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Retention in the Transition to Higher Education: Chatbots and Student Mental Health

Abstract

Mental health presents an obstacle to an increasing number of students. It is widely known that when people first join an institution of higher learning they encounter anxieties, uncertainties, frictions, and obstacles. Many such challenges go beyond the cognitive domain, into the affective domain, with far-reaching implications for mental health and well-being. However, the nature of the specific barriers different people face and how they navigate the transition into higher education are poorly understood; at least, in terms of realising valid and reliable statistical models with predictive utility. How can universities better identify and support students with their mental health and well-being in the early stages of their studies? This research proposes the use of chatbots to not only signpost students to relevant support services but also to diagnose and alert stakeholders to high-risk cases. The data from such tools offers a new lens into this important question. This poster illustrates research-in-progress that proposes to leverage queries submitted to the chatbot to model the likelihood of retaining students. Thus, highlighting risks to consider and laying the foundations for interventions that enact positive change and improve the success of new learners.

Figure 1. Proportion of Undergraduate Stage One Intermissions and Withdrawals Motivated by Mental Health

Proposal

Retention is a widely-research challenge in higher education. There are many models to predict dropout [1]. However, these models omit student mental health, which has emerged as a ``crisis'' [2]. There are ways to support students with poor mental health [3], but early diagnosis and intervention are key [4]. Notwithstanding these challenges, in 2019 the UK government set an ambitious target of 85% continuation [5]. Given as few as 72% of students successfully complete their first programming course [6], even before mental health presented such a considerable obstacle, this will present a considerable challenge in many contexts. It is therefore a topic of interest to many computing educators.

The Faculty of Screen, Technology, and Performance at Falmouth University in Cornwall is a multidisciplinary community of around 3500 undergraduate students, developing digital skills across a range of different courses. It hosts a Games Academy, an Academy of Music and Theatre Arts, as well as a School of Film and Television. The computing subject area permeates the faculty, with research programmes spanning areas such as immersive experience design and virtual production.
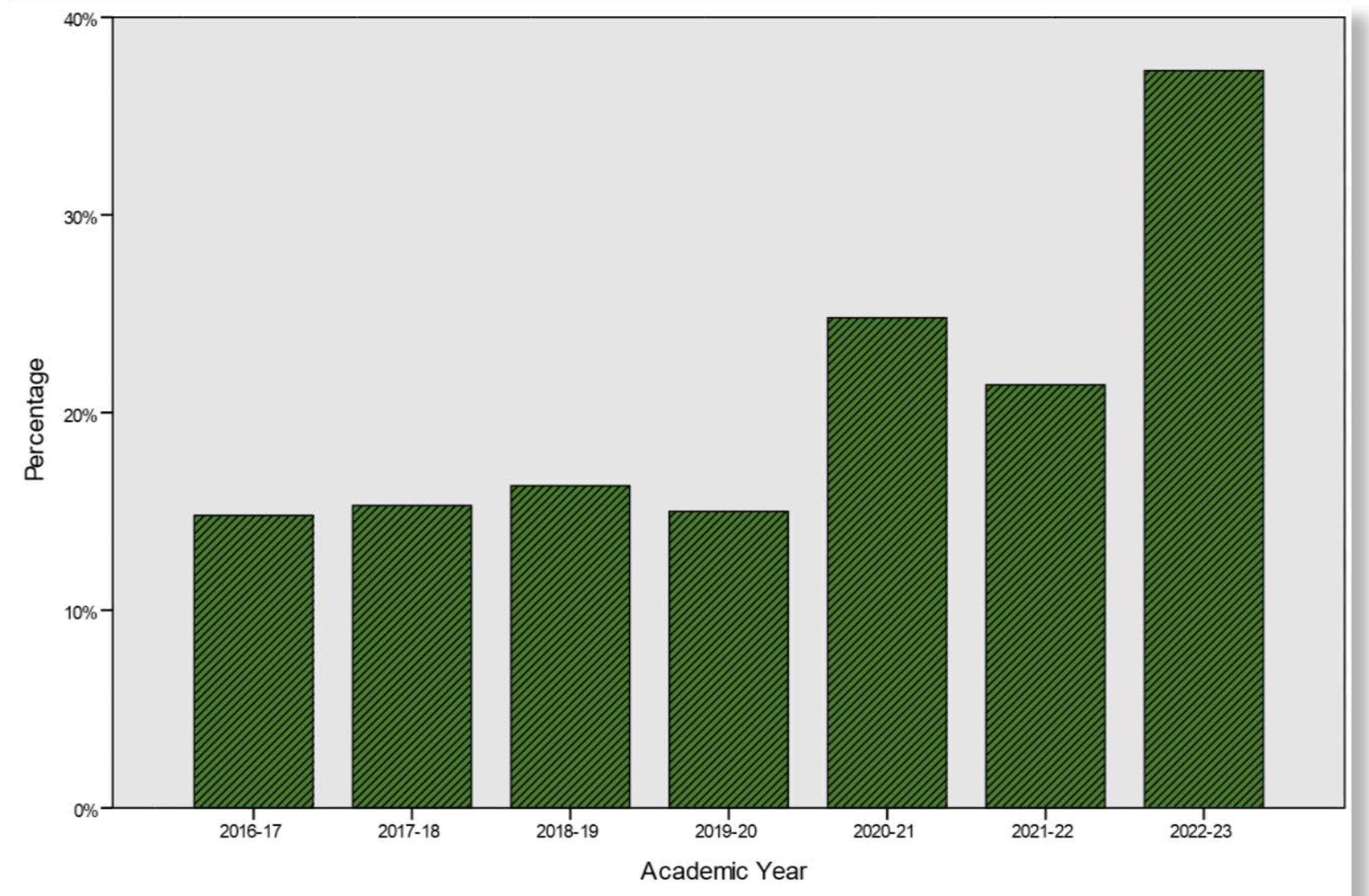
An area of focus in the faculty is the transition into higher education. This is because, of the students who intermit or withdraw, typically 60% ±4% are in their first stage of study. Recent work on computing retention illustrates progress towards a risk model and network of support mechanisms which can be successful [7], illustrated in Figure 2, However, further analysis has revealed an alarming trend. In 2016, only 1% of enrolled students left their course due to mental health. Between 2017 and 2019 this increased to 2%. This further increased to 3% in 2021 and to 4% in 2023. Figure 1 shows that of the proportion of all stage one intermissions and withdrawals, fewer than 15% of first-stage leavers in 2016 cited mental health as their motivation. However, by 2023, this had doubled to more than 37%.

Using *Woebot* [8] as a framework, the authors propose to gather insights by mining data from students as they interact with chatbots. This positions conversational artificial intelligence as both diagnostician and first responder, investigating and acting upon the mental health challenges that students encounter. A mixed-methods approach to analysing the conversation logs using inductive coding and clustering will contribute to improving a retention risk model and associated support mechanisms [9]. Notionally, using clustering techniques to classify queries according to risk indicators and then logistically regressing these with student outcomes; thus, computing a log-likelihood for successful retention. This will then be integrated into existing professional service infrastructure so that struggling students can be automatically directed to appropriate help. Consequently, addressing those risks posed to student mental health and enacting positive change to improve outcomes for students during their transition into higher education. The ethical dimensions are presently being explored in accordance with Coghlan's [10] recommendations, with a data protection impact assessment progressing.
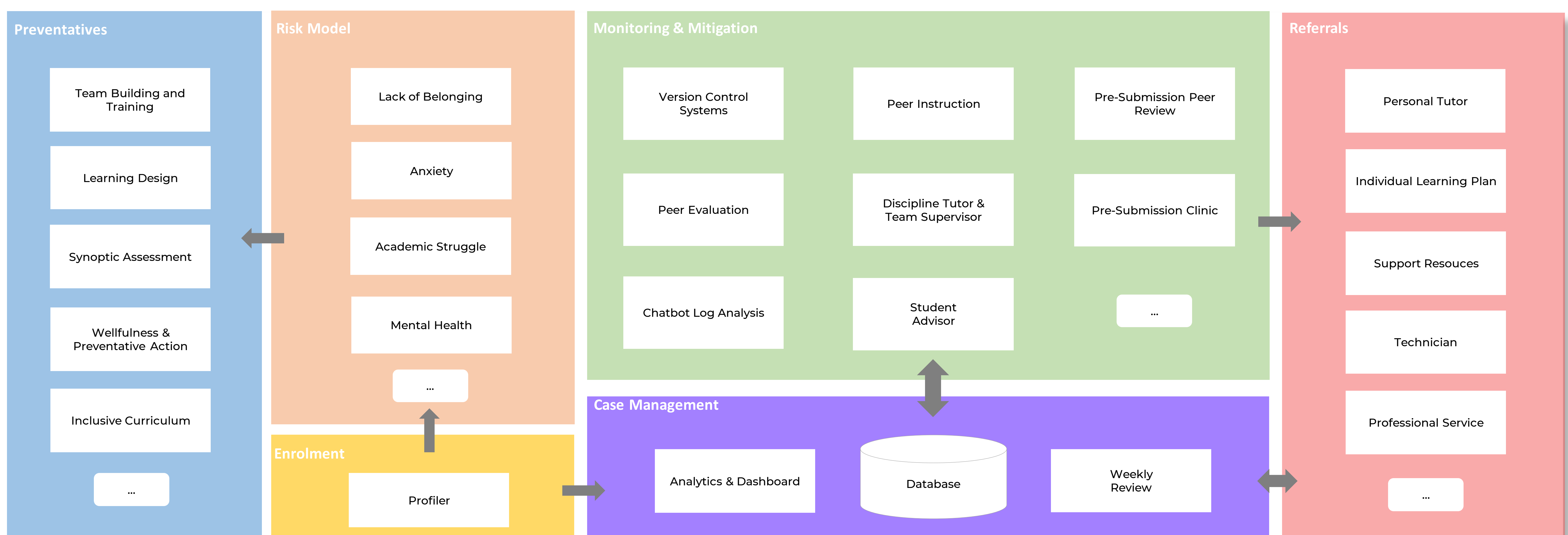

Figure 2. Illustration of the support mechanisms deployed in first-stage undergraduate computing to identify and address the risks factors associated with dropout, amended to include mental health factors

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