

Learning by Questions - an evolved pedagogy



50 Schools Feedback Project - Concluding Report **October 2018**
 See LbQ in a real classroom at www.lbq.org

Primary	Secondary	Overall	What teachers say about the effect of LbQ in their classrooms after using it for a school year*
94.2%	93.6%	94.0%	of teachers state that LbQ has helped to reduce their workload.
100.0%	90.9%	96.5%	of teachers state they have less marking to do when they use LbQ.
100.0%	93.9%	97.6%	of teachers find LbQ easy to use in lessons.
17.3%	27.3%	21.8%	of teachers save up to 1 hour per week when using LbQ.
51.9%	69.3%	58.7%	of teachers save up to 2 hours per week when using LbQ.
19.2%	3.0%	12.9%	of teachers save 2 to 4 hours per week when using LbQ.
11.5%	0.0%	7.0%	of teachers save more than 4 hours per week when using LbQ.
98.1%	93.9%	96.5%	of teachers state that their pupils enjoy learning maths more using LbQ.
92.3%	75.8%	85.9%	of teachers state that LbQ helps them with classroom management.
98.1%	97.0%	97.7%	of teachers state that LbQ has helped with differentiation in classes.
98.1%	97.0%	97.7%	of teachers state they can intervene more effectively when they use LbQ.
94.2%	75.8%	87.1%	of teachers state they can plan or prepare lessons better when they use LbQ.
96.1%	84.9%	91.8%	of teachers state their lessons have become more effective because they use LbQ.
100.0%	97.0%	98.8%	of teachers enjoy using LbQ in their lessons.
98.0%	87.9%	94.1%	of teachers state that the quality of LbQ maths mastery questions compares favourably to other resources.
98.1%	78.8%	90.6%	of teachers state that LbQ has enabled them to help their pupils achieve greater academic progress than they would have done without LbQ.
98.1%	87.9%	94.1%	of teachers state their pupils' confidence in maths has grown as a result of using LbQ.
100.0%	93.9%	97.6%	of teachers are confident that LbQ's pedagogy will be used widely in the next five years.

*Based on 85 teachers in the project completing an exit survey

Teachers using LbQ claim to save on average 1 hour for each LbQ lesson...

... due to the elimination of marking and ease of planning lessons. This is based on a low average usage of just 2.37 Question Sets per week each. With increased usage across more subjects, additional time will be saved.

One of the feedback project teachers described it as **“revolutionary”**.

Introduction

The Bowland Charitable Trust created Learning by Questions with the objective of introducing a pedagogy in classrooms. It uses effective questioning with instant feedback for pupils and real-time analysis to allow teachers to facilitate improvements in teaching and learning during lessons. Live insights into the teaching and learning process provide teachers with information to inform their interventions and teaching approach.

Learning by Questions is built upon 15 years of innovation at Promethean, the global leader in learner response devices and software. Since the launch of the original ActiVote handset in 2004, millions of devices have been supplied to classrooms around the globe.

During this period, Promethean established thought leadership in the use of formative questioning to engage pupils and to provide teachers with real-time actionable feedback.

The marketplace is now transitioning to more widespread use of digital tablets, which have overtaken the use of handsets. Learning by Questions was developed to use digital tablets and computers to further improve engagement in the classroom and ease teacher workloads.

The 'Feedback 50' project was conceived to guide this development and prove and improve the pedagogy, content and technology based on widespread and detailed feedback and data about teacher usage.

Key Aims of LbQ

<p>ONLINE MASTERY CONTENT WITH SCAFFOLDED QUESTION SETS</p>	<ul style="list-style-type: none"> • Over 1,850 adaptable Question Sets are currently being used in classrooms across the UK with 60,000+ questions covering maths, science and English in KS2, KS3 and KS4. • 98% of teachers report that the quality of the content is good to excellent, describing Questions Sets as “masterpieces” and “the best lesson” on that subject they have ever taught. • 100% of teachers describe the pedagogy as ‘easy’ or ‘very easy indeed’ to use.
<p>REAL-TIME ANALYSIS, GUIDING INTERVENTION AND CONTINUAL FORMATIVE ASSESSMENT WITH FEEDBACK</p>	<ul style="list-style-type: none"> • Teachers are using results in real-time to help with intervention during the lesson. • “The results grid gives me a better snapshot of class position than marking all the books ever could.” • Immediate feedback for pupils is cited by most teachers as one of their top three favourite features of the pedagogy.
<p>DIFFERENTIATION WITHIN MIXED ABILITY GROUPS AND PUPIL ENGAGEMENT</p>	<ul style="list-style-type: none"> • Teachers can adapt and run up to three question sets simultaneously to cater for all abilities. • “Pupils like this miles better” is a typical response in surveys. Multiple anecdotal examples of increased pupil engagement have been recorded, peppered with phrases such as “boosted confidence”, “really turned a corner” and “kids were 100% focused”. • Pupil confidence is boosted due to instant feedback and the ability to retry questions straight away, as well as by having a wide variety of reasoning practice. • Many teachers have re-examined their previously-held assumptions of pupils’ abilities based on surprising Question Set results.
<p>REDUCE TEACHER WORKLOADS</p>	<ul style="list-style-type: none"> • Even with modest usage of on average 2.3 times a week, teachers are saving 100–120 minutes due to significantly reduced marking, worth around 2 weeks per year per teacher. • The vast majority (96.5%) of teachers declared that LbQ has saved them marking time. 22% reported saving up to 1 hour per week, 59% reported saving up to 2 hours, 13% reported saving 2–4 hours per week and 7% reported saving more than 4 hours per week. • Lesson preparation has been made more efficient by 15 to 30 minutes for the majority of teachers, with a wider range of instantly accessible resources to cover “identified gaps in learning”. • Newly qualified teachers who are building content from scratch particularly benefit.

Questions Sets and questions

What we learnt from teachers	How it helped improve the system
<p>Teachers didn’t have the time to create their own Question Sets to use alongside our published ones as we originally thought they would. We realised that the pedagogy would not be used unless LbQ provided the questions.</p>	<p>We set up and trained a team of teachers to develop Question Sets. By Christmas 2017, we had 6,000 maths questions and usage had increased rapidly. We now have 60,000+ questions, and are aiming to have around 100,000 by the end of 2020, covering maths, science and English for years 3 to 9, as well as KS4 maths.</p>
<p>Offering so many Question Sets meant that teachers found it difficult to find the specific questions they needed. Teachers wanted a quick and easy way to see the breadth and depth of the questions in a Question Set.</p>	<p>We enhanced the Question Set filters to make it easier to search subjects by topic. We are also producing printed books containing all questions for each subject and year group to help teachers quickly view the questions available. The books will contain Quick Search References, so Question Sets can be easily located.</p>
<p>Teachers thought the progression in our Question Sets was important. Maths Question Sets have four levels to support this: Understanding, Fluency, Reasoning and Problem Solving.</p>	<p>With the support of teachers, we decided to apply the progression model to our English Question Sets, and have developed and trialled Question Sets that provide a learning journey to higher levels of pupil development.</p>
<p>A useful function of LbQ is to help pupils learn basic elements that they need to memorise. LbQ was seen as a very good practice and revision tool.</p>	<p>We have developed additional materials to meet this need, including times tables, division and number bonds practice in maths and spelling and grammar practice in English.</p>
<p>The high quality of the LbQ Question Sets was seen as very important.</p>	<p>We instigated a rigorous review and quality assurance process to maintain the high quality of our Question Sets.</p>
<p>It was important to teachers that our Question Sets were flexible and adaptable to accommodate a broad range of abilities within a class.</p>	<p>We introduced the ability for teachers to quickly adapt Question Sets to closely meet the needs of their class, including adapting Question Sets for different-ability pupils by selecting only specific levels or questions, randomising the questions, and running up to three Question Sets in a class concurrently.</p>
<p>In some cases, our delivery of questions in sets did not meet teachers’ exact needs, particularly for areas such as revision.</p>	<p>We have developed the ability for teachers to select and compile questions from across all Question Sets. Teachers can even combine these with their own questions to create a customised Question Set.</p>
<p>Pupils grew in confidence due to the variety and depth of reasoning questions. These equipped the pupils so well that they were no longer phased when they came across questions posed in new ways, because they had already had lots of practice in mastering the concept.</p>	<p>We developed more reasoning questions.</p>

Usage

What we learnt from teachers	How it helped improve the system
In many cases, although the reaction from teachers using LbQ was positive, they didn't have time to share LbQ with other teachers, so it often didn't spread between teachers in a school, or from school to school, without buy-in from the head teacher. This was sometimes because tablets were not available in other classrooms.	We have introduced an affordable tablet package to help provide tablets for more classrooms. We are producing books of Question Sets for each year and subject to allow teachers to quickly see the value of using LbQ. We have also decided to offer a free LbQ account to all teachers from www.lbq.org/trylbq so they can access all of the high quality resources for front-of-class teaching until they are ready to connect with tablets for automatic marking, instant feedback and lesson analysis. In addition, we engaged the author Robert Powell to use interviews with teachers to publish a book called <i>The Power of Live Feedback</i> .
Although only a matter of seconds, time was taken up when pupils moved from one Question Set to another because they had to enter a new code for each one.	To simplify the use of the system and maximise lesson time, we changed the system so that a single entry of a lesson code enables pupils to join a number of tasks selected by the teacher.
In some cases, teachers would like to extend the amount of time a Question Set is available for to allow their pupils to complete Question Sets after the class has ended.	We adjusted the system so that teachers can set a Question Set to be available until midnight.
There needed to be an easier way for teachers to review pupils' answers to open-ended questions that could have more than one correct answer.	We introduced the facility for teachers to see all pupils' answers to a question in a single view, and to select any answer to bring up on the classroom display as a model answer, or to use as a teaching point.
Pupils are very enthusiastic about lessons using LbQ. They love learning this way and as a result, move through more questions than they might normally, so they learn more. We found that this effect does not seem to wear off over time.	This had a drawback. When the teacher asked for the pupils' attention, they were reluctant to stop! We therefore introduced a pause button which allowed the teacher to pause the tablets at any time. The teachers appreciate the extra control this gives them.
An important measure of a pupil's progress is the number of questions answered right first time, and teachers wanted to be able to monitor this easily.	We have made this number more prominent on the left side of the live results matrix. We also enabled teachers to quickly re-order pupils to rank them by higher or lower performance, allowing the teacher to easily prioritise which pupils to help.
There are literally hundreds of ways to use LbQ.	We have collected some of the ways teachers are using it and are issuing a booklet with over 100 ways to use LbQ.

Feedback

The feedback was extremely valuable to pupils as they answered questions. The ability to retry questions straight away after receiving feedback for an incorrect answer helped to boost pupils' confidence.	We modified the feedback to make it less conversational. Incorrect feedback now provides a scaffold with a number of clear steps to assist pupils to work towards a correct answer. We use correct feedback to reinforce and expand learning. We also present the feedback in different places for each incorrect answer to draw the pupil's attention to it.
Pupils often did not read the feedback when they entered a wrong answer. Teachers did learn to mitigate this by stressing the importance of reading the feedback instead of rushing on to the next question.	We make it optional for pupils to retry a question when they answer incorrectly. They can retry or skip to the next question. We do not limit the number of retries.

Equipment and Software Platform

Although schools had pledged to make sets of tablets available for participating teachers when joining the project, three schools had to drop out as devices were not actually available. We found that some schools had limited resources and were sharing tablets between classrooms, resulting in them not always being available.	We have put together an economical classroom tablet package with 32 pupil tablets plus a larger teacher tablet and storage/charging cabinet that will allow a teacher to provide affordable tablets for every pupil for the whole lesson as required. The affordable package was designed to spread costs through leasing at less than 25p per day per pupil or £1,100 per year for a class, including warranty.
Teachers would value the ability to pause an activity part way through and broadcast a new question to the class before continuing.	We developed the ability for teachers to ask an 'ad hoc' question of all the class at any time, and for the teachers to be able to see all the answers instantly. At the request of the teachers, this was developed further so that a question could be directed to a specific group of pupils.
The speed at which LbQ handles pupil responses is important as it helps to maximise learning time, which can be reduced by delays caused by the system.	Throughout the project, we increased the speed of response and tuned the system to make it tolerant of drops in Wi-Fi signals in schools. In a recent test of 25 pupils on a multiplication exercise, in which pupils had to answer 90 combinations correctly as quickly as possible, the system coped with nearly 2,000 answers in 4 minutes.
Due to GDPR data protection legislation, we needed to modify our system and policies.	We modified the system so that users can only see pupils' names in saved results if there is a data processing agreement in place with the school. If there is no data processing agreement in place, then teachers can see pupil names while a task is running, but names will then be anonymised in any saved reports.
We needed to make LbQ as easy to use as possible.	We have added help tips and a My LbQ user central access point for all functions.
For teachers to know where to intervene, they need a tablet with a larger display so they can easily see the progress of the whole class as they move around the room.	We have put a larger-screen device for the teacher in the tablet package. We also delivered larger tablets to some of our project teachers, which were sometimes also used by teaching assistants.

Read the project report by the
Institute for Effective Education
www.lbq.org/ieereport

View teacher and pupil survey results
www.lbq.org/feedbacksurvey



www.lbq.org

info@lbq.org

+44 (0)1254 688060

Learning by Questions has been created by the founder of Promethean and it is owned and financed through his family charity, the Bowland Charitable Trust.

“It has changed my teaching. Life is made simpler.”

Merline Worgess, Gainsborough Road Primary, Newham

“Thank you. This has revolutionised our classroom!”

Corinne Drysdale, Assistant Headteacher, Rock Ferry Primary, Wirral

Background to the School Feedback Project

Following BETT 2017, we recruited 50 schools, both primary and secondary, for a one-year project using LbQ. Schools were divided into seven geographical clusters covering more than ten local authorities: Belfast, Lancashire (2), Wirral and London (Hackney, Newham and Waltham Forest). Each school was asked to provide two teachers for the project and to allow them to attend an initial one-day training session, followed by two cluster meetings during the project and a third at the end.

Teachers were required to run three Question Sets each week and report on their experience of 50 of these during the year.

The Institute for Effective Education in York participated by monitoring the teacher feedback. When each school had provided 100 reports, the school was presented with an interactive panel as a mark of LbQ's gratitude. Schools were paid for supply cover teachers during

training and meetings and teachers were presented with Amazon vouchers for attendance at the cluster meetings.

Additionally, all teachers at the schools have been provided with free access to the LbQ Questions Sets for three years.

These arrangements were made as we appreciate that schools are under great financial pressure, and teachers are under extraordinary time pressure, which prevents the introduction of new ideas, however good they might be. Schools were asked to provide tablets to the classes involved and they agreed to do so.

Most of the schools began to use LbQ at the beginning of October. The project covers years 5-8 maths mastery Questions Sets, but initially, the curriculum wasn't fully covered, though it now is. We now have over 1,850 sets with more than 60,000 questions, most with feedback and

all scaffolded from understanding to problem solving.

We have published sixteen 300-page teacher planning books that list all the Question Sets and questions at all levels covering the curriculum to go alongside.

Out of the 96 teachers participating in the study, 43 submitted significantly more reports than required. As teachers got familiar with the programme, we saw an exponential trend in feedback, with more reports coming in each week. We expected to receive 1,000 lesson feedback reports, but actually received 4,970, with a good mixture of primary and secondary. The cluster meetings have worked well, and usage of LbQ is also extending outside of the project.