

## Enhancing students' acquisition and application of the conventions of scientific writing

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Scientific writing is a key learning task in undergraduate science programs, promoting the development of effective communication, reasoning and thinking skills (Zimbardi *et al.*, 2015; Colthorpe *et al.*, 2017). In facilitating students' mastery of scientific writing, educators often direct students to scientific literature to model their own writing upon (Porter *et al.*, 2010). However, novice students often lack the awareness and appreciation for the conventions of this writing genre. Moreover, the intricate subtleties of how these conventions are applied in the literature may pose a significant hurdle for students (Gillen, 2006; Snow, 2010). The aim of this study was to enhance students' recognition of conventions of scientific writing. To support completion of a laboratory report, the online science communication tool "CLIPS" (Hardy *et al.*, 2017) was embedded in a 1<sup>st</sup> semester 2<sup>nd</sup> year physiology course. Students (n=376) were asked at the start and end of semester what information from CLIPS was useful and why. Responses were analysed to assess recognition of scientific conventions, and how this developed over the semester. Academic performance, both overall and in each report marking criteria, was compared to the previous year. At the start of semester, students most commonly reported the usefulness of the Displaying Data (33%) and Writing (44%) modules, identifying key elements for presenting data and text construction but describing these somewhat superficially. At the end of semester, these were again the most commonly cited modules, but Displaying Data (48%) was more favoured. Responses about conventions for figure legends, graph formatting and use of statistics increased up to four-fold, and students were recognising the nuances of variation in these conventions. There was also a notable increase in responses highlighting the value of CLIPS for structure and purpose of sections in a report. By the end of the semester, students appeared to have developed a deeper appreciation of scientific conventions and their purpose for enhancing communication. In 2017, the mean report score was significantly higher than 2016, with fewer failing and more in the higher performing bands. Within criteria, the median achieved in Methods, Results description and presentation increased by one grade band to 80%. Students appeared better at recognising and applying scientific conventions to handling and reporting of data. There was no improvement in median performance in the Introduction and Discussion sections between years, although the standard achieved for the Introduction by the lower quartile increased from 40% to 60%. Although students had acquired some basic understanding of writing for these sections, they did not appear to have the higher-order skills, such as evidence-based reasoning, to effectively construct complex ideas. Both student responses and academic performance demonstrate the efficacy of CLIPS in enhancing students' recognition and application of conventions of scientific writing. In turn, students' awareness of these conventions and the nuances within them may lead to a heightened capacity to recognise such features in scientific literature, and thus enhance development of more complex writing skills.

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