



How do we assess now?

Nicolas Labrosse

School of Physics and Astronomy

University of Glasgow

@niclabrosse

Brief outline of talk

- Why do we use exams?
 - Consequences of the loss of invigilated tests and examinations
- Examples of modified assessments
- How do we assess now?
- Conclusions

Why do we use in-hall exams (to such an extent)?

- Consistent assessment – conditions same for all students
- Well suited to assess students' independent competence to
 - perform certain algebraic derivations
 - apply knowledge to certain technical meaningful tasks in a timely way
- Supports a focus on developing independent thinking
- In-person invigilated exams guarantee authenticity of assessed students and increase academic integrity

Loss of invigilated tests and examinations

Remote examinations have led to

- Wild variations among students' circumstances during exams
- Lesser opportunity to demonstrate independent thinking or ability to demonstrate knowledge and understanding
- Issues with academic integrity

Remote examinations have highlighted the need to rethink how we assess students.

Re-thinking assessment

- Add a narrative to exam questions for students to accompany their workings, e.g.
 - with explanation of what question is asking and approach taken
 - references
- Open-ended questions
 - Can use rubric for marking
- Portfolios
 - Opportunity to meaningfully demonstrate learning and practice e.g. across domains matched to ILOs
 - Fit well with programmatic approach
 - Exams may still be used to assess Physics knowledge / independent thinking

Modified assessments

- Open-book examinations...
 - Test understanding rather than rote learning
 - Open-ended problems require more explanations
 - Move to higher levels of testing understanding
 - **Students tend to prepare less and spend time consulting / using resources without thinking carefully about the questions**
- Automatic marking
 - Multiple Choice Questions
 - Tools to test mathematical content
 - **Students want to get at least partial credits / marks for working out the answer**

Take-home assessments

- In an emergency these can be
 - Completely identical to an invigilated in-person exam – double-marking of a small sample of papers is recommended
 - Same questions, but modified marking scheme – more weight towards open-ended questions / unseen applications as opposed to bookwork
- With more time to prepare these can be
 - Modified questions - develop questions that not only reward deeper understanding, but require it [3]
 - Alternatives to exams: e.g. give access to a public data set and require students to perform an analysis on it; analyse a complex issue with a specific audience in mind
 - Course learning outcomes must be assessed – maintain constructive alignment
- **Challenge of contract cheating / “homework support” web sites**

IOP accreditation scheme

- “Changes must be based on a sound educational justification *from the physics department*” (*IOP Accreditation Scheme Guidance / Ross Galloway & Robyn Henriegel*)
- Revised scheme puts more emphasis on skills and encourages greater variety of assessments

Where do we go now... and how?



The future - choices

Return to previous assessment practice.

Retain parts of “Covid” adjustment e.g. open book examinations, online assessment.

Find ways of dealing with the problems encountered e.g. prevent plagiarism by remote proctoring.

Embrace a different future, looking for assessment variety and authenticity, mindful of need to involve staff and students in the process and not to overload either group.

~~Impossible dream?~~

How do we assess now?

- Innovations? *We don't need* to innovate, we need to think more carefully about possible approaches and existing tools

“Assessment has focused on ranking and classifying – now we need to use assessment to develop 21st century skills”

(Eric Mazur)

- Physics education research and scholarship of learning and teaching
 - It is essential we understand not just how students learn but also how students learn physics.
 - Commitment at department level to support staff active in PER / SOTL
 - Support from physics departments, universities, research councils, government (e.g. funding for postgraduate researchers and research assistants; setting up collaborations)

Assessment and learning

- Assessment *of* learning -> assessment *for* learning -> assessment *as* learning
- Benefits
 - More meaningful assessment and feedback that enhances students' learning
 - A better experience of assessment and feedback for students and staff
 - Life-long and self-regulated learners who are able to apply their learning beyond university
- Some principles of assessment
 - Meaningful – develop physics knowledge + knowledge and skills that can be applied in varied contexts
 - Iterative – students build incrementally on assessment and feedback
 - Programmatic –organised across a programme rather than for individual courses
 - Inclusive – all students have the same opportunities to learn through assessment
 - Encourage assessment literacy and academic integrity

Too much assessment, not enough learning?

THE Times Higher Education News Rankings Jobs Study abroad Ever

TESTING, TESTING: RISE IN ASSESSMENT TASKS

News Home Latest Opinion In-depth

Are universities over-assessing their students?

The number of assignments per term has been going up and up; is continuous assessment now harming, rather than helping, students' learning?

June 29, 2022

Tom Williams

Twitter: @TWilliamsTHE

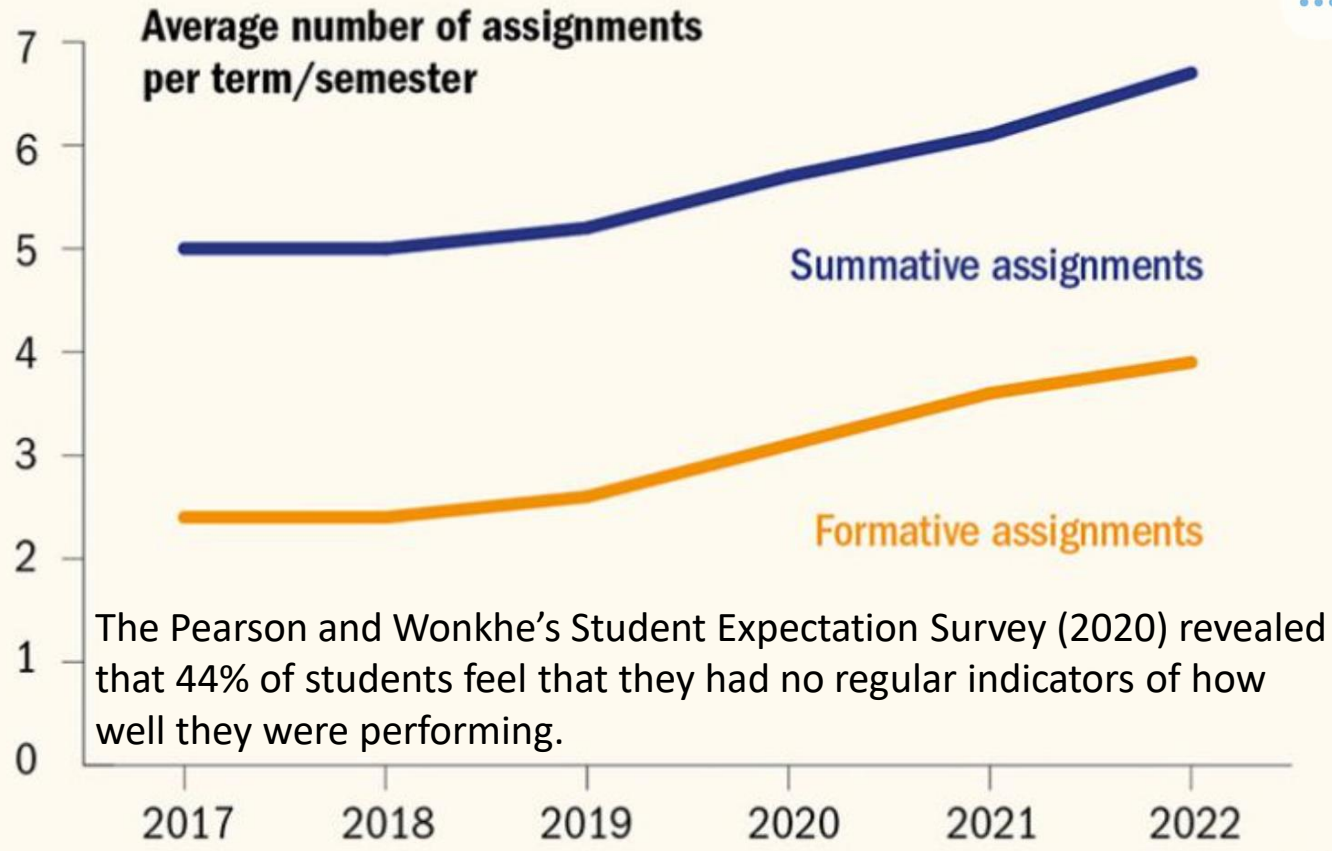


Academics nursing their wounds after coming through another gruelling assessment round might balk at the idea that this period should be one of joy.

Students may complain about the work they are expected to do, but the burden of setting assignments, marking them and then dealing with increasing numbers of appeals is placing a strain on teachers too.



Buckling under the strain: 'as soon as you get one assessment in, it is on to the next one. The time for contemplation, reflection - there's no time for



The Pearson and Wonkhe's Student Expectation Survey (2020) revealed that 44% of students feel that they had no regular indicators of how well they were performing.

Source: Advance HE/HEPI

Source: Advavnce HE/HEPI

How do we assess now? – Work with students

- Prepare students to new forms of assessments
 - Purpose
 - How it works
 - What to expect
 - How to prepare
 - Formative opportunities
- Accessibility
- Get them involved
 - Students designing exam-style questions (e.g. “Problem Project” [6])
- Reduce attainment gap

How do we assess now? – work with employers

- Why? Most students go to uni to increase their prospects to get a job that they'll like and where they can contribute
- Employers / tutors with industry expertise can get involved in curriculum and assessment design in specialised / advanced modules
- Reduce recruitment gap
- Assessment by ability?

Technology – the future of assessment?

- Technology can already help with assessment of basic competencies
- Higher-order skills and competencies require a careful approach
- Remember
 - Assessment should be authentic, meaningful, inclusive
 - Assessment as learning
- “Alexa... how am I doing with my quantum mechanics assignment?”
 - Will AI coach and support students meaningfully to enable tutors to intervene where / when it matters?

Or... have I been talking nonsense?

- Do we need to be more radical?
- Re-invent the physics degree?
- Where do we want to be in 50 years?
- Where were we 50 years ago?



Conclusions

- Act now
- Walk, don't run
- Work with all stakeholders
- Programme-level assessment with inclusivity, authenticity, integrity

1. Main, P. (2022). Assessment in University Physics Education. IOP Publishing, Bristol, UK <https://doi.org/10.1088/978-0-7503-3851-6>
2. Physics Learning and Teaching in Higher Education Community meetings - <https://www.liverpool.ac.uk/central-teaching-hub/physicslthe/>
3. Take-home assessments <https://lta.hw.ac.uk/wp-content/uploads/Assessments-Making-your-exam-work-as-a-take-home-assessment.pdf>
4. IOP Higher Education Group resources <https://www.iop.org/physics-community/special-interest-groups/higher-education-group>
5. Are universities over-assessing their students? <https://www.timeshighereducation.com/depth/are-universities-over-assessing-their-students>
6. Schumm et al. (2022). Student-created physics problems as an independent and equitable assessment tool. <https://arxiv.org/abs/2202.07091>
7. Ferrell & Knight (2022). Principles of good assessment and feedback <https://www.jisc.ac.uk/full-guide/principles-of-good-assessment-and-feedback>
8. Learning and teaching reimagined Jisc report <https://repository.jisc.ac.uk/8150/1/learning-and-teaching-reimagined-a-new-dawn-for-higher-education.pdf>
9. University of Glasgow Assessment and Feedback Toolkit <https://www.gla.ac.uk/myglasgow/leads/aftoolkit/>
10. Why we need to support research into university physics education <https://physicsworld.com/a/why-we-need-to-support-research-into-university-physics-education/>