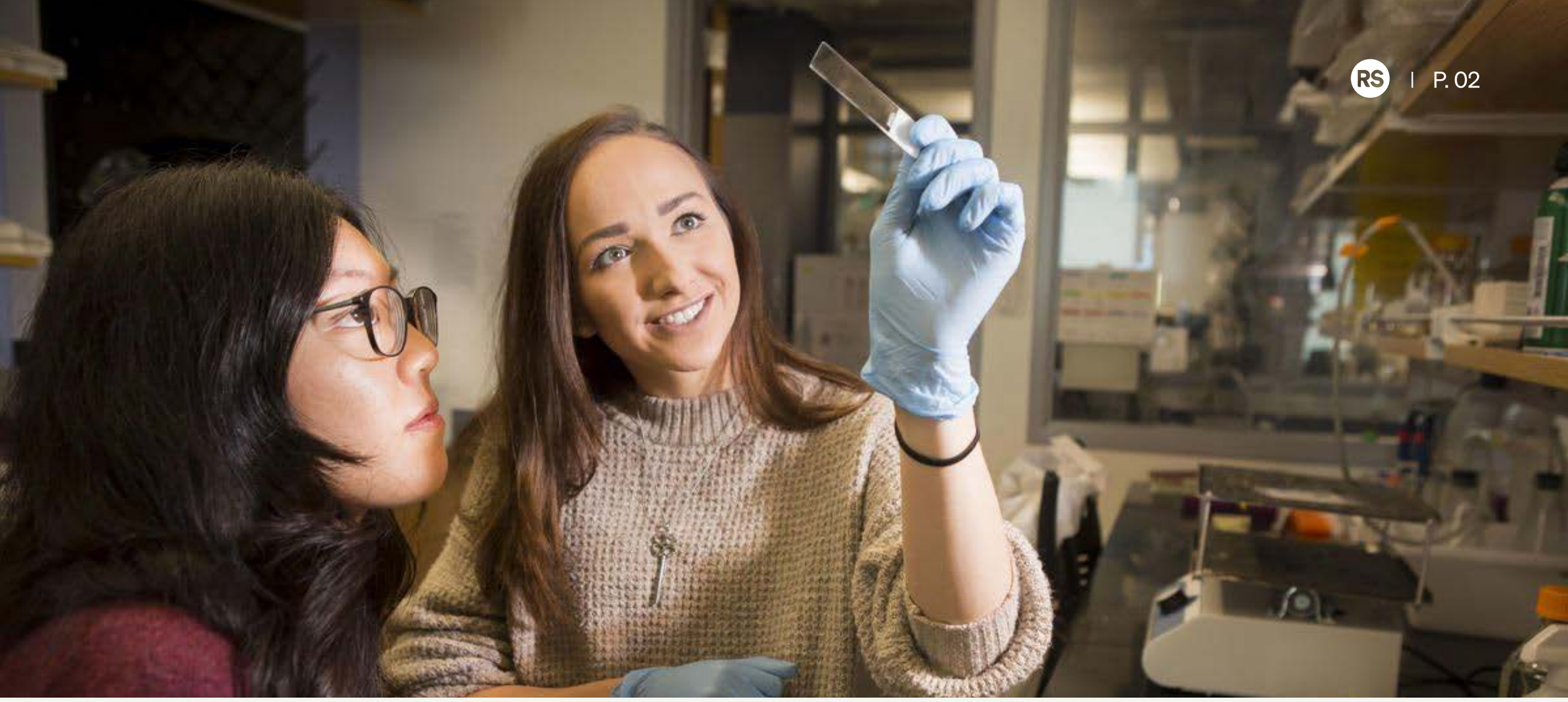
Research Solutions | VANDERBILT UNIVERSITY Jean *and* Alexander Heard Libraries

Academic Case Study

Responsible AI In Academic Research: How Vanderbilt Librarians Integrated Scite Into Information Literacy

Photos by Vanderbilt University/Harrison McClary



Executive Summary

Librarians at Vanderbilt University's Sarah Shannon Stevenson Science and Engineering Library faced the challenge of helping students navigate the rapidly evolving landscape of artificial intelligence in academic research. The library team developed a framework to guide students in responsible AI use, implementing it through curriculum-integrated instruction.

Their approach led to significant increases in students' likelihood to use AI tools for research and demonstrated that even brief educational interventions can shape students' understanding of AI's capabilities and limitations. This case study documents their experience with Research Solutions, implementing Scite as part of their broader AI literacy initiatives.

Key Stats

425	users at the institution
812	searches conducted
3.404	AI assistant queries
458%	increase in the proportion of students who were willing to use AI research tools after librarian-led instruction

Background

Vanderbilt University, located in Nashville, Tennessee, is a private research university with approximately 13,000 students across undergraduate, graduate, and professional degree programs. Vanderbilt's Jean and Alexander Heard Libraries consist of nine campus libraries, including the Stevenson Science and Engineering Library, which primarily serves the School of Engineering (~1,500 students) as well as science and mathematics disciplines in the College of Arts and Science.

As generative AI tools like ChatGPT gained prominence in late 2022, many educators responded with alarm, concerned that these technologies would undermine academic integrity and learning. Vanderbilt's librarians recognized an opportunity to integrate AI literacy into their existing information literacy instruction rather than prohibiting these powerful tools.

Challenge

Librarians at the Science and Engineering Library faced multiple interconnected challenges as they sought to address AI literacy in their information instruction. The exponential growth of scientific research—doubling approximately every nine years and spread across over 40,000 journals—had already created significant information overload for students.

The emergence of AI tools added another layer of complexity. Survey data revealed varying levels of AI experience among students, with only 11.8% reporting they used AI tools "often" or "very often" for research-related assignments prior to instruction. Many students expressed uncertainty about using these technologies for academic work, unsure of ethical boundaries and appropriate applications.

Meanwhile, faculty members and administrators were grappling with questions about academic integrity in an AI-enabled educational landscape. The librarians recognized a critical need for a context-specific framework that could guide students on when and how to appropriately use AI tools for academic research, particularly regarding the limitations of these technologies. Without such guidance, students risked either avoiding potentially helpful tools entirely or using them inappropriately without understanding their constraints.

Solution

The Science and Engineering Library team, led by librarians Alexander J. Carroll and Joshua Borycz, developed and implemented a multipronged approach:

1. The 5 I's Framework

They created a conceptual framework identifying five key limitations of large language models for information seeking:

- **Incomplete:** Most models cannot access the most recently published work or proprietary work
- **Inconsistent:** Unable to replicate the same results for the same question over time
- **Incoherent:** Cannot provide provenance for information sources
- **Illogical:** Fail to solve problems that are trivial for humans
- **Indulgent:** Encourage confirmation bias rather than critical thinking

2. Curriculum Integration:

Rather than creating separate AI workshops, they embedded AI literacy into existing course-integrated information literacy sessions across 10 science and engineering courses, reaching students from various disciplines and academic levels.

3. Research-Based Approach:

Their interventions were informed by both pedagogical best practices and ongoing research into students' AI usage patterns and perceptions.

4. Scite Implementation:

The library incorporated Scite, Research Solutions' AI-assisted search with citation context and comprehensive coverage of research literature, as a concrete example of AI tools designed specifically for academic research contexts.

"Our data shows that after learning about AI research tools in context, students recognize their value for tasks like search assistance and topic development." "Tools like Scite that provide scholarly context and citation tracking help address the 'incomplete' and 'incoherent' challenges we identify in our framework, making students more likely to use these resources appropriately."

Alexander J. Carroll
Associate Director of the Science and Engineering Library

Results

458% Increase In Student Willingness To Use AI Research Tools

The library team's approach to AI literacy instruction yielded significant positive outcomes across multiple measures. Following the information sessions, student attitudes toward AI tools shifted dramatically, with 65.9% indicating they were "likely" or "very likely" to use these tools for research-related tasks—a substantial increase from the mere 11.8% who had previously used them "often" or "very often."

The statistical analysis provided very strong evidence that this shift in student attitudes wasn't random chance but a meaningful change directly resulting from the instruction they received. Importantly, this positive impact was consistent across all subject areas, suggesting the framework's broad applicability regardless of discipline.

Improved Understanding Of AI Limitations & Applications

Qualitative analysis provided deeper insights into students' evolving understanding of AI tools. After participating in the sessions, students demonstrated sophisticated comprehension of AI limitations, identifying issues such as incomplete data (43 students), imprecise responses (27 students), incoherent reasoning (18 students), citation problems (15 students), and inconsistent outputs (12 students). Simultaneously, they recognized valuable applications for these tools, particularly in search assistance (47 students), brainstorming and topic development (43 students), and information synthesis (30 students). This balanced perspective indicated students had developed a nuanced understanding of when and how to effectively incorporate AI into their research workflows.

Successful Scite Adoption Metrics & Usage Data

The implementation of Scite as part of the instruction program proved particularly successful. Between June 2023 and January 2024, the institution recorded 425 users conducting 812 searches, viewing 1,270 reports, and generating 3,404 AI assistant queries through the platform. These metrics suggest that when students are educated about appropriate use cases and limitations of AI research tools, they engage more confidently with these technologies in ways that enhance rather than undermine their scholarly work.

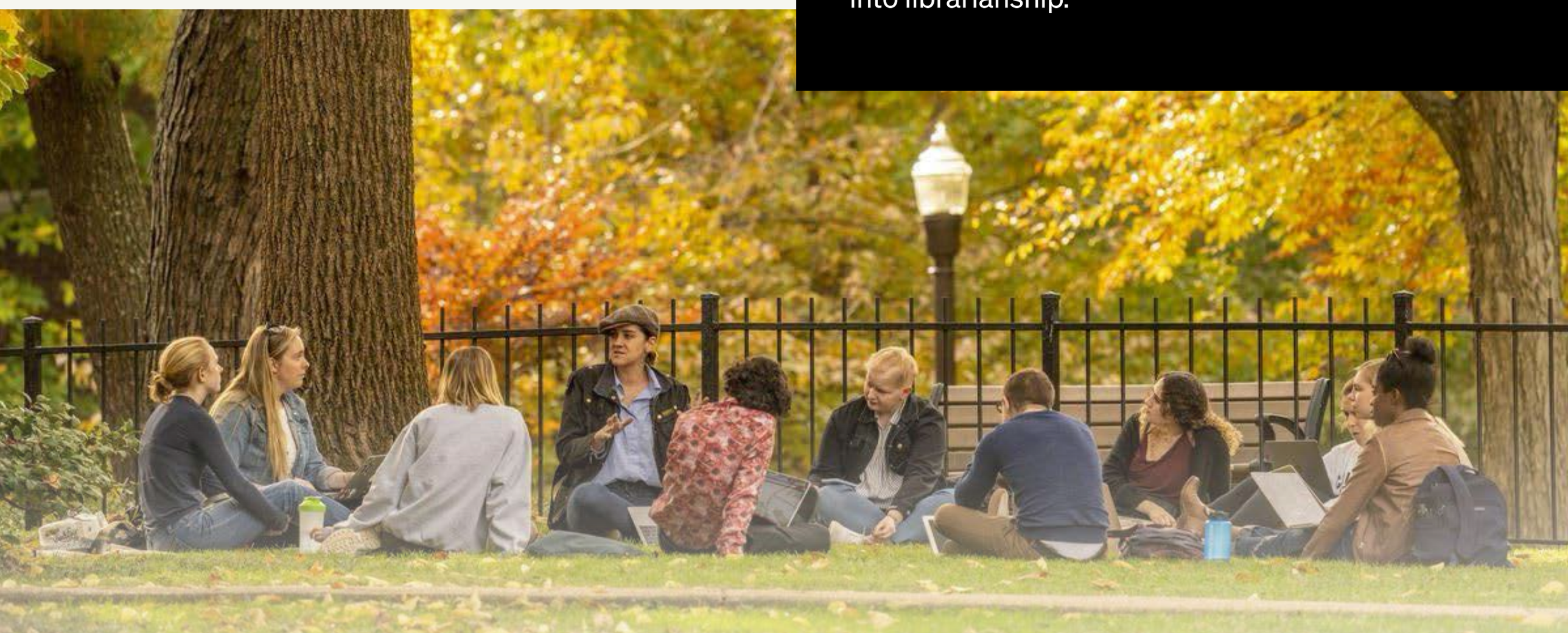
Key Takeaways

The Science and Engineering Library team, led by librarians Alexander J. Carroll and Joshua Borycz, developed and implemented a multipronged approach:

1. **Brief interventions can be effective:**
   Even 15-minute instructional segments on AI tools within existing classes had a significant impact on students' understanding and attitudes.
2. **Students seek ethical guidance:**
   Students demonstrated interest in understanding appropriate AI use within ethical parameters rather than circumventing academic standards.
3. **Frameworks help with complex concepts:**
   The 5 I's framework provided an accessible way for students to grasp AI's limitations while still appreciating its potential benefits.
4. **Educational approach works:**
   By focusing on educational opportunities around AI tools rather than prohibitions, the librarians observed positive outcomes for students.
5. **Library collaborations matter:**
   The success of this approach relied on collaboration between librarians, faculty members, and integration of tools like Scite that provide scholarly context for AI-assisted research.

About Vanderbilt University

Vanderbilt University, located in Nashville, Tennessee, is a private research university with approximately 13,000 students across undergraduate, graduate, and professional degree programs. The university's library system includes nine campus libraries that support the institution's academic and research mission. The Sarah Shannon Stevenson Science and Engineering Library featured in this case study serves the School of Engineering and science disciplines in the College of Arts and Science. The library team's approach to AI literacy instruction, including their use of Research Solutions' Scite product, represents one example of how academic libraries are adapting to rapidly evolving technologies in higher education. For more on their approaches to using AI to support information literacy instruction and improve researcher productivity, see *Essentials of STEM Librarianship*, their forthcoming monograph from ALA Editions | Neal-Schuman. This title, due out in late 2025, includes a chapter-length treatment on the topic of how to thoughtfully integrate AI into librarianship.



To learn more about how Scite works and how your institution can benefit, visit our website or contact us at sales@scite.ai.

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