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A collaborative digital 'treasure hunt' to build student engagement in architectural technology

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Abstract

Students in architectural disciplines need to acquire skills in technical disciplines and design, but also in collaborative practice and self-reflection (AACA, 2021). Exploring these ideas in an authentic space can legitimise their learning activities and provide the foundation to build competencies critical to their future professional practice (Herrington, 2006). In reviewing a core subject in architectural technology at the Faculty of Architecture Building and Planning (The University of Melbourne), we considered the overarching 21st-century graduate attributes defined by the National STEM School Education Strategy 2016-2026 (McDonald, 2016), as well as how students were engaging in the subject, finding a disconnect between lectures and assessment tasks, and limited opportunities to collaborate and build skills progressively.

As part of the subject redesign, we aimed to embed constructivist approaches and build students' confidence within the discipline by providing opportunities to collaborate on authentic, low-stakes, iterative tasks. A high-stakes exam was replaced with weekly authentic 'treasure hunt' (TH) activities designed to support student self-reflection, critical thinking, engagement, and skill development and articulated to progress from simple questions (to gain declarative and procedural knowledge within the subject area) towards more complex questions based on pattern recognition and critical thinking (to manipulate information in ways consistent with the learning goals).
The new tutorial activities were constructed in digital Miro boards, to which student groups were given edit access to collaborate, prioritising mutual support (Bandura, 1977; Bloom, 1984; Lamb et al., 2022).

A 2023 evaluation using surveys and interviews showed most students found TH activities provided meaningful opportunities to interact with peers and teaching staff (51% *A lot*; 22% *Somewhat*). They felt their individual learning needs were supported, and their contribution mattered (38% *A lot*; 27% *Somewhat*). In interviews, one student highlighted the greater value of collaborative and progressive learning of these activities compared to the final exam: working together on real documentation and finding relevant information consolidated their knowledge and helped them complete their assignments with increased confidence.
Overall, the new TH activities enabled learners to reflect on their learning, including at an interdisciplinary level, by allowing diverse outcomes open to multiple solutions rather than a single correct response. The focus on collaboration helped students develop negotiation and delegation skills, with tutors assisting and coaching in the learning process.

Incorporating a reward-based strategy (low-stake assessments) to promote student engagement proved successful in reinforcing learning and motivating students because, as anticipated by Deci et al. (2001), the extrinsic motivation (the reward) was balanced with the intrinsic challenge of problem-solving tasks, recognising the need for specialist information to fulfil the given tasks and then access the appropriate resources. Digital collaborative workspaces proved successful in creating flexible, equitable learning spaces, allowing students to rework topics at their own pace and build skills outside the pressure of the classroom.
Incorporating low-stakes authentic learning tasks allowed students to explore complex concepts, enhance their skills, and foster collaboration. This is key for technical fields, where establishing a connection with the discipline early in a degree can positively impact students' success.

References

Architects Accreditation Council of Australia (AACA) (2021). National Standard of Competency for Architects. Available at: https://aaca.org.au/national-standard-of-competency-for-architects/performance-criteria/

Bandura, A. (1977). *Social Learning Theory*. New York, Pearson.
Bloom, B. S. (1984). The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring. *Educational Researcher*, 13(6): 4-16.
Deci, E. L., Koestner, R., Ryan, R. (2001). Extrinsic Rewards and Intrinsic Motivation in Education: Reconsidered Once Again. *Review of Educational Research Spring*, 71(1): 1–27. https://doi.org/10.3102/00346543071001001
Herrington, J. (2006). Authentic e-learning in higher education: Design principles for authentic learning environments and tasks. *Proceedings of the World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education*. Hawaii, US.
Lamb, J., Carvalho, L., Gallagher, M., & Knox, J. (2022). The Postdigital Learning Spaces of Higher Education. *Postdigital Science and Education*, 4(1): 1–12. https://doi.org/10.1007/s42438-021-00279-9
McDonald, C. (2016). STEM Education: A review of the contribution of the disciplines of science, technology, engineering and mathematics. *Science Education International*, 27(4): 530-569.