

Integrating Ai-powered Design Tools In Architecture Education: Opportunities, Challenges, and Pedagogical Implications In The Context Of Bangladesh

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INTRODUCTION & AIM

AI-powered design tools are entering architecture education through **concept generation, visual exploration, research support, and design communication**. In Bangladesh, students are already using these tools, but their use remains informal and uneven because of **limited guidance, access issues, and lack of clear studio policy**.

Problem Statement

- AI supports faster ideation, visual communication, & also design analysis.
- Unguided use may weaken drawing, modelling, spatial-reasoning, and critical judgment.
- AI-generated work raises concerns about authorship, originality, academic integrity, and reliability.
- Architecture education needs guided and ethical AI integration, not shortcut-based use.

Aim

Responsible AI integration in architecture education, practice + research.

Objectives

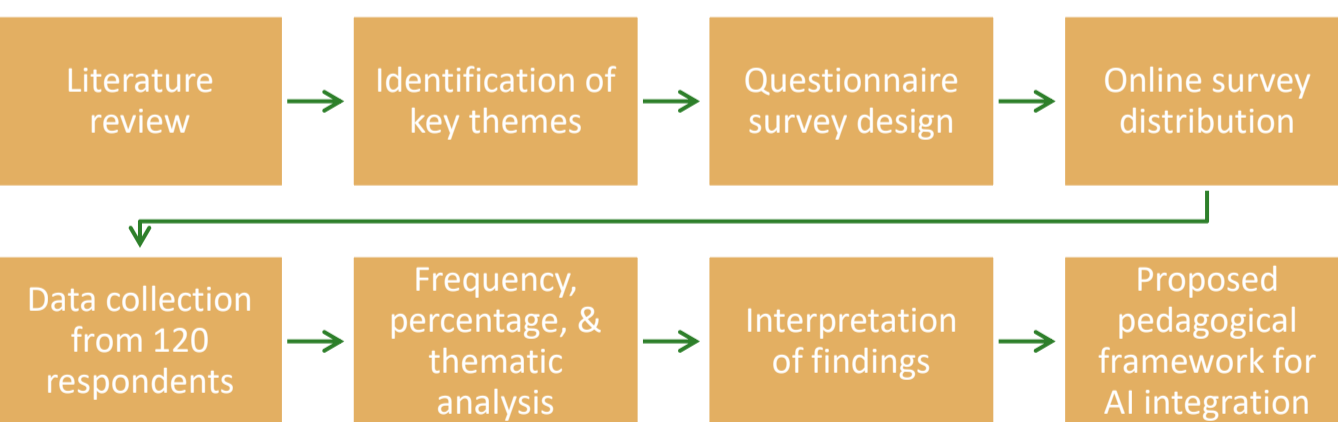
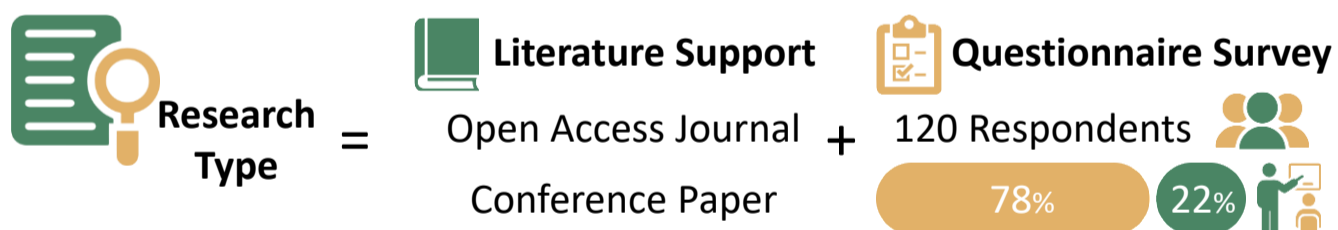
- Identify current AI use
- Examine key benefits
- Highlight risks and ethics
- Curriculum integration

Outcome

AI as a learning aid plus design & research tool, not a replacement for studio-based design thinking.

METHOD

A **survey-based research** design was used, supported by a **focused literature review**. The questionnaire collected perception-based data from architecture students (78%) and teachers (22%) from three architecture schools in Bangladesh.



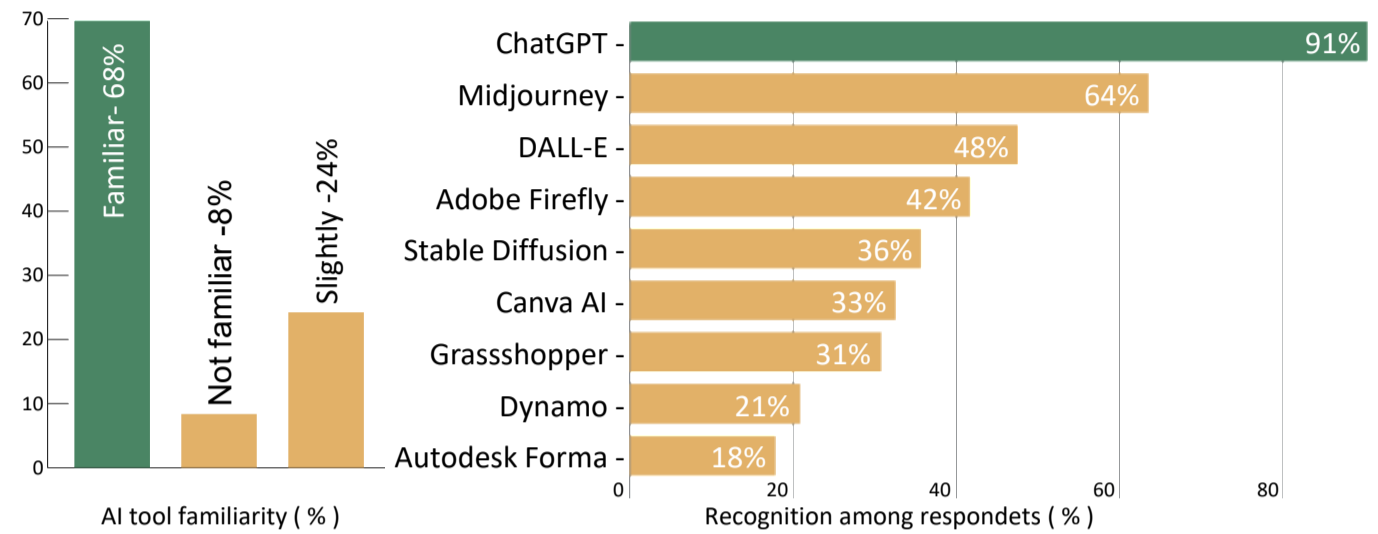
Research Methodology Flow.

This method was selected because **the research focuses on educational perception, not tool performance testing**. The survey captured how students and teachers understand AI use, while the literature review helped frame the findings within current debates on design pedagogy, ethics, and curriculum change.

RESULTS & DISCUSSION

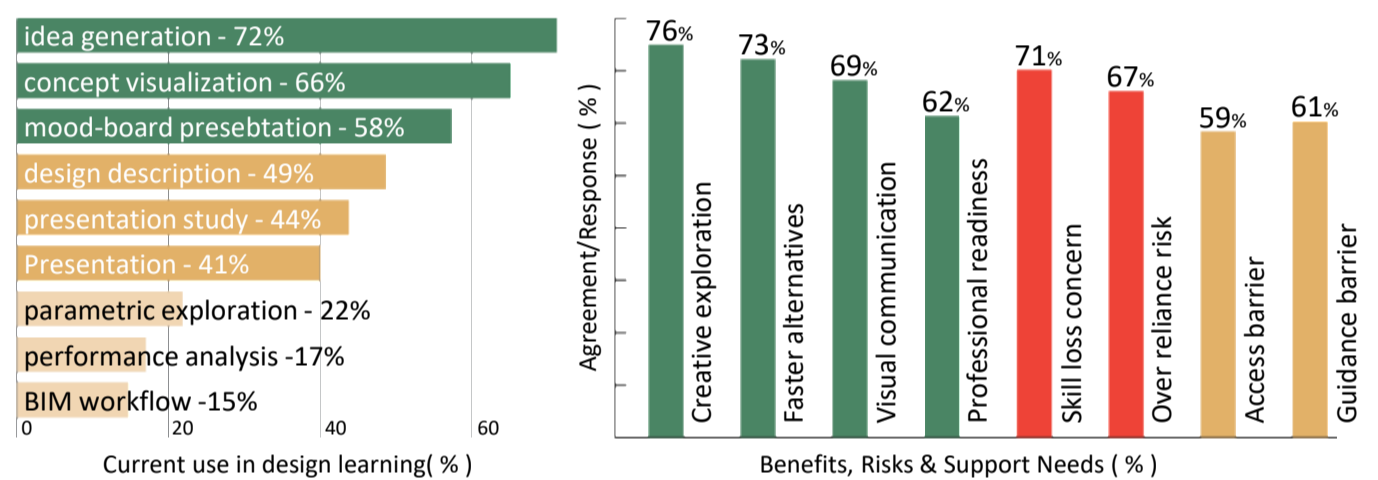
AI use is most visible in **early design** and **presentation-related tasks**, where students rely on familiar language-based and image-generation tools. However, advanced AI applications for **parametric design, BIM, and performance analysis** remain limited, showing a gap between creative use and technical integration. Respondents valued AI for exploration and faster iteration, while raising concerns about skill loss, over-reliance, authorship, and unequal access. This suggests that AI should be introduced with clear studio guidance rather than left to individual experimentation.

Finding 1: High AI awareness with uneven tool familiarity.



Respondents were **familiar with AI tools & recognition was stronger for language & image tools** than for BIM-based or performance-oriented tools.

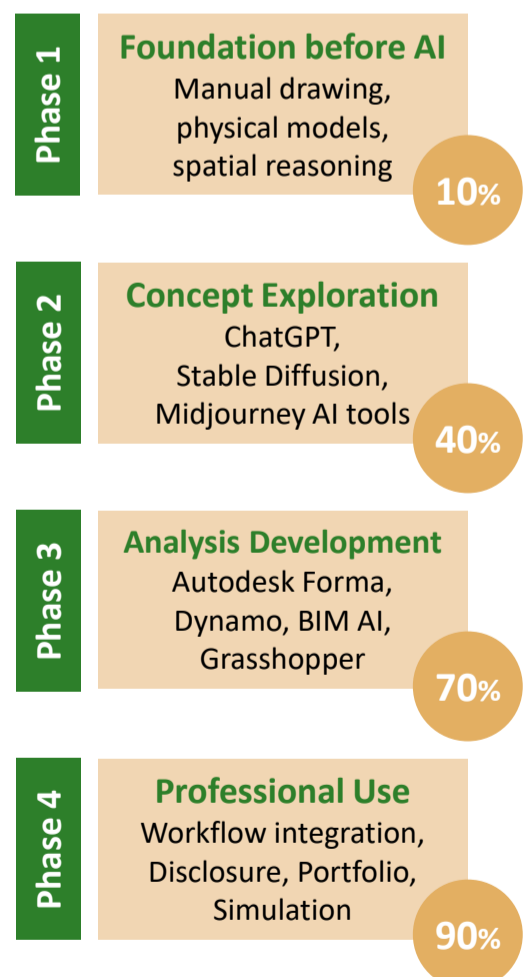
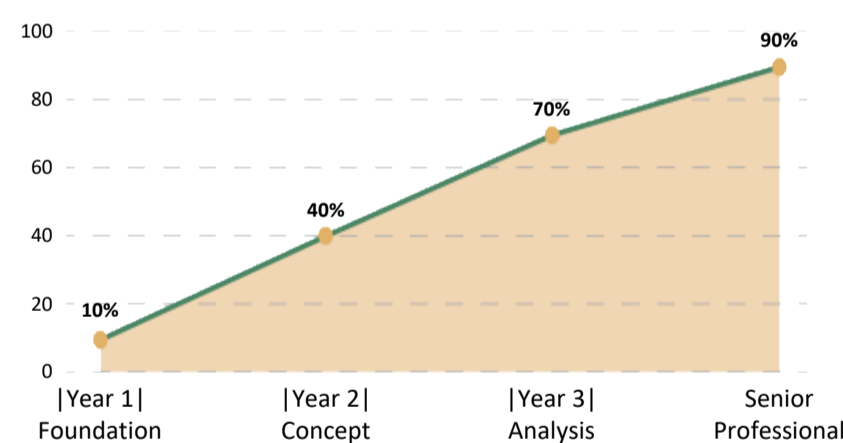
Finding 2: Strong early benefits, controlled integration needed.



Conceptual and presentation uses are dominant, while technical integration remains limited and key concerns need control.

CONCLUSION

Proposed phased AI integration



- AI advances ideation, visualization, research support, and professional readiness.
- Academic adoption must replace informal and unguided use.
- A phased framework is essential to protect design skills, ethics, authorship, fair access.
- This can align AI use with studio learning, research, and future practice.

FUTURE WORK / REFERENCES

Future research may **expand the survey across more universities**, compare student and teacher perspectives, and **evaluate how phase-based AI integration influences design quality, studio learning, architectural research, and professional practice**.

[1] Alamsi, R., & Asfour, O. S. (2026). *Applications of generative AI in architectural design education: A systematic review and future insights*. Digital, 6(1), Article 6.
[2] Huh, M. B., Miri, M., & Tracy, T. (2025). *Students' perceptions of generative AI image tools in design education: Insights from architectural education*. *Education Sciences*, 15(9), Article 1160.