unlikely to be that simple.

Imagine the average student in the average classroom using an average-sized tablet. Once they have opened the task and zoomed appropriately so that they can read the question fully and can see the answer box, there is not a lot more screen-space available. They cannot see the required equations (which are in a PDF version of the data book in a different app), they cannot scroll up to the diagram or previous sub-questions without losing sight of the question they are working on and although they can remind themselves of the "*principle of moments*" with a few quick taps in a web browser, this requires another different app that will probably take up the full screen. Phew – it's tiring just thinking about it! By the

# WHY CAN'T I JUST LOOK IT UP?
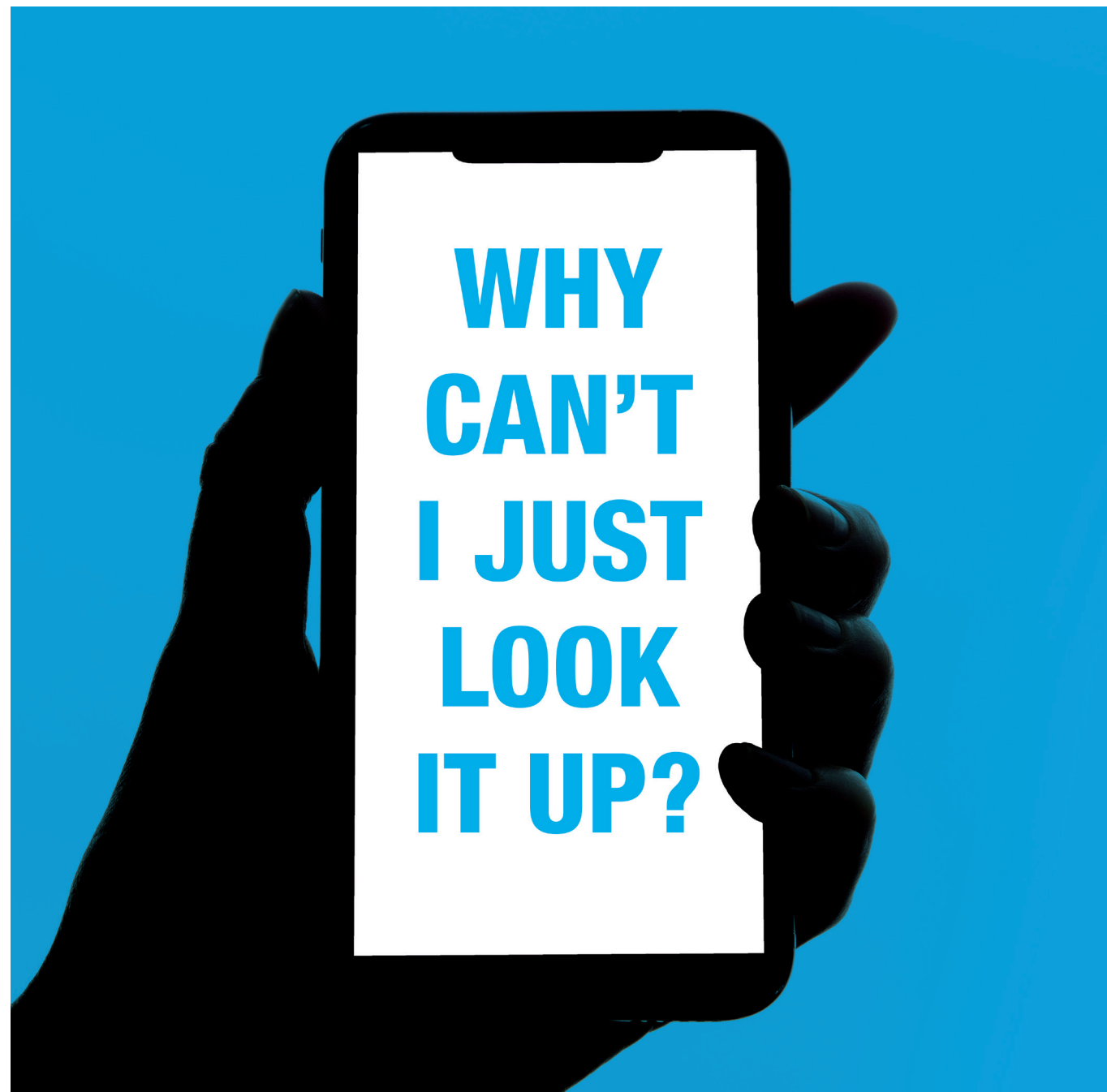
time all the necessary information has been gathered, the student's working memory is full, and they have forgotten what the original question was asking.

Tablets are a wonderful introduction to classrooms. They allow for a wider variety of tasks, adaptive self-testing and reflection, collaboration with other students, real-time feedback from teachers and the availability of a wealth of resources in a fraction of the space and time. They are not however, a sole replacement for more traditional resources. If our "average student" above had a paper copy of the data booklet and had previously learnt the "principle of moments", they would only need to scroll up and down one page to obtain all the information they needed and solve the problem.

## The way forward.

Like all technology, tablets in classrooms are only advantageous if used with care. We need to encourage students to work electronically, for all the advantages that holds, but show them how to reduce the load on their working memory. This means there is still a vital place for paper copies of scientific data books, literary texts, geographical maps and historical source material, at least until students' tablets are the size of a standard classroom desk. In the interim, it requires us teachers to keep a stock of paper versions in classrooms, so that we can hand them out when we see students struggling with their various electronic resources. The more practice they get where they can access the information they need successfully, the more that is committed to long-term memory and the smoother the whole process becomes.



# Education Networks and Educational Flourishing

*Cat Davison, Director of Service and Social Impact*

'Ubuntu' is an African word used across the continent to describe a feeling of togetherness. Mbiti (1969, 125) describes the deep relationality of this view: 'I am because we are, since we are therefore I am'. Mudimbe suggests that western philosophies often take an uncontextualised 'I' as a starting point, with an 'I' being 'defined in relation to the self and its inner being, rather than in relation to others' (Mudimbe, 1988, 1).

Identification with a wider group can enhance well-being and the wider flourishing of individuals and societies. Network participation seems to satisfy Maslow's needs of belongingness and love needs, self-esteem and safety (Maslow, 1943). We can also hypothesise that networks may contribute to the domains of meaning and purpose and close social relationships offered in VanderWeele's account of human flourishing (VanderWeele, 2017).

In Social Movements, Donatella della Porta and Mari Diani (2020, 118) outline three functions of social networks:

- They enable the spread of information and opportunities amongst groups united by interest in a cause.

- They increase the likelihood of people becoming socialised towards specific values and act in support of causes.

- Contact with people in networks can generate social pressure or motivation to sustain action over time, even when challenges emerge.

This article will explore the above claims, drawing evidence and experience from two education networks I lead and participate in. EduSpots is an education network with over 300 volunteers in Ghana, Zambia and Kenya and the UK working together towards a vision of communities creating the future they want to see through education, linked to a physical network of 42 education centres. The Schools Community Action group linked to the Independent Schools Council has existed since the 1980s, bringing 80 teachers together who are united by a desire to advance the quality of our students' educational engagement and wider impact of community action.

## What is a network?

It is important to distinguish the concept of 'networking' from the deep type of network engagement explored here. Networks bring groups of people together, under the umbrella of a shared goal, building impact through relationships. They differ from groups or organisations in that they often bring people together from diverse groups and locations and are distinguished from movements in that they usually offer more structured forms of engagement. Undoubtedly, groups feed into networks, and networks often form can the structure needed for social movements to gain momentum. There are an increasing number of education networks taking advantage of social media, including #EduTwitter and #WomenEd.

## Types of network members

It is vital to acknowledge that 'it is the position that one occupies within a network that matters, rather than the mere fact of being involved in some kind of network.' (Porta and Diani, 2019, 119)

Drawing from my observations, firstly, we have network leaders who play a role in the strategic formation of a network. Great network leaders are often highly active participants in the network. There are also core participants: those who are actively engaged in activities and hold close relationships with other core members. Some of these may also be network activators – people with an extremely strong affinity to the overall goal, also offering the energy to strengthen the experience