

AN INSTRUMENT TO GUIDE INSTRUCTORS OF UNDERGRADUATE EXPERIMENTAL PROGRAMS: A COMMENT ON FINDINGS FROM PHYSICS

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Degree programs usually have a series of experimental activities, ranging from practicals, investigations, projects, to field work, forming a contained program often referred to as the ‘undergraduate experimental program’. The experimental program provides students with an understanding of the processes of science, contributes to student experiences and is relevant for mapping against graduate qualities – soft skills. While extant literature points to evaluations of individual experiments (Barrie et al., 2015; Yeung, Cornish, Kable, & Sharma, 2019), evaluations of complete experimental programs are rare. To this end, we have developed the ASELL Laboratory Program Evaluation (ALPE) survey for eliciting student experiences of undergraduate experimental programs. The ALPE was administered with 9790 students in 71 programs at 10 Australian universities, in five disciplines. Based on exploratory factor analysis, two factors emerged: the first factor included ALPE items relating to how the laboratory program influenced students’ science discipline knowledge and skills; the second factor included ALPE items related to how well the course contributed to development of general capabilities, such as items about “teamwork” and “ethics”.

Herzberg’s 1968 Two Factor Motivation-Hygiene theory originated in the organisational psychology sphere and has since been applied in various educational settings. The “motivation” factor refers to the elements of work that enhance a person’s satisfaction – associated with achievement and competency. The “hygiene” factor refers to the elements of work that include the provision of resources and support, such as supervision practices and procedures. In this presentation, we demonstrate how the “motivation-hygiene” theory applies to the two factors that emerged from the ALPE survey data, and how it can provide a meaningful framework for interpreting students’ perspectives of their undergraduate laboratory programs.

Finally, we comment on the findings from physics within this data set – of the five disciplines included in the large study of the ALPE survey, physics is a standout with lower correlations between individual items and overall laboratory program experience.

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