

Evaluating Online Worksheets as an Assessment in Practical Chemistry Courses



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Introduction

The traditional assessment for practical chemistry courses are written reports, which can be time-consuming to write and mark, reduce available time for other course activities such as tutorials, lack assessment diversity, and are often viewed as an all-or-nothing assessment in which grades are based on one attempt.

Here, we explore the use of smart online worksheets¹⁻⁷ as an assessment method in two second-year practical courses. Developed alongside LearnSci, the worksheets are a replacement to written report assessments for some of the experiments the students perform.

We present here the qualitative evaluation of their use across a physical chemistry laboratory course and a biological chemistry laboratory course.

Methodology



Two similar but distinct, anonymous, voluntary student surveys were conducted, which included Likert-scale and free-text response questions.

The surveys were distributed through the virtual learning environment, which was supplemented with lecture, tutorial, and lab session announcements.

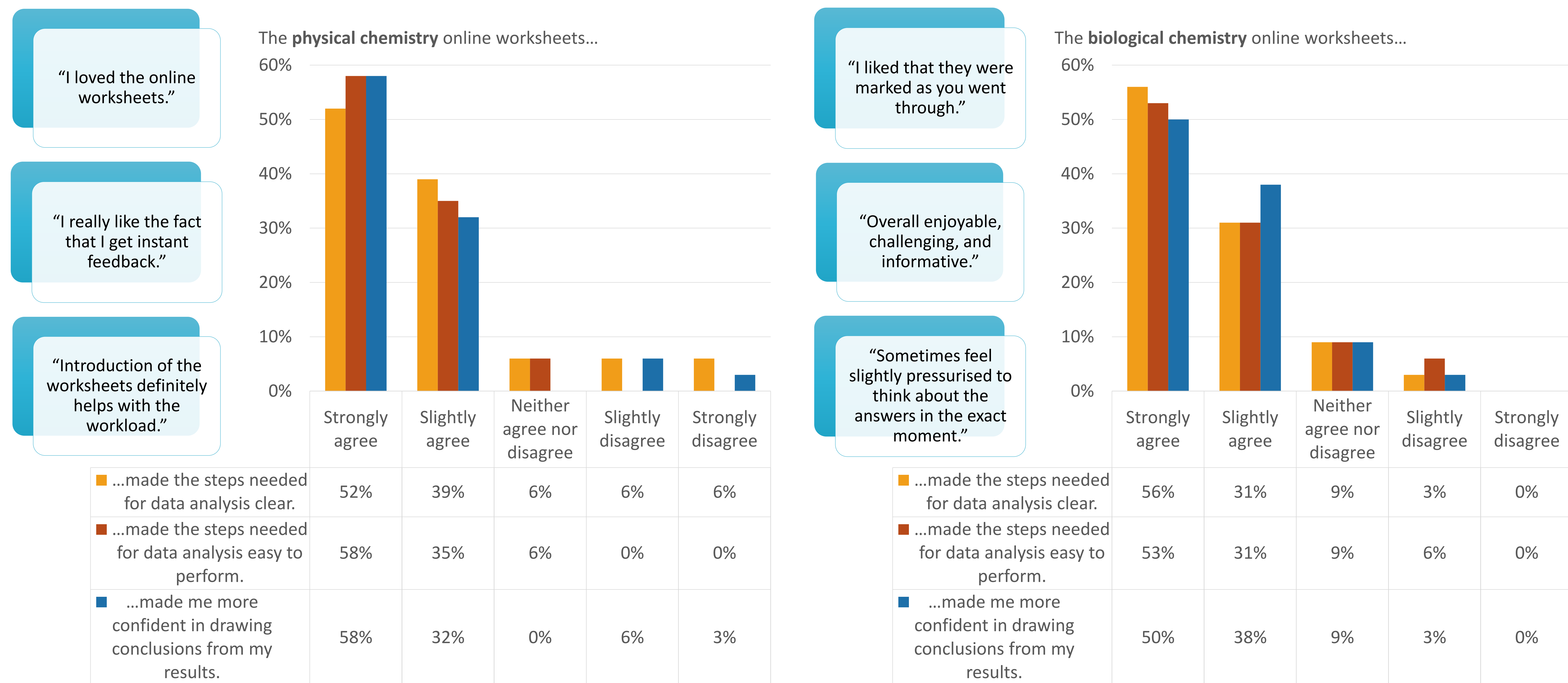
The response rate was about 20% for both courses.



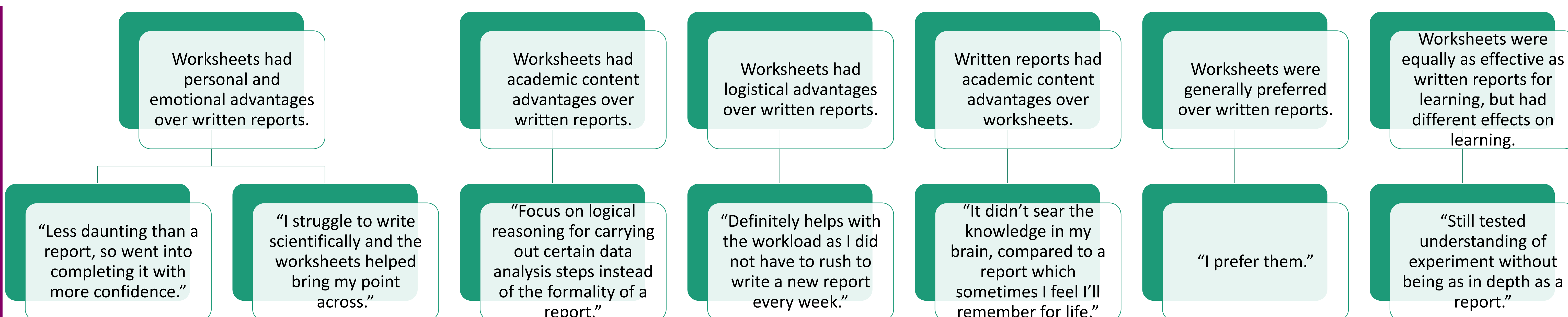
Thematic analysis was used to analyse qualitative data.

Statistical testing was carried out on IBM SPSS at the 95% confidence interval.

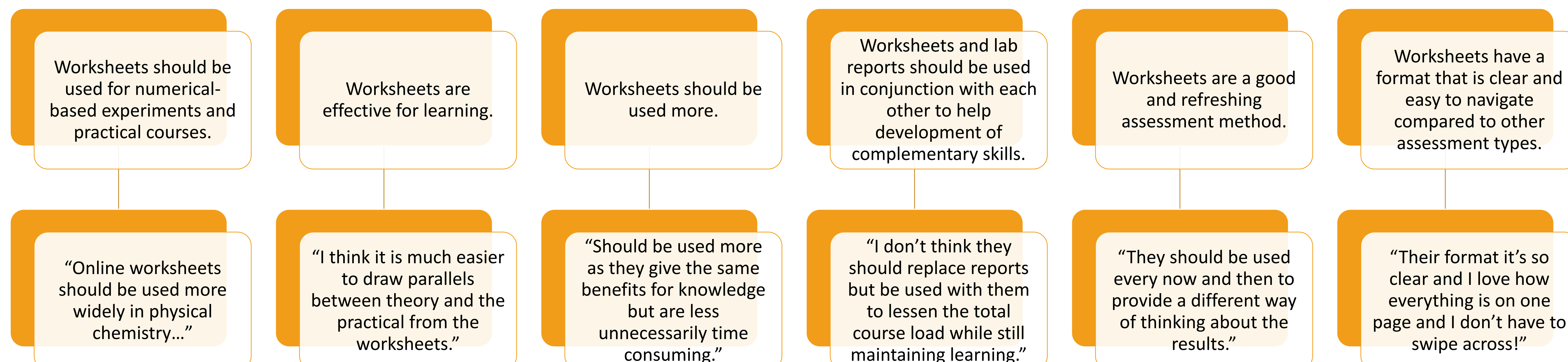
Research Question 1 – How do students perceive the smart online worksheets?



Research Question 2 – How do students perceive the smart online worksheets in relation to lab reports?



Research Question 3 – Do students think smart online worksheets should be used more widely in practical chemistry courses and why?



References

[1] LearnSci Worksheets, <https://www.learnsci.com/products/smart-worksheets>, accessed 24 April 2025. [2] N. A. Williams, *J. Chem. Educ.* 2022, 99, 1, 171–176. [3] N. J. Harmer and A. M. Hill, *J. Chem. Educ.* 2021, 98, 12, 4094–4100. [4] J. McCartney *et al.*, *SA Pharm. J.* 2021, 88, 31–33. [5] D. E. Shallcross *et al.*, *J. Chem. Educ.* 2024, 101, 4, 1735–1740. [6] E. Coyte and R. B. Lowry, *J. Chem. Educ.* 2024, 101, 8, 3514–3521. [7] D. E. Shallcross, *et al.*, *J. Chem. Educ.* 2025, 102, 3, 1062–1070.