COMMUNICATION IN UNDERGRADUATE SCIENCE – WHAT ARE WE DOING?

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BACKGROUND

Communication is a ubiquitous graduate attribute and learning outcome for undergraduate science degrees across the world and an invaluable tool for students to demonstrate their learning. Most vocation-focussed science degrees, such as engineering and health professions, articulate clear, highly specific communication outcomes for students that are informed by feedback from industry groups. These outcomes combined with best practice within the profession help to guide the design and implementation of student learning activities. General science degrees, such as a Bachelor of Science, have neither clear, specific goals nor feedback from specific industry groups. A valuable start has been made to guide good practice in educating undergraduate science students in the TLO4: Communication (Colthorpe, Rowland & Leach, 2013). However, there is little evidence available as to what aspects of communication are currently taught in a science context, and detailed discussions have not yet been had as to what elements of communication are most relevant for modern undergraduate science students to learn. This presentation will bring these two topics into focus by reporting on preliminary research findings to help stimulate and garner momentum for clarity and change around the education of undergraduate science students in communication.

AIMS

1. Quantify the proportion and types of communication-style assessment tasks in the Bachelor of Science program (across all majors) at research-intensive universities.
2. Review and critique existing literature on what constitutes effective science communication.

DESIGN AND METHODS

1. Data for 1352 units of study (e.g., courses) assessment tasks were collected from profiles publicly available on university websites from five research-intensive Go8 in 2012/2013. Assessment tasks were categorised as “exam”, “communication” or “other”. “Communication” assessment tasks across 8 majors were categorised according to audience, medium and purpose.
2. Over 25 relevant published articles, mostly peer-reviewed, from the disciplines of science, communication and science communication were reviewed and critiqued according to research methodology and relevance to undergraduate education.

RESULTS

Communication style assessment tasks constituted about 20-30% of assessment in BSc programs, with the exception of mathematics (<10%). The vast majority of communication types reflect traditional communication practices of research scientists namely; audiences of scientists in the same discipline (90 - 95%), traditional written media (e.g., lab report; 75 - 80%) and for the purpose of presentation and/or interpretation of results (50-70%).

The literature review highlighted substantial differences in best practice as deemed by the discipline (engagement model) with current practices of many scientists and scientific organisations (deficit model). Educational discussions centred primarily on both postgraduate and fully fledged communicators and scientists, with minimal reference to undergraduate science students. Distillation of essential elements for effective communication is possible and focuses mostly on non-technical audiences.

CONCLUSIONS

Bachelor of Science degrees assess a narrow range of somewhat outdated models of communication. There is a pressing need to stimulate and support evidence-based discussion on what communication practices, models and principles undergraduate students in general science degrees should learn. One option is to document outcomes of such discussions in documented in a framework to help inform best educational practice. We welcome discussion from colleagues interested in furthering these ideas.

REFERENCES

Colthorpe, K., Rowland, S. and Leach, J. (2013) TLO4: Communication Good Practice Guide. Office for Learning and Teaching, Australian Government.

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