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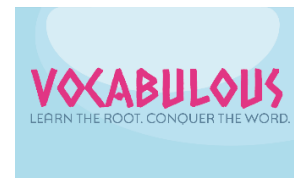
Learn the root.  
Conquer the word.

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Investigating the  
efficacy of *Vocabulous*  
in teaching word roots

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## Abstract

*Vocabulous*, an online learning platform, uses Latin and Greek root words to teach English word patterns. This report reflects the findings of a year-long research trial which investigated the efficacy of this platform in teaching word roots and vocabulary to Year 6 and Year 7 pupils across eleven schools in the north of England. Baseline and terminal assessments, based on a small sample size, suggest that *Vocabulous* can support children to improve their recognition of word roots and to apply this knowledge to understand and use a range of new English vocabulary.

## About the authors

**Professor Arlene Holmes-Henderson MBE** is a Senior Research Fellow in Classics Education at Christ Church. Her research explores the learning and teaching of literacy, oracy and critical skills in schools and communities. She advises governments, parliaments and assessment organisations in the UK and internationally.

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## Introduction

*Vocabulous* teaches 26 roots and over 1,000 English words via 36 ready-to-use lessons. Launched in 2021, the website was used by primary and secondary schools during a pilot period and this research trial took place with eleven schools during the academic year 2022/23. The trial was led by Principal Investigator Professor Arlene Holmes-Henderson and Katrina Kelly and was funded by the Christ Church College Research Centre at the University of Oxford.

*Vocabulous* won the Let Teachers SHINE Competition in 2021 and has since been funded by the SHINE Trust. SHINE is an education charity which works with teachers, schools, and other organisations, helping disadvantaged children in the North of England. The schools which were approached to participate in this research trial were therefore all located in the North of England and had above-average percentages of disadvantaged students (as reflected by the number of students eligible for the Pupil Premium<sup>1</sup>).

This report brings together analysis of quantitative (survey responses, school contextual information, test results) and qualitative (text responses, in person and online feedback sessions) data and presents novel findings.<sup>2</sup>

## What is *Vocabulous*?

*Vocabulous* is an educational online platform designed to be used by students learning English Tier 2 and 3 vocabulary; this ordinarily takes place in Key Stages 2 and 3, for students between the ages of 7 and 14 years old. *Vocabulous* is predominantly used by students aged 10 to 13, across Years 6, 7 and 8 of the English education system.

*Vocabulous* was created by Lucy Huelin, who is a trained classicist and chartered accountant and a former Latin and Classics teacher. Lucy had witnessed students in the classroom giving up when faced with working out the meaning of a new word and she sought to devise an engaging way of providing students with explicit training in exactly how they can work out unfamiliar vocabulary, using their pre-existing knowledge of word parts, such as roots or prefixes.

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<sup>1</sup> Pupil Premium is government funding provided to state-maintained schools with children who fall into one or more of the following categories: pupils who are recorded as eligible for free school meals, or have been recorded as eligible in the past 6 years, including eligible children of families who have no recourse to public funds; children looked after by local authorities; children previously looked after by a local authority or other state care.

<sup>2</sup> For details of the project's ethical approval, please contact Professor Holmes-Henderson at [arlene.holmes-henderson@classics.ox.ac.uk](mailto:arlene.holmes-henderson@classics.ox.ac.uk).

Rather than teaching lists of words in isolation, *Vocabulous* illuminates the connections that exist in English vocabulary, especially the Latin and Greek root patterns, and shows students that by developing problem-solving skills and spotting these connections, they can work out complex words in any subject area. To devise the programme, Lucy consulted the SUBTLEX-UK database, which analyses English word frequency by looking at subtitles on UK television and produces a list of around 330,000 words in order of their frequency on television. Lucy identified where the derivatives from 26 chosen roots were placed on the list and gave a score as to how frequently derivatives from each of the roots were used. 'Port', meaning 'carry', came up as the most commonly used root, with the word 'important' being the most frequently used derivative on the list. 'Monolithic' was the least commonly used word, from the prefix 'mono' meaning 'one', so 'mono' is the final item to be taught on *Vocabulous*.

*Vocabulous* can be used at home or in the classroom via its supporting resources and its 36 lessons can be split across one academic year (weekly use) or two years (fortnightly use). Users are not encouraged to use *Vocabulous* in any particular way, except to unlock one root at a time, rather than unlocking whole levels at once, so that teachers can pace student progression. This is also to aid memory and retention, as the design of the programme revisits previously-learnt roots, and enables spaced repetition. Many schools undertake a 14-day trial to look around the site and determine how it would work best for them and their students. Generally, most Year 7 (secondary) classes complete the "Learn" section to learn each new root on the board in class, and then complete the quizzes on devices at home, whereas most Year 6 (primary) classes complete the entire content in-class. A popular schedule for using *Vocabulous*, particularly in primary schools, is three ten-minute slots ('Learn' on a Monday, 'Quiz' on a Wednesday and 'Revise' on a Friday).

## Teaching and learning methods

*Vocabulous* can be used by any teacher as part of English/Literacy lessons, and no prior knowledge of Latin or Ancient Greek is required for either teacher or pupil. Many aspects of the online user experience are 'gamified' to encourage student participation and increase engagement throughout the course. Roots are split into ten different levels, which are named after Olympian Gods. Teachers and students access a video teaching each new root, and then videos explaining how eight English derivatives come from that root. Each video shows

the root, prefixes and suffixes, explains the definition and supports with an image to help students retain the information.

Each level contains two or three Latin and Greek roots and, after completing the learning module, students compete to win badges by working through six quizzes which focus on different elements of vocabulary acquisition to consolidate all their previously learned roots. There are 12 quiz types, all based on vocabulary acquisition research. Students practise different skills, such as breaking down a word into its morphemes, applying root knowledge to a new word and working out which word is appropriate in context. There is a class leader board, and students can compete with their peers to win stars and “become *Vocabulous*”. Teachers can view students’ scores, how long quizzes are taking them, their progress over time and completion rates, and can generate data reports. Pupils can view their own progress and the roots that teachers have unlocked.

## The research trial

In the academic year 2022/23, eleven schools participated in a research trial which sought to explore and evaluate the effectiveness of *Vocabulous* in teaching word roots and vocabulary at the transition from Key Stage 2 to Key Stage 3. This was measured by pupils taking a baseline test at the beginning of their *Vocabulous* use (in September-October); then using the website for a period of 7–10 months; before taking a final assessment with similar but not identical questions in the following July.

## Methodology

The questions of the baseline and final assessments were carefully designed to track progress between the two tests and to map onto an element of England’s KS2/3 national curricula i.e., explicit knowledge of etymology (language families) or morphology (derivational and inflectional affixes). Both assessments consisted of 30 multiple-choice questions, split into three difficulty sections: easy, medium and hard.

In each section, students were asked 10 questions from a total of 15 possible question types, each assessing different components of vocabulary knowledge or decoding skills. Students were asked to recall the meaning of a root, such as ‘duc’ or ‘scrip’ (What does the root ‘scrip’ mean?). Some questions focused on root application, so students were given the meaning of a root and asked to identify the meaning of one of its derivatives, or were asked to define a word containing a familiar root, but without being reminded of the root’s



meaning (If the root 'chron' means 'time', then what do you think 'anachronistic' means? What does the word 'interject' mean?). One question required students to apply the meaning of a made-up root to a derivative, which is purely testing the application of a root rather than any specific knowledge (If the made-up root 'saf' means 'eat', then what would the made-up word 'insafable' mean?).

Students were also required to demonstrate morphological awareness and the ability to break down words into their constituent parts, by identifying the root in a word or identifying words that derive from a particular root ('Which root does this word come from: "compose"?'; 'Which of the following words come from the root "spec"?'). Knowledge of and ability to apply affixes was also tested; students were asked to identify the meaning of a word, given another word which shares the same prefix, or they were given a word and asked to identify the meaning of this word when a prefix had been added ('If "antisocial" means "the opposite of being social", then what does "antithesis" mean?'; 'If "biography" means "a written history of someone's life", then what does "autobiography" mean?'). As well as testing knowledge of roots and their derivatives' meaning, students were asked to apply this knowledge in scenarios, whether in true/false questions, or when asked which answer the derivative related to ('True or False: Antiseptic cream should be put on cuts to stop them getting infected?'; 'Which of these is not a form of transport?'). Finally, some questions required students to identify the most appropriate root or derivative to fill the blank in a sentence, using the context of the rest of the sentence to select the correct option ('The alarm went on for fifteen minutes before it was finally de...tivated').

Alongside exploring word knowledge development, the evaluative assessments captured information about pupils' wider literacy (e.g. languages spoken, reading enjoyment/habits), as well as their attitudes towards the programme and measured self-reported confidence levels in decoding unfamiliar vocabulary.

## Participants

Six primary schools and five secondary schools from across the North of England participated in the research study. The schools were approached based on their geographical location – with a focus on engaging schools in areas of socio-economic deprivation – and their percentage of pupils qualifying for Pupil Premium.

These eleven schools responded positively to an approach to take part and there were therefore six groups of Year 6 pupils and five

groups of Year 7 pupils who participated, totalling more than 1,400 pupils and more than twenty teachers. The research trial originally included a further two secondary schools and one primary school, all three of which became unable to proceed with the trial due to staffing issues.

<b>School</b>	<b>Percentage of Pupil Premium students<sup>3</sup></b>
<b>Primary A</b>	29.1
<b>Primary B</b>	56.2
<b>Primary C</b>	46.9
<b>Primary D</b>	50.7
<b>Primary E</b>	52.5
<b>Primary F</b>	30.4
<b>Secondary G</b>	28
<b>Secondary H</b>	23.4
<b>Secondary I</b>	22.9
<b>Secondary J</b>	21.6
<b>Secondary K</b>	67.3

These figures only capture the school-wide pupil premium percentage of the groups and so do not directly align with the pupils involved in the trial: due to data permissions, we do not hold individual data about each student who participated in the trial so we cannot compare results at the micro (pupil) level but only at the macro (school) level.

## **Approaches to teaching and learning using *Vocabulous***

Trial schools were not advised to use *Vocabulous* in any particular way since a key part of the platform is its versatility for student/teacher use and each school context varied. Students therefore used *Vocabulous* differently across the trial schools. This variety means it is difficult to make direct comparisons in teaching methods and knowledge acquisition, based on the test results. It does, however, provide evidence bank that *Vocabulous* can be used flexibly by teachers to suit their own and pupil needs.

Many students used the website in the classroom: some by watching each 'learn' video as a whole class; others by using individual devices to learn and test themselves at their own pace; others by teacher-led learning or daily/weekly 'root of the week' approaches. Some schools

<sup>3</sup> The percentage of pupils in receipt of free school meals in state-funded primary schools in 2022/23 across England was 24.0; in secondary state-funded schools, it was 22.7.

had enough technology to enable each pupil to have their own device during lessons, as witnessed during a visit by the research team to Primary A where *Vocabulous* was used as a classroom task before the start of the day's lessons. Some schools required sharing devices or a hybrid approach in which the 'learn' section was worked through on the board as a whole-class activity, and then students completed quizzes independently at home; others could only use *Vocabulous* during designated 'IT' lessons (for example, Primary D) rather than more flexible use within the main classroom.

Some students were also set online tasks on *Vocabulous* outside of the classroom; for many students, such as those in Secondary G and Secondary H, they only used *Vocabulous* at home. Whilst a common barrier for students studying at home is that English may not be the primary language spoken, *Vocabulous* does not require parental support and therefore gives pupils' independence to study at home. This allowed pupils to engage in their own time and meant they could make swift progress if levels were unlocked for them. Not all pupils, however, could access the appropriate technology at home, so this is an important consideration for teachers when deciding how to use the platform. As one Secondary H teacher explained: 'we set *Vocabulous* as homework every two weeks to expand their learning... there would be more impact if we did stuff within class to enhance it – that's been the issue – and we could have made more of it if we had picked up more in class e.g. done a starter activity to link it in the lesson on that week's homework'. In order to retain control over class progression, 'we only unlock some units at a time, some of them sometimes want more but otherwise we would have no homework for the year so we have to proceed slowly'. Secondary K also set *Vocabulous* solely as homework.

From a questionnaire completed by 14 of the trial school teachers, it became clear that most of those students who used devices in class, completed the 'learn section' together, with only some doing this individually in the classroom. Primary C spent less than 30 minutes per fortnight using *Vocabulous*; Primary E spent the longest time: 2–3 times a week with an average of more than 30 minutes per week, including use in class and at home. Primary F reported that even though pupils 'know they can access it at home, not many of them choose to'.

Whilst all eleven schools undertook the baseline assessment during the autumn term, staff shortages and handovers, internal pressures, and technical difficulties within IT/HR departments meant that in some schools there were delays with enrolling pupils on *Vocabulous*



and setting up their planned learning programme.<sup>4</sup> The following table captures the number of pupils who were using the site on 13 January 2023, at the start of term two, and the progress level the classes had reached as a whole (some pupils were at very different points, in some cases, as can be seen<sup>5</sup>), compared to 8 March, which captures the rate of progress over a six week period, including a week of half term.

School	Progress levels: 13 January	Progress levels: 8 March
Primary A	1–5	1–5 (mostly level 4)
Primary B	5	6 (mixture of levels 1–6)
Primary C	1–5 (1 pupil on level 6)	1–8
Primary D	1 (class 1) and 5 (class 2)	1–3, and 6
Primary E	6	1–8 (mixture)
Primary F	4	5
Secondary G	4	6
Secondary H	7	8
Secondary I	Not started	1–2
Secondary J	4–5	1–5 (mixture)
Secondary K	1	1–2

This data shows which classes adopted the "unlock one root at a time" approach (e.g. primary F, secondary G, secondary H) as their students were all on the same level at the same time. This is the recommended approach, as it enables classroom discussion of a particular root, rather than students all being at different stages.

By May, Secondary H had 163 students using the platform, of whom 58 had reached level 10, but 17 hadn't started at all.

## Quantitative data

The baseline assessment, a 30-mark multiple-choice test, with some introductory checkbox and free text box questions, was open for responses during September and October 2022. 874 responses were

<sup>4</sup> For example, students struggled to log in using their own long email addresses (too many typographical errors) so students are now given a nine digit username and teachers set/reset student passwords so they have great control. No further issues have been reported.

<sup>5</sup> This can particularly be seen where classes within a year group start at different times, for example, secondary J had a new class start between those two dates, which explains why some of the cohort were at levels lower than 4.



received. The final assessment, a similar 30-mark multiple-choice test, with three additional 'yes/no' questions, was open for responses during July 2023. Only 627 responses were received and secondary school I, which had participated in the trial, failed to return any responses. These response rates reflect the competing demands on teachers and the challenges of conducting research in busy educational environments.

After the removal of some anomalous or duplicate responses, the full response count was as follows.

### Primary

School	Baseline	Final
<b>A</b>	68	82
<b>B</b>	69	33
<b>C</b>	48	40
<b>D</b>	54	26
<b>E</b>	53	58
<b>F</b>	26	24

### Secondary

School	Baseline	Final
<b>G</b>	242	211
<b>H</b>	28	121
<b>I</b>	46	0
<b>J</b>	133	5
<b>K</b>	85	12

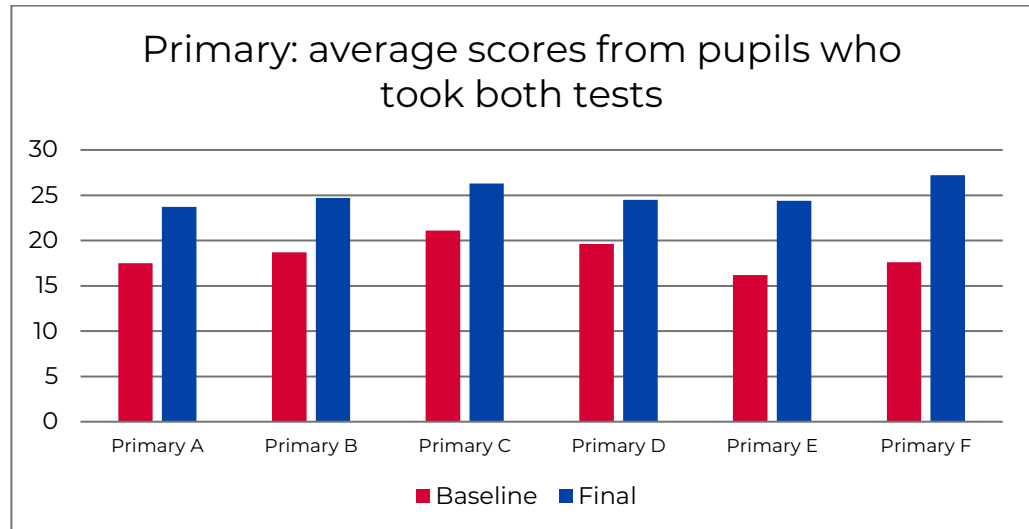
Pupil information was only taken at the baseline assessment stage. There was a near even split between male and female respondents, with a small percentage identifying as non-binary or preferring not to state their gender. Approximately 17% of takers of the baseline assessment had English as an additional, rather than their first, language. The most common non-English first language was Urdu, followed by Polish, Spanish and Italian. Almost three quarters of takers of the baseline test stated that they read outside of school either 'sometimes' or 'quite often'; 72 out of 874 (8%) 'never read outside of school'.

## Average test scores

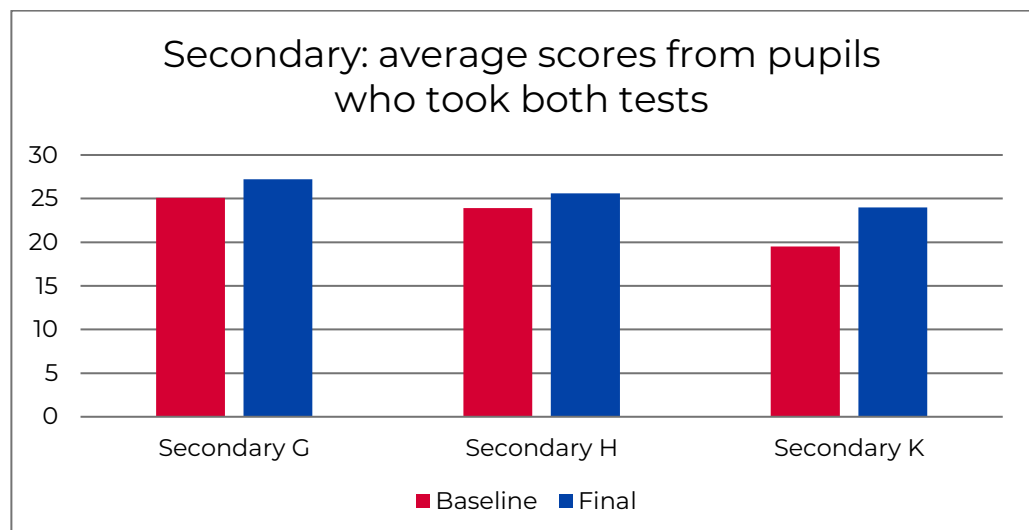
For those pupils who took **both** tests and for whom we therefore have the best comparative data, there was clear improvement in students' recognition of word roots and ability to apply this knowledge to understand and use a range of new English vocabulary.



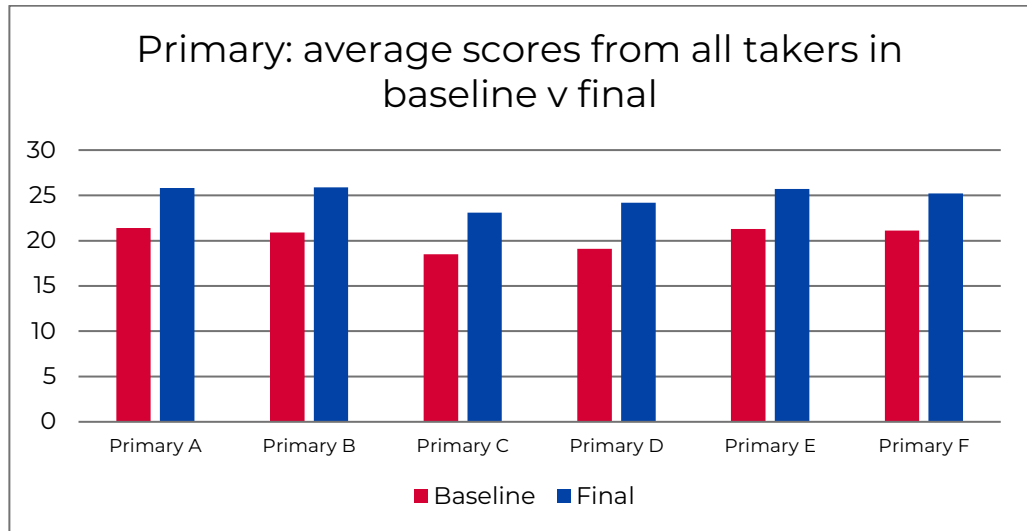
The number of primary pupils who took both tests were: Primary A (32), Primary B (20), Primary C (12), Primary D (10), Primary E (30), Primary F (22) and the average scores showed a progression of 6.2, 6, 5.25, 4.9, 8.2, and 9.6 (a range of 16%–32%).



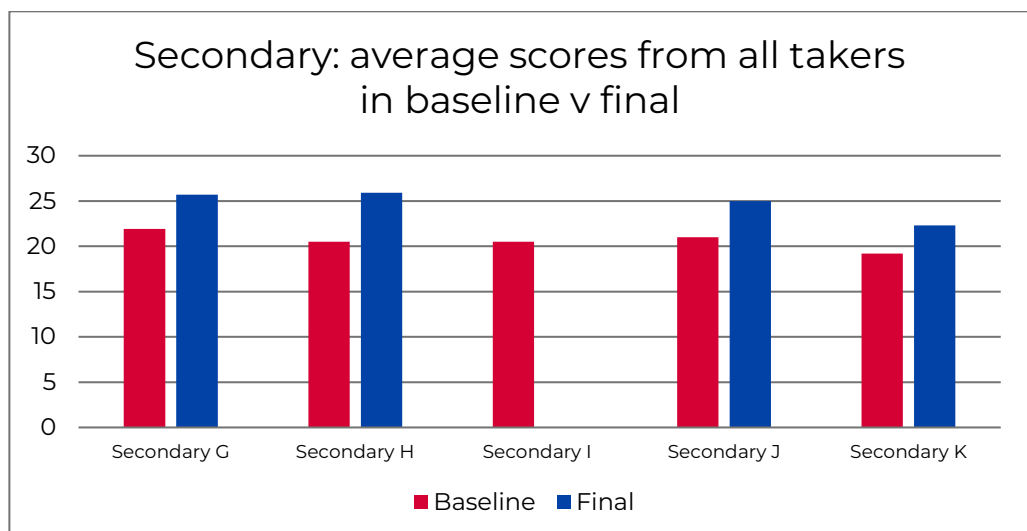
The number of secondary pupils across the three schools with a large enough sample size who took both tests were: Secondary G (89), Secondary H (17), and Secondary K (6). Their results were as follows, with the average scores showing a progression of 2.1, 1.7 and 4.5 (6%–15%), but it must be noted that the baseline scores for Secondary G and H were already very high at 25 and 24 out of 30.



This can be compared with all takers, across the six primary schools, whose average scores from both the baseline and final test responses showed a significant 4–5 mark (16%) improvement.



Similarly, across the five secondary schools in the trial, the data was as follows, showing a 3–5 mark (13%) improvement in those schools which partook in both assessments.

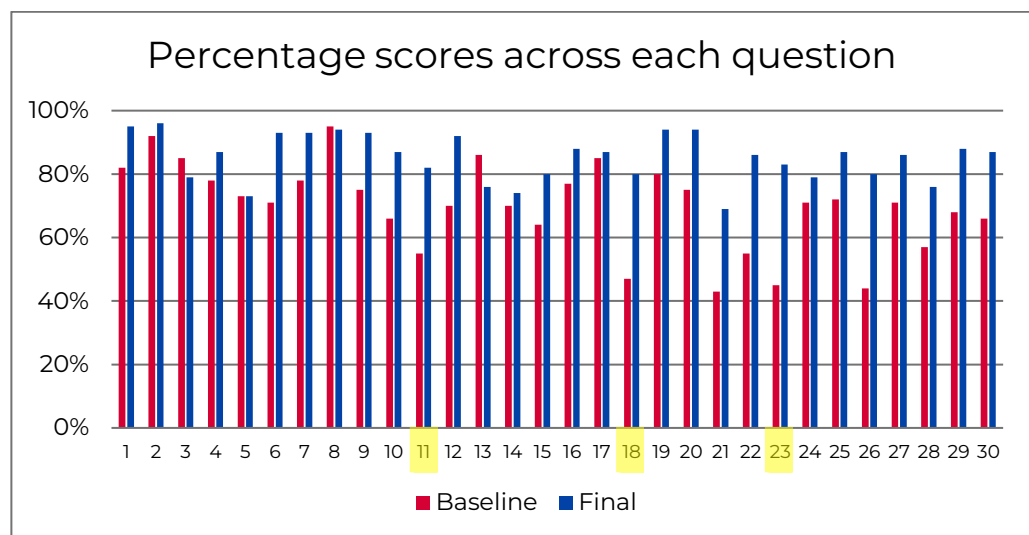


Pupils taking the tests had experienced different amounts of time using *Vocabulous*, and in different settings (classroom/home), and had reached different stages prior to taking the final test. Not every respondent, therefore, was taking the test after having undertaken the same amount of ‘teaching’ or ‘learning’; some had only begun using *Vocabulous* in May whilst others had begun in September. Some pupils were reported as having completed the entire programme before the end of the second term, whilst others had only encountered a few word roots by this stage.

However, it is clear from the data presented above that a positive trend can be seen across all groups. In each primary school where both tests were taken, there was an average point improvement of at least 4.9 (16%), with a particularly significant improvement seen at Primary F where there was an average score improvement of 9.6

(32%) amongst the 22 pupils (out of a maximum of 26 pupils in the class, so therefore a good representative sample size) who took both tests. It is interesting to note that Primary F had embedded *Vocabulous* into their classroom dialogue, with the 'root of the week' posters displayed on the wall and frequent references back to previous weeks' roots.

The greatest improvements in the responses to the same types of questions across the two tests were question 11 ('what does this root mean', 'chron' c.f. 'vis' ), question 18 ('which word in this sentence means...' – a pick word to match definition type of question) and question 23 ('choose the correct root to complete this sentence' therefore capturing learning around the correct word parts needed to express meaning in a sentence).



## Feedback from teachers and learners

At the end of the first term of using *Vocabulous*, students were asked to give their feedback via a Microsoft Form, from which it became clear that *Vocabulous* was having a positive impact upon their learning and their enjoyment of their English/Literacy lessons. Acquiescence bias, whereby (in this case, young) students respond affirmatively to research questions because they want to please their teacher, may have played some part in this. These findings were, however, corroborated by in-person focus groups hosted by the research team.

From Primary D respondents, 100% stated that the website had been helping them learn new words (either 'definitely' or 'a bit') and that they either 'really' or 'quite' like using it. 99% agreed in both regards at Primary B; 95% of respondents from Primary C agreed that it was helping their learning, as did 98% at Primary E; Secondary K had 100%



positive feedback and all respondents from Secondary H agreed that *Vocabulous* was benefitting them. From a much larger pool of respondents (212), 42% (89) Secondary G students thought it was 'definitely helping me', 50% (105) that it was helping 'a bit' and 9% (18) responded negatively.

By the end of the year, when all respondents to the final test were asked 'Has *Vocabulous* helped you to build your vocabulary?', 76% (474 respondents) answered 'yes'. In response to the question 'Has *Vocabulous* increased your confidence when you meet new words?', 65% (406) said that it had. However, teachers responding both in written feedback and in-person focus groups particularly commented upon their students' enjoyment of the learning experience and the newfound confidence it had afforded them: 'the children have really enjoyed it and they like the competition aspect and the leader board and (like us) to see what they've done'; 'it has built up students' resilience and they are more willing to have a go at breaking words down and thinking about where they came from and working out prefixes and little triggers to say "oh we saw that in *Vocabulous*" (Secondary H).

Whilst individual pupil SEND data was not available to the researchers, teachers reported that their classes included a range of pupils with different educational needs but that the 'learn' sections were 'bite-sized and manageable pieces, small enough for them to manage if they have processing needs' (Secondary H) and that parental feedback had been positive.

The authors conducted lesson observations, focus groups and interviews in-person at Primary A where 90 pupils across three classes, all with a very high EAL percentage, used *Vocabulous* across the trial year. All students have their own device to use in class (it is not set it as homework because all pupils do not have access at home) and teachers match *Vocabulous* to their 'speed words of the week' and their Literacy Working Wall, so it is part of a wider commitment to vocabulary learning, phonics and their reading programme. The headteacher, when discussing the high level of disadvantage faced by the majority of pupils at her school, said that using *Vocabulous* has 'given them strategies to cope with the challenges they face' outside of the classroom; she drew the connection between *Vocabulous* use and recent spelling scores which were 'the highest they've ever been'.

Year 5 students took part in focus groups with researchers and in response to being asked if they had noticed a difference in their learning and understanding since using *Vocabulous*, they all responded positively, commenting upon the engaging, competitive



and motivating aspects of the website and how their confidence has grown in reading and writing, in class, in tests and in their life outside of school: 'it helps because if you're doing guided reading, you maybe don't know the word, but you can work it out'; '*Vocabulous* tells you the meaning and you can write the word in your stories'; 'it teaches me about new words and then I read *Harry Potter*, for example, and new words I can just tell by looking at them'.

Whilst the baseline and final assessments did not particularly focus upon the reading abilities required to use, or indeed gained via use of, *Vocabulous*, this was noted by both students and teachers. At Primary A, one teacher commented that 'pupils do need to be of a certain reading age (around Key Stage 2) to access *Vocabulous* and to work independently on it. We have turned off the video sound so that they can watch them with subtitles in class (this means more reading!), we then introduce a word with the whole class, which some then re-watch to scaffold and support their learning.'

Students clearly enjoyed using *Vocabulous* and commented particularly on the competitive element of the quizzes, stars acquisition and class leader boards ('it makes me play more and learn more words'). Half of the focus group talked about how much they enjoy learning about the gods and goddesses, and one pupil then pointed to all the images and started explaining the name and function of each ancient deity. A popular request when asked what else they would like to feature in *Vocabulous* was 'battles' (a reference to functionality which exists in a popular online times-table learning platform), alongside more characters, more badges and more leader boards (i.e. by year as well as by class). Teachers noted that some pupils can rush the quizzes in their competitive haste and press randomly on multiple choice answers so learning isn't always as 'deep' as the results may show but they would like to be able to add their own words (from Year 5/6 vocabulary lists) and to focus on the application of prefixes.<sup>6</sup>

## Conclusion

The qualitative feedback received during the course of the Research Trial was positive. As one teacher commented, it is 'absolutely fantastic for disadvantaged pupils to do in school' and can increase 'their vocabulary to another level to what's spoken at home'. This trial was conducted during a phase where access to the platform was free

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<sup>6</sup> This has since been added, as each end-of-level badge revision section brings together previously-learnt roots by prefix pattern.

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for all schools and it will be interesting to analyse its use and popularity when it is paid for out of schools' budgets.<sup>7</sup>

The quantitative data from the two assessments indicates an encouraging upward trend in pupils' ability to recognise and use new vocabulary but a larger sample size is required to make definitive claims. It would be useful for further studies to compare results in geographical locations beyond the North of England and to be able to gather student data so that results could be filtered by categories such as EAL, SEND, PP and gender.

Future research may also have to contend with the difficulty of measuring impact when teachers and students use the platform very differently across schools. To create a more reliable dataset, a larger study would need to prescribe the pedagogical approach(es) and time allocated to the resource to ensure consistency across learning environments. Those schools which used the platform the most consistently throughout the research trial appeared to show the greatest improvement in average test scores (i.e. Primary F) and pupils gained confidence in working out unfamiliar words.

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<sup>7</sup> Classics for All is offering funding to state schools for their first year of using *Vocabulous*, so this is an option if schools are struggling to find sufficient resources.



