UNIVERSITY OF BIRMINGHAM | SCHOOL OF EDUCATION

GCSE Prepper as a Tool for Improving Exam Performance

Aleksandra Krogulska (University of Birmingham, Jagiellonian University)
Julie A. Hadwin (University of Birmingham)
Greta M. Fastrich (University of Southampton)
Rosalind Potts (UCL)
Kou Murayama (University of Tuebingen)
Philip A. Higham (University of Southampton)

Economic and Social Research Council
Innovate UK

Learning and technology in the classroom

- Evidence suggests that practising retrieval of curriculum content compared to simple restudying confers learning benefits
- In successive relearning (SR) students:

  Receive corrective feedback for questions that they answer incorrectly

  Are asked to repeat incorrectly answered questions within a learning session until they are answered correctly (to achieve mastery)

  Have an opportunity to go over the same curriculum material multiple times at spaced intervals
- Current focus on the effective translation of evidence-based practice into the classroom using digital technology

GCSE Science Prepper (Exam Prepper Ltd)

- An online learning platform that supports students in learning GCSE foundation and higher tier science
- It aims to support teachers via marking student work
- It utilises question formats with 1 to 6 marks consistent with the GCSE exam (e.g., MCQ, fill-in-the-blank, ordering items)
- Students can use a hint function
- It aims to utilise learning principles linked to SR

  It includes feedback for every question, and repetition within a session for incorrect answers

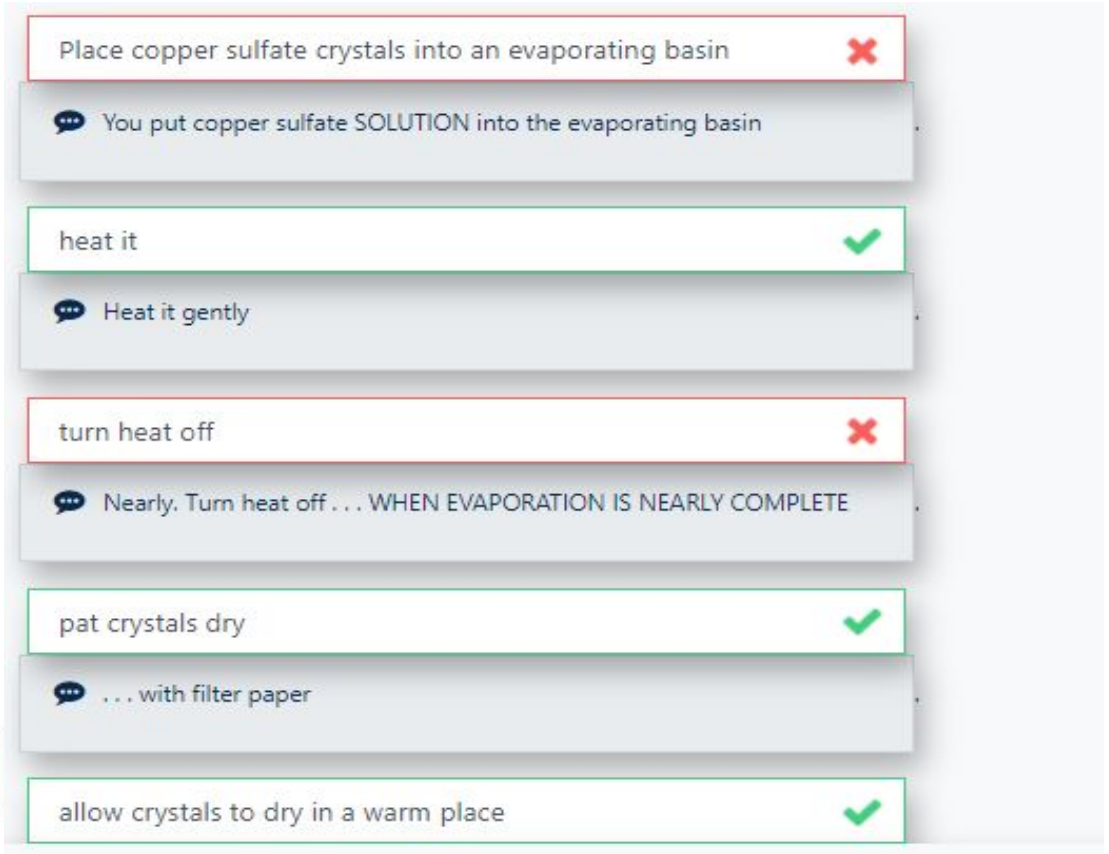
  Optimised mode – an algorithm that delivers a spaced retrieval practice schedule
- Manual mode – students can choose questions to practise
- Homework mode - teachers use the platform to set homework

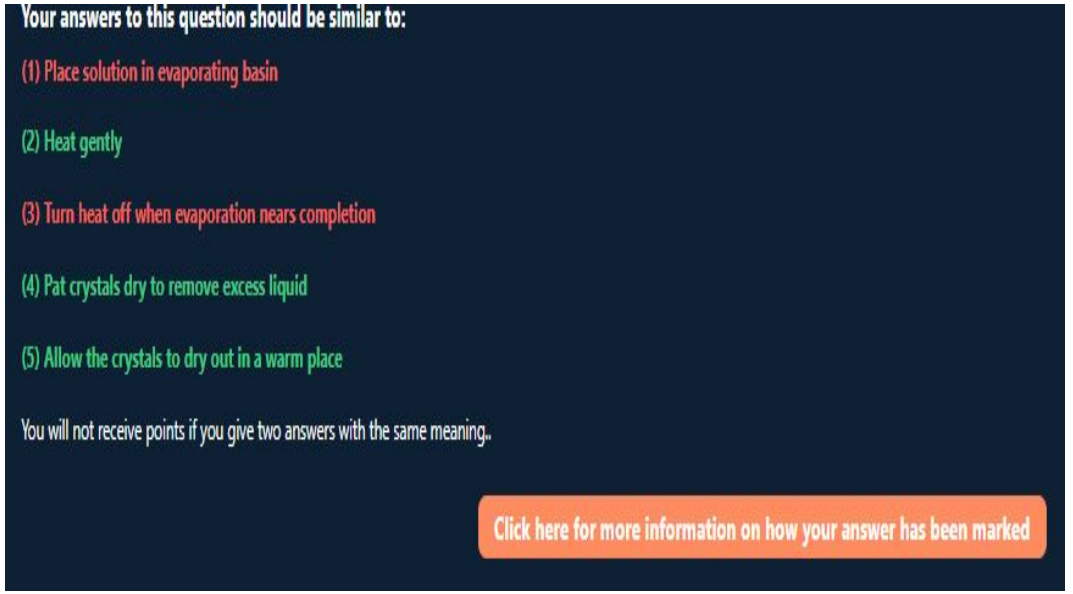
UNIVERSITY OF BIRMINGHAM

Multiple mark question – with example feedback and hint function

Outline a plan to produce copper sulphate crystals from a beaker containing copper sulphate solution.

Please make as many separate points as you can in the boxes that follow:





Research aims

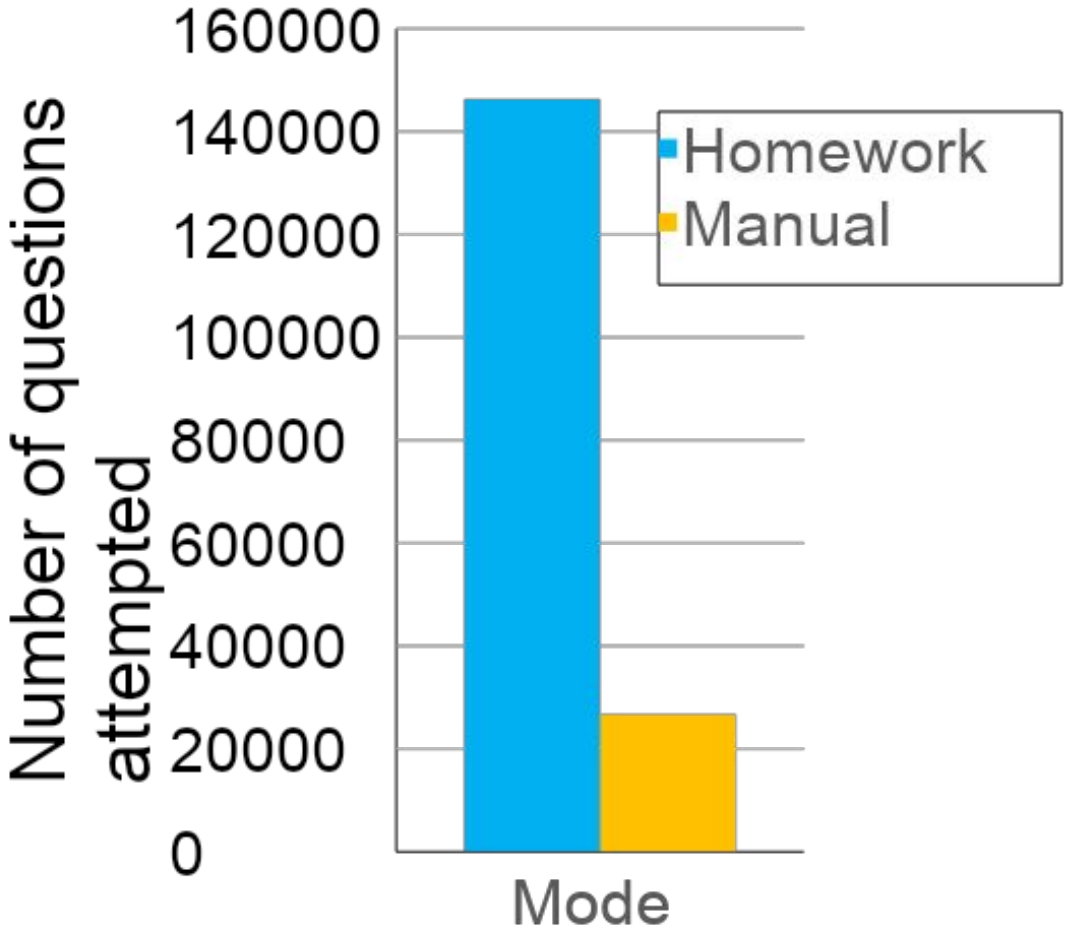
To explore how students have used the platform to identify directions in which the platform could be developed

To understand whether student engagement and accuracy of their answers in the platform were linked with GCSE exam scores

To consider exam level (foundation vs. higher), access to pupil premium, and general cognitive abilities measured by Cognitive Ability Test scores in understanding this association

Platform usage

- Period: 04.10.2019 – 11.09.2022
- Number of students: 4,335
- Number of schools involved: 37
- Only about 14% of questions attempted were practised more than once in subsequent sessions
- No students used the optimised mode



UNIVERSITY OF BIRMINGHAM

Participants and measures

- N=247 students (across N=3 schools) who used the platform and for whom we obtained GSCE results in the school year 2021/22
- Platform use

  (1) Accuracy= % correct answers on sub-questions (/sub-questions attempted) - M = 46.4% (SD = 20.9)

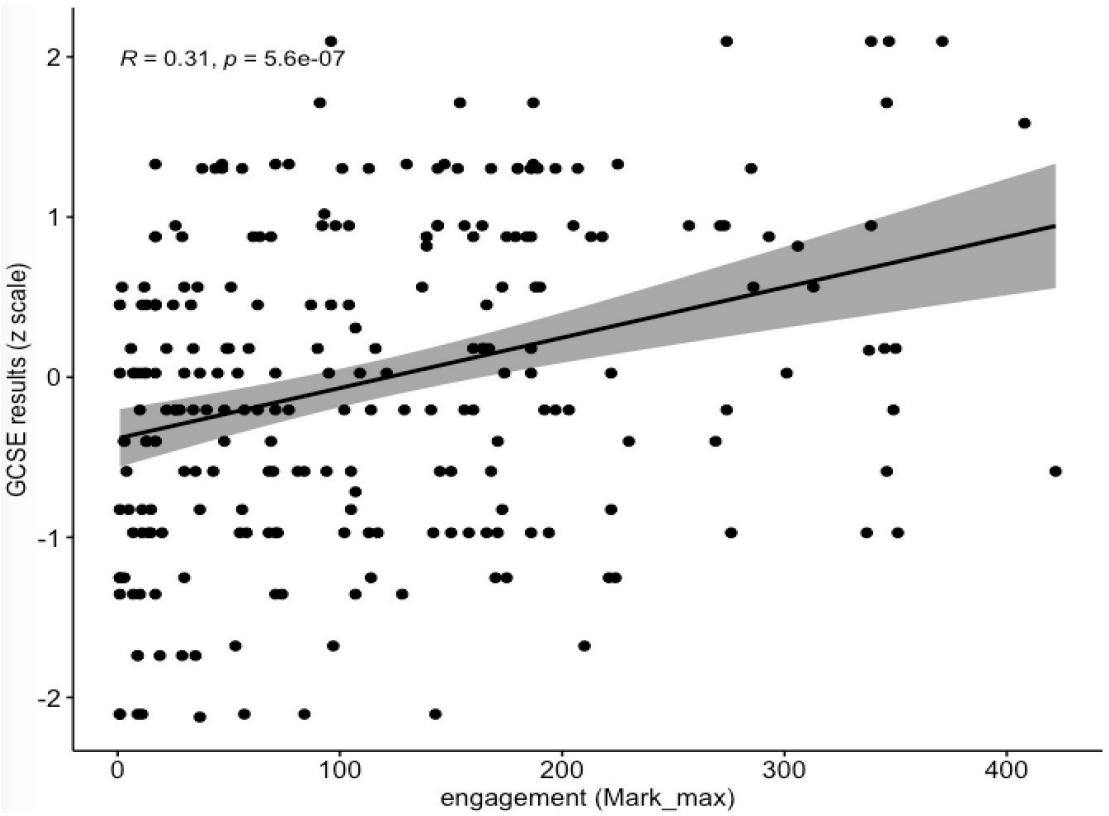
  (2) Engagement – the number of sub-questions attempted - M = 124 (SD = 124.09)
- Other factors

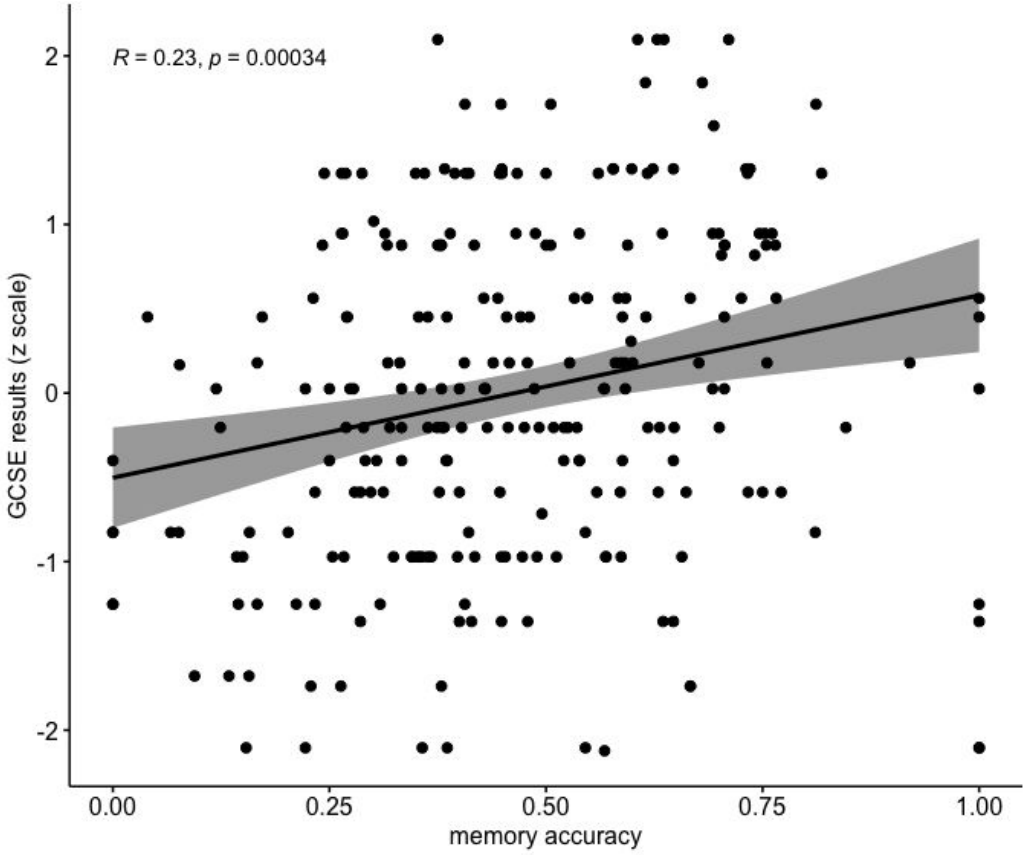
  (3) Exam level – n = 107 students (foundation tier) and n= 140 students (higher tier)

  (4) Pupil premium (to improve educational outcomes for disadvantaged students) – n= 55 students and 192 students with and without

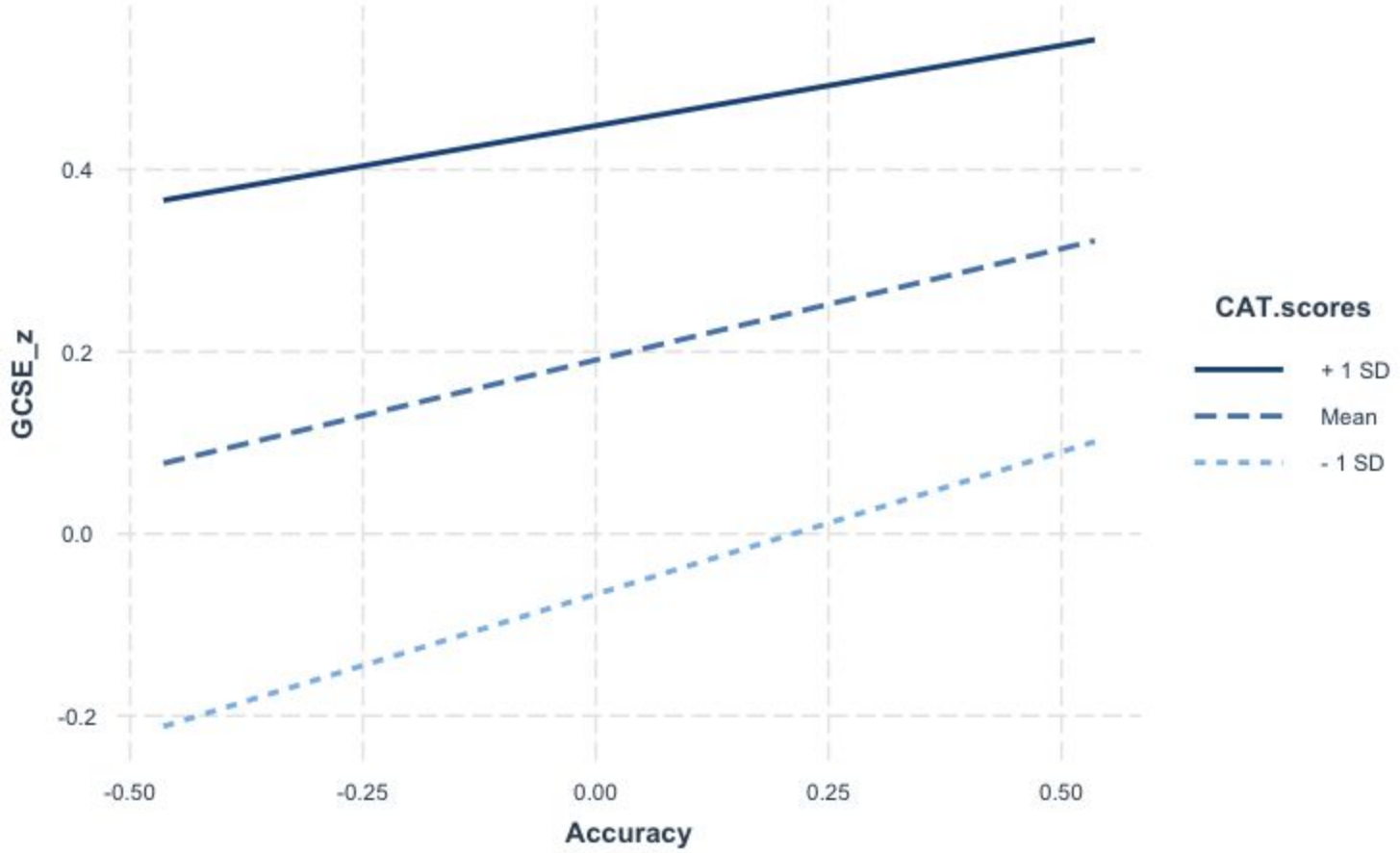
  (5) CAT scores – N = 147 (M = 96.03, SD = 11.80)

Platform engagement and accuracy predicted GCSE results



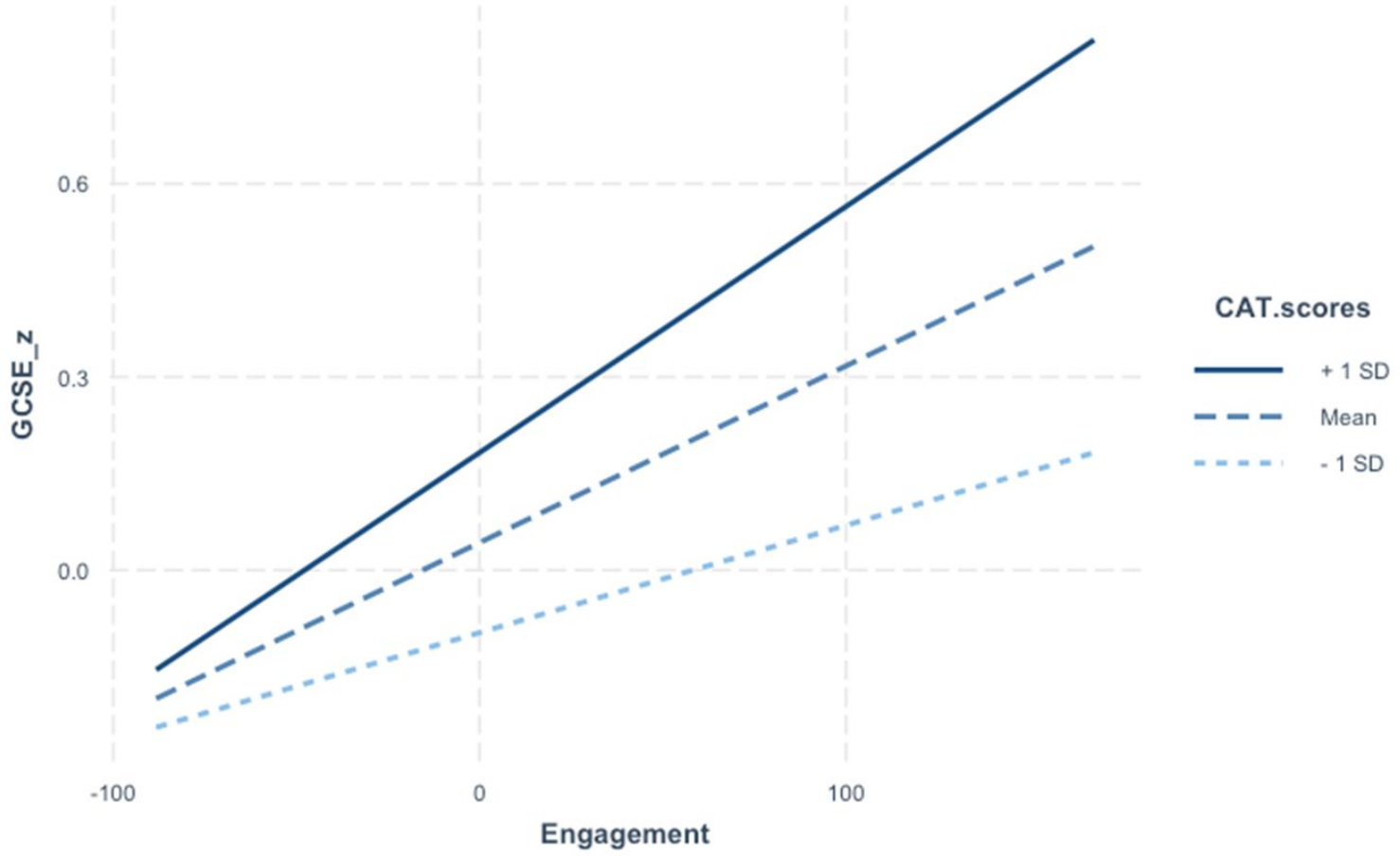


Platform accuracy predicted the GCSE results regardless of CAT scores



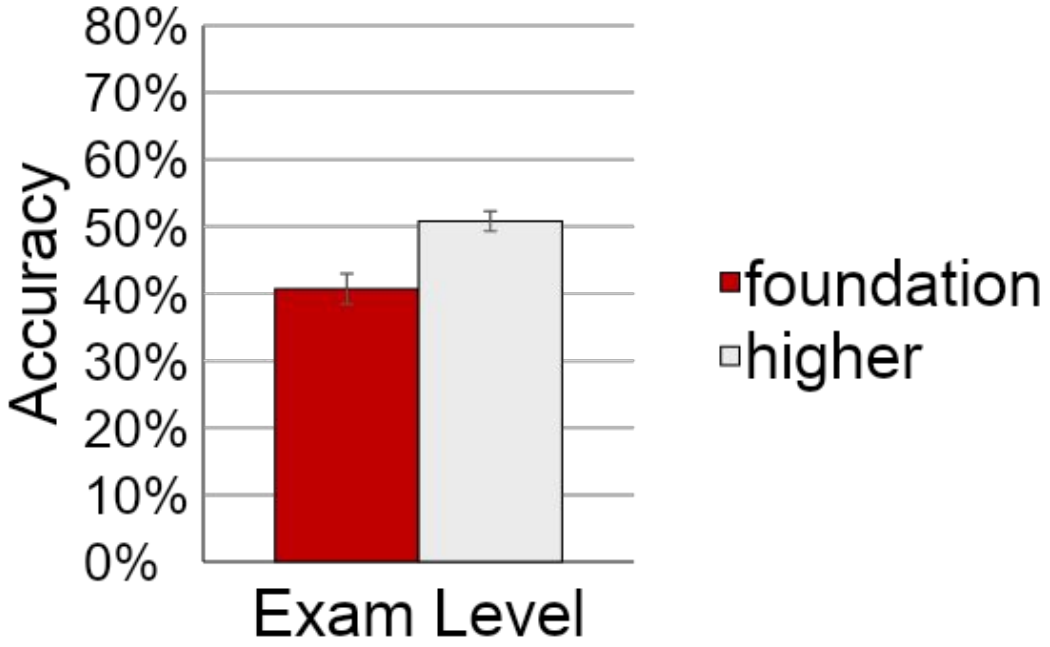
UNIVERSITY OF BIRMINGHAM

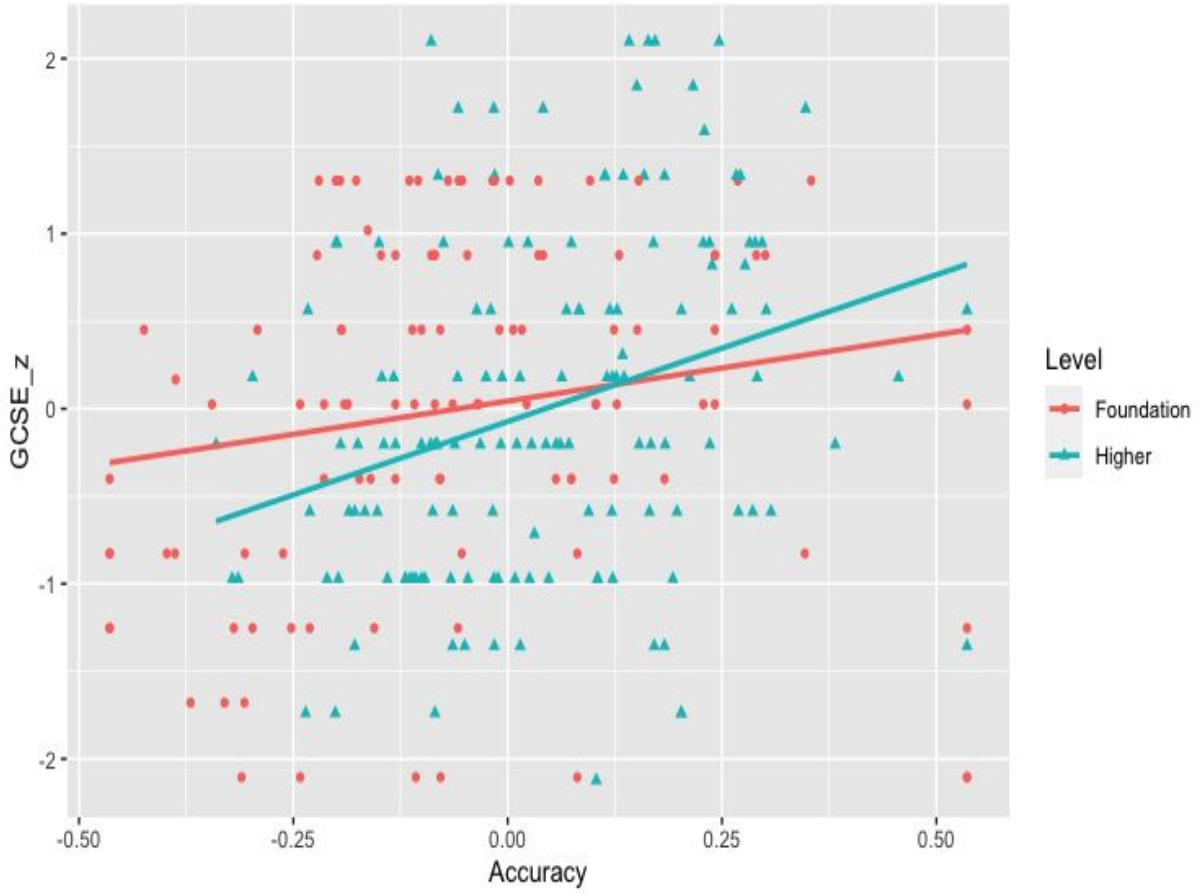
Platform engagement predicted GCSE results regardless of CAT scores



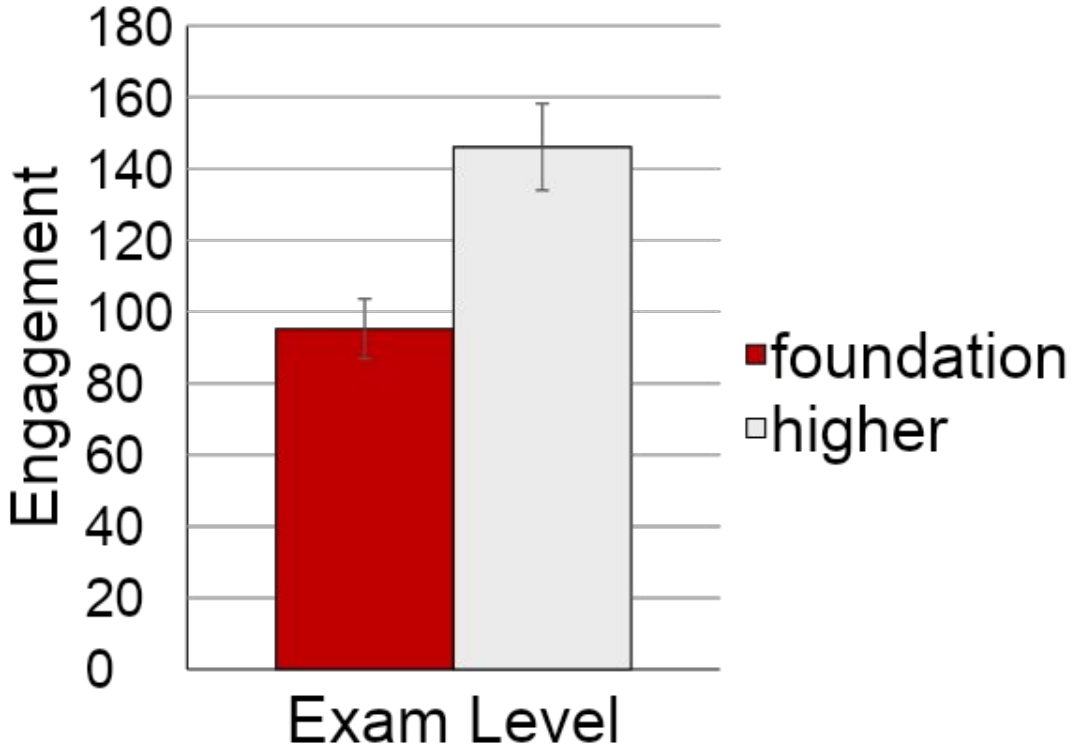
UNIVERSITY OF BIRMINGHAM

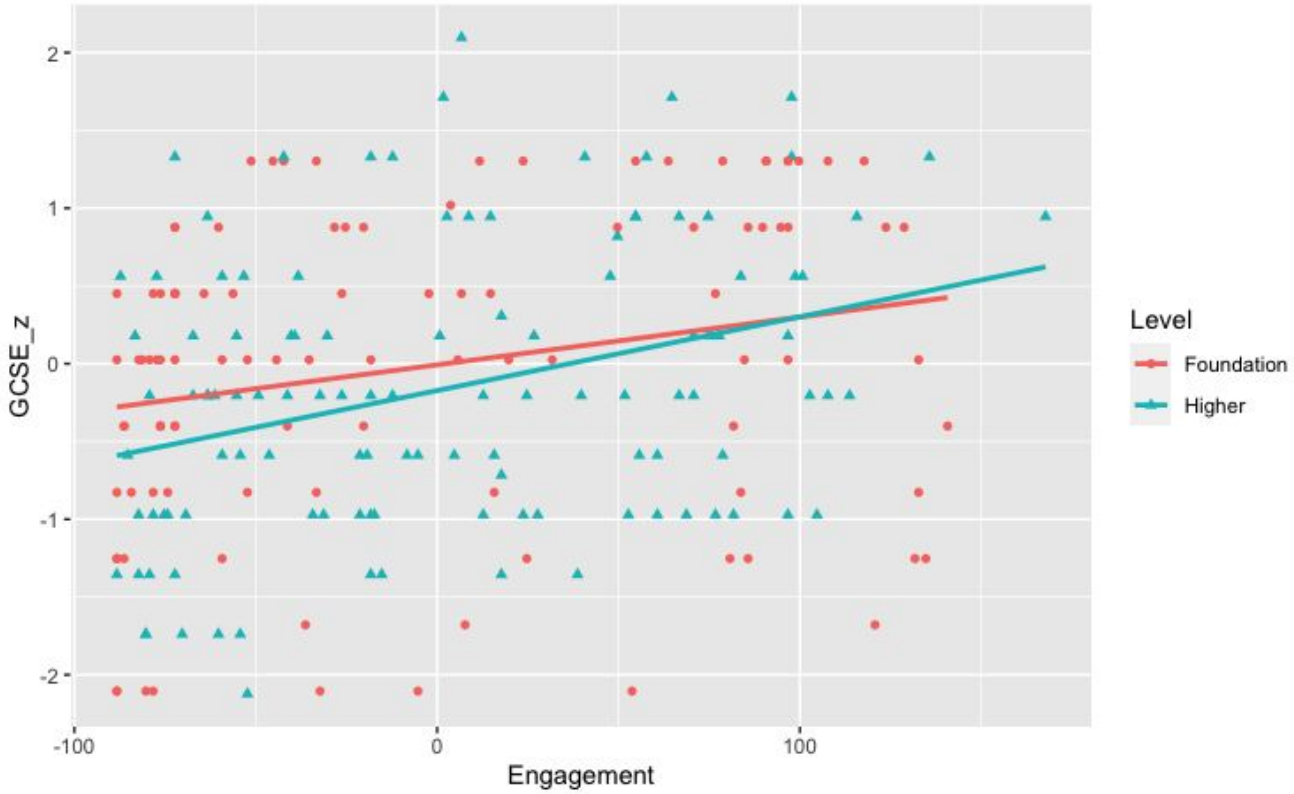
Platform accuracy predicted GCSE results regardless of the level of study



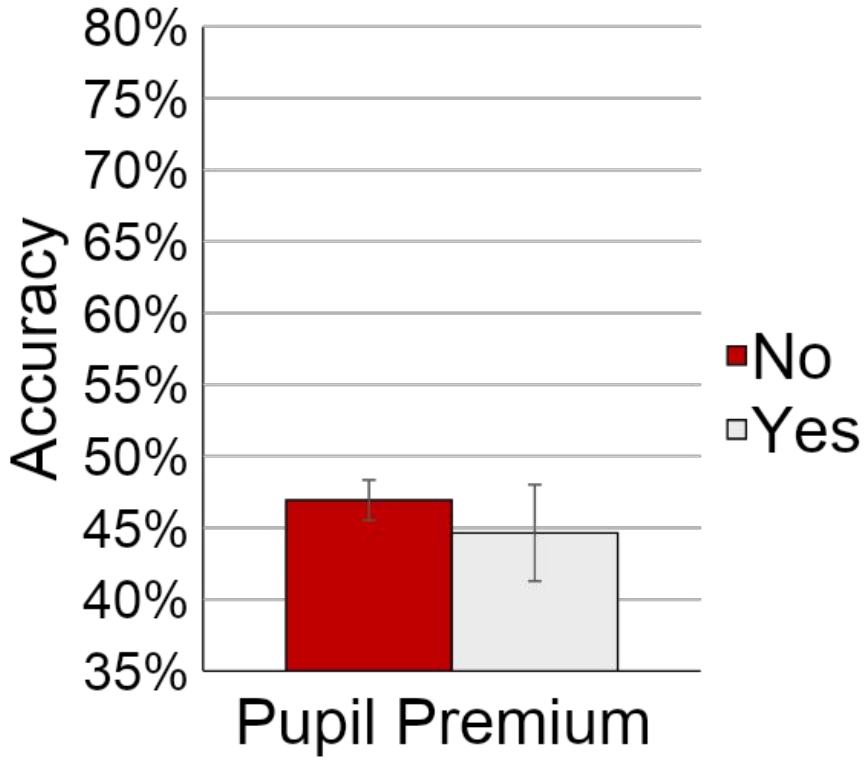


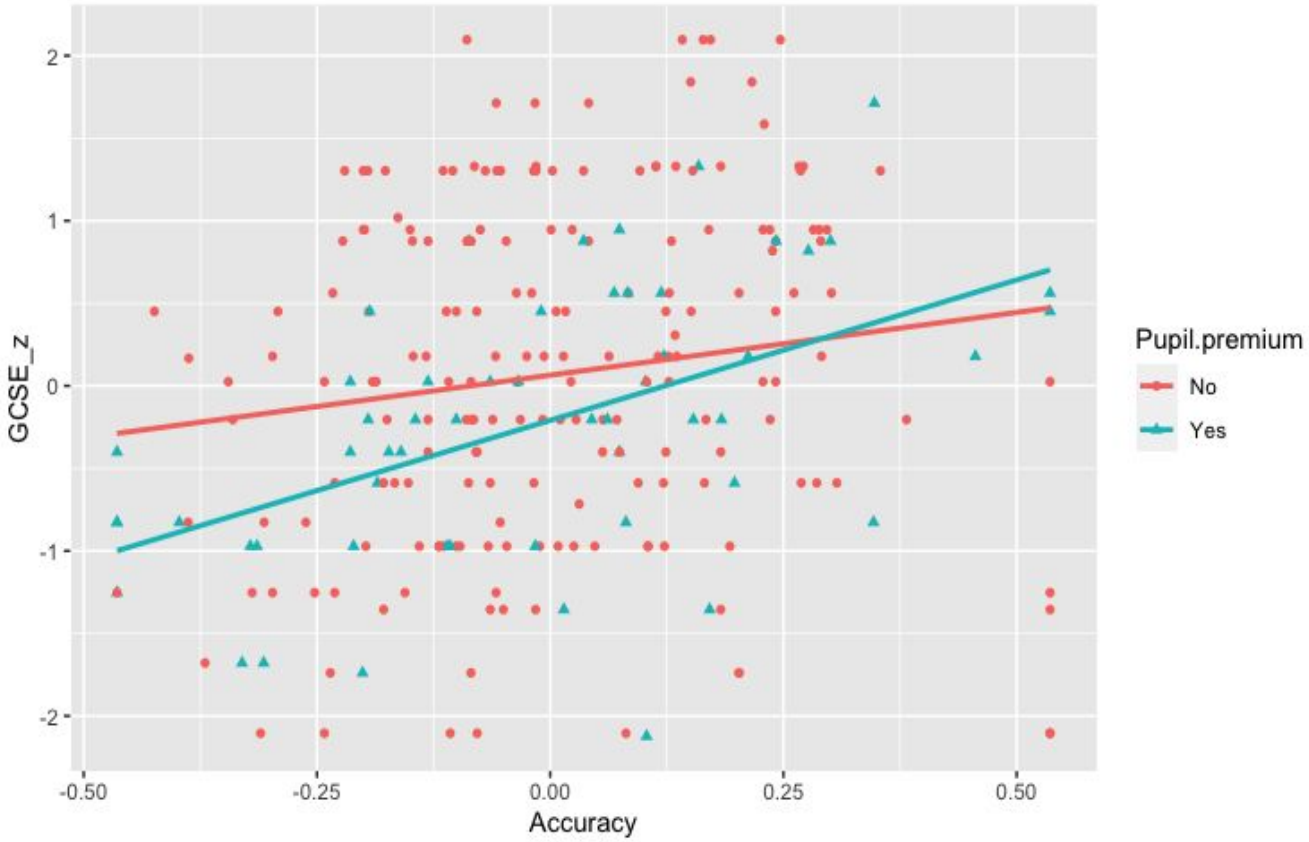
Platform engagement predicted GCSE results regardless of the level of study



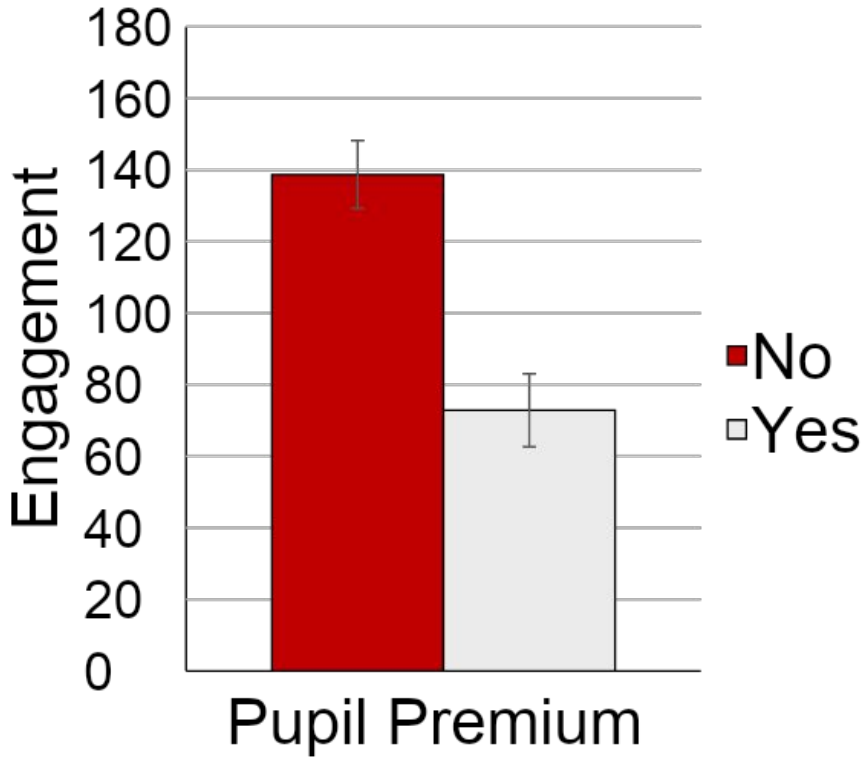


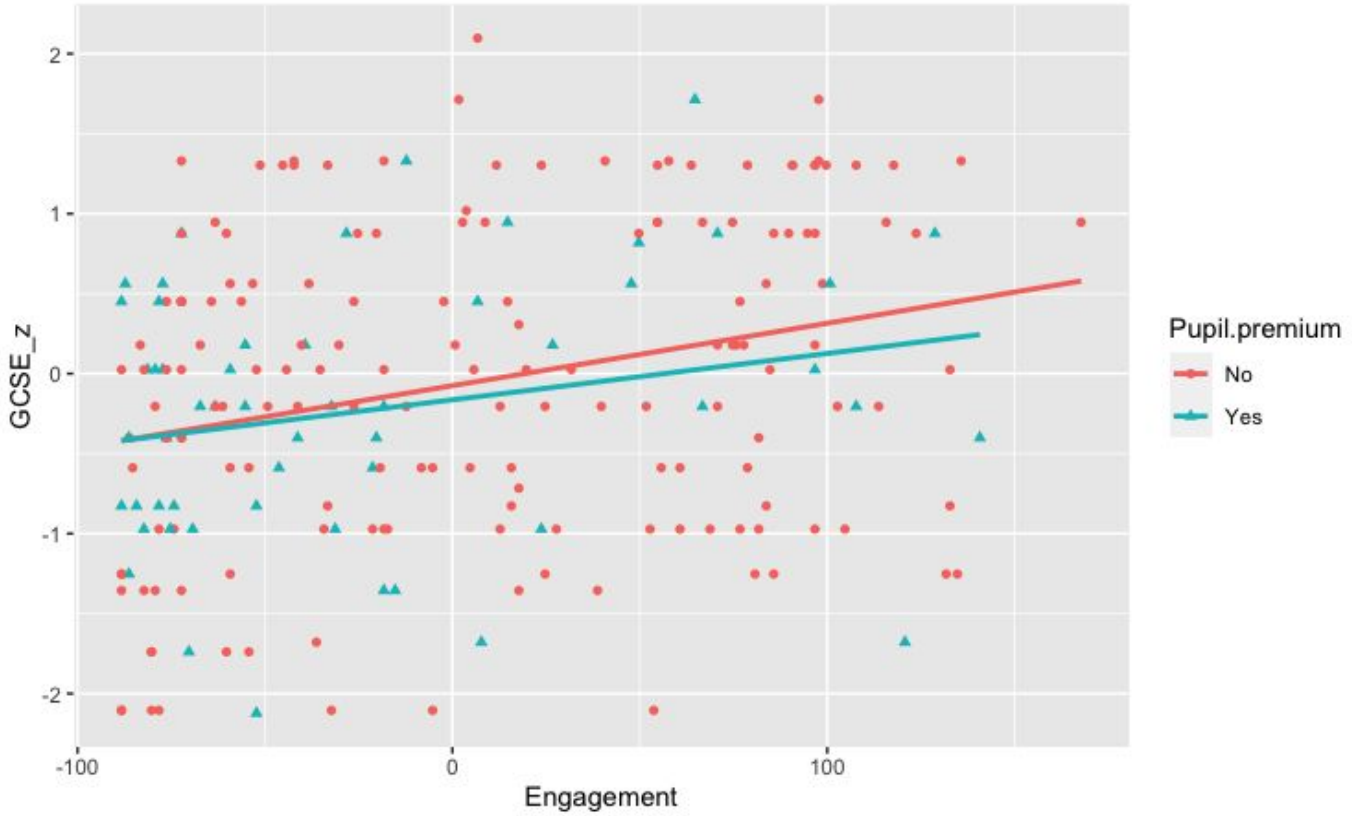
Platform accuracy predicted GCSE results regardless of pupil premium status





Platform engagement predicted GCSE results regardless of pupil premium status





Results summary and future directions

- Summary

  Platform accuracy and engagement were linked with GCSE final exam scores

  CAT scores, level of study and access to pupil premium and did not moderate this effect

  Students studying at foundation level used the platform less and showed lower levels of accuracy

  Students who have access to pupil premium used the platform less

- Future directions

  To develop the platform to (1) more effectively support teachers in the classroom and to (2) encourage student engagement (including the use of optimised mode) to improve learning outcomes and the student experience

  To inform teaching practice via the utilisation of data to understand the impact of repetition and spacing on student learning in science

UNIVERSITY OF BIRMINGHAM

Thank you for listening

Any questions?