

Design AI Interactions and Innovations: Strengthen Skills, Battle Deskillling

*Insights from Future of Innovation Lab x
Lee Kuan Yew Centre for Innovative Cities*

In January 2025, SUTD pivoted to be the world's first Design AI university to nurture innovators who design with advanced AI's expanded possibility as a **teammate**. Since then, working across the university, SUTD has completed the following Design AI research, yielding findings on this expanded possibility:

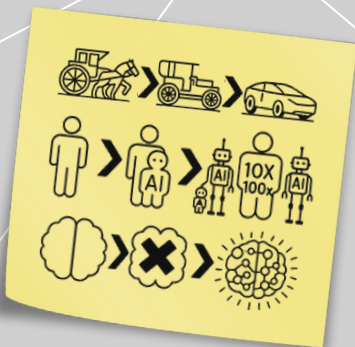
- **PET:** UG class in Design Technology and Innovation (DTI) for entire cohort.
- **PET:** UG class in Humanities, Arts, and Social Sciences (HASS).
- **CET:** PG class in Smart Cities/Urban Science, Policy, and Planning.
- **CET:** C-suite and senior management executive education in Strategic Design AI.
- **Interactions:** AI Trust and Creativity economic experiments (funded by AI.SG).
- **Work:** AI Impact on Policy Officers (funded by Public Service Division).
- **Teaming:** Lit review and fieldwork on the tasks/interactions humans and AI excel in.

The findings converge on three insights that compel us to rethink conventional strategies:

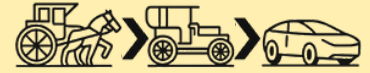
01 Gen AI is in a “horseless carriage moment” – we must move to Design AI-native

02 Nurturing 10x – 100x innovators is a reality

03 10x – 100x Design AI-native innovating is skills strengthening instead of deskillling



01 Gen AI is in a “horseless carriage moment” – we must move to Design AI-native

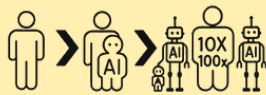


Tech history rhymes. The first cars were “horseless carriages”. The first web search engines were “library-less directories”. And the first mobile apps were “browser-less websites”. The innovations that came after, taking full advantage of all new native capabilities, made the most impact.

Gen AI is in its “horseless carriage moment”. Many still use Gen AI as a super search engine or chatbot. For example, two-thirds or more of those in our CET programmes are still using only text as the primary mode of interaction with AI. They thus remain daunted by issues like hallucinations.

But once we show them how to go Design AI-native: code without coding, use vision and voice interfaces/interactions, verify with social science techniques, and design trusted safe multi-modal AI assistants in ten minutes, they are inspired. A senior leader in a CET programme told us they realised “how far behind they are”. And in a recent teachers workshop, **87% of participants were excited, and 82% immediately started creating Design AI-native innovations for themselves.**

Tech history shows that those stuck in the “horseless carriage moment” will be superseded. SUTD’s experiences show we can pivot everyone to go Design AI-native.



02 Nurturing 10x – 100x innovators is a reality

Going Design AI-native is a force multiplier for innovation. Design Thinking and Innovation (DTI) is a Term 2 course for all SUTD students. Students work in teams of five to design solutions, guided by interdisciplinary instructors and cohort-based pedagogies.

This year, they were encouraged to go beyond working with AI as a “Tool” (conventional practice), to AI as a “Tool, Teammate, and Neither” (Design AI-native). As a result, several teams **co-opted AI as a sixth teammate** to:

- Collapse Minimum Viable Product idea-to-prototype time **from days to hours.**
- Build electronics/RFID/systems **without prior hardware and coding backgrounds.**
- Guardrail for trust by using **multiple AI models** to cross-check and expand understanding.

They show us that going Design AI-native can create **10x innovators** (e.g. see idea-to-prototype time above). 10x might even be too conservative, and SUTD is exploring **100x as a stretch goal.**

This is consistent with what mathematician Terence Tao did. He launched a project in Fall 2024 using AI to study algebra rules. He looked at rules for combining elements, and wrote thousands of statements about possible behaviours with 22 million “if this, then that” cases. Over two months, 50 collaborators (including amateurs) used AI tools and hand proofs to check them. By April 2025, they drew a big map of rule connections, showing how AI and humans can team up. (Cepelewicz, 2025).

03 10x – 100x Design AI-native innovating is skills strengthening instead of deskilling



In the above, instead of deskilling our students, AI as teammate strengthened their skills. The evidence for this is empirical: instructors found this year's designs to be **higher quality**. It is also research-grounded: **AI tutoring can outperform conventional learning** (Kestin et al., 2024).

The evidence is pedagogical too: recent studies have found that **integrating Gen AI into design thinking strengthens higher order learning outcomes** through complex problem solving, critical thinking, and iterative innovation (see References). Hence, by choosing to combine AI with our strong culture of doing/experiential learning, we transform mindless AI use into mindful Human-AI teaming.

We saw the same in the Humanities, Arts, and Social Sciences (HASS), and for PG students as well. In the HASS class, UG students went beyond writing papers to creating Design AI-native prototypes. They found it “super cool”, “engaging”, and “innovative”, because they learned beyond abstract theorising into experiential translating of HASS theories to **understand Human-AI collaboration**.

In the PG Smart Cities class, both STEM and non-STEM students felt **empowered**. And the three Design AI-native **prototypes are now being adapted** by several stakeholders, including one – Interview Companion GPT – by NLB's Oral History Center to help train interviewers.

Further Research: Use SUTD's Headstart to Jumpstart Singapore's Advantage

The above are consistent with workforce research insights. In the projects on AI Trust and Creativity and AI Impact on Policy Officers, we found that creativity and forecasting capacity respectively can be raised by many multiples when we team Humans and AI. This is especially so when people are empowered to create their own Design AI-native solutions.

With AI as a teammate, skills and domain knowledge are strengthened, offering a strategy and solution to battle AI deskilling,

SUTD has a headstart on how to do this. We know because our literature review of over 100 papers (and counting) show that insights on how to team human and AI interactions, the interfaces needed, and the implications are thin and just emerging.

With 15 years of design innovation expertise, 10 years of future of work and innovation research, and accelerated experimentation from its Design AI pivot, SUTD's headstart can jumpstart Singapore's global research and practice competitive advantage in this field.



1. Cepelewicz, J. (2025, April 30). *Mathematical beauty, truth and proof in the age of AI*. Quanta Magazine. <https://www.quantamagazine.org/mathematical-beauty-truth-and-proof-in-the-age-of-ai-20250430/>
2. Chen, L., Song, Y., Guo, J., Sun, L., Childs, P., & Yin, Y. (2025). How generative AI supports human in conceptual design. *Design Science*, 11, e9. <https://doi.org/10.1017/dsj.2025.2>
3. Kestin, G., Miller, K., Klales, A., Milbourne, T., & Ponti, G. (2024). AI tutoring outperforms active learning [Preprint]. *Research Square*. <https://doi.org/10.21203/rs.3.rs-4243877/v1>
4. Wadinambiarachchi, S., Kelly, R. M., Pareek, S., Zhou, Q., & Velloso, E. (2024). The effects of generative AI on design fixation and divergent thinking. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (Article 380, pp. 1-18). Association for Computing Machinery. <https://doi.org/10.1145/3613904.3642919>
5. Zemke, H., Stahmann, P., & Janiesch, C. (2025). Leveraging generative artificial intelligence for design thinking in creative processes: A literature review. In *Proceedings of the 58th Hawaii International Conference on System Sciences (HICSS-58)*. <https://doi.org/10.24251/HICSS.2025.018>