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Co-Designing Classroom Practice to Improve Student Attention and Engagement in Computer Science Degree Programmes

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ABSTRACT

Educators have long researched student attention and how this influences learning, teaching and assessment. Focusing on how this specifically impacts upon CS education, we present early work that constructs a deeper understanding of CS student attention during learning and teaching activities, alongside co-designing a set of recommendations. We conducted an in-depth analysis of student perspectives and experiences related to their attention in CS courses through diaries and focus groups, working with students as partners on recommendations for increasing student attention and engagement. The outcomes of this preliminary work provides the foundation for developing future engagement activities and targeted interventions for undergraduate CS students.

CCS CONCEPTS

• **Social and professional topics** → **Computing education; User characteristics.**

KEYWORDS

Student engagement, attention, digital distraction, co-design

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Background & Approach: Maintaining attention while engaging with an educational task is crucial for success [7]. Maintaining student attention and engagement has long been a challenge, with myriad potential distractions; more so during the COVID-19 pandemic [2]. With learners who purport to be increasingly digitally confident and capable now entering higher education, academics may need to reconsider their approaches to learning, teaching and assessment strategies. As student performance is dependent on attentional engagement, it is crucial to identify and mitigate potential distractions that might capture attention and undermine performance [3, 6, 7]. To improve attention, practitioners have considered aspects such as activity timings [5], or the role of the teacher [1],

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but co-design approaches have only been recently employed as strategy for student engagement [4]. This work focused on addressing student attention and distraction issues in undergraduate CS teaching sessions, adopting a co-design approach. Through this work, seven undergraduate students kept week-long diary logs of their attention and distraction behaviour during teaching sessions at three points during the semester. After each diary week, focus groups were convened to discuss their observations and attention. **Preliminary Findings:** Initial analysis of the diary data identified aspects of learning and teaching which shaped discussions in the focus groups regarding maximising attention and reducing distraction in teaching sessions. The recommendations, co-designed and refined with student and staff input, regarded interactive and responsive teaching practice and expected classroom conduct in a collegial setting to improve self-awareness and self-discipline for students. Further thematic analysis of the diaries, focus groups and interviews with CS students, revealed several themes impacting on student attention and distraction. The main themes were: approach to delivery (interactivity, real-world examples), module structure (session type, duration), learning environment (study context), student behaviour and state (mindset, tiredness, concentration, motivation) and lecturer behaviour (discipline, humour, approachability). Furthermore, the diary method encouraged students' self-reflection on teaching sessions, presenting a previously unseen perspective of their classroom behaviour.

Future Work: The co-design process allowed both students and faculty to critically discuss differing perspectives, working towards improving CS curriculum delivery and student experience, and identifying student-centred solutions. The next stage in this work will be to further refine the recommendations, including exemplars, and how they impact upon core CS areas (e.g. introductory programming, mathematical foundations, etc).

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