

ASSESSMENT FOR LEARNING EXAMINATION GUIDELINES: FINAL RESULTS FROM AN ACDS TEACHING AND LEARNING PROJECT 2022

Sara H. Kyne^a, Grace E. O. Constable^b, Reyne Pullen^c

Presenting Author: Sara H. Kyne (s.kyne@unsw.edu.au)

^aSchool of Chemistry, Faculty of Science, University of New South Wales, Sydney, NSW 2052, Australia

^bFaculty of Science and Technology, University of Canberra, Canberra ACT 2617, Australia

^cSchool of Chemistry, The University of Sydney, Sydney NSW 2006, Australia

KEYWORDS: Assessment design, Assessment for learning, Revised Blooms Taxonomy, Examinations, science education

SUBTHEME: Assessment

This research project was motivated by the major changes to teaching and learning delivery that have occurred in Australia and worldwide in recent years, particularly in assessment strategies such as summative final examinations. Historically, closed-book, in-person, paper-based final examinations were commonly used across the sector (Williams & Wong, 2009). However, during the COVID-19 pandemic many universities moved from traditional paper-based examinations to online delivery (Dicks et al., 2020). Now, universities are using a much wider variety of formats and implementations than was traditionally observed. Thus, we are at an opportune time to re-evaluate summative assessment for and of learning to ensure that we establish pedagogically robust procedures for creating and delivering examinations across the sector.

In this research, funded by an ACDS Teaching and Learning Project grant 2022, we present the final results of a multi-institution exploration of first-year undergraduate examinations in science subjects comparing end-of-semester examinations from 2019–2021. To determine the pedagogical differences between subjects and years, we undertook a multi-step analysis of:

- i) Question type;
- ii) Question response format;
- iii) Order of thinking pattern required to respond to questions (Agarwal, 2019);
- iv) Classification of question according to Bloom's Taxonomy (Bloom et al. 2001).

Outcomes from our data analysis provide guidance for practitioners and decision-makers on best practices that balance institutional and student expectations, while also delivering authentic assessment experiences. Our research offers concrete recommendations for best practice in summative examinations for Australian science subjects, encompassing design elements that integrate both technological and pedagogical aspects required for effective assessments.

REFERENCES

- Agarwal, P. (2019). Retrieval Practice & Bloom's Taxonomy: Do Students Need Fact Knowledge Before Higher Order Learning? *Journal of Educational Psychology*, 111(2), 189–209. <https://doi.org/10.1037/edu0000282>.
- Bloom, B. S., Airasian, P., Krathwohl, D. R., Cruikshank, K., Mayer, R., Pintrich, P., Raths, J., & Wittrock, M. (2001). A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives, Anderson, L. W., Bloom, B. S., Krathwohl, D. R., (Eds.), Longman: New York.
- Dicks, A. P., Morra, B., & Quinlan, K. B. (2020). Lessons learned from the COVID-19 crisis: Adjusting assessment approaches within introductory organic courses. *Journal of Chemical Education*, 97(9) 3406–3412. <https://doi.org/10.1021/acs.jchemed.0c00529>.
- Williams, J. B., & Wong, A. (2009). The efficacy of final examinations: A comparative study of closed-book, invigilated exams and open-book, open-web exams. *British Journal of Educational Technology*, 40(2) 227–236. <https://doi.org/10.1111/j.1467-8535.2008.00929.x>.

Proceedings of the Australian Conference on Science and Mathematics Education, The University of Canberra, 18 – 20 September 2024, page 62, ISSN 2653-0481.