

Collaborative Intelligence And Innovation In Knowledge Work

What makes human–technology collaboration improve digital work?

Ziyi Zhao examines how people and digital technologies jointly develop the intelligence and capabilities needed to solve complex problems. The dissertation follows two stages of digital production: programmers using generative AI to create solutions and app developers managing products across mobile platforms.

In the first study, programmers trusted human sources more but rated identical GenAI-attributed solutions as higher quality. The strongest results came from programmers who modified and verified AI-generated code. Within the GenAI group, these Collaborators achieved a 75% success rate, compared with 33.3% among Revisers who changed solutions without testing them. Verification prevented programmers from becoming trapped in repeated cycles of evaluating and re-prompting without moving closer to a correct answer.

The second study analyzed 3,482 apps and found that expanding from iOS to Android could improve quality on the original platform. These gains were strongest and most persistent when developers used cross-platform software development kits on both platforms. Shared codebases allowed feedback, debugging insights, and performance improvements to move more efficiently between platforms. Together, the studies show that technology creates value when interactions and technical systems are deliberately designed to support feedback, verification, and learning.

• MAJOR TAKEAWAYS:

- GenAI produced the strongest results when programmers modified and verified its outputs instead of accepting them or repeatedly re-prompting without testing.
- Programmers viewed human sources as more credible but rated identical GenAI-attributed solutions as higher quality.
- Mobile apps achieved stronger cross-platform quality improvements when developers used shared cross-platform development tools.

WHO NEEDS TO KNOW:

- Software development leaders
- Programmers and other GenAI users
- App developers and product managers
- Platform owners and SDK providers
- Technology educators and workforce trainers

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