

## Sociotechnical Synthesis

The rapid integration of emerging technologies into everyday life creates challenges not only in how systems are designed, but also in how they are used and interpreted by users. Both of my thesis projects—my technical project, *NBA4U*, and my STS research on academic integrity in the age of AI—explore a common sociotechnical problem: how to design and implement accessible, data-driven technologies in ways that enhance user decision-making without promoting overdependence or reducing human engagement. The technical project focuses on sports fans and how they consume NBA player performance data, while the STS project focuses on secondary school students and how they engage with AI tools like ChatGPT in educational settings. Together, these projects examine how user-centered design, automation, and personalized outputs influence how individuals interpret, trust, and act upon data—raising questions about usability, ethical design, and critical thinking in tech-mediated environments.

My technical project was the development of *NBA4U*, a full-stack web application that allows users to search for a current NBA player and receive real-time statistics and a personalized letter grade based on recent performance. Built using Python, Django, JavaScript, and an external NBA stats API, the application aims to simplify the process of accessing and evaluating NBA player performance for casual fans. It includes a custom grading algorithm that weighs a player's recent game stats, efficiency metrics, and matchup difficulty to generate a letter grade. This approach makes advanced analytics more digestible and engaging, bridging the gap between raw data and meaningful insights. During testing, users found the platform intuitive and appreciated the way complex data was summarized clearly. The success of the project demonstrates how personalized, automated data summaries can improve user engagement with otherwise inaccessible information.

In my STS research, I examined how AI tools like ChatGPT are affecting academic integrity and learning behaviors among secondary school students. Using the framework of cultural lag, I analyzed how the rapid adoption of generative AI outpaced school policies and teaching practices. I found that students benefit from using AI tools for productivity and learning support, but also risk becoming overly reliant on them, leading to reduced critical thinking and independent work. Interviews, online discussions, and studies revealed that students often use AI to generate essay drafts or summarize readings, but many do so without fully understanding the material. I argued that instead of blanket bans, educators and administrators should develop tiered, age-appropriate policies and structured assignments that promote critical engagement with AI. The study

concluded that thoughtful policy and curriculum design can help students use AI responsibly while still developing core academic skills.

Taken together, these two projects highlight the dual nature of technology: its power to enhance access and efficiency, and its potential to encourage passivity or reliance if not thoughtfully implemented. In the case of *NBA4U*, automation was used to enrich the user's experience without replacing personal engagement—users still initiate the search, read the stats, and interpret the grade in context. In contrast, the STS research shows how unstructured use of AI can lead to disengagement, particularly among students who lack guidance or self-regulation. While my technical project succeeded in addressing a design problem in sports analytics, my STS research contributed to a broader understanding of how institutional responses must evolve alongside technology. Future work could explore ways to build AI and data tools that require active user reflection—such as explainable algorithms or prompts that encourage users to compare machine output with personal judgment.

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