BASELINE MOTIVATIONAL FACTORS OF FIRST-YEAR SCIENCE STUDENTS: INSIGHTS FROM THE SPIRES FRAMEWORK

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SUB-THEME: Equity, Diversity and Inclusion

BACKGROUND

Many students leave STEM programs during their first year of study (Chen, 2013). Understanding student motivation is a key factor influencing persistence and retention in STEM education (Sithole et al., 2017). This study uses the SPIRES instrument (self-determination, purpose, identity, and engagement) to explore how motivational factors linked to autonomy, competence, and relatedness function within specific educational contexts (Ryan & Deci, 1985; Skinner et al., 2017).

AIM

To establish baseline levels of student motivation using the SPIRES instrument and explore how these factors vary by demographic characteristics.

DESIGN AND METHODS

A mixed-methods study was conducted with students enrolled in first-year introductory chemistry units at Deakin University (T2/T3 2024 and T1 2025). Around 570 participants completed the SPIRES survey, and a subset (~15) were interviewed.

RESULTS

Preliminary results (T2/T3 2024; n=263) show that female students reported higher relatedness, engagement, and science career plans. First-in-family students exhibited stronger behavioural engagement, while international students showed greater emotional disaffection. In T3, male students reported stronger science identity, and students speaking another language reported lower disaffection. Data from T1 2025 are at the final stages of analysis.

CONCLUSION

Findings suggest key motivational disparities across gender, cultural background, and first-in-family status. These insights can inform targeted supports to improve belonging, identity, and persistence among underrepresented STEM students.

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