



Diversifying Assessment Strategies in Chemistry Lab Education

Julieta Litka Milian, litka.milian@durham.ac.uk

Introduction

Diverse assessment methods in chemistry laboratory education for undergraduate students play a pivotal role in fostering comprehensive learning experiences and skill development¹. By embracing a variety of assessment techniques such as written reports, video presentations, quizzes, self and peer assessment and collaborative projects, educators can cater to diverse learning styles and aptitudes^{2,3}. This approach not only encourages active engagement but also cultivates critical thinking, problem-solving abilities, and communication skills essential for success in scientific pursuits⁴. Incorporating diverse assessment methods promotes inclusivity by accommodating students from various backgrounds and learning preferences⁵. Thus, by harnessing the power of diverse assessment strategies, chemistry laboratory education can be enriched, empowering undergraduate students to thrive in both academic and professional domains.

Formative assessment

Students' comments

Self-assessment

- reflective and lifelong learning
- independence and responsibility
- critical thinking

- mixed feelings
- motivate to prepare
- better understand skills
- challenging, stressful

Peer-assessment

- communication and teamwork skills
- critical thinking and analytical skills
- diverse perspectives and feedback
- understanding of assessment criteria

- concerns about quality
- lack of confidence
- different point
- feedback without judgement

Online quizzes

- immediate feedback and learning
- flexibility and accessibility
- tracking progress and performance

- can retake to improve
- learn from mistakes
- not personalised feedback
- benefit from post-quiz discussions

Lab notebooks

- documentation of experimental work
- scientific record-keeping skills
- preparation for future research

- positive perceptions
- prepare for labs
- good way to improve your grades
- less stressful than lab reports

COSHH assessment

- safety awareness
- risk management skills
- encouraging responsible chemical

- overwhelming
- useful
- time-consuming
- helpful

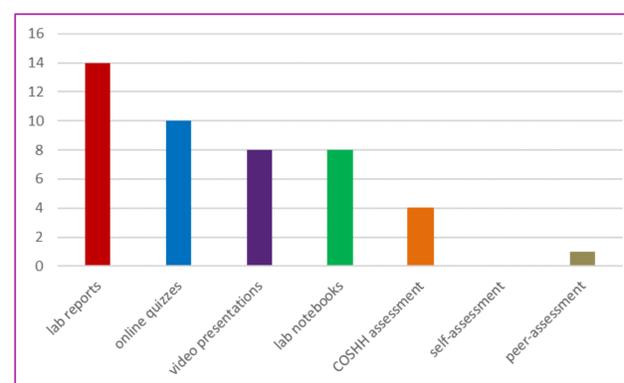


Fig.1. Which assessment method(s) engaged you the most in the learning process?

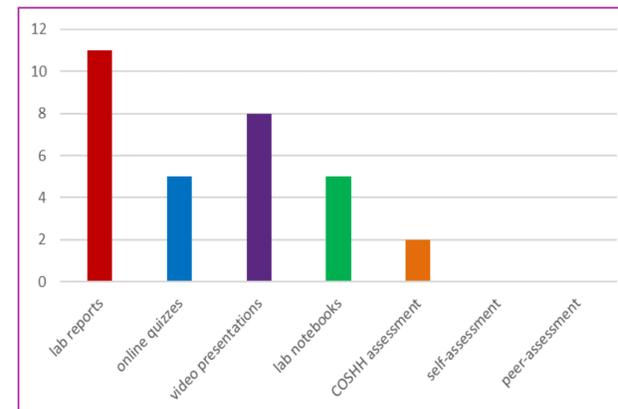


Fig.2. Which lab assessment method(s) contributed most to your understanding of the subject matter?

Summative assessment

Students' comments

Lab report

- scientific writing and communication
- critical thinking
- analytical skills

- time consuming - lots of data analysis
- specific to experiment
- not always reflect on lab skills
- technical writing

Video presentation (5-min)

- creativity and digital literacy
- timed scientific communication
- recorded presentations

- very time consuming
- easy
- allow for creativity and personalisation
- anxiety and technical challenges

Summary

- Diverse assessment methods enhance learning and skill development.
- These methods cater to different learning styles and promote critical thinking, problem-solving, and communication.
- Formative assessments like lab notebooks and peer assessments prepare students for research, teamwork, and safety, offering immediate feedback.
- Summative assessments focus on developing scientific writing and digital literacy.
- The inclusive approach accommodates students with varied backgrounds and preferences.

References:

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