

How can the use of data help inform and plan mathematical key skills sessions?

Orchard Primary School, Upper Key Stage 2 Phase

Abstract

The purpose of this action research project was to investigate how we can effectively use data to support children in closing the gap in learning that has arisen from missed 'formal' education due to the COVID-19 pandemic. This project focused on children in their last year of primary education. Data was collated for comparable review of implemented strategies around the country and how these have supported children in 'closing the attainment gap'. Both summative assessments (testing, assessment) as well as formative assessments (pupil feedback, assessment for learning) were used to implement key skills sessions and data evaluation identified key threads of success in gap closure.

Introduction

Orchard is a larger than average primary school, with three form entry per year group. Located in the diverse borough of Hackney, London and has exceeded the national average for the end of Key Stage 2 assessments consistently over the past seven years.

Data presented by the Rising Stars White Paper has shown that children have fallen behind with a decline in 'performance by 5% to 15% on previous years', with the biggest drop being in maths scores. In particular, children from disadvantaged backgrounds have been worst affected. As a result, many schools have introduced catch up sessions, be these added lessons in the curriculum, after school tutoring sessions or additional members of staff to support.

At Orchard School, daily 'key skills' sessions were introduced from Year 1 to 6 for all pupils. These sessions were planned to take account of missed learning due to partial closure and gaps identified during teaching. The sessions included a variety of foci including handwriting, spelling, times tables, grammar, punctuation and *targeted* maths sessions. These sessions were assessed based on pupil progress and application consistency of core skills to ensure that were effective. The rationale for this approach was to ensure gap closure, re-establish confidence, ensure curriculum coverage, maximise learning time and support 'knowing more, remembering more' over time.

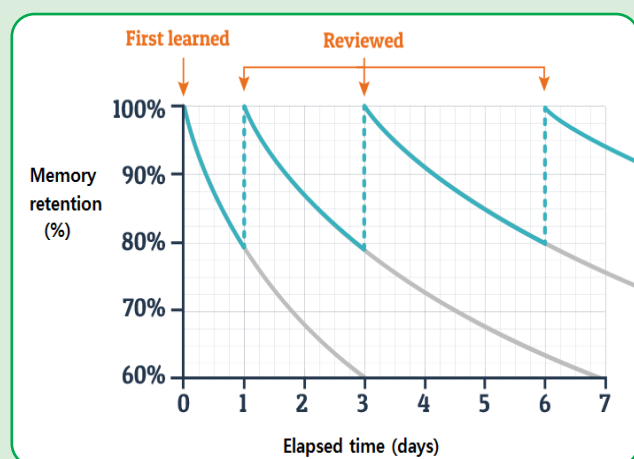


Fig. 1 – Ebbinghaus' 'forgetting curve'

Ebbinghaus' forgetting curve (fig. 1) supports the use of reviewing and revisiting knowledge to support knowledge. If reviewed 3 or 4 times, knowledge is retained much more strongly and can then therefore be utilised to a greater effect. Ebbinghaus hypothesised that time taken to repeat information decreases the effects of the forgetting curve. This is what the curriculum aims to do. As the curriculum is so broad and the lasting effects of partial closure of skills, key skills provides valuable time to build on gained knowledge and increase memory retention.

Furthermore, the OFSTED framework of 2021 states that *‘over the course of study, teaching is designed to help learners to remember in the long term the content they have been taught and to integrate new knowledge into larger concepts’* and that *‘teachers and leaders use assessment well, for example to help learners embed and use knowledge fluently or to check understanding and inform teaching.’* It is clear to see then the benefits of the key skills sessions, if effective, would ‘help learners to remember in the long term’ as well as ensure that teachers use ‘assessment well’.

Research Process

To investigate the effectiveness of the responses to the Covid-19 Pandemic, children’s progress within a maths class of ‘lower attaining’ pupils was measured and observed, as we planned and implemented key skills sessions. To further observe how Covid-19 has affected schools and responses to partial closure of schools, a questionnaire asking teachers about their schools’ responses to lockdown was also created and sent. Teachers were asked to reflect on what their school did to help close the gaps, what issues they faced and what tools they utilised during the March 2020 – July 2020 partial closure. The purpose of the questionnaire was to contextualise the wider national response within the evaluation of the school action research.

A focus group of Year 6 pupils who were working below the expected standard (WTS) were identified for the purpose of the study. Key skills sessions were planned for specific groups based on gaps discovered and noted in lessons and through assessments. For these lessons to be as effective, assessment needed to be accurate. Not only were written assessments important for gap analysis but also the use of mental/oral starters in maths lessons, individual pupil end of year assessment grids and formative assessments supported teacher knowledge. With these in place, the key skills sessions were purposeful and had a clear structure. Sessions were therefore planned with the idea to specifically close identified gaps. For example, if an assessment showed a weakness in measurement for a particular group, then that week the key skills sessions for maths would focus on that weakness to ‘close that gap’.

During the second partial closure from January 2021 to March 2021, lessons were presented on Google Classroom for children to access and key skills lessons continued during this time period.

Findings

When these teachers from other areas of the country were asked about the gaps appearing in their school, the majority of those surveyed noted that writing and reading / phonics had suffered more than maths. All those who participated in the survey identified early intervention in their schools as a whole school strategy were in place. The majority of responses indicated an improvement in gap closure as the result of intervention. Parental engagement was also identified as a common feature of success. One teacher stated that they *‘have had meetings with all parents to discuss each child’s strengths/weaknesses to ensure these can be supported at home too,’* which has resulted in *‘supportive parents’* who *‘are aware of potential struggles their child [may be] encountering.’*

Findings

The results show that during the Autumn term, pupils made progress in their maths results; scores across the 3 papers improved significantly and as a result, their confidence improved during this time, fig 2.

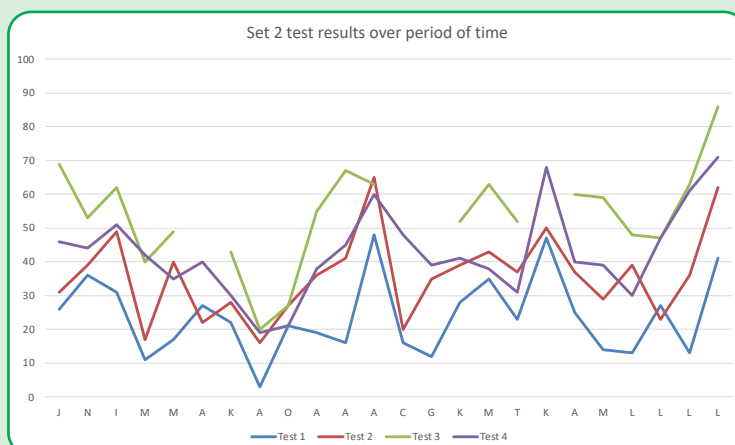


Fig. 2 Set 2 test results over time

From the data gathered during Autumn, there was an upward trend Test 1, 2 and 3 were taken before December (October, November, December) and Test 4 undertaken in May. The improvement in raw score results in the first 3 tests for almost every child, but Test 4 shows a dip. Key skills were still being taught and tailored for specific groups, but as these tests were taken after the partial closure spanning from January to March, it highlights the importance of continued taught provision.

In addition to formal assessments, teacher in lesson assessment noticed that gaps had appeared and meant that lessons were planned to ensure coverage in the curriculum. Further observations of the children during maths lessons also highlighted gaps in learning and these were then planned into key skills sessions which supports the data progression.

Within the WTS group, more of a focus was put on times tables, fluency and arithmetic problems. This has had the desired result as arithmetic scores had improved in not only assessments but also work in their books, with greater confidence and accuracy. This was reflected in pupil interviews carried out by the school. One child, from Set 2 commented on how Key Skills helped support understanding in *'challenging areas in numeracy'* and that *'Key Skills sessions have helped improve on this'*. Additionally, children in a higher attaining group mentioned how *'key skills have enabled me to become more fluent at recalling my times tables'* as well as saying that *'[key skills] are to teach us what we have missed out during school closure.'* This buy in and understanding from the pupils about why the key skills sessions are delivered has also helped their success in closing the gaps but also in helping children understand the importance of their education and importance of being in school.

The Key Skills sessions and their resulting success have brought to light the importance of *targeted* lessons, how to use data to effectively close gaps, how quickly students can learn and implemented learned techniques, the importance of revisiting key concepts and skills and how important and vital it is to know every pupil you teach so that lessons are always appropriately pitched and planned for.

References

- 2021 white paper: The impact of school closures on spring 2021 attainment - May 2021 Katie Blainey, RS Assessment from Hodder Education Timo Hannay, SchoolDash - https://www.risingstars-uk.com/getmedia/8181effc-58ef-48f7-9f78-94186578efa5/The_Impact_Of_School_Closures_May_2021
- England: 'shocking' decline in primary pupils' attainment after lockdown - <https://www.theguardian.com/education/2020/nov/11/england-shocking-decline-in-primary-pupils-attainment-after-lockdown>
- Ofsted reports on the effects of lockdown - <https://dfemedia.blog.gov.uk/2020/11/10/ofsted-reports-on-the-effects-of-lockdown/>
- What is responsive teaching? -: Harry Fletcher-Wood – June 2018 <https://improvingteaching.co.uk/2018/06/03/what-is-responsive-teaching/>
- Education Inspection Framework – April 2021 <https://www.gov.uk/government/publications/education-inspection-framework/education-inspection-framework>
- https://www.researchgate.net/figure/Ebbinghaus-forgetting-curve-and-review-cycle_fig1_324816198
- B Chun and H Heo, 2018, 'The Effect of Flipped Learning on Academic Performance as an Innovative Method for Overcoming Ebbinghaus' Forgetting Curve'