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Do the onebillion maths apps promote young children's mathematics attainment?

Submission date
16/05/2018

Recruitment status
No longer recruiting

Registration date
30/05/2018

Overall study status
Completed

Last Edited
05/09/2019

Condition category
Mental and Behavioural Disorders

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[X] Results
[ ] Individual participant data

Plain English summary of protocol

Background and study aims
The aim of this study is to evaluate whether children who practise mathematical concepts and vocabulary using the onebillion maths apps in a tablet make more progress in mathematics than children of comparable age and ability who did not use the apps during their first year in school. Two maths apps – one for ages 3 to 5 and the other for ages 4 to 6 – are being evaluated. They are used as a sequence: the children first complete all the activities in the app for 3 to 5 years and then go on to the second one, for ages 4 to 6.
The apps were developed by Onebillion.org, a non-profit organization registered as a charity in England and Wales (Number 1159480). They are designed using principles from instructional psychology known as the sequence "model, lead, test". This means that the children first see a worked out example of the activity they need to do; then they have the opportunity to do the same thing as they receive instruction from a teacher built into the apps; after a sufficient large amount of practise, they are tested on the same activity. At the end of the test, children who get all the answers right are rewarded by the appearance of a star on the screen. If they do not receive the star, they are encouraged to go back, practise again, and repeat the quiz.
Pupils progress through topics on their own and at their own pace. The apps cover several topics: for example, counting (with activities organized in different levels, taking counting up to 100), classification by different criteria (shape, color), shape (geometrical shapes vocabulary, symmetry), lines and patterns (straight or curved; repetitions of figures in a pattern), position (vocabulary about spatial relations), measures (length, time, mass and capacity), addition and subtraction (arithmetic with pictures, number bonds and number line work), sharing and fractions (half and quarter).
The apps have been evaluated in Malawi and in a small study in England with promising results. The Education Endowment Foundation is funding this large scale study in order to support schools in their decision regarding whether to acquire the apps.
Who can participate?
Children aged 5-6 years in Year 1 at a participating school in the 2017/18 academic year

What does the study involve?
At the start of the study, all schools nominate 9 or 10 pupils who are struggling with mathematics and could benefit from additional support.
The schools are randomly allocated to one of two groups, after the children participate in a pre-

test of mathematical achievement. Schools in the first group take part in the onebillion programme. At the end of the project, children in both intervention and control schools are tested in the outcome measure.

What are the possible benefits and risks of participating?
Participants may benefit from improved skills in maths. There are no notable risks involved with participating.

Where is the study run from?
113 schools, mostly in the Greater Manchester, Lancashire, Liverpool, and West Yorkshire regions (UK)

When is the study starting and how long is it expected to run for?
September 2017 to December 2018

Who is funding the study?
Education Endowment Foundation (UK)

Who is the main contact?
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Study information

Scientific Title
A randomised control trial of the impact of the onebillion maths apps on Year 1 children's mathematics attainment

Study objectives
Primary hypothesis:
Children identified by their teachers as struggling with mathematics at the start of Year 1 who participate in the onebillion intervention should show greater progress in mathematics than children identified by their teachers as struggling with mathematics at the start of Year 1 who do not participate in the intervention.

Secondary hypotheses:
1. The onebillion intervention is as effective for children entitled to FSM as for other children from the onebillion intervention, as assessed by the progress test in maths
2. The onebillion intervention is as effective for boys as for girls, as assessed by the progress test in maths

Ethics approval required
Old ethics approval format

Ethics approval(s)
Central University Research Ethics Committee of the University of Oxford, 06/11/2018, ref: ED-CIA-17-014

Study design
Cluster randomised controlled trial

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Mathematic attainment

Interventions
All schools nominate 9 to 10 pupils, depending on the number of year 1 children in the classroom, who are considered by teachers to need additional practice with mathematics.

When this has been provided to the evaluation team, the schools are randomly assigned either to an intervention or to a control group by the evaluation team, with an equal allocation of schools to each group.

Intervention group: The intervention is delivered to the children who work individually on an iPad tablet through two different onebillions apps. It is managed by teaching assistants (TAs) who supervise the children as a group and provide pedagogical and technical support where needed. Teaching Assistants (TAs) and/or schools receive the opportunity to be trained in person or via online communication to enable their delivery of the intervention. These TAs supervise the children for four 30 minute sessions each week for twelve weeks. These sessions are in addition to usual, daily classes of mathematics. In this RCT, the sessions are delivered during the end of term 2 and the remainder during term 3 of Year 1.

Control group: Schools take a business as usual approach to supporting pupils who struggle with mathematics. The schools are offered a financial incentive of £1,000 in order to cooperate with the evaluation team up to the end of the trial and the further incentive of receiving free access to the app once the project is completed.

Intervention Type
Behavioural

Primary outcome(s)
Mathematics ability is assessed using the Progress Test in Maths 5, from GL Assessments, in February before the start of the intervention and the parallel form the Progress Test in Maths 6, in June/July, at the end of the academic year. This assessment is given immediately after the end of the intervention. It is administered by teachers to children individually.

Key secondary outcome(s))
There are no secondary outcome measures

Completion date
01/12/2018

Eligibility

Key inclusion criteria

1. Year 1 pupils in English state supported primary schools in the 2017/18 academic year
2. Children identified by their teachers as struggling with mathematics at the start of the year

Participant type(s)
Other

Healthy volunteers allowed
No

Age group
Child

Sex
All

Total final enrolment
1124

Key exclusion criteria
1. Children in the higher half of their class according to the teachers assessment for mathematics
2. Children with a statement of special educational needs
3. Children who have difficulty in understanding English

Date of first enrolment
01/09/2017

Date of final enrolment
01/01/2018

Locations

Countries of recruitment
United Kingdom

Study participating centre
113 schools in the UK
Mostly in the Greater Manchester, Lancashire, Liverpool, and West Yorkshire regions
Nottingham
United Kingdom
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Sponsor information

Organisation

Education Endowment Foundation

ROR
https://ror.org/03bhd6288

Funder(s)

Funder type
Charity

Funder Name
Education Endowment Foundation

Alternative Name(s)
EducEndowFoundn, The Education Endowment Foundation (EEF), Education Endowment Foundation | London, EEF

Funding Body Type
Private sector organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are not expected to be made available to anyone outside of the team. Anonymised data is sent to the funders, The Education Endowment Foundation. They keep this archived and allow access following an application through the Department for Education.

IPD sharing plan summary
Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Basic results		22/03/2019	25/03/2019	No	No
Funder report results	results			No	No
Participant information sheet	version v1	30/05/2018	02/04/2019	No	Yes