

Can tablet-based cognitive training improve attention and everyday functioning in children and adolescents with ADHD-related symptoms?

Submission date 10/09/2026	Recruitment status No longer recruiting	☒ Prospectively registered
		☐ Protocol
Registration date 14/09/2026	Overall study status Ongoing	☐ Statistical analysis plan
		☐ Results
Last Edited 14/09/2026	Condition category Mental and Behavioural Disorders	☐ Individual participant data
		☒ Record updated in last year

Plain English summary of protocol

Background and study aims

Attention-deficit/hyperactivity disorder (ADHD) is associated with difficulties with attention, concentration, impulse control and other thinking skills that can affect children's everyday functioning and learning. In the UK, children with ADHD-related difficulties may also experience long waits for assessment and support. There is therefore a need to investigate accessible, non-medication approaches that could support children with attention difficulties.

Mastermind is a tablet-based programme that uses game-like activities designed to exercise attention, memory, processing speed and other thinking skills. It also includes short visual and eye-movement exercises. This study aims to find out whether taking part in the Mastermind programme improves ADHD-related symptoms compared with taking part in other tablet-based educational activities. The study will also examine whether Mastermind is associated with changes in attention and other thinking skills, executive functioning, everyday functioning and educational skills.

Who can participate?

Children and adolescents aged 8–15 years attending participating schools in the Luton and Bedfordshire area of England may be eligible. Parents or carers who are interested in the study will first be asked to complete a questionnaire about their child's attention and behaviour. Children who show elevated ADHD-related symptoms on the Conners 4 questionnaire may be invited to participate.

A formal diagnosis of ADHD is not required. A parent or legal guardian must provide written consent and the child must also agree to participate. Children must be able to complete the tablet-based activities safely. Certain medical conditions that could make the activities unsuitable or unsafe may prevent participation.

What does the study involve?

Children who are eligible and agree to participate will complete assessments before the programme begins. These include questionnaires completed by parents and/or teachers and

activities that assess attention, memory and other thinking skills. Children will also complete assessments of eye movements and educational skills.

Participants will then be randomly allocated to one of two groups. One group will complete the Mastermind cognitive training programme. The other group will complete age-appropriate educational activities on a tablet and will act as an active comparison group. Random allocation means that participants cannot choose which group they enter.

Both groups will complete approximately three 20-minute sessions each week for about 14 weeks. The programme is planned to include approximately 42 sessions. Most sessions will take place at school and will be supervised by trained study staff. The study also includes a subgroup completing activities at home.

The Mastermind programme includes game-like cognitive exercises designed to challenge skills such as attention, working memory, processing speed and executive function, together with short visual and eye-movement exercises. Participants in the comparison group will spend a similar amount of time using educational applications but will not receive the Mastermind cognitive training exercises.

Assessments will be repeated immediately after the programme. Where feasible, participants may also complete a later follow-up assessment to examine whether changes are maintained.

Participation is voluntary. Children can take a break during activities or stop participating without penalty, and choosing not to participate or withdrawing from the study will not affect their education or relationship with their school.

What are the main outcomes being measured?

The primary outcome is change in ADHD-related symptoms from before to immediately after the approximately 14-week intervention, measured using the Vanderbilt ADHD Rating Scale.

The secondary outcomes are changes in objective measures of attention and cognitive functioning from before to immediately after the intervention. These include sustained attention and inhibitory control measured using a continuous performance task (mCPT), cognitive performance measured using the Mastermind Assessment, and eye-movement and oculomotor functioning measured using the RightEye system.

Additional exploratory outcomes will examine everyday executive functioning, educational skills, health-related quality of life and other aspects of everyday functioning. The study will also explore participant engagement and whether outcomes differ according to factors such as age and whether training is completed at school or at home.

What are the possible benefits and risks of participating?

Children may find the tablet activities enjoyable and may experience improvements in attention, memory or other skills, but improvement cannot be guaranteed. The study may also provide useful information about whether tablet-based cognitive training could help children with ADHD-related difficulties in the future.

The study is considered low risk. Some children may experience temporary tiredness, mild eye strain or frustration while completing the activities. Sessions are relatively short, children can take breaks when needed, and they may stop an activity if they feel uncomfortable. Study staff will supervise school-based sessions and follow the participating schools' safeguarding procedures.

Where is the study run from?

The study is being conducted in participating schools in the Luton and Bedfordshire area of England. It is a collaboration involving the University of Bedfordshire, Mastermind Cognitive Training, CHUMS and participating schools. Most study activities will take place at participating schools, with a subgroup completing the training activities at home.

When is the study starting and how long is it expected to run for?

Participant screening began in 2026. Baseline assessments and the main study are planned to begin in September 2026. The approximately 14-week training period is expected to run from September 2026 to January 2027, followed by post-training assessments. Where feasible, additional follow-up assessments will be conducted later in the 2026–2027 school year.

Who is funding the study?

Mastermind Cognitive Training, USA.

Who is the main contact?

Dr Anastasia Giannakopoulou, University of Bedfordshire, UK, anastasia.giannakopoulou@beds.ac.uk

Contact information

Type(s)

Public, Scientific, Principal investigator

Contact name

Prof Anastasia Giannakopoulou

Contact details

University of Bedfordshire, Park Square
Luton
United Kingdom
LU1 3JU
+44 (0)1582 489188
anastasia.giannakopoulou@beds.ac.uk

Type(s)

Public, Scientific, Principal investigator

Contact name

Prof Joaquin Anguera

Contact details

675 Nelson Rising Lane
San Francisco
United States of America
94158
+1 (0)7348460030
joaquin.anguera@ucsf.edu

Additional identifiers

Study information

Scientific Title

A randomized active-controlled trial of Mastermind technology-enabled cognitive training for improving ADHD-related symptoms, cognitive function, and everyday functioning in children and adolescents with elevated ADHD symptoms

Acronym

Mastermind UK ADHD Study

Study objectives

1. The primary objective is to determine whether approximately 14 weeks of Mastermind technology-enabled cognitive training reduces ADHD-related symptoms in children and adolescents with elevated ADHD symptoms compared with an active control condition.
2. Secondary objectives are to determine whether Mastermind cognitive training produces greater improvements than the active control condition in objective measures of attention and cognitive functioning, including sustained attention and inhibitory control, cognitive performance, and oculomotor/sensorimotor functioning.
3. Exploratory objectives are to examine changes in everyday executive functioning, educational skills, functional impairment, health-related quality of life and well-being; to assess intervention engagement, acceptability and treatment expectancy; and to explore whether intervention-associated changes differ according to developmental stage and school-based versus home-based delivery.
4. The primary comparison will evaluate between-group change from baseline to immediately post-intervention. Where feasible, follow-up assessments later in the school year will explore maintenance of outcomes.

Ethics approval required

Ethics approval required

Ethics approval(s)

Approved 30/06/2026, University of Bedfordshire Research Institute Ethics Committee (CRELLA) (University of Bedfordshire, University Square, Luton, LU1 3JU, United Kingdom; +44 (0)1582 489000; research@beds.ac.uk), ref: IRB-2026-03

Primary study design

Interventional

Allocation

Randomized controlled trial

Masking

Blinded (masking used)

Control

Active

Assignment

Parallel

Purpose

Basic science, Treatment

Study type(s)

Health condition(s) or problem(s) studied

Attention-deficit/hyperactivity disorder (ADHD)-related symptoms in children and adolescents

Interventions

Participants will be randomized 1:1 to Mastermind cognitive training intervention or treatment-as-usual/wait-list control using a computer-generated permuted-block randomization sequence, stratified by school. Randomly varying block sizes will be used to maintain approximate within-school allocation balance while reducing predictability.

Mastermind intervention: Participants allocated to the intervention will complete tablet-based Mastermind cognitive training approximately three times per week for approximately 20 minutes per session over approximately 14 weeks, with a planned total of approximately 42 sessions. The programme combines visual/oculomotor exercises with gamified cognitive exercises targeting attention, working memory, processing speed and executive function. The visual/oculomotor component includes exercises involving optokinetic stimulation and combinations of near/far, saccade, convergence/divergence and fixation exercises. The cognitive training component consists of game-based exercises delivered through the Mastermind platform. Difficulty and performance are managed within the digital training programme.

Active control: Participants allocated to the active control condition will complete age-appropriate tablet-based educational activities for approximately the same session frequency and duration as the intervention group. Control activities use educational applications such as ScratchJr, Pocket Code (Catrobat), GCompris and Tux Paint and do not include the Mastermind cognitive-training components. The active control is intended to provide a comparable experience involving tablet use, engagement with structured activities and study contact while controlling for non-specific effects of participation.

Delivery: Most participants will complete their assigned activities at participating schools in the Luton/Bedfordshire area under study supervision. A predefined subgroup will complete the assigned intervention or active-control activities remotely at home. Participants in both groups will otherwise continue their usual school curriculum. Attendance, session completion and engagement will be recorded. Participants may pause or discontinue activities if discomfort occurs and may withdraw from the study at any time without penalty.

Assessments will be conducted before randomisation/before the intervention and immediately following the approximately 14-week intervention period. Where feasible, additional follow-up assessments will be conducted later in the school year.

Intervention Type

Behavioural

Primary outcome(s)

1. ADHD-related symptoms: the primary endpoint is change in ADHD symptom score from baseline to immediately post-intervention; measured using NICHQ Vanderbilt ADHD Rating Scale total ADHD symptom score at baseline (pre-intervention) and immediately post-intervention (approximately 14 weeks after intervention commencement)

Key secondary outcome(s)

1. Sustained attention measured using Mastermind continuous performance task (mCPT), at baseline (pre-intervention) and immediately post-intervention (approximately 14 weeks after intervention commencement)
2. Cognitive performance measured using Mastermind Assessment, a tablet-based cognitive assessment battery, at baseline (pre-intervention) and immediately post-intervention (approximately 14 weeks after intervention commencement)
3. Oculomotor and sensorimotor function measured using RightEye eye-tracking assessment at baseline (pre-intervention) and immediately post-intervention (approximately 14 weeks after intervention commencement)

Completion date

01/04/2027

Eligibility**Key inclusion criteria**

1. Country of recruitment: United Kingdom / England
2. Setting: Primary, middle and secondary schools in the Luton/Bedfordshire region, with a home-based delivery subgroup
3. Aged 8–15 years
4. Enrolled at a participating school
5. Elevated ADHD-related symptoms as determined by Conners 4 T-score >60 during screening
6. Written parent/legal guardian informed consent
7. Child assent
8. Normal or corrected-to-normal vision and hearing
9. Able and willing to participate in the study procedures

Healthy volunteers allowed

No

Age group

Child

Lower age limit

8 Years

Upper age limit

15 Years

Sex

All

Total final enrolment

0

Key exclusion criteria

1. Medical conditions that may make tablet-based participation unsuitable or unsafe, including epilepsy or significant visual/vestibular disorders
2. Inability to participate in the intervention schedule or complete study procedures

Date of first enrolment

15/09/2026

Date of final enrolment

08/10/2026

Locations

Countries of recruitment

United Kingdom

England

Study participating centre**Somerles Primary School**

Wigmore Lane

Luton

England

LU2 8AH

Study participating centre**St Margaret of Scotland Catholic Primary School**

Rotheram Avenue

Luton

England

LU1 5PP

Study participating centre**Parkfields Middle School**

Park Road

Toddington

Dunstable

England

LU5 6AB

Study participating centre**Icknield High School**

Riddy Lane

Luton
England
LU3 2AH

Study participating centre
Putteridge Primary School
Putteridge Road
Luton
England
LU2 8HJ

Study participating centre
Putteridge High School
Putteridge Road
Luton
England
LU2 8HJ

Study participating centre
Arnold Academy
Hexton Road
Barton-le-Clay
England
MK45 4JZ

Study participating centre
The Meads Primary School
Sawtry Close
Luton
England
LU3 2UE

Sponsor information

Organisation
Mastermind Cognitive Training, Inc. (United States)

ROR
<https://ror.org/057y32x81>

Funder(s)

Funder type

Funder Name

Mastermind Cognitive Training

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Not expected to be made available