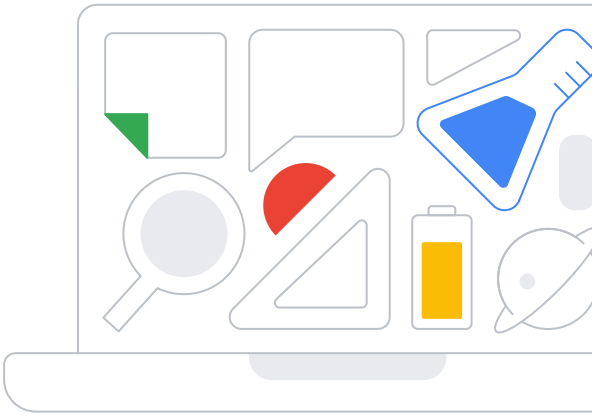
Google for Education

canopy

Research Report: Piloting Chromebooks for Students with SEND: from Access to Agency



This report summarises a pilot research study conducted between September and December 2024. The pilot investigated the potential effectiveness of Chromebooks as an innovation for students with Special Educational Needs and Disabilities (SEND) in Portsmouth contexts.

The study aimed to support the decision making processes of schools within the Portsmouth Digital City Project (DCP) by conducting contextually specific research into Chromebooks for improving the access to learning of students with SEND. DCP has already enacted the findings, with some schools both within and beyond the research pilot purchasing Chromebooks for student use.

Canopy Education CIC conducted the study, funded by Google for Education, on behalf of DCP. The study involved five DCP schools in Portsmouth, with a total of 30 students with SEND using Chromebooks for one school term.

The research focused on the perspectives of the teams of adults supporting these students in schools. This multi-perspective approach included school leaders, IT teams, teachers, Special Educational Needs Coordinators (SENDCOs), and teaching assistants. The study offers valuable insights into the positive impacts of Chromebooks for children with SEND in Portsmouth.

Research Questions

1. What training and support are needed to effectively implement Chromebooks for students with SEND?
2. How do Chromebooks impact on access to learning for students with SEND, and what changes are observed in student attainment, engagement, enjoyment, and motivation?
3. What are the challenges and benefits for Portsmouth of integrating Chromebooks into the classroom for students with SEND?

Google for Education

canopy

Key findings

The study revealed significant positive impacts of Chromebooks on SEND students' learning experiences in the Portsmouth schools. Key findings are consistent with wider research literature and include:

The importance of organisational and human factors: The effectiveness of this Chromebook pilot in each school depended on human and organisational factors, including training, staffing, and infrastructure and local leadership. In the four schools who were able to engage with the support and training on offer through the pilot we saw strongly positive outcomes.

Positive responses to innovation from a range of practitioners and settings: The study highlights an overwhelmingly positive response to Chromebooks as an innovation. The positive responses are seen from a range of practitioners in a range of diverse school contexts. School leaders, Teachers, SENDCos, Technical Teams, and Teaching Assistants positively assessed Chromebooks for relative advantage, simplicity, trialability, compatibility and observability in their schools.

Consistent improvement in students' access to learning across primary and secondary schools: Chromebooks issued to students consistently improved their access to learning across all the schools when compared to learning with pen and paper. Teachers reported significant advantages for students, and found that the Chromebooks removed obstacles to learning for students with SEND.

Specific applications and features of Chromebooks were key to success: The Chromebooks' built in Accessibility Tools, customised to each student's needs: (text-to-speech, dictation, stylus, motor and dexterity tools, screen readers), were key to the students' success and progress.

Consistently reported increases in student attainment, engagement, enjoyment, and motivation across primary and secondary schools: Teachers, SENDCO's and Teaching Assistants report that resolving access needs results in wider improvements. This was especially the case in schools who were able to take a pupil-led approach to the project.

Development of Agency: Beyond improving access, practitioners frequently report that the Chromebooks supported the development of agency in learning. Many schools found that students were able to become more independent and confident in their learning for the first time.

Improvements to self-regulation for some students: Teachers, SENDCos and Teaching Assistants note that for some learners access to a Chromebook improved self-regulation by reducing frustration and improving attainment.

> I have been able to witness how, given the right tool, the children can take ownership of their learning as well as being more independent" - School Leader

Research timeline, process & phases

Phase 1
Feb 24 - Sept 24: Research Planning & Design

- Collaborative work with DCP through local lead
- Identify research questions, appropriate frameworks, consideration of ethical issues. Participant and site selection.
- Match Chromebooks to student needs
- Pedagogical and Technical training for pupil-facing staff teams
- Technical onboarding for schools

Phase 2
Sept 24 - Dec 24: Fieldwork and Data Collection

- Ongoing Pedagogical and Technical training for staff teams. Chromebooks provided to students with SEND.
- Workshops and onboarding for students.
- Surveys for staff teams (Start. Mid point, End).
- Focus groups and interviews (End)

Phase 3
Jan 25 - March 25: Data Analysis & Presentation

- Data analysis
- Report preparation
- Sharing of outcomes

Quantitative data summary

The pilot worked with the adults in the schools, for ethical and practical reasons. We surveyed all the adults involved at three key points in the study to gain a multi-perspective view on the impacts of Chromebooks as an innovation in their schools.

Of the five participating schools, one was unable to launch the pilot to pupils due to administrative and technical difficulties. School 5 did not complete surveys 2 and 3, but did take part in the final focus groups and interviews offering valuable insights.

Table 1 shows a summary of the respondents at the three survey points.

	Survey 1 - Start	Survey 2 - Mid	Survey 3 - End
Total Number of Responses	21	15	16
Number of Schools Responding	5	4	4
Respondents' Roles (nb - respondents may have more than one role)	Leadership (7) SENDCo (5) Teacher (7) Teaching Assistants (3) Technical (3)	Leadership (1) SENDCo (4) Teacher (7) Teaching Assistants (3) Technical (2)	Leadership (2) SENDCo (4) Teacher (9) Teaching Assistants (2) Technical (3)

Surveying for innovation & impacts

Innovation Themes

Drawn from Rogers Diffusion of Innovation

Relative Advantage: To what extent, might Chromebooks have advantages over paper and pen for students with SEND?

Simplicity / Complexity: How simple or complex are the Chromebooks to use?

Compatibility: How compatible are Chromebooks for students with SEND with existing classroom practice in Portsmouth schools?

Trialability: How well does this pilot help Portsmouth practitioners to trial Chromebooks for students with SEND?

Observability: How easy is it for practitioners in the pilot to observe any potential benefits or drawbacks of using Chromebooks for students with SEND in Portsmouth schools?

The survey questions were designed to explore innovation, based on five Innovation themes, taken from Rogers's diffusion of innovation theory (Rogers, 1963).

Participants responded to a series of Likert scale questions about Chromebooks as an innovation, with rankings 0-5 (not at all - very much / disagree strongly - agree strongly), and optional open text boxes for extended answers and illustrative examples.

Questions were repeated in each survey, for example asking about expected advantage in survey 1, advantage seen so far in survey 2, and overall advantage in Survey 3. This allowed us to analyse for themes across the project timeline.

Example Questions are shared below.

> On a scale of 0 to 5, how beneficial have you found this project with Chromebooks so far for your understanding of their effectiveness as a SEND support tool?

> How compatible have you found the Chromebooks with current teaching practices in your school over the course of the project?

> Would you like to add anything else about the challenges or benefits you have found in integrating Chromebooks in your school so far?

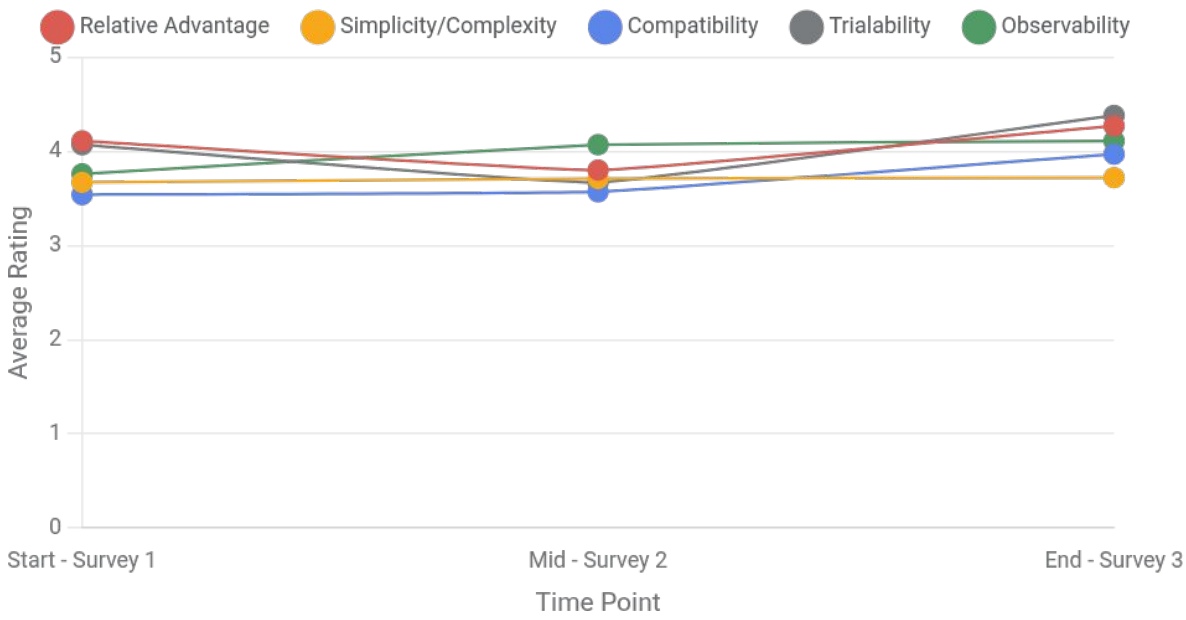
Comparing and collating the quantitative data for each theme across the relevant questions and across the surveys shows a common pattern. Most participants begin the pilot in early September with high hopes of the Chromebooks as innovation, perhaps based on the project pre-launch training sessions and early excitement. Initial ratings in Survey 1 are high across all five themes, with strongly positive expectations, averaging between 3 and 4 out of 5 for expected Advantage, Simplicity, Compatibility with existing Practice, Trialability and Observability.

At the the midpoint survey (after four to six weeks of use) on most measures we see a levelling off or a slight drop in scoring on some metrics, as participants get to grips with the reality of introducing devices and ways of working in their classrooms. Scores remain high, but Observability rises, to 4.1.

At the closing survey, we see an overall rise on most aspects for all participants. Simplicity and Complexity remains level from survey one at 3.6, all other factors of innovation rise beyond the initial high expectations, recovering from the midpoint dip.

On average, all participants in all schools which used the Chromebooks with their students found them to be advantageous, simple to use, compatible with existing practice, and easy to trial and observe the benefits. The interoperability of Chromebooks is clearly seen in the scoring patterns which were consistent in schools not using any technology for learning the classroom, schools using primarily Microsoft tools, and schools using some Google tools already.

Average ratings by dimension over time

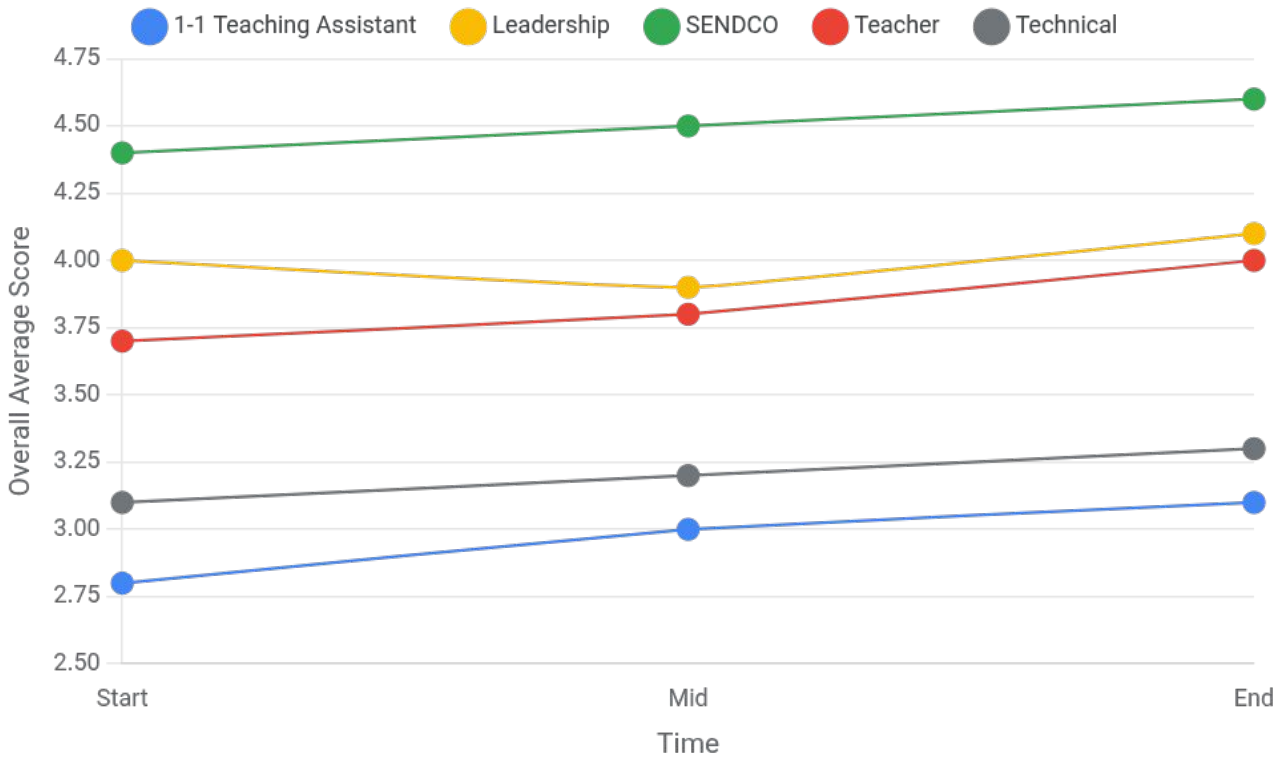


Exploring the responses organised by role offers further insights. The SENDCOs, perhaps those with deepest understanding and experience of the challenges faced by students, are the most positive group of responders. They begin with high hopes, quickly see benefits, and continue to learn and explore throughout the pilot ending with the highest overall scores for the Chromebooks.

One-to-one Teaching Assistants are initially the most hesitant, although they go on to offer some of the most compelling qualitative reflections at the project close. This may reflect the fact that many of them were not able to attend any pre-training as they are completely committed to their work with the students. When we visited them in their schools with their students they are inspired and encouraged by what their 1-1 support students can now do with their Chromebooks.

Technical teams are also slightly more reserved in their quantitative assessments. They are open to the idea of Chromebooks as an innovation, but may never have worked with them before. For external technical teams who may not be based in the schools they support, their perspective on Chromebooks as an innovation will be relayed from the school teams rather than experienced directly, so their overall positive view is also further evidence of the impact of Chromebooks as an innovation.

Overall average score by role over time



Qualitative data summary

In addition to the rating scales for innovation factors, the surveys included the option for participants to respond in text, giving examples or extending their answer. Thematic analysis of these answers reveals five key themes which align to the key findings of the study.

These high level themes reflect the existing literature and the quantitative data that Organisational factors (both supportive and restrictive) and Training are key. Overcoming. Challenges, connects to Benefits for students, and many participants discuss specific features of Chromebooks which they think students find helpful.

Survey themes

Challenges

Lack of training
Lack of confidence (student)
Lack of confidence (teacher)
Lack of time (for training/upskilling)
Technical issues
Limited resources

Organisational factors (supportive/restrictive)

Staffing
Infrastructure
Technical support
Local leadership

Benefits for students

Improved learning outcomes
Greater independence
Enhanced motivation
Improved organisation and self-regulation
Increased engagement and enjoyment

Training & support

Pedagogical training
Ongoing support
Peer collaboration
Time for upskilling adults
Technical training

Key features of Chromebooks mentioned

Display and vision tools (magnifier, ChromeVox, colour, zoom, reading mode, braille support)
Cognitive and spoken feedback tools (dictation, cursive, select-to-speak)
Motor and dexterity (touchpad, sticky keys, switch access, touchscreen)

Qualitative data themes over time

Analysing the qualitative responses and comparing these over time offers further support to Chromebooks as an innovation in Portsmouth schools.

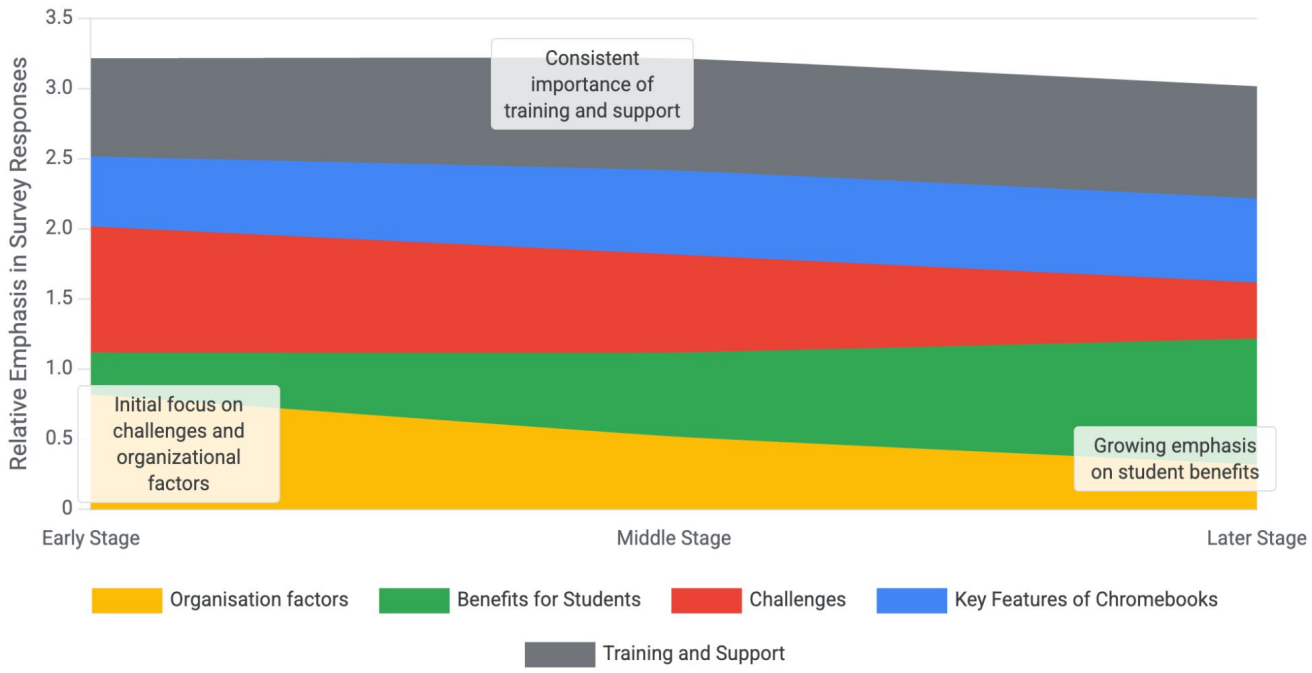
Early stage text responses from Survey 1 at the start point, tend to emphasise technical issues and organisational constraints—such as limited resources, infrastructure setups, and challenges in delivering effective training. This is consistent with the wider literature about the importance of planning, pre-and ongoing training and local leadership to making device roll outs effective in schools.

By the midpoint (Survey 2) we see how quickly themes are shifting, towards benefits for students, suggesting that after a few weeks, most of the teething troubles have been resolved and students and teachers are adapting.

By survey 3, there is a significant shift in focus thematically, towards the benefits seen through the project such as improved access, enhanced student independence, and improved engagement and learning.

Additionally, later responses placed more emphasis on the value of ongoing training and support, suggesting that once the initial hurdles were overcome, the practical advantages became much clearer.

Evolution of themes across survey stages



Chromebook specific features

As a study of Chromebooks, we regularly asked the participants to identify which specific features they thought that students had found to be particularly useful.

While one participant felt that these benefits might be seen with any device, every other participant identified specific Chromebook features which they felt were making a difference for their students.

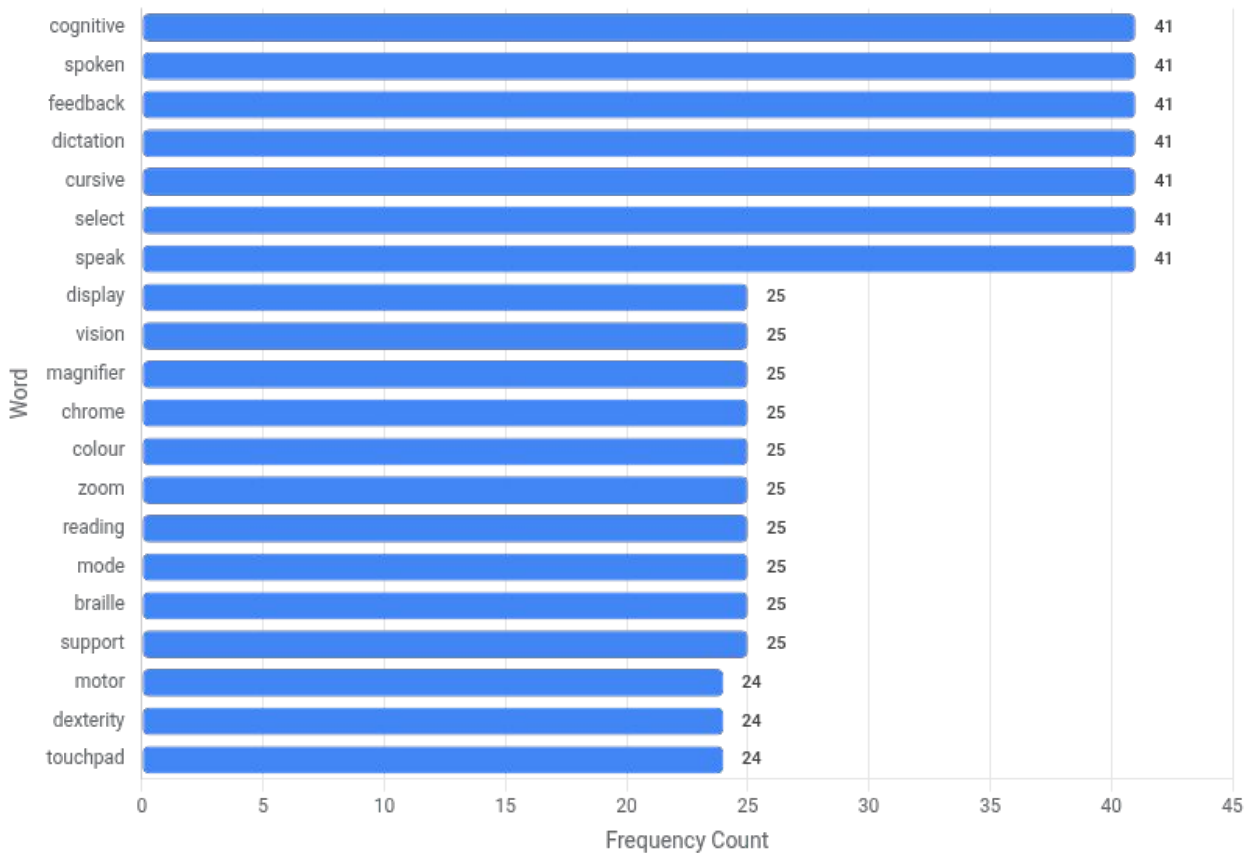
Frequency analysis of responses to this repeated question highlights the range and depth of use of the assistive tools used in such a short pilot.

This is strongly suggestive of the level of good practice achieved in such a short time in a range of settings.

T/his gives further evidence to the schools' ability to quickly learn how to use Chromebooks as an access tool for their students with SEND.

Some of this also reflects the pre-pilot training delivered in phase 1, but much of this reflects strong local leadership of the project from DCP key personnel.

Top 20 most frequent words (excluding standalone "tools")



Focus groups and interviews

At the close of the project focus groups at four schools and interviews with key individuals allowed us to further understand the participants' views on Chromebooks as an innovation.

Qualitative analysis of the focus groups conversations continues to reveal the schools' strongly positive perspectives that the pupils have benefitted from this experience. Many schools reflected that the benefits seen were even more than was anticipated.

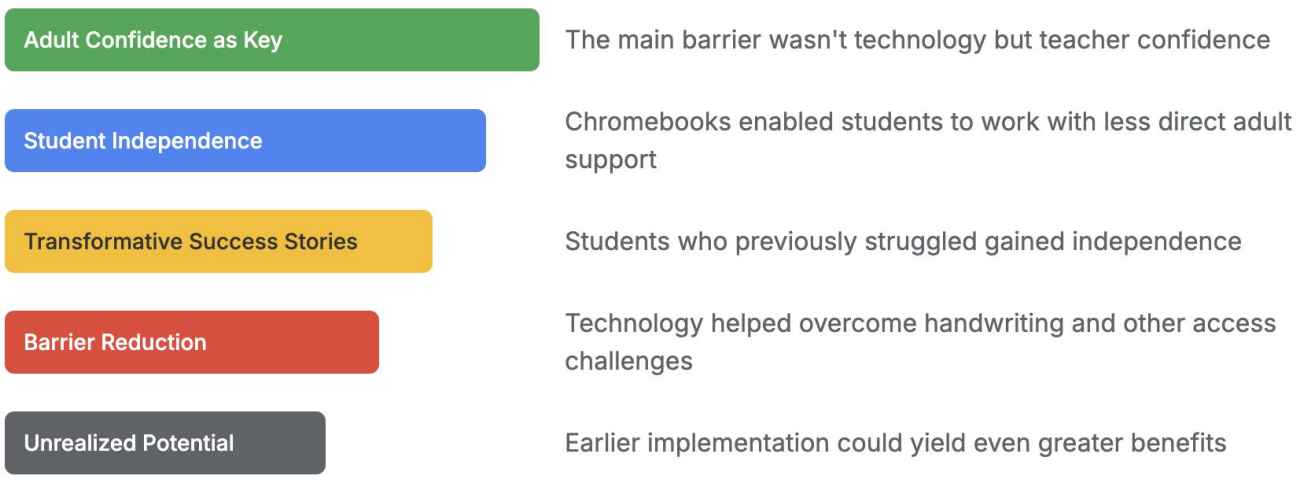
Interviews at the study school who were not able to launch the Chromebooks with their pupils are consistent with the wider study findings, that a joined up approach and strong local leadership is needed to overcome organisational barriers.

Participants frequently discuss their view that the limitations which were seen are caused by the adult's lack of confidence with comments such as "The main barrier wasn't technology, but lack of teacher confidence". This reflects the consistently stated need for ongoing support, training, and local leadership.

The next most common theme is one of student independence, many of these stories came from the 1-1 teaching assistants who describe themselves as "shocked and surprised by how much more the students can achieve" with less support if they have their Chromebook.

A further frequent theme is that of unrealised potential. Participants reflected about other students they teach, or had taught in the past and how Chromebooks could help them.

Most powerful messages from focus groups



Bar length represents relative emphasis and impact in focus group responses.

Focus group voices

Everyone involved in the project had a story to tell of their pupils and how the project had helped them. We heard about students who had never before been able to complete a learning task, and students who had been at risk of exclusion or disruptive in the classroom who were now able to self -regulate and contribute positively due to the support they'd received and their Chromebook.

It is through the focus groups that it becomes most clear that the Chromebooks have not only been a successful innovation for access, but also demonstrated significant benefits for student agency, independence, self-esteem and ownership of their learning.

> The students absolutely embraced it and wanted and would ask for it in different classes" - *Teacher*

> Pupils have appreciated this opportunity and it has made a really positive difference to their access to education. It has inspired me to see what we can do to implement such support longer term." - *Technical*

> The Chromebooks are being used differently by different sites, but the feedback I am receiving from visually impaired students is unanimously positive. It has improved student engagement and gives VI students the tools they need to access their learning independently and without needing enlarged paper resources." - *Teacher and VI specialist*

> The experience has been beneficial, seeing the difference the touch screen and stylus have made for the children over our other devices has shown this is a device with higher engagement and features for the children. To see children who have not been able to write or communicate before using the touch screen & having the confidence to have a go is amazing." - *Teacher*

> Chromebooks have been instrumental in helping children understand themselves and their brains better and what they need" - *SENDCO*

> I like being able to do things on my own" - *Student*

> I've never got any support in regular school and now I feel like I've got everything I need" - *Student*

Key recommendations

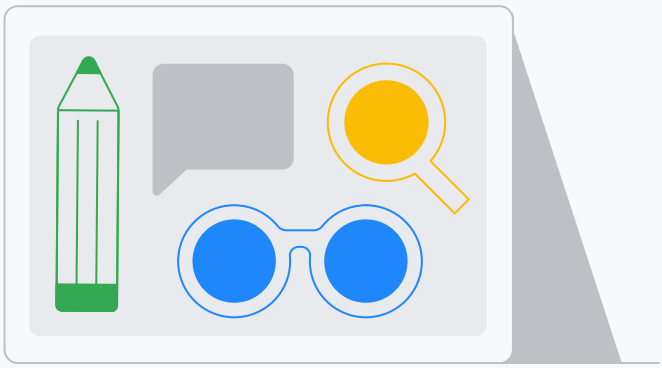
For a successful wider roll-out of Chromebooks for Portsmouth:

Continue to identify and resolve organisational factors: ensure schools have infrastructure and personnel with capacity to enact the successful integration of Chromebooks.

Continue with a holistic, multi-perspective approach connecting Leadership, SENDCos, Technical and Teaching Teams.

Invest in ongoing training and support alongside continued local leadership.

Consider Chromebooks for all pupils where the schools and staff have capacity to support them. In particular SEND students will benefit, but also EAL, SEMH and other disadvantaged groups.



Ensure Chromebooks considered for wider purchase match the needs of pupils. All Chromebooks have core features, but match size, weight and features to specific needs for best outcomes. Where possible include pupil voices in these discussions.

Monitor and Evaluate: Continuously monitor and evaluate the impact of Chromebooks on student learning and make adjustments as needed.

Conclusions

The pilot study has demonstrated that Chromebooks can be a valuable tool for improving access to learning and fostering agency among SEND students. However, successful implementation requires careful planning, adequate training, and ongoing support. By addressing the organisational factors and providing tailored support, Portsmouth schools can effectively leverage Chromebooks to enhance the learning experiences of their SEND students removing barriers to learning and building confidence and enjoyment through full participation. It has been a delight to conduct this study, and Canopy looks forward to supporting future projects with DCP.