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ChatGPT in lesson preparation - A Teacher Choices Trial

Submission date 17/07/2024	**Recruitment status** No longer recruiting	[_] Prospectively registered [X] Protocol
Registration date 25/07/2024	**Overall study status** Completed	[X] Statistical analysis plan [X] Results
Last Edited 15/01/2025	**Condition category** Other	[_] Individual participant data

Plain English summary of protocol

Background and study aims

Generative AI (GenAI) in one of its most well-known forms (ChatGPT) has only been available to the public since November 2022 and already has more than 100 million weekly active (global) users. ChatGPT is a large language model which generates human-like text responses to questions or prompts entered by users. It has been trained on data from the internet including websites, books, articles and manuals which it uses to predict the next word in a sequence. It has been designed to respond in an accessible and conversational manner allowing users to engage in natural language interactions on various topics and almost anyone can interact with the program once they have a log in. The Department for Education (DfE) in England recognised that the education sector was using GenAI with increasing regularity and issued a call for evidence on the topic in 2023. It showed that these tools are already being used for lesson planning, creating resources, and writing exam questions. Benefits of using GenAI were reported to include 'freeing up teacher time, providing additional educational support, including for pupils and students with special educational needs and disabilities (SEND) and pupils and students for whom English is an additional language (EAL), and subject specific applications'. Although the Education Secretary has said that "AI will have the power to transform a teacher's day-to-day work", there is limited research on how teachers are actually using AI.

Who can participate?

Any state secondary school in England can take part as long as there is at least one teacher who teaches Years 7 and/or Year 8 science, and who completes the baseline survey. Any science teacher who teaches Years 7 and/or Year 8 science (including non-specialist science teachers and Early Career Teachers (ECT)) at a participating school and who is willing to be part of the trial can take part. Teachers are only considered eligible once they complete the baseline teacher survey for the trial.

What does the study involve?

This is a cluster trial with randomisation at school-level. Schools were randomly assigned to one of two arms with equal allocations. The two arms are the ChatGPT group and the Non-GenAI group. In the ChatGPT group, science teachers are asked to use ChatGPT to prepare lessons and resources for upcoming Year 7 and/or 8 science lessons. They will also receive access to the online ChatGPT guide to guide their lesson and resource preparation. In the Non-GenAI group,

science teachers are asked not to use ChatGPT or any other GenAI tool in any lesson and resource preparation for their Year 7 and/or 8 science lessons. Teachers will be asked to complete a weekly diary during ten weeks of the 2024 summer term regarding the lessons they delivered in each week.

What are the possible benefits and risks of participating?
The primary hypothesis of the study is that using ChatGPT will beneficially reduce workload for teachers. We do not anticipate any side effects of trial participation.

Where is the study run from?
The National Foundation for Educational Research (https://www.nfer.ac.uk/)

When is the study starting and how long is it expected to run for?
December 2023 to July 2024

Who is funding the study?
The study funder is jointly funded by the Education Endowment Foundation (https://educationendowmentfoundation.org.uk/) and the Hg Foundation (https://www.thehgfoundation.com/)

Who is the main contact?
Palak Roy, Senior Trials Manager at NFER, p.roy@nfer.ac.uk

Study website
https://educationendowmentfoundation.org.uk/projects-and-evaluation/projects/choices-in-edtech-using-generative-ai-chatgpt-for-ks3-science-lesson-preparation-2024-teacher-choices-trial

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Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number

ClinicalTrials.gov number
Nil known

Secondary identifying numbers
Nil known

Study information

Scientific Title

A two-armed randomised controlled trial investigating the effect of ChatGPT use during lesson preparation on the time spent on lesson preparation by teachers of Year 7 and/or Year 8 science classes over a 5-week period

Study objectives
Primary hypothesis:
Teacher lesson and resource preparation time for Year 7 & 8 science lessons over five weeks (second half of summer term 2024) will not be equal in ChatGPT and Non-GenAI groups.

Secondary hypotheses:
Teacher lesson and resource preparation time for Year 7 & 8 science lessons over five weeks (first half of summer term 2024) will not be equal in ChatGPT and Non-GenAI groups.
The quality of lesson and resource materials used in Year 7 & 8 science lessons will not be equal in ChatGPT and Non-GenAI groups.
The proportion of lessons for which teachers use ChatGPT will not be equal in the first five week period and the second five week period.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 09/01/2024, NFER Code of Practice Group (The Mere, Upton Park, Slough, SL1 2DQ, United Kingdom; +44 (0)1753574123; Enquiries@nfer.ac.uk), ref: EEAI

Study design
Two-armed cluster (school)-randomized controlled trial

Primary study design
Interventional

Secondary study design
Cluster randomised trial

Study setting(s)
School

Study type(s)
Treatment

Participant information sheet
See study outputs table

Health condition(s) or problem(s) studied
Teacher workload

Interventions
This is a two-armed randomised controlled trial. The randomisation is at the school level which is stratified by school size (i.e., the number of participating teachers per school). The stratification variable was the number of teachers, cut into two categories. Within each stratum, schools were randomised to one of two study groups through simple random assignment in R. Participating

science teachers will be asked to implement their allocated approach for 10 weeks over the summer term of 2024 with their Year 7 and/or Year 8 classes. The two arms are: ChatGPT and Non-GenAI.
In the ChatGPT group, teachers are asked to use ChatGPT when preparing for lessons and creating resources.
In the Non-GenAI group, teachers are asked to not use any GenAI tools (ChatGPT or otherwise) when preparing for lessons and creating resources.
For both groups, the teacher guide emphasises that teachers do not need to create any additional lesson resources or do any additional planning specifically for this project, over and above what they usually would. All teachers are asked to teach their lessons as normal.

Intervention Type
Other

Primary outcome measure
Total hours spent in lesson and resource preparation measured using data collated from a weekly teacher diary over a five-week period (second half of summer 2024 term)

Secondary outcome measures
1. Total hours spent in lesson and resource preparation measured using data collated from a weekly teacher diary over a five-week period (first half of summer 2024 term)
2. Quality of lesson and resource materials used measured using ranking of teachers' lesson resources by an independent panel of teachers in the second five-week period
3. Proportion of science lessons where ChatGPT was used for lesson and resource preparation measured using a weekly teacher diary over a five-week period
4. Proportion of weeks when the ChatGPT teacher guide was consulted at least once measured using a weekly teacher diary in each five-week period

Overall study start date
11/12/2023

Completion date
31/07/2024

Eligibility

Key inclusion criteria
1. School eligibility: Any state secondary school in England can take part as long as there is at least one teacher who teaches Years 7 and/or Year 8 science, and who completes the baseline survey
2. Teacher eligibility: Any science teacher who teaches at an eligible school, who teaches Years 7 and/or Year 8 science (including non-specialist science teachers and Early Career Teachers (ECT)), and who is willing to be part of the trial. Teachers are only considered eligible once they complete the baseline teacher survey for the trial.

Participant type(s)
Learner/student

Age group
Mixed

Sex
Both

Target number of participants
174

Total final enrolment
258

Key exclusion criteria
Participants will be excluded if they request to withdraw from the trial

Date of first enrolment
01/02/2024

Date of final enrolment
12/03/2024

Locations

Countries of recruitment
England

United Kingdom

Study participating centre
National Foundation for Educational Research (NFER)
The Mere
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Sponsor information

Organisation
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Sponsor type
Research organisation

Website
https://www.nfer.ac.uk/

ROR
https://ror.org/044sxgs38

Funder(s)

Funder type
Research organisation

Funder Name
Education Endowment Foundation

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

Funding Body Type
Private sector organisation

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

Location
United Kingdom

Funder Name
Hg Foundation

Results and Publications

Publication and dissemination plan
Teacher accessible output and trial report will be published on EEF website - https://educationendowmentfoundation.org.uk/projects-and-evaluation/projects/choices-in-edtech-using-generative-ai-chatgpt-for-ks3-science-lesson-preparation-2024-teacher-choices-trial

Intention to publish date
09/12/2024

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be available upon request from FFT Education. The EEF data archive is managed by FFT Education (FFT) and held by the ONS within their Secure Research service. https://educationendowmentfoundation.org.uk/privacy-notices/privacy-notice-for-the-eef-data-archive

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet		05/02/2024	18/07/2024	No	Yes
Protocol file	version 1.0		23/07/2024	No	No
Statistical Analysis Plan	version 1.0		23/07/2024	No	No
Funder report results		31/12/2024	15/01/2025	No	No