

# **From Coursework to Careers: Findings from a Feasibility Study on AI-Aligned Experiential Learning at an HBCU**

## **1. Introduction**

Artificial intelligence is changing how work gets done in healthcare, finance, cybersecurity, and government. As a result, employers increasingly expect graduates to arrive with more than coursework: they want evidence of applied experience, professional judgment, and familiarity with real project environments. For many students at Historically Black Colleges and Universities (HBCUs), that transition from completing AI-relevant coursework to securing an AI-related role, is still uneven and often depends on individual connections rather than consistent institutional pathways.

At many HBCUs, the barrier is not whether students can complete computing coursework. Students earn degrees in computer science, data science, cybersecurity, and related areas and demonstrate capability in class. What is harder to access is the bridge to employment: projects with external partners, internships that fit students' schedules and financial realities, exposure to workplace expectations, and the networks that often lead to referrals and early opportunities.

Bowie State University's (BSU) Department of Computer Science has built several experiential learning efforts intended to close that gap, including initiatives highlighted in *The New York Times* through coverage of BSU's Tech Pipeline Program and its employer partnerships. As these efforts grew, the department needed a clearer picture of what students, faculty, and partners viewed as the main constraints and what it would take to expand experiential learning in a coordinated, sustainable way.

This paper reports findings from a feasibility study funded by the University System of Maryland Elkins Transformation Award. The study examined barriers to student participation in AI-aligned experiential learning and assessed institutional and partner readiness for scaling career-connected learning. We present the study design and findings and discuss what they suggest about the role experiential learning centers can play as an institutional strategy for strengthening AI workforce preparation at HBCUs.

## **2. Background and Institutional Context**

Bowie State University is an HBCU located in Prince George's County, Maryland. The region's demographics and proximity to major government and industry employers' position BSU as an important contributor to the STEM workforce pipeline, particularly for students who have been historically underrepresented in computing fields.

The Department of Computer Science enrollment has increased from 219 in 2019 to 495 in Fall 2025, alongside growing student interest in computing careers. The Computer Science program is ABET accredited and also holds an NSA/DHS Center of Academic Excellence in Cyber Defense designation, and participates in research and partnership activities that support applied

learning. Department has eight research labs including work in autonomy, cybersecurity, and human-centered AI providing student engagement in applied projects.

In addition, the department has pursued experiential learning through employer-facing initiatives. The Tech Pipeline Program has connected students to paid internships and project experiences, including opportunities with minority-owned technology startups. The department's Booz Allen Hamilton capstone partnership has also embedded industry engagement into the senior capstone experience through sponsored projects and recurring mentorship, with project showcases that have attracted recruiters and, in some cases, led directly to hiring.

Despite these strengths, the department recognized that its experiential learning activity had grown through a mix of individual relationships, grant-supported efforts, and informal coordination. The Elkins-supported feasibility study provided a structured way to assess barriers, capacity, and partnership requirements before expanding these efforts further.

### **3. Study Methodology**

The feasibility study focused on two questions:

1. What prevents BSU computing students from participating in AI-aligned experiential learning opportunities (internships, projects, and applied experiences)?
2. What capacity and partnership conditions would be required to scale experiential learning in a coordinated way?

### **Participants and Data Collection**

**Students (n=200):** Surveys and structured interviews captured participation in internships/projects/research, employment and time constraints, commuting patterns, financial considerations, confidence in career readiness, and perceptions of access to opportunities.

**Faculty (n=15):** Interviews and focus groups examined advising and mentorship capacity, feasibility of industry project oversight, and constraints on expanding experiential learning within current workloads.

**Industry partners (n=10):** Structured interviews and group discussions explored partners' willingness to host students, provide projects, mentor, and the conditions needed to sustain partner engagement (coordination, scope clarity, feedback mechanisms).

**Peer institution consultation:** The study team held structured consultations with experiential learning programs at peer institutions to understand common operational models, sustainability considerations, and partnership practices.

### **Analysis**

Survey results were summarized to identify patterns. Interview and focus group notes were coded thematically, organized around student barriers, institutional capacity, and partner

readiness. Peer-institution insights were synthesized to identify recurring implementation features and constraints relevant to BSU.

#### **4. Key Findings**

The findings were groups as follows: student barriers, departmental capacity, partner conditions, and peer-institution lessons.

##### **4.1 Student barriers: experience and confidence gaps**

A substantial share of graduating seniors reported limited access to applied experience. **Seventy percent** indicated they had not participated in an internship, industry project, or faculty-led research experience. Students consistently expressed interest in applied opportunities but described barriers that made participation difficult.

Financial constraints were a recurring theme. **Eighty percent** reported working part-time in non-technical roles, which limited flexibility for internships, networking events, and unpaid or low-paid opportunities. Commuting was another constraint: **seventy percent** of students commuted to campus, reducing their availability for on-campus mentoring and evening activities often associated with internship pipelines.

These constraints contributed to confidence gaps. **Ninety percent** of students reported feeling underqualified for AI-related roles, even after completing relevant coursework suggesting that coursework alone did not translate into confidence about workplace readiness.

##### **4.2 Faculty and institutional capacity**

Faculty described strong support for experiential learning and pointed to existing partnerships and labs as assets. At the same time, faculty emphasized that scaling experiential learning would require coordination capacity beyond what could reasonably be absorbed through existing teaching and service workloads. The most consistent operational need identified was a dedicated coordination function (e.g., project scoping, placement logistics, partner communication, and progress tracking).

##### **4.3 Partner perspectives: interest with conditions**

Partners expressed interest in deeper engagement and described strong alignment between their entry-level needs and BSU's student pipeline, particularly in areas such as AI, data science, and automation. However, partners also identified conditions for sustainable participation: a single point of coordination at the university, well-scoped projects, predictable timelines, and lightweight feedback mechanisms that would not create high administrative burden for their staff.

Minority-owned startups noted particular interest in early-stage placements where students could gain foundational industry exposure and contribute meaningfully to smaller teams.

#### **4.4 Lessons from peer institutions**

Peer-institution consultations surfaced common features of scaled experiential learning models: (1) dedicated coordination and partner management, (2) formal integration with academic structures (credit, capstone alignment, or recognized co-curricular pathways), and (3) diversified funding approaches rather than dependence on one source.

#### **5. Discussion**

The feasibility results suggest that the gap between AI coursework and AI careers is driven less by curriculum coverage and more by access to applied experiences and by whether students can realistically participate in them. Students who commute, work non-technical jobs, and manage financial constraints often cannot take unpaid opportunities or attend professional development activities that lead to internships and referrals. In practice, experiential learning is not an “add-on”; it is the infrastructure that makes career-connected experiences reachable.

For HBCUs, the implication is straightforward: if institutions want stronger workforce outcomes, they need coordinated structures that make applied experiences predictable, accessible, and financially feasible. Paid participation stipends, wages, or funded project roles matters because it allows students to engage in training, projects, and professional development without having to choose between building career readiness and earning income.

The study also points to the value of building cohort-based communities where students work in teams on real problems and receive consistent support. A model that pairs student teams with graduate mentors can strengthen accountability, reduce isolation, and accelerate skill development by creating a near-peer bridge between faculty oversight and day-to-day project guidance.

Finally, industry feedback suggests that partners are more willing to engage when the university provides clear coordination and low-friction participation. Sustained employer engagement is difficult to maintain through informal relationships alone, especially as programs grow so the partnership structure is part of the workforce pipeline, not an afterthought.

#### **6. Conclusion and Future Directions**

This feasibility study clarified barriers that limit student participation in AI-aligned experiential learning at BSU and identified operational conditions needed to scale applied opportunities in partnership with employers. The results point to the importance of coordinated experiential learning structures, especially at HBCUs where students may face time, commuting, and financial constraints that reduce access to traditional pipeline opportunities.

Future work will track implementation choices and outcomes as BSU expands its career-connected learning infrastructure, with attention to student participation, placement outcomes, and partner experience. More broadly, this study suggests that feasibility research can be a useful

step for HBCUs seeking to strengthen AI workforce preparation by aligning institutional capacity, student realities, and employer engagement.