# Designing Peer Assessment Tools To Enhance The Learning Experience

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## Motivations

**Uncertain feedback quality:** Peer feedback is often inaccurate or inconsistent due to students´limited knowledge, low engagement, or lack of motivation.

**Scarcity of suitable tools:** Few peer assessment tools exist for computing education, and many are outdated or unsupported.

**Dual impact of generative AI:** AI enables easy feedback and assignments but risks plagiarism and lost learning; thoughtful integration can turn these risks into opportunities.

**Improving learning experience:** Integrating AI can improve feedback quality, strengthen the assessment process, and support student learning.

**Identifying essential requirements:** Define the key features needed for effective peer assessment tools in computing education.

## Research Questions

**RQ1.** What are the key requirements, features, and uses of peer assessment tools in computing education?

**RQ2.** How can Gen-AI support the Peer feedback process?

**RQ3.** What impact can integrating Gen-AI have in giving and receiving peer feedback?

## State Of Art

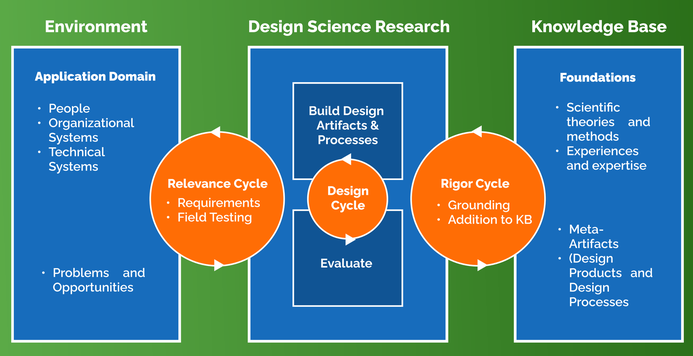
**Limited exploration** of AI in peer assessment for computing education → limited knowledge about requirements for new-generation tools.

**Concerns:** uncertain feedback quality & risk of bypassing learning opportunities with LLM-based tools.

**Need for thoughtful AI integration** that enhances learning by focusing on the process, not just final artifacts (assignments).

## Methodology

### Design Science Research (DSR)




## Conducted Studies

### Students' perceptions toward essential functionalities and qualities of peer code assessment tools

The study explored essential requirements and qualities of peer code assessment tools through an exploratory case study.

**Method:**
- Exploratory case study
- Systematic observation & semi-structured interviews
- Self-regulated learning theory as the theoretical lens

**Findings:**
- Features: inline comments, general comments, rubrics, thread, code editor, auto test.
- Qualities: user-friendliness, step-by-step process, customized tool for the task.

### The Impact of Multi-Peer Feedback Summary Organization on Review and Implementation of Feedback

The study examined how different visual organizations of AI-generated multi-peer feedback summaries affect students' perceptions and feedback implementation.

**Method:**
- Exploratory focus group
- Three different visual design of AI Summaries (categorized, Textual, List-based)
- Measures:length, organization, readability, understandability, trustworthiness, actionability.
- Students shared perceptions and compared designs.

**Findings:**
- Well-structured and traceable summaries can enhance the peer feedback review process
- Grouping similar and opposing feedback improved the feedback review process and increased the likelihood of implementation.

### AI in Peer Assessment: Supporting or Undermining Self-Regulated Learning?

The study examined peer assessment challenges, how students use AI to address them, and the new challenges AI introduces.

**Method:**
- Exploratory qualitative case study
- Semi-structured focus groups using two GenAI-supported peer assessment scenarios
- Self-regulated learning (SRL) as a lense

**Findings:**
- Peer assessment challenges increased cognitive and self-regulation demands.
- GenAI supported students but introduced validation costs and overreliance risks.
- Guidance-based AI promoted greater learning, ownership, and engagement.

### Supporting Without Replacing: Exploring AI Skills as Constrained Scaffolding in Peer Code Review

The study examined how constrained AI skills support peer code review, their effects on review quality, learning, and efficiency, and how students engage with AI while maintaining agency over their judgments.

**Method:**
- Mixed-methods quasi-experimental study comparing constrained AI-skill users with non-participants
- Analysis of peer feedback, feedback-on-feedback rankings, self-reflections, and post-task questionnaire responses
- Focus groups exploring students' experiences, AI use, cognitive effort, reliance, and agency

**Findings: Preliminary analysis in progress**

## Upcoming Study

### How Students Use Constrained AI Skills: A Behavioral Study of Peer Code Review

The study investigates how students use and engage with different constrained AI skills during peer code review, focusing on their actual usage patterns, needs, and critical interactions with AI responses.

**Method:**
- Mixed-methods field study using four constrained AI skills during authentic peer code review
- Anonymous interaction logging of skill use, duration, prompts, AI responses, and interaction patterns
- Analysis of skill usefulness, students' needs, and critical engagement with AI responses

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Excited
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