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Sense of Belonging of Undergraduate Computing Students: A Comparative Analysis of University Entry Routes

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ABSTRACT

Sense of Belonging (SoB) is an individual's personal conviction as to their acceptance as a valued member of an academic community. The importance of SoB lies in correlations with motivation, persistence, and other outcomes. However, SoB is subject to variations influenced by factors such as race/ethnicity and gender. We examine the impact that entry route into university has on SoB by comparing that of students who entered our College of Science, including the School of Computer Science, via the traditional school leaving route or one of several alternative access routes.

VARIATIONS BY ENTRY ROUTE

In addition to a traditional competitive school leaving route, our university (UCD) offers multiple entry routes, including routes for students who are mature, have disabilities, or are socio-economically disadvantaged. In 2022 we conducted an SoB survey of students in the College of Science (CoS), including the School of Computer Science (SCS), with ethical approval from our Human Research Ethics Committee. Questions were adapted from the "Math Sense of Belonging Scale" [1]. Variations in SoB associated with race/ethnicity and gender are discussed in our prior work [2, 3].

Results reveal a statistically significant difference (Welch's t-test, $t=3.99$, $p=0.0001$) in SoB between students entering the CoS through the traditional school leaving route ($N=268$, $M=45$, $SD=37$) and those entering via access routes ($N=61$, $M=25$, $SD=35$). Furthermore, within the SCS, the SoB of school leaving students ($N=52$, $M=39$, $SD=36$) was significantly higher ($t=2.91$, $p=0.008$) than combined access route students ($N=13$, $M=9$, $SD=31$). Of the 13 students entering through combined access routes 38% identified as minoritised because of their age, socio-economic status and/or disability.

According to student comments, access routes do attract students and help them in gaining admission to desired programs. However, once accepted, they feel a lack of support, expressing feelings of inadequacy and a sense of not belonging compared to peers. For

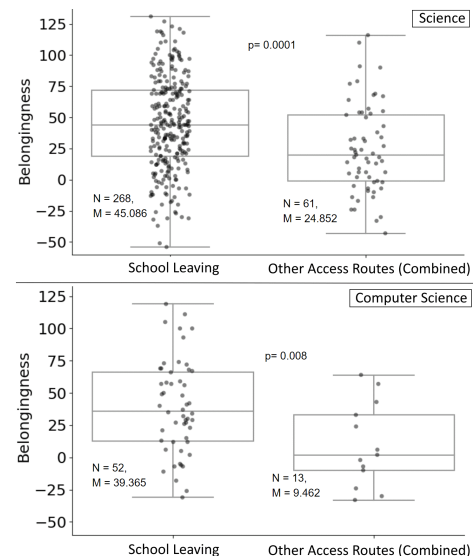


Figure 1: Distribution of SoB scores by entry route

instance, comments include "I feel like I haven't earned my place properly" and "I feel out of place among those who feel they belong", indicating that the university experience is demanding and emotionally draining for these students when they are treated the same as those entering via non-access routes. Given statements like this, it is crucial to recognise and address the differing experiences of students entering university via different access routes.

We believe our results may be of interest to other computing departments in similar contexts and help motivate the development of interventions to increase the SoB of students entering computing programmes through non-traditional entry routes.

REFERENCES

- [1] Catherine Good, Aneeta Rattan, and Carol S Dweck. 2012. Why Do Women Opt Out? Sense of Belonging and Women's Representation in Mathematics. *Journal of Personality and Social Psychology* 102, 4 (2012), 700.
- [2] Catherine Mooney and Brett A. Becker. 2020. Sense of Belonging: The Intersectionality of Self-Identified Minority Status and Gender in Undergraduate Computer Science Students. In *United Kingdom & Ireland Computing Education Research Conference*. (Glasgow, United Kingdom) (UKICER '20). ACM, NY, NY, USA, 24–30. <https://doi.org/10.1145/3416465.3416476>
- [3] Shamima Nasrin Runa, Anna Markella Antoniadi, Brett A Becker, and Catherine Mooney. 2023. Student Sense of Belonging: The Role of Gender Identity and Minoritisation in Computing and Other Sciences. In *Proceedings of the 25th Australasian Computing Education Conference*. 87–96.

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