



Tutorfair Foundation On-demand Tutoring Evaluation

Impact Report December 2018

TSIP

The Social Innovation Partnership

EXECUTIVE SUMMARY

One-to-one tutoring can make a big difference to students' outlook and academic progress. Being able to get focused support can help students to look at problems in new ways, discover hidden talents, and become more confident in their own abilities. The added benefits of having a tutor are visible in students' results. Having a one-to-one tutor has been shown to help students make five additional months' progress, on average.¹ Support from a tutor can give students a leg up. What about those who are left behind?

Educational inequality is a serious issue in the UK. Students receiving free school meals (a common measure of deprivation) are only about half as likely to attend a school judged 'Good' or 'Outstanding', and much less likely to achieve 5 A*-C GCSE results compared to students overall.² Globally, the UK ranks 16th among rich countries for educational equality.³

The average cost of private tutoring is about £20 per hour around the UK. To pay for one hour of tutoring per week would cost a family £1,040 over the course of a year. For families whose children qualify for free school meals, this represents 14% of net income.⁴ The high cost of private tutoring puts it firmly out of reach for students from poorer backgrounds, reinforcing existing educational inequalities.

While there are organisations offering free or low-cost alternatives aimed at increasing access, these services tend to be concentrated in big cities where skilled volunteers are plentiful. There is a shortage of affordable tutoring options, especially for students living in rural areas.

To tackle this inequality the Tutorfair Foundation has developed an on-demand app, offering one-to-one maths tuition to students from disadvantaged areas through an instant messaging platform. The app was piloted in four schools over the 2017-18 academic year, beginning in September 2017, and has since been rolled out to other schools across the country.

This report presents the findings from this pilot, based on an evaluation by The Social Innovation Partnership (TSIP).

App users

Across the four pilot schools, 440 students were given access to the app and 54 of them have made use it, completing 153 tutoring sessions between them. During the pilot year, another 21 schools were enrolled, giving access to a further 2,997 students. 115 of these students completed at least one session and in total this group completed 282 sessions.

Analysis of app users found that those who use the app are mainly female (>70%) and have medium to high maths ability (over 90% of users were graded 4 or more in their GCSE's, compared to 60% of those that didn't register).

App impact

Tutorfair anticipated that the app would lead to improved attainment in maths, improved access to tuition, improved attitudes towards maths and receipt of high-quality tuition.

¹ <https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/one-to-one-tuition/>

² <https://www.teachfirst.org.uk/our-mission/the-issue>

³ https://www.unicef-irc.org/publications/pdf/an-unfair-start-inequality-children-education_37049-RC15-EN-WEB.pdf

⁴ <https://www.tes.com/news/government-sets-ps7400-annual-income-threshold-free-school-meals>

Attainment: The difference between actual and predicted grades was 0.35 grades higher for regular app users compared to non-users. On average, non-users' final GCSE Maths results were 0.62 grade points below their teacher prediction, while regular app users achieved only 0.27 grade points below their teacher predictions. These results are encouraging, although it is hard to say whether they are representative given the small number of regular users over the course of the pilot.

Access: This app gives access to tutoring, to those who might otherwise not be able to obtain it. Without this app 65% of app users at pilot schools and 90% at the other schools wouldn't have a tutor, based on the baseline survey.

Attitudes: The shortened Attitudes Towards Maths Inventory (sATMI) was used to measure attitudes towards maths. Students scored 3.9 for how much they value maths, 3.2 for how much they enjoy maths and 3.5 for how confident they feel with maths, all out of five. There was no significant change in attitudes amongst regular users of the app, indicating that five sessions isn't enough to impact attitudes to maths.

Quality of tuition: was found to be good through an internal assessment by the Tutorfair Foundation, with most transcripts scoring Good or Excellent against 10 competency areas. Tutors scored an average of 4.1 out of 5 in a maths tutoring self-efficacy survey, indicating a high level of confidence in their tutoring ability after receiving training from Tutorfair.

Feedback from students and teachers

Students completed a post session satisfaction survey, scoring the app 3.9 out of 5 stars on average.

The post tutoring survey found that most students felt the app was fit for purpose, with 77% of students responding that the tutor had helped them answer their question. 78% of these students selected the response: "The tutor explained it well and now I think I can do it".

Feedback from interviews with two class teachers whose students are enrolled with the app suggests that they are very enthusiastic about the app and believe it has a lot of potential to offer the personal attention and instant feedback that can't always be offered in class. They feel that the app offers a useful alternative environment, where students can ask 'stupid questions' using an instant messaging platform, which mirrors the way in which students are used to communicating with their friends. Tutors were also excited about the app, what it offers students and noted its impact on improving their own tutoring skills.

RECOMMENDATIONS

Based on this evaluation we have made some recommendations for next steps for Tutorfair to take in continuing to improve and develop this programme and demonstrate its impact. The recommendations are developed in more detail at the end of the report, in summary we would recommend:

Increase engagement and encourage repeat usage

Engagement has been a difficult challenge, and the impact of this initiative is most likely to be felt by those that use the app often. We believe that the Foundation can reach the 176 regular users required to demonstrate significant impact by working closely with 22 schools and ensuring every GCSE student registers and uses the app once. We have set out several strategies to increase engagement and repeat usage below, including:

- Run demonstrations and live sessions
- Develop teacher relationships and engage teachers as promoters
- Trial the app at youth clubs and after school clubs
- Promote the app to parents
- Create a points system to incentivise repeat usage

Target those that need it most

There is a disparity between levels of access to tutoring. The app is likely to have the biggest impact in those areas where tutoring isn't otherwise widely available, away from cities and university towns. We would recommend identifying and engaging suitable schools in rural areas for the next phase of the programme roll out.

Gather more feedback from users

More could be done to understand user perspectives. We would recommend making a small change to the post-session survey through an open text box which will give more space for comments from users to explain what they like and don't like about the app, what would make them use it more often and will lead to better product and service as the programme continues to scale.

TABLE OF CONTENTS

Executive Summary.....	1
Recommendations	3
Table of Contents.....	4
1. Introduction.....	5
Background	5
About the Tutorfair Foundation.....	6
About TSIP	6
About this report	6
2. The Pilot.....	7
Objectives.....	7
Delivery.....	7
Users.....	9
3. Evaluation Methodology	10
Evaluation design.....	10
Improved attainment in GCSE maths.....	11
Improved access to GCSE maths tuition.....	11
Improved enjoyment and confidence.....	11
Receipt of high-quality tuition	11
Methodological limitations.....	12
Data Cleaning.....	13
4. Findings.....	13
Objectives.....	13
Improved attainment in GCSE maths.....	13
Improved access to GCSE maths tuition.....	14
Improved enjoyment and confidence.....	15
Receipt of high-quality tuition	16
Experience of the app and broader impact.....	18
5. Recommendations	20
Increasing engagement and repeat usage	20
Targeting those in need.....	22
Improving feedback	23
Appendix.....	24
Survey details.....	24
Registration survey	24
Baseline survey.....	24
Student feedback questions	24
Tutor observation framework.....	25
Tutor self-efficacy survey.....	25
Theory of Change.....	26

1. INTRODUCTION

BACKGROUND

Tutoring has become a key part of the education of young people in Britain today. One-to-one and small group tuition can have a transformative effect on a student's attainment; on average having a one-to-one tutor has been shown to help students make five additional months' progress.⁵

Organisations such as Tutorfair have become a key tool for providing one-to-one tuition to pupils in London and beyond. A 2016 report by the Sutton Trust found that thirty percent of students aged 11-16 have had tutoring.⁶ In London, 44% of students will have received additional tuition by the time they are 16, with the chances of receiving tuition increasing with parental income.⁷

However, one-to-one tuition is traditionally only available to those from richer parts of society, able to afford the additional cost. If tuition can have a significant impact on outcomes and provision is biased toward higher-income households, there is a real danger that the tutoring industry will only widen the gap in educational outcomes, leaving those unable to pay priced-out of already competitive selection processes.

The average cost of private tutoring is about £20 per hour around the UK. To pay for one hour of tutoring per week would cost a family £1,040 over the course of a year. For families whose children qualify for free school meals, this represents 14% of net income.⁸ The high cost of private tutoring puts it firmly out of reach for students from poorer backgrounds, reinforcing existing educational inequalities. While it makes sense for those who can afford tuition to pay for it, it is not fair for those who can't pay to go without. Educational inequality is a serious issue in the UK. Students receiving free school meals (a common measure of deprivation) are only about half as likely to attend a school judged 'Good' or 'Outstanding', and much less likely to achieve 5 A*-C GCSE results compared to students overall.⁹ Globally, the UK ranks 16th among rich countries for educational equality.¹⁰

Tutorfair, through the Tutorfair Foundation (the Foundation), seeks to tackle this inequality, delivering high-quality tutoring for free to those that need it most. Although, there are currently several initiatives aiming to provide volunteer-led tutoring to pupils from disadvantaged backgrounds, these initiatives tend to serve parts of the country with a plentiful supply of skilled volunteers such as urban areas with a large university student population. Nesta and the Office of Civil Society have identified a need for tutoring models which can provide tuition in geographical areas where there is not a ready supply of skilled volunteers, including rural and semi-rural areas as well as coastal towns.

The Tutorfair Foundation has a growing network of volunteer tutors, however their current in-school volunteer programme is not available to many tutors, especially to those based outside London. To volunteer in school, tutors must commit to a minimum of 10 hours of tutoring at the same time on a

⁵ <https://educationendowmentfoundation.org.uk/evidence-summaries/teaching-learning-toolkit/one-to-one-tuition/>

⁶ John Jerrim, Extra Time, Private tuition and out-of-school study, new international evidence, Sutton Trust, 2017, <https://www.suttontrust.com/research-paper/extra-time-private-tuition/>

⁷ For more about the relationship between private tutoring and social mobility in the UK see: Philip Kirby, Shadow Schooling: Private tuition and social mobility in the UK, 2016, available at www.suttontrust.com/wp-content/uploads/2016/09/Shadow-Schooling-formatted-report_FINAL.pdf

⁸ <https://www.tes.com/news/government-sets-ps7400-annual-income-threshold-free-school-meals>

⁹ <https://www.teachfirst.org.uk/our-mission/the-issue>

¹⁰ https://www.unicef-irc.org/publications/pdf/an-unfair-start-inequality-children-education_37049-RC15-EN-WEB.pdf

weekly basis. The rigidity of the timetable makes it challenging for potential volunteers who are only able to help outside of classroom hours. Furthermore, the volunteering programme is highly variable by school and measuring the impact of 10 hours of tutoring over the course of the academic year is not feasible.

Responding to these needs the Foundation team built, from scratch, an instant messaging app which offers more flexibility for both students and tutors. The Tutorfair On-Demand app (the app) increases access to high-quality tuition by enabling tutoring to be delivered remotely – reaching students in areas where volunteers are not. The ground-breaking app enables live one-to-one tuition through the platform, using pictures and text, to anyone with a computer or a smartphone.

Nesta and the Office for Civil Society, through their Click Connect Learn fund for innovative programmes providing online tutoring to disadvantaged students, has supported a pilot of the app. The pilot launched in four schools over the 2017-18 academic year, beginning in September 2017, and has since been rolled out to other schools across the country.

ABOUT THE TUTORFAIR FOUNDATION

The Tutorfair Foundation is the charitable arm of Tutorfair, London's leading tutoring marketplace. The Foundation aims to make quality tuition available to as many students as possible. The Foundation's main service is providing in person tutoring for students who might otherwise be unable to access great tutors. The Foundation works with schools with low income catchment areas and an inspiring vision. Class teachers select the students they believe will benefit most and tutors go into the schools to help those pupils.

Tutoring is provided by a growing team of volunteers, fully trained by Tutorfair, who generously give their time to help students reach their full potential. Tutorfair's on-demand tutoring app builds on the systems and experience they've developed through their in-person work.

ABOUT TSIP

TSIP is a dynamic social consultancy, innovating for public good. TSIP acts as a trusted advisor to government, foundations and charities working with civil society.

We support our clients in their work to tackle some of society's biggest challenges, tailoring our support to each project and drawing on expertise in interdisciplinary research, strategy consulting, civic engagement, social impact evaluation and civic technology. TSIP takes a proactive and citizen-centred design approach, driving cross-sector engagement to deliver transformational change and enable our clients to secure economic and social value.

ABOUT THIS REPORT

The Social Innovation Partnership (TSIP) was commissioned by Tutorfair to evaluate the pilot programme. This report covers the period from the first academic year of the pilot, from its launch in September 2017 until the end of the July 2018, looking at the impact of the app and lessons learned to date. This report builds on an interim report completed in February 2018.

The focus of the report is on the results from the four pilot schools that have been involved from the beginning of the programme.

In the section below (The Pilot) we describe the objectives and structure of the pilot. The third part of this report (Evaluation Methodology) explains how the pilot has been evaluated and methodology used. The bulk of this report consists of the Findings section, which discusses our findings what effect the app is having and how well it has met its objectives. Finally, some of the key learnings and recommendations for next steps are in the Recommendations section.

2. THE PILOT

OBJECTIVES

The Foundation hoped that those using their on-demand tutoring app would experience the following benefits for pupils:

- Improved attainment in GCSE maths
- Improved access to GCSE maths tuition
- Improved enjoyment and confidence in maths
- Receipt of high-quality tuition

The intended link between the app and these outcomes is illustrated in a theory of change.¹¹

In addition to these benefits for students, the Foundation also hoped that volunteers would be able to develop online tutoring skills and that teachers would find the app helpful.

DELIVERY

The pilot was launched at the beginning of the 2017 academic year across four London schools, at which over 50% of students are entitled to free school meals, which already have an existing relationship with Tutorfair. Since the launch, the programme has rolled out to a further 21 schools across the country.

Students were enrolled through their teachers, who provided some background data to Tutorfair and emailed them a link to the app. The students were then asked to register and answer some basic demographic questions, after which they were able to access tutoring.

If a student is stuck with maths homework or revision, they can type a question, add a picture and hit send. This request will appear to all tutors currently logged-in to the system. The tutors can review the request and decide if they are able to help. The first tutor to accept the request will be entered into a private message thread with the pupil and can begin tutoring them through the specified topic.

¹¹ See Appendix

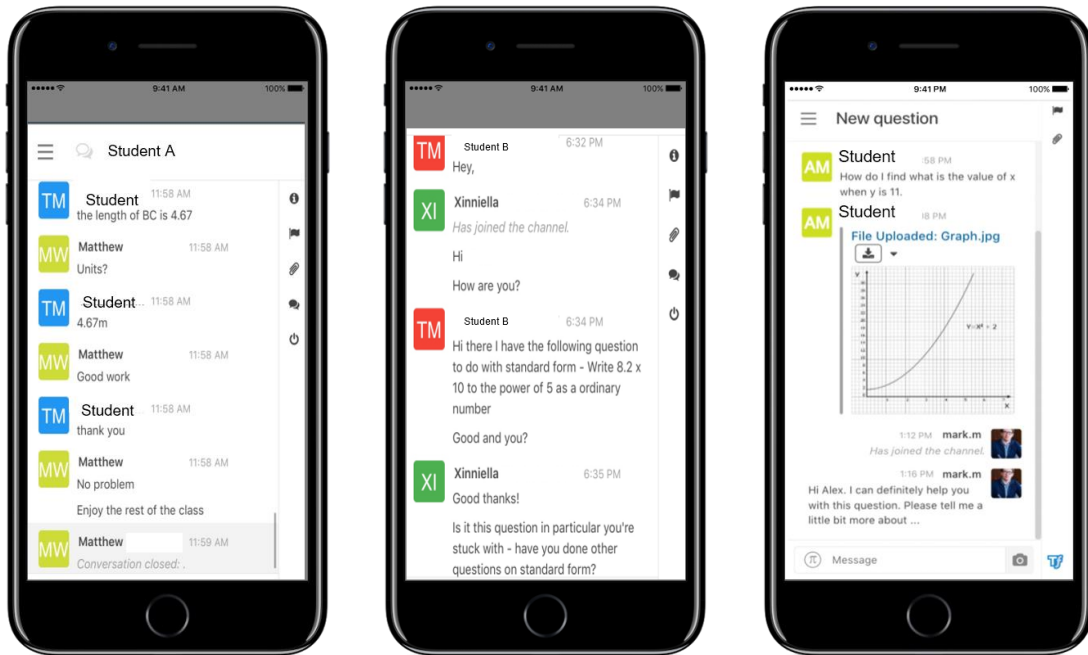


Figure 1: Screenshots of the app in use¹²

In the four pilot schools, 440 students were enrolled by their teachers. 177 students went on to register and 54 students had at least one tutoring session. In total, 43 students completed between one and four sessions, referred to as ‘occasional users’ in this report. Eleven students completed five or more sessions, referred to as ‘regular users’.

¹² Students have been anonymised

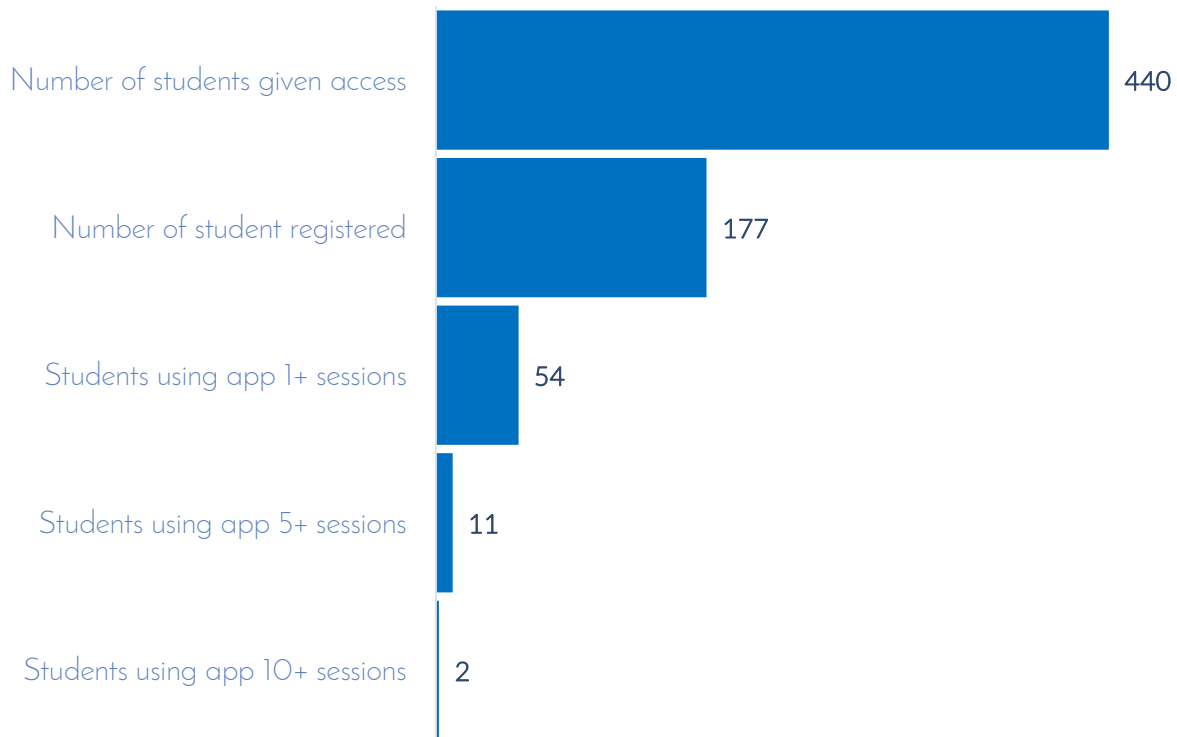


Figure 2: Funnel of app usage at pilot schools

The ratio between the numbers of students registered and eventual users was similar in the other 21 schools that came on board during the pilot year.

Students who did use the app mainly used it in the first few months after being introduced to it.

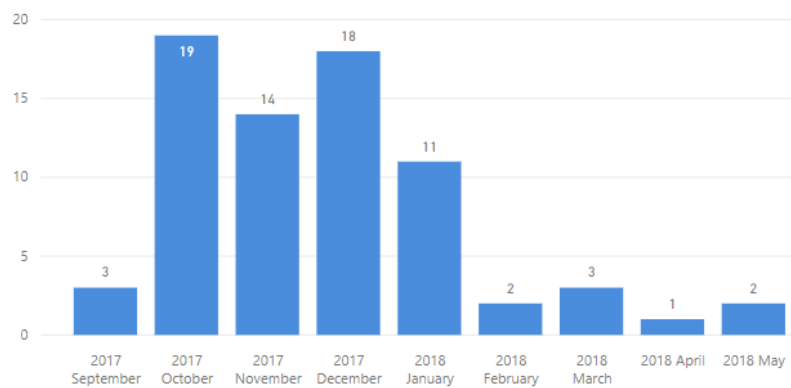


Figure 3: Count of sessions each month with pilot school students

USERS

At the pilot schools, the registered students were from a mix of ethnic backgrounds; mainly Asian (37%), White (25%) or Black (16%). The other schools had a smaller Asian population and a larger white population.

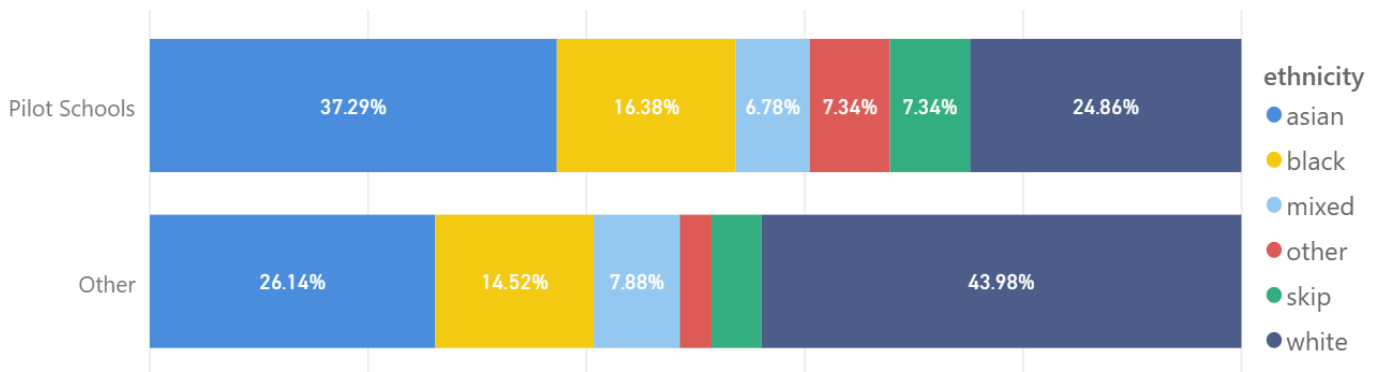


Figure 4 Ethnicity of registered students

In both school groups, most of the students that registered were female (66% and 61% for pilot and other schools respectively). As seen in the diagram below, the percentage of students that actually went on to use the app was even higher (over 70%). It may be that this type of tutoring service appeals more to female students.¹³

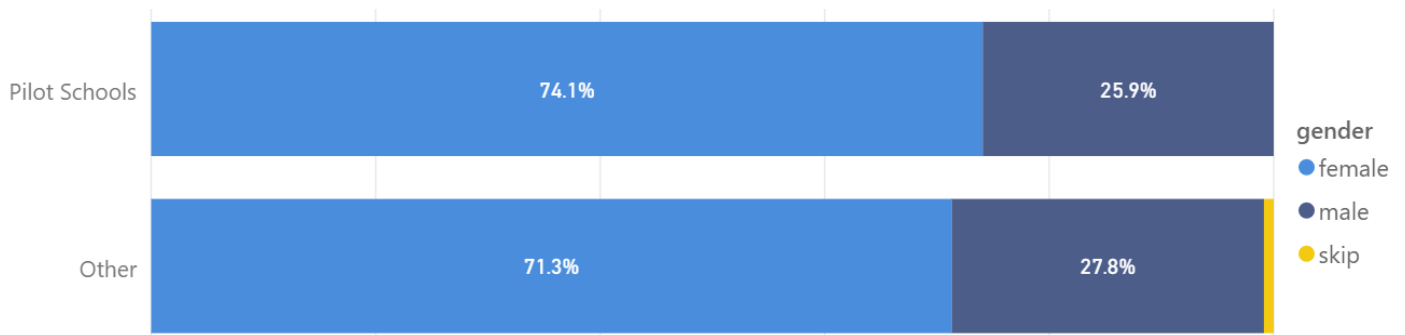


Figure 5: Gender of app users

App users had higher actual grades (5.7) compared to non-users (4.8). This difference may point to the fact that lower achieving students needed more encouragement, or that higher achieving students were more motivated to use the app.

3. EVALUATION METHODOLOGY

EVALUATION DESIGN

The aim of the evaluation was to assess the extent to which the pilot delivered the intended benefits as well as how well it was working in practice, including student and teacher satisfaction. Below, we've set out our approach to measuring each key student outcome in turn. Our measurement approach involved:

- Surveying students using the app, once when they first used the app and every fifth sessions thereafter
- Gathering student feedback after each tutoring session
- Asking teachers to predict grades for participating pupils

¹³ For relevant literature on gender and different perceptions of mathematics see: Smith, C., 2014, Gender and participation in mathematics and further mathematics A-levels: a literature for the Further Mathematics Support Programme. <http://discovery.ucl.ac.uk/1474127/1/Gender%20Literature%20Review%20UCL%20IOE%20Final.pdf>

- Semi-structured interviews with teachers to understand their experience and perspectives of the app
- Analysing data about how the app was used

The Foundation contributed to the evaluation by:

- Analysing and grading tutoring transcripts
- Surveying tutors before their first and after their tenth tutoring session

Improved attainment in GCSE maths

At the start of the pilot, we asked teachers to predict each participating student's GCSE maths grade. The change in this prediction with the student's actual GCSE result has been used as an indication of improved attainment. The change from predicted to actual grade for those that used the app regularly has been compared with the change for those students that never used the app, demonstrating how using the app has impacted attainment.

Improved access to GCSE maths tuition

Our baseline survey asked students if they currently have a tutor and if not, if they ever had a tutor. Given that the tuition access disparity exists across subjects, the questions are not-specific to maths.

Improved enjoyment and confidence

We included questions from a validated tool designed to measure attitudes towards maths in our baseline and follow-up surveys for students: the Attitudes Towards Mathematics Inventory (ATMI)-shortened form.¹⁴ The tool covers three areas and there are five questions on each, which students are asked to respond to on a five-point scale from "strongly disagree" to "strongly agree":

- (i) **Enjoyment**, defined as 'the degree to which students enjoy working on mathematics'. This domain also strongly correlated to students' **motivation** to do mathematics.
- (ii) **Confidence**, defined as 'the confidence of their performance in mathematics'.
- (iii) **Value**, defined as the 'students' beliefs on the usefulness, relevance and worth of mathematics to their lives'.

We also conducted semi-structured interviews with teachers in which we asked them if they had noticed any changes in pupils' attitudes to maths.

Receipt of high-quality tuition

The Foundation has created a robust observation framework to monitor quality of tuition by analysing tuition transcripts. The framework was established with the following aims:

- Assess volunteer tutors against rigorous criteria and gain a reliable overview of tuition quality.
- Gain insight into areas for improvements which can be used to direct the development of training materials.
- Establish an effective procedure by which all new volunteers can receive two observations within their first 10 tutorials.

¹⁴ Lim, S.Y. and Chapman, E., 2013. Development of a short form of the attitudes toward mathematics inventory. *Educational Studies in Mathematics*, 82(1), pp.145-164. With minor revisions, see Appendix

Each transcript was marked by an observer using the observation framework developed by Tutorfair. The framework consists of ten core competencies which reflect different dimensions of high-quality tutoring and score against a four-point scale, ranging from “area for improvement” to “excellent”.¹⁵

The Foundation also surveyed tutors about their self-efficacy beliefs through a 9-point tool which they designed based on the 21-point Mathematics Teaching Efficacy Beliefs Instrument (MTEBI).¹⁶ Tutors were asked to complete the survey before their first tutoring session as a baseline and then again in a follow up survey after ten sessions. The results of these surveys shed light on whether tutors believe they are becoming more effective over time.

Students were also asked for their feedback. After each tutoring session students were asked two questions:

1. How satisfied are you with the Tutorfair app today? (on a scale of 1 – 5 stars)
2. Did this tutoring session help answer your maths question? (Yes/No)

Students were then asked to explain their answer from a dropdown menu or through written comments.¹⁷

Furthermore, as part of the follow-up survey (every fifth session), students were also asked whether they would recommend the app to a friend (on a scale of 1-10). This will help identify the net promoter score.

METHODOLOGICAL LIMITATIONS

The main limitations to our evaluation design are:

- The risk of selection bias: Students got to choose whether or not to use the app. Those who chose to use it may differ from those who did not in ways that influenced their outcomes (for example, those who chose to use it may be more motivated students who we would expect to perform better, with or without the app). Furthermore, in some schools, teachers encouraged specific students to use the app, who they thought might particularly benefit from it.
- The risk of response bias: The fact that students could choose whether or not to use the app also affected who we received data from. As set out above, we surveyed students when they first used the app and every five sessions thereafter. We therefore only received follow-up responses from students who used the app at least five times. It is possible that those students who chose to continue using the app differed from those that did not in ways that influenced their outcomes (for example, those who continued using the app may have found it more helpful than those who did not).
- Different timings for data collection: We surveyed students according to when they used the app – students completed their first survey when they first used the app and their second after five sessions. The amount of time between when each student completed their first and their second survey varies according to how frequently they used the app. We know that, even without the app, students are likely to have improved over time, as they continued to learn in school. The fact that the amount of

¹⁵ See Appendix

¹⁶ Enochs, L. G., Smith, P. L. and Huinker, D. (2000), Establishing Factorial Validity of the Mathematics Teaching Efficacy Beliefs Instrument. *School Science and Mathematics*, 100: 194–202.

¹⁷ See Appendix for full list of options

time between the first and follow-up surveys varies between pupils introduces another possible explanation for differences in pupils' results beyond the app, which will make it difficult to draw conclusions about who the app works best for.

- Accuracy and precision of the indicators: The difference between predicted grade and actual grade has been used as a proxy for increased attainment, however this assumes that teachers have a good knowledge of their students' ability, understanding of the grading systems and how much students are likely to progress as a result of schooling. GCSE mathematics recently transitioned to a new curriculum and grading system (9-1, rather than A* - G), which may make it harder for teachers to accurately predict results.

There are also process issues which may diminish from the validity of the evaluation. The evaluation to date has been somewhat limited by issues with low student engagement. As discussed later, only few students have used the app for five or more sessions and have completed the follow-up survey. The low numbers to date somewhat limit the confidence we can have, particularly in relation to changes over time.

Data Cleaning

The findings in this report are based on students who registered with the app prior to the end of April 2018 (any later and they won't have used the app in the summer GCSE) and were in years 10 or 11. Increased attainment is based on a smaller subset of students recorded as achieving a grade of at least one. Also note that some of the predicted grades were submitted in the previous letter gradings and have been converted to numerical grades in line with Ofqual's conversion, although grades are not quite equivalent resulting in half grade approximations.¹⁸

4. FINDINGS

OBJECTIVES

This section explores how successful the pilot has been in achieving its intended objectives.

Improved attainment in GCSE maths¹⁹

The main aim of the app, and of tutoring in general, is to support students to increase their knowledge and skills as reflected in improved exam results.

At the pilot schools, teachers predicted an average grade for all students of 5.8 on the 9-1 scale.²⁰ The average actual grades achieved by these students was almost a whole grade lower at 4.9. Other schools had a lower-ability cohort with average grade predicted grade of 4.5 and an actual grade of 3.9.

Correlation with app usage

At the pilot schools, students who never used the app had a difference of 0.9 grades (SD = 1.3) between teacher predicted grades and actual grades. The 31 students who used the app occasionally (1-4 times) had a difference of -0.1 grades (SD = 1.1) and for the 10 students who used the app regularly (5+ times) the difference was -0.5 grades (SD = 1.3).

¹⁸ <https://ofqual.blog.gov.uk/2018/03/02/gcse-9-to-1-grades-a-brief-guide-for-parents/>

¹⁹ Note, numbers in this section refers to a smaller pool of students where we know their exam results as not all schools shared results.

²⁰ GCSE grades are being treated as an ordinal approximation of a continuous variable.

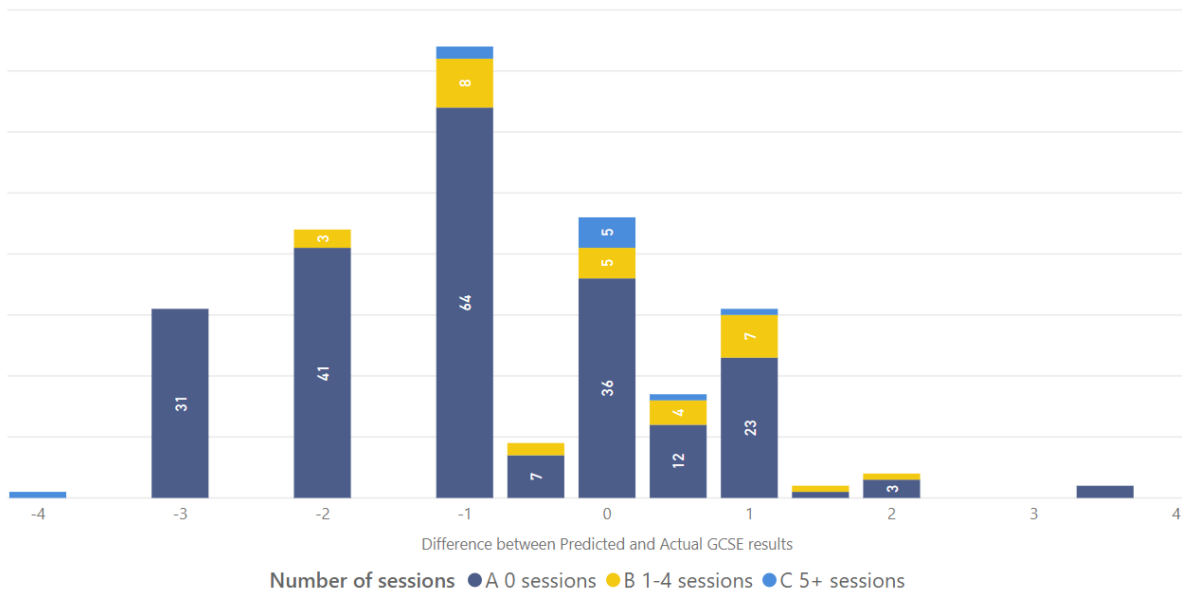


Figure 6: Number of students and difference between predicted and actual GCSE results (positive results indicate that the student exceeded the prediction)²¹

At the other schools, students who never used the app had a difference of -0.5 grades (SD = 1.5) whilst the 23 students who used the app (more than once) had a difference of -0.2 grades (SD= 1.2).

Teacher predicted grades generally exceeded the actual grades achieved, and as seen in the above diagram above sometimes differed by several grades in either direction. Overall students at all schools who never used the app had achieved 0.62 grade points (SD = 1.49) below their teacher predictions, while regular users of the app were only 0.27 (SD = 1.34) grade points below the teacher predictions.²² However, with the small number of regular users one should be cautious about drawing any conclusions.

Improved access to GCSE maths tuition

Through the app, all students now have access to a tutor, in particular availability has been improved for the 137 app users who reported that they don't have a tutor.

At the pilot schools 34% of app users reported that they currently have access to a tutor and a further 20% reported that they had previously had a tutor.

This level of access to tuition is higher than typical, as previously discussed, the pilot study was conducted with schools that had an existing relationship with the Tutorfair Foundation, so may already have had access to their in-person tuition service. Furthermore, all four pilot schools were London-based and have a large BAME population, and rates of private tuition for these demographic groups are known to be higher than average.^{Error! Bookmark not defined.}

Amongst the non-pilot schools, only 9.7% of the app users said they currently have access to a tutor, with 11% of the remaining students previously having had a tutor. These levels of access are far more typical, and it is possible that the on-demand app will have more impact on this group of students.

²¹ Some differences are by half grades because of the conversion between the old letter grade system to the new numerical scale.

²² It is hard to imagine that a student who had fewer than five sessions would achieve a significant change in grade.

Improved enjoyment and confidence

The baseline survey showed that the pupils demonstrated relatively high scores in the attitudes assessment for how much they value maths (3.9, SD = 1.1), with middling scores for maths enjoyment (3.2, SD = 1.2) and confidence in maths (3.5, SD = 1.0), all out of five.²³ There was little difference between the pilot schools and the rest of the population of users.

The high score for the value domain could be ascribed to self-selecting nature of this intervention; the students who value maths the most are the ones most motivated to seek additional tuition.

Amongst regular users of the app, baseline score were similar (Value 4.2, enjoyment 3.5 and confidence 3.4). The slightly higher scores in the value and enjoyment domains may suggest that the students most likely to use the app frequently are those that value maths highly and find it more enjoyable. Students completed a follow-up survey at their fifth session, and the scores were largely unchanged (Value 3.9, enjoyment 3.3 and confidence 3.4). Overall it would seem that five sessions is not enough to impact attitudes to maths.

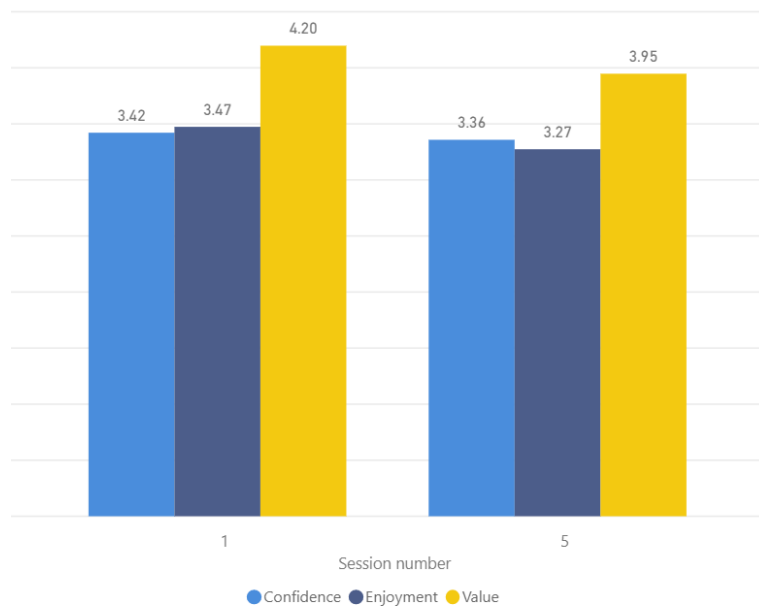


Figure 7 Attitudes to Maths, before the first and fifth session for 'regular users'

²³ Scores in each domain are out of 5

Receipt of high-quality tuition

Student feedback

Students were generally positive about the app. Feedback was given following 208 of the 435 completed tutoring sessions. The average post-session satisfaction rating was 3.9 out of 5 stars (3.7 in the pilot schools and 4.0 in the others), with 103 out of the 208 rated five stars.

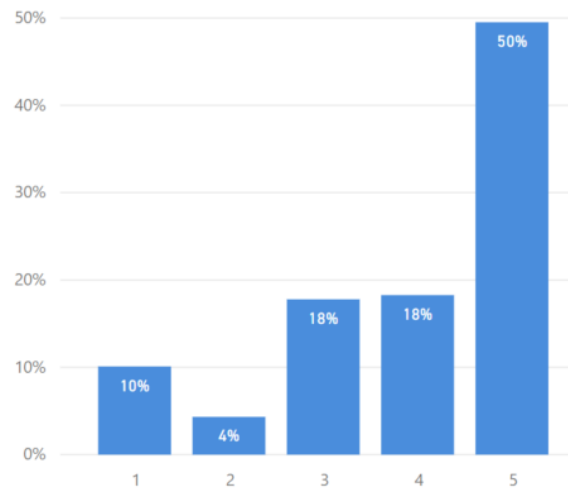


Figure 8: Post-session satisfaction star rating

In 77% of sessions, the tutees reported that they felt the tutoring had helped them solve their question. Of those that felt that session had helped, most (78%) gave the response that “The tutor explained it well and now I can do it” although a few (5%) responded that “The tutor wasn't great but now I think I can do it” or that “I worked out how to solve the problem without the tutor” (3%).

On the other hand, of the 23% of sessions that students found unhelpful, the most common reason given was that ‘I had to leave halfway through the chat’ (11 sessions). Other reasons given were that the tutor didn’t understand them or they didn’t understand the tutor (10 sessions), issues understanding the maths (7 sessions) or technical issues (6 sessions).²⁴

Other responses given by students were:

“I didn't finish”

“I was confused with her teaching, didn't learn anything”

“it took long but I understand the question”

“The tutor helped as much as he could but I was confused - I sort of understand”

One student particularly felt the app was impacting their confidence and progress, telling their teacher:

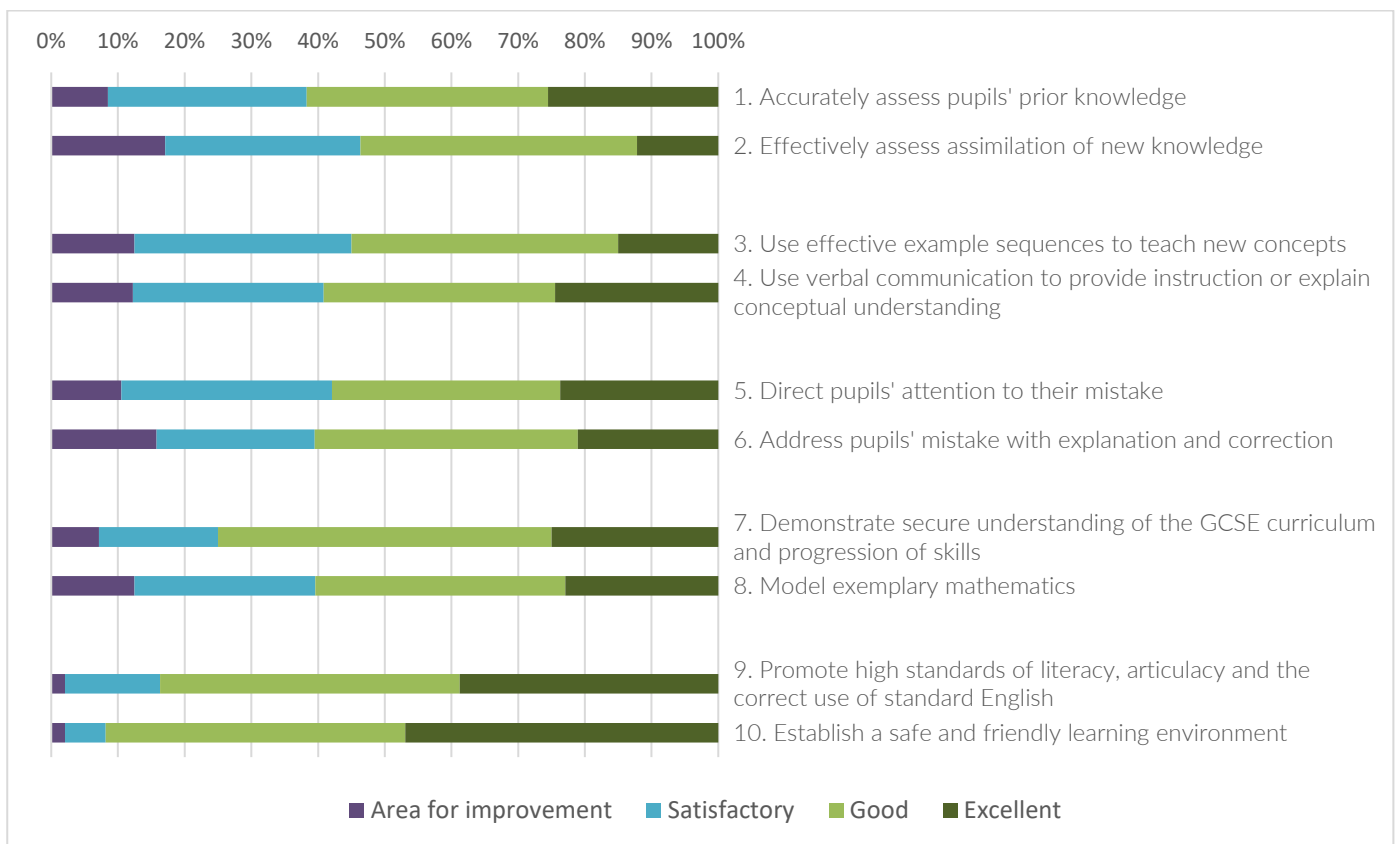
“the On-Demand platform has been very helpful for me when I've had homework and when I wasn't exactly sure what to do. Edward, the online tutor, has been very helpful and explains things very well and goes the extra mile to ensure that the student knows what to do. I feel that I am more confident and that I am defiantly progressing in maths as a whole since I've used the service!” - student

²⁴ In 5 cases (2.5% of sessions with feedback) students said that no tutors came online to help, it is possible that this occurred more often, and students closed the app before feeding back.

Regular users gave an average ‘Would you recommend’ score of 7.31 (SD = 2.17) out of ten for the app, which translates to a neutral net promoter score of 0.²⁵ Together with the other feedback data, it would seem that, on average, app users are happy with the tutoring service they are receiving but not to the point that they are interested in enthusiastically promoting it. Going forward, it will be worth exploring why students gave the recommendation score they did and finding ways to make students more enthusiastic about the app.

Tutorial quality

49 tutoring sessions had their transcripts assessed by experienced Tutorfair tutors as part of their quality assurance programme. The transcripts were marked against ten competencies divided into five domains (Assessment, Instruction, Correction, Subject Knowledge, General). As seen in the figure below, in general the quality of tuition was found to be high, with tutors rated as ‘Satisfactory’ or higher in over 80% of transcripts and ‘Excellent’ or ‘Good’ in over 50% of transcripts across competencies.



Tutor sense of self-efficacy

A total of 126 tutors completed a baseline survey using Tutorfair’s adapted form of the Mathematics Teaching Efficacy Beliefs Instrument, scoring an average of 4.1 out of 5 (SD= 0.61). This result indicates that most of the volunteer tutors had a strong belief in their ability to effectively teach maths. This kind of self-belief has been associated with more effective teaching and also indicates that tutors had a high level of confidence after the training delivered by Tutorfair.

²⁵ Defined as Percentage of promoters (who gave a score of 9 or 10) – detractors (who scored 1 to 6) on a scale from -100 to +100.

Ten of these tutors have since delivered over ten tutoring sessions and have also completed a follow-up self-efficacy survey. The average scores at follow-up for these tutors was similar to their average at baseline (4.1 vs 4.0), implying that tutors had maintained their high self-belief, though ten sessions isn't enough time to have further impacted their sense of self-efficacy.

Experience of the app and broader impact

We spoke with two school teachers, from different schools, to understand how schools are making use of the service and whether the teachers feel the app is having a broader impact on the students or the way they run their lessons.²⁶ We also heard from other teachers through feedback given directly to Tutorfair.

Perceptions and engagement

Overall the teachers were very positive about the app and believed strongly in the concept behind it.

However, the teachers felt that their students weren't proactive in engaging with the app and would only use it after a lot of teacher encouragement. One teacher reported that they specifically set homework, telling the students to use the app if they struggle.

One teacher had initially been concerned that the app would be used by students to cheat at homework, however when watching a student use the app was impressed with how the tutor was careful to go through the topic with the student, ensuring that student understood how to get to the answer.

The teachers reported positive feedback from the students that had used it:

"The ones that used it, have really liked it".

"Student X is getting awarded for the progress made which I would credit to the online tutoring and his tutor Edward!"

Impact on students and lessons

Both teachers felt not enough students were using the app to be able to make any general comments about the effect on the class, but that on-demand tutoring has many positive features that complemented what they could offer as a class teacher:

- The app offers instant feedback and personal attention which they can't always offer in the classroom.
"...they want to be able to have that instant feedback and we can't offer that in lessons."
- It's a relief for the teacher to know that if a single student is struggling with a topic and the rest of the class understands, the teacher can suggest they go over it with a tutor through the app later and there is no need to hold back the rest of the class.
"If I don't have time for some reason I can say 'use the app for that'."
- One teacher had seen that the students are willing to ask the tutor questions that they would be scared to ask in class (because they felt it might be a silly question).
- Most students are always on their phones and messaging friends. The on-demand app allows them to learn through their favoured communication channels.

²⁶ Both teachers interviewed teach one class of students enrolled with the app but not all the students. One of these teachers is the head of the Maths Department.

"Students are always on their phones. They are always so impatient, in lessons if they have their hand up for more than a minute they will be complaining that they've had their hand up for hours. They want to get answers now, like they do on social media."

Tutors' perspective

The concept of an on-demand app is not only potentially transformational for students, but for the tutors too. Removing the need to travel to meet the tutee cuts down on travel and costs and opens up the market to tutors from across the country. Tutorfair reported that they had plenty of interest from potential volunteer tutors and had no issues with finding enough tutors to meet demand, even as the programme grew.

Volunteers were generally enthusiastic about the initiative and its impact on their tutoring.

"It's amazing that there is a place that students can log in and have their maths questions answered every night of the week. On Tutorfair On-Demand the students come with questions to be answered. This means they hit the ground running and can focus on new skills during the tutorial"

Tutors also felt that the experience and challenge of tutoring through the app has enhanced their tutoring skills.

"Tutorfair offers students a really unique opportunity to provide help as and when they need it. Whether that be with their evening homework, or a bit of last-minute exam prep...The experience of tutoring on demand has taught me how to effectively explain mathematical solutions using only text and images. It has also helped me to develop my ability to include students in every step of my explanation."- Ed H, volunteer tutor

"Being in the position of adviser and tutor has helped my perspective on how to deliver an effective online tutorial. I think this process has also helped me in giving real world tutorials. This is because in typed form you can really dissect where the student's understanding was and how it progressed. For example, when a student doesn't understand something, I believe I am more patient now, I spend a greater time filling in the gap between what they do understand and what they don't, and more time checking that they grasp the new information." - Iain R, volunteer tutor

5. RECOMMENDATIONS

Findings from the pilot provide a basis for shaping the future of the app and how success is measured going forward. We believe that the app has the potential to be more impactful and to better demonstrate its impact by increasing repeat usage and more focussed targeting at those likely benefit. Furthermore, by improving the feedback process, the Foundation could gain a better understanding of what users like or dislike about the app which will lead to a better product, higher satisfaction and ultimately more users.

Increasing engagement and repeat usage

To really have a noticeable impact both in terms of attainment and attitudes to maths, the app would need to be used often, so it is worth considering how to encourage students to make more use of the app. We have calculated that to be able to demonstrably prove that the size of change in grade (about half a grade) between those that use that app regularly and those that never use it) you would need to secure 176 regular users, and the same number or more non-users, for comparison purposes. A bigger difference in grade could be observed with a smaller sample of just 64 students in each group.²⁷ In order to achieve these numbers, Tutorfair should increase engagement (getting more people to register with the app) and increase repeated usage, strategies to achieve this are laid out below.

With attrition rates similar to those in the pilot schools, 7,040 students would need to be offered access to the app in order to achieve 176 regular users, see diagram below. Assuming each school has 100 GCSE students, this would mean working with approximately 70 schools. The high ratio between the number of students given access to the app and the number of eventual regular users presents challenges for future rollout and evaluation, given the effort required to recruit new schools and engage new students. We recommend taking steps to lower this ratio by targeting higher retention through the top of the funnel, where student numbers are initially large and fall steeply.

By using the strategies laid out below, working with schools to ensure that every GCSE student completes at least one session, we believe that the Foundation could achieve a 90% registration rate for those offered access (compared to 40% at the pilot schools) and ensure that 90% of registered users complete at least one session (compared to 31%). That way, even if only 10% of those students go on to become regular users (compared to 20%), the Foundation would only need to work with approximately 22 schools (compared to 70) to achieve the same number of regular users.

²⁷ The sample size (number of regular users) to target depends on the effect size you wish to demonstrate: To detect a small effect (*cohen's d* = 0.3) equivalent to about 0.5 grade points, you would need 176 people in each group To detect a bigger effect (*cohen's d* = 0.5) equivalent to about 0.8 grade points you would need 64 people in each group. Calculations made using a standard [sample size calculator](#) with a statistical power = 0.8 and a significance level (probability level *p*) = 0.05. Effect sizes calculated [here](#) based on the standard deviation of difference between predicted and actual score observed = 1.5 (Note: teachers may get better at predicting grades as they get used to then new system which would mean a smaller standard deviation and a smaller sample size required).

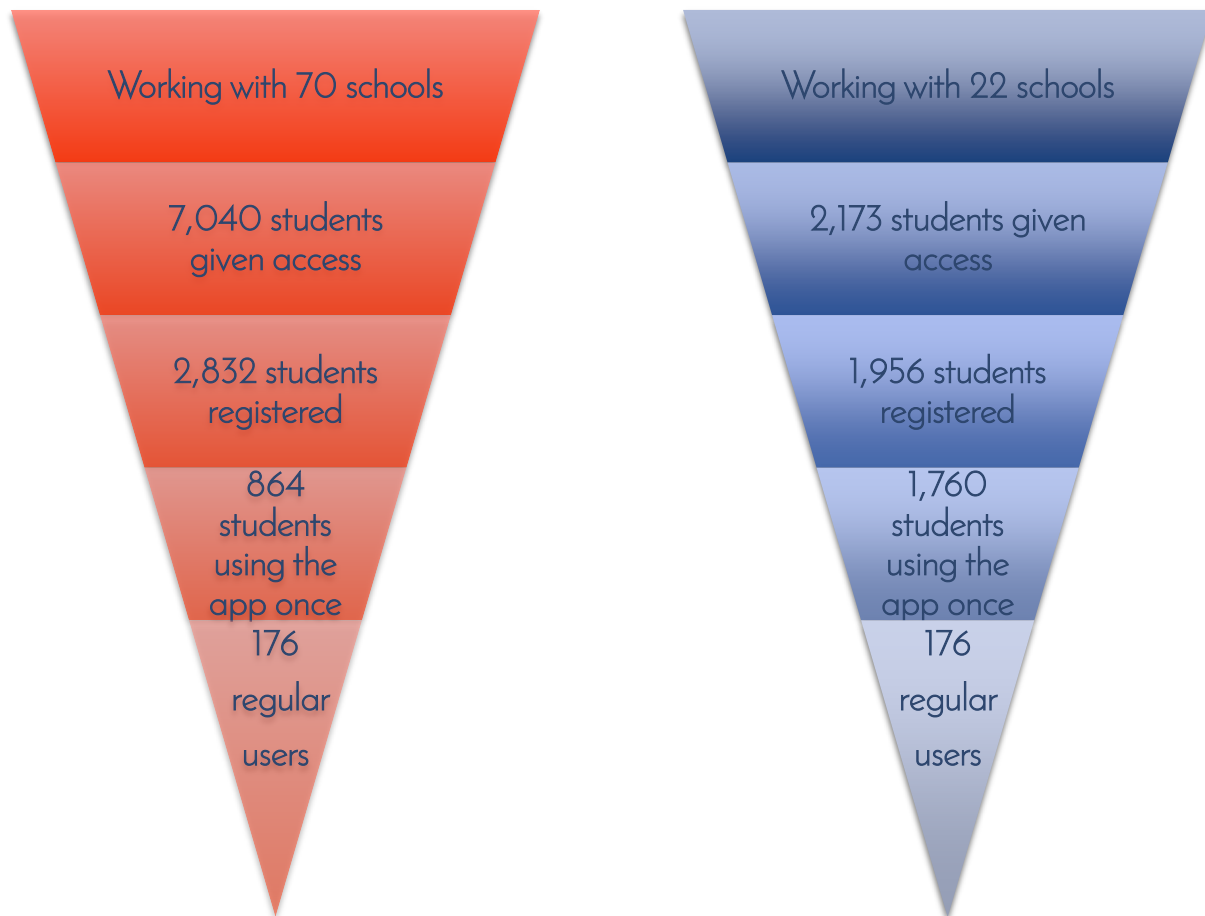


Figure 9: Funnel diagram demonstrating number of schools and students required to engage to achieve significant usage numbers of regular users. Current attrition level in red and proposed intense engagement

Demonstrations and live sessions

Approximately 50% of students who completed one tutoring session went on to use the app at least one more time, so encouraging more students to complete an initial session is likely to lead to more regular users. We recommend that the Foundation incorporate demonstrations and in-class sessions into the process of onboarding new schools or organisations, with a view to ensuring that nearly all students given access use the app at least once.

Develop teacher relationships

From the teacher feedback, it is clear that teachers feel that Tutorfair’s approach of working with schools and specifically classroom teachers that interact directly with the pupils is the best way to engage the students and target the students that could most benefit from it.

The most promising engagement method is to build on this approach, working on a school-by-school basis. Agree with each school how many students will be signed up and work with teachers to agree the most promising sign-up and engagement strategy for their class. All engagement should include in-person contact and demonstrations.

Engage teachers as promoters

Teachers have a strong understanding of their students’ need and are well placed to identify where they need more support. During the pilot, some teachers excelled in matching those support needs to what the app could offer and signposting students towards it.

There is an opportunity to get teachers to signpost to the app more frequently, by helping them to recognise its potential. We recommend that the Foundation provide teachers with a list of ideas for how they could make use of the app and encourage their students to do so – with a view to highlighting situations in which one-to-one support would be helpful but would otherwise be lacking. One example suggestion for teachers could be to refer students to the app as a way of helping them to understand post-exam feedback, since each student will have struggled with different questions and the teacher may not be able to support each pupil individually. Another would be as a way of getting help with challenging homework assignments – as one teacher did during the pilot. These situations provide opportunities for students and teachers to realise the value of on-demand tutoring – leading to greater use.

Explore other engagement routes

It may be also worth targeting students outside of the school setting, by offering the app to youth centres that offer homework clubs or other initiatives that offer student support outside of the school. We recommend trialling these approaches alongside the existing school rollout with a small number of suitable youth centres and testing if this approach increases engagement rates.

Another approach to explore is promoting the app through parents or guardians. Parents are typically the people available to support their children complete homework and are often the ones making decisions around hiring tutors and letting them know about the availability of this tutoring service. Direct access to suitable parents can be difficult, but asking schools to promote the app directly to the parents as well as the students offers an additional engagement route. We would recommend preparing marketing material for schools to distribute to parents and asking schools to promote the app to parents at parent's evenings and through parent groups.

Incentivisation

Many students, especially those that struggle with maths, don't find the prospect of maths tuition appealing. Small incentives to engage with the app could increase the attraction and change student's mindset.

Students who are completely disinclined to engage may need 'real world' incentives to drive use, such as the opportunity to win a prize or a small reward per session, whereas for others a virtual reward may be sufficient to change behaviour. Gamifying the app is an effective way of increasing the appeal,²⁸ for example, allocating students points or badges within the app for regular or repeat usage may encourage students to make greater use of the app – especially if there is an opportunity for students to compare and compete with others.

We recommend setting up a point system, with points for achievements such as completing sessions, completing in-app surveys or making good comments in a tutoring session. The point system should be complemented with a leader board for comparison between classes and schools.

Targeting those in need

In the pilot schools, students scored higher than expected for access to tutoring. Nesta, the Sutton Trust and others have identified several rural parts of the country where access to tutoring is much

²⁸ Gamification in education and education technology is becoming increasingly common, see for example: Filatro, Andrea, and Carolina Costa Cavalcanti. "Structural and content gamification design for tutor education." In E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education, pp. 1152-1157. Association for the Advancement of Computing in Education (AACE), 2016.

more limited, such as the North West England and coastal areas.²⁹ Offering the app to students in these areas is likely to have a greater effect on equality of access than areas with less need. Students living in these areas are also more likely to make use of the app – since they have fewer alternative ways of accessing similar support. We recommend identifying and engaging with schools in rural, coastal areas which have students that are likely to benefit from this provision.

Improving feedback

Going forward it is important to understand why students aren't using the app: are they reluctant to spend more time on maths out of school hours, do they feel they already have enough additional support through school, tutors and parents or are they simply not aware of the app?

Most of the students indicated that they found the tutoring sessions to be helpful, but the current post session feedback collection is fairly limited. Going forward, it is worth rethinking how feedback information is collected. We recommend adding an open text box for comments in the post-session feedback form so as to give the student space to indicate what they have liked and disliked about their tutoring session. This will make it easier to distinguish between feedback on the tutor, the usability of the app, and their attitudes towards homework.

²⁹ Shadow Schooling, Private tuition and social mobility in the UK Improving social mobility through education, Philip Kirby, September 2016, https://www.suttontrust.com/wp-content/uploads/2016/09/Shadow-Schooling-formatted-report_FINAL.pdf, <https://www.nesta.org.uk/project/click-connect-learn-fund-volunteers-as-digital-tutors/>

APPENDIX

SURVEY DETAILS

Registration survey

- Demographic data
 - Gender (male/female)
 - Ethnicity (White, Asian, Black, Mixed, Other)
 - Mobile phone number (optional)

Baseline survey

Completed before student's first session

- Self-assessed GCSE prediction – (on new GCSE scale 9-1)
- Do you currently have a private tutor for any subject? (YES/NO)
- Have you ever had a private tutor for any subject? (YES/NO)

sATMI Scale

To what extent do you agree with each of these statements?

On a scale of 1-5 (1 = strongly disagree, 5= strongly agree)

Confidence:

- Studying maths makes me feel nervous
- I am always under a terrible strain in a maths lessons
- It makes me nervous to even think about having to do a maths problem
- I am always confused in maths lessons
- I feel a sense of insecurity when attempting maths

Enjoyment:

- I have usually enjoyed studying maths in school
- I like to solve new problems in maths
- I really like maths
- I am happier in a maths lesson than in any other lesson
- Maths is a very interesting subject

Value:

- Maths is a very worthwhile and necessary subject
- Maths is important in everyday life
- Maths is one of the most important subjects for people to study
- Maths lessons are very helpful no matter what I decide to study in the future
- (A strong maths background could help me in my professional life)³⁰

Student feedback questions

Completed after every session

- How satisfied are you with the Tutorfair app today – (star rating 1 to 5)

³⁰ Due to a technical issue, data wasn't collected in some cases on the final question, therefore we have only considered the first four indicators in the 'Value' domain.

- Did this tutoring session help answer your maths question? (YES/NO)
- If 'No' a drop-down menu with options:
 - I'm not sure I fully understand
 - I understand it when my tutor explains, but can't do it by myself
 - My tutor didn't understand my question
 - I did not understand my tutor
 - I had to leave halfway the chat
 - I had technical issues.
 - Other: _____ (please state reason)
- If 'Yes' a drop-down menu with options:
 - The tutor explained it well and now I can do it
 - The tutor wasn't great but now I think I can do it
 - I worked out how to solve the problem without the tutor helping much
 - Other: _____ (please state reason)

Tutor observation framework

Following a tutorial, the transcript is downloaded and a score for each competency is recorded by the observer. Following the observation, a report is produced, showcasing the rationale for the grading while providing constructive feedback to the volunteer. The observation report is sent to the volunteer who is offered an additional consultation with the observer, should they wish to discuss further.

Competencies covered:

1. Accurately assess pupils' prior knowledge
2. Effectively assess assimilation of new knowledge
3. Use effective example sequences to teach new concepts
4. Use verbal communication to provide instruction or explain conceptual understanding
5. Direct pupils' attention to their mistake
6. Address pupils' mistake with explanation and correction
7. Demonstrate secure understanding of the GCSE curriculum and progression of skills
8. Model exemplary mathematics
9. Promote high standards of literacy, articulacy and the correct use of standard English
10. Establish a safe and friendly learning environment

Tutor self-efficacy survey

Completed before the first and the tenth tutoring session.

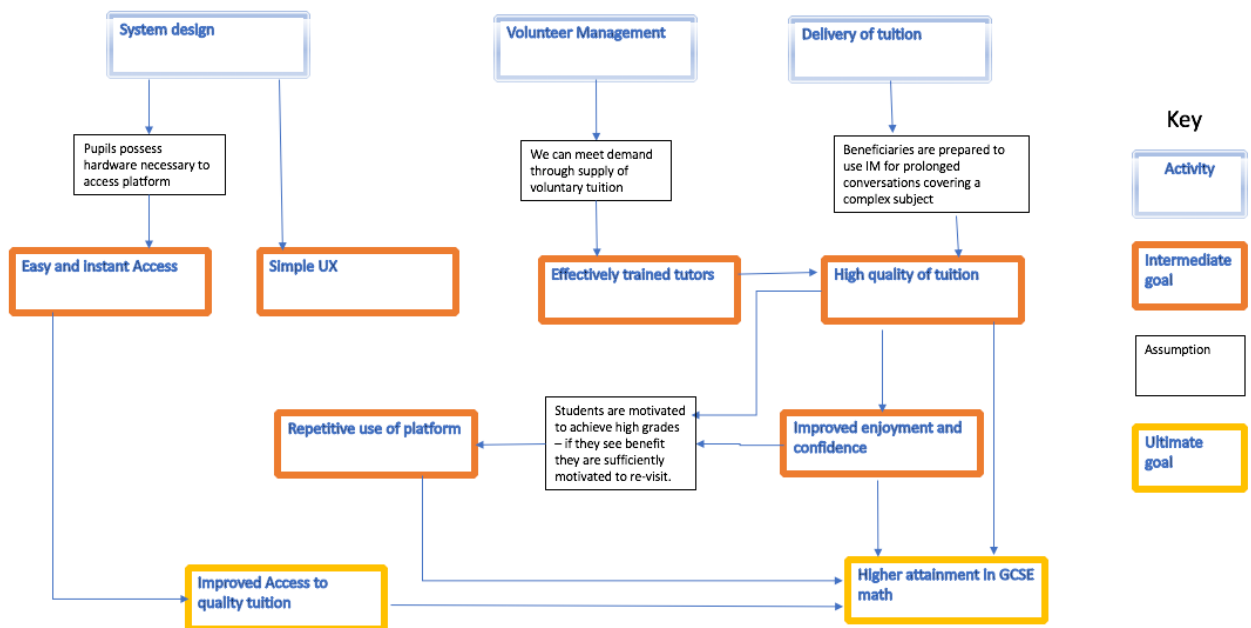
On a scale of 1-5 (1 = strongly disagree, 5= strongly agree). Questions with an * are negatively phrased and are scored in reverse.

1. I will continually find better ways to teach mathematics
2. I feel confident in providing effective GCSE maths tuition via text communications
3. I wonder if I will have the necessary skills to teach mathematics*
4. I do not know what to do to turn students onto mathematics*

5. When the mathematics grades of students improve, it is often due to their teacher having found a more effective teaching approach
6. I will typically be able to answer students' questions in GCSE mathematics
7. I will generally teach mathematics ineffectively*
8. I can explain GCSE maths concepts very effectively using text-based communication
9. I understand the requirements of the GCSE maths syllabus well enough to provide effective tuition

THEORY OF CHANGE

Developed by the Tutorfair Foundation ahead of the evaluation



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