Preparing an Undergraduate Workforce at an HBCU for Career Opportunities in Plant Data Science through Immersive Classroom Experiences using PlantCV

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November 1, 2022

Community colleges and minority-serving institutions are often ill-equipped with research facilities necessary for providing post-secondary students with opportunities for engagement in authentic research that would equip them with practical skills. Partnerships with research organizations can address gaps in professional training of post-secondary students to better equip them with skills aligned with industry needs, such as data handling. Through collaboration between the Donald Danforth Plant Science Center (DDPSC) and Harris-Stowe State University (HSSU), a local Historically Black College and University, a plant data science Course-based Undergraduate Research Experience (CURE) was developed to improve undergraduate access to research experiences and equip racially minoritized students with cutting-edge data science techniques. Biology and mathematics majors at HSSU used DDPSC researcher-generated plant image data to immerse themselves in real-world plant biology research. Students enrolled in this course used PlantCV, a Python-based image data processing software, to analyze the phenotypes of plants subjected to abiotic stresses. They interacted with image data to investigate heat stress responses in *Zea mays* (maize) and were exposed to complex interdisciplinary concepts that challenged their understanding of how biology and data science intersect. Students learned to analyze image data to extract conclusions based upon student-generated questions. Qualitative data from students' weekly surveys reveal the building of data science knowledge within students engaged in the CURE, providing insights for educators involved in planning and assessing undergraduate learning experiences at minority-serving institutions. This course

highlights the importance of training undergraduates in interdisciplinary concepts that cultivate innovative skills aligned with industry needs.