Flexible learner or imposter? Learning A Level mathematics in England through the COVID-19 pandemic

How are Pearson mathematics A Levels resources and assessments used by students and teachers? What is the impact of that on classroom experiences and the range of valued student outcomes, including appropriate progression? (2017-2021)

How have practice in, learning of, and outcomes from, mathematics A Levels developed since the onset of the pandemic in 2020?

Summer 2020

218 y13 surveys March; 28 teacher surveys July; End of year assessment data to contextualise sample (27 classes)

Autumn 2020

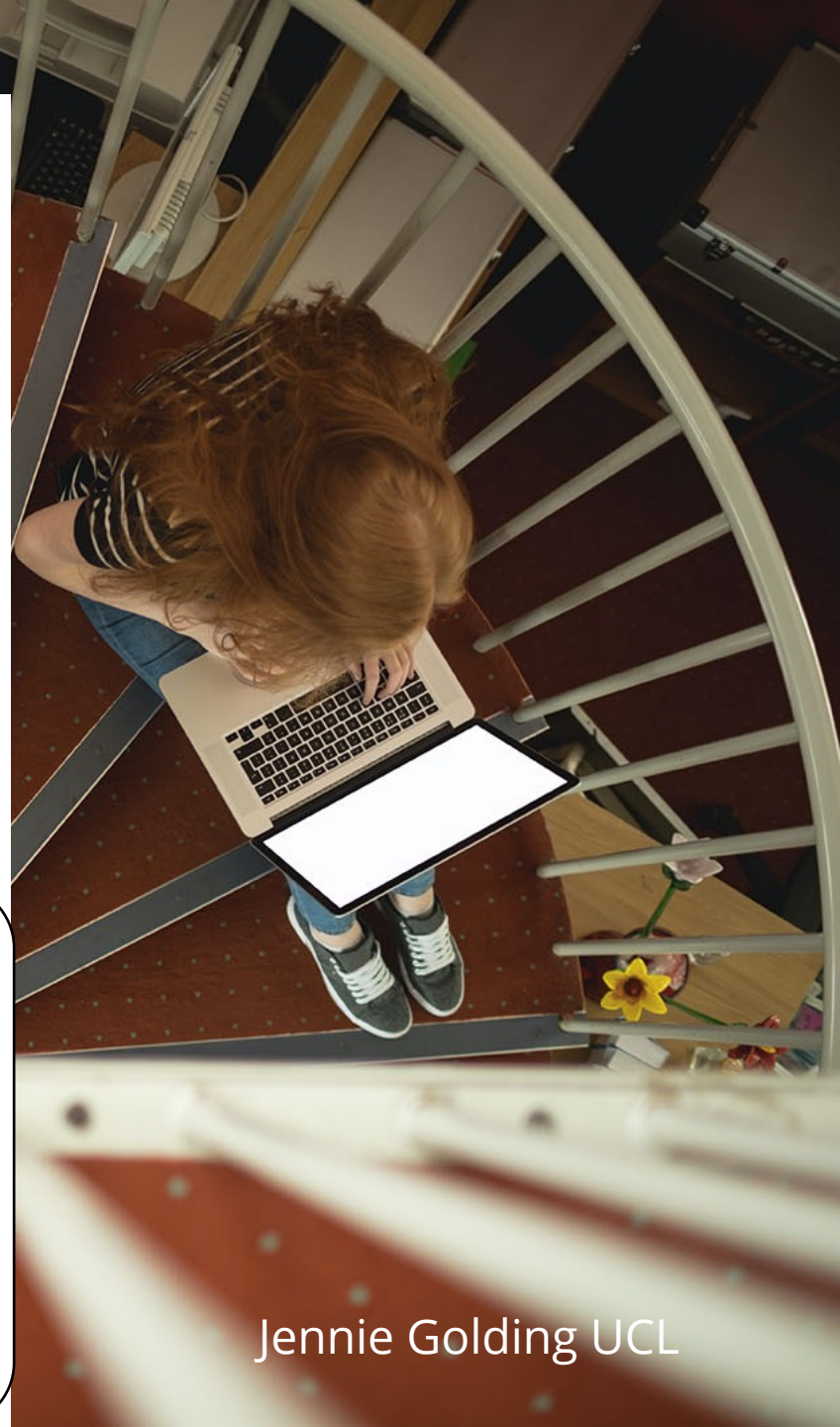
14 teachers' surveys; 198 y12 and 179 y13 student surveys; 25 y12,13 class sets of baseline grades. *Interviews or surveys from 44 (34 HEIs) academics, focused on mathematics or Ma support.*

Late March 2021

26 teacher surveys; 132 y13 student surveys

July 2021

19 teachers' surveys; 205 y12 student surveys; 26 class sets of year 11 to y13 assessment grades



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- Reasonably representative sample of 13 centres, and of Ma A Level students
- A Levels from September 2017 feature a renewed focus on mathematical problem solving and proof. They require all students to study mechanics and statistics (including engagement with a large dataset using technology). Pre-pandemic, at least 60% of year 12 and 13 students and their teachers reported significant pressure on time and performance in studying for the new mathematics A Levels (less marked in academically selective centres).
- Centres were closed to most students March-June 2020, and Jan-March 2021, plus… GCSE and A Level examinations were cancelled in 2020 and 2021.
- Teacher and students had to learn how to work remotely – but made progress: significantly enhanced variety, structure and demand of remote learning over the 2021 lockdown
- **Access to appropriate hardware and/or bandwidth remained a problem** for at least 20% of students
- **Access to teachers and peers generally much-reduced**
- **A large majority of A Level Ma students (over 90%) found it very difficult to learn effectively remotely, with concentration, feelings of isolation, and understanding reported to be key issues**: '*When online there is only ever surface level coverage, we don't do hard bits like proof parts of a question' ; 'It's very hard to focus and not do something else, and it's kind of one-D just using a laptop all the time`; 'A good cry every now and again and watching youtube videos on topics I struggle with'.*
- **At least 2/3 of teachers reported significant shortfall in usual learning,** for most students
- **Academically weaker students generally hardest hit. Mental health issues also significant.**

- Little use of mathematics-specific software for learning, either remotely or on return to centre. **Within mathematics, problem solving, proof and applied areas were thought to be most challenging to develop remotely: at least 85% of teachers, and 88% of students, reported considerable, persisting, difficulties in teaching or learning.**
- **Reduced opportunities for practical work, enrichment, work experience, and university visits**.
- ~2/3 of HEI respondents considered the **mathematical foundations of the 2020 entry cohort to be markedly weaker,** on average, than their predecessor cohort's, and with greater range of initial functioning and preparedness – across the categories of mathematical preparedness probed, and all levels of A Level grades awarded.
- Students were, further, reported often ill-equipped to cope with pressures of university assessments, with **less confidence, and greater incidence of unresolved 'imposter syndrome'.**
- BUT potential student gains from learning remotely – from reduced travelling time, to enhanced confidence and fluency in learning independently: '*I have developed an aptitude for self learning and discipline, that will stand me in good stead next year'; 'Ability to focus on my weakness and tailor my learning to overcome these: good prep for uni'; 'I can rewind videos teachers record and learn at my own pace'.* **5-10% of students, mostly well-motivated, organised, high-attaining reported some learning gains from working remotely (pace, focus).**
- **Overall, teaching and learning of the new A Levels (from 2017) still in flux**