GIFTS – Implementing High Impact Practices to Support Transition from High School to First-Year Engineering Courses

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Introduction

The First-Year Engineering Program (FEP) at the University of Arkansas (UA) aims to provide foundational engineering knowledge and proactive support for new students, as well as improve retention and graduation rates. Established in 2007, FEP boosted second-year retention rates in the College of Engineering from 61% to around 70%, now fluctuating between 71-76%. FEP continually seeks new ways to support first-year students and enhance retention. According to the Association of American Colleges and Universities (AAC&U), High-Impact Practices (HIPs) offer significant educational benefits, especially for historically underserved groups, by cultivating substantive relationships, promoting engagement across diverse perspectives, facilitating the application of acquired knowledge, and fostering reflective processes aimed at personal development [1]. Students involved in HIPs are more likely to experience positive outcomes like academic achievement, persistence, and attainment of goals that prepare a student to live a rewarding life [2]. It is recommended to integrate HIPs into curriculum in alignment with course objectives and resources. This paper outlines our implementation approach.

Discussion

There are eleven HIPs shown to enhance student success, persistence, and graduation. All eleven HIPs are available at the University of Arkansas [3] and the College of Engineering. Students are placed in FEP courses based on their math placement, and the HIPs students encounter depends on the specific FEP course in which they are enrolled. All students take Introduction to Engineering I & II. In addition, Honors Research or Innovation Experience courses are offered to Honors students with advanced math credit. Regardless of which FEP course students are enrolled in, they all take a common drill section. The HIPs included in FEP (first column of Table 1), align with our learning objectives, which focus on real-world challenges, holistic growth, professional advancement, critical thinking, and innovation. The second column in Table 1 indicates how the HIPs are incorporated in FEP curriculum. All FEP courses are First-Year Seminars, with other HIPs integrated across the courses to varying degrees. Some HIPs not included in FEP, like capstone courses, service learning and writing-intensive courses are introduced later in the students' academic careers in College of Engineering.

Table 1. HIPs and Implementation into FEP

HIPs in FEP	First-Year Engineering Program Component
First-Year Seminar	First-Year Engineering Course Sequence
Common Intellectual Experiences	Students grouped by math placement, Common first-year courses, and access to Peer Mentoring and Academic Coaches
Learning Communities	Engineering fraternity/STEM sorority
Collaborative Assignments and Projects	Open-ended, real-world, class-based projects
Undergraduate Research	Honors Research and Innovation Experience and Symposium
Diversity/Global Learning	Project-based learning and Drill seminars
ePortfolios	Honors Research Experience Course
Internships	Drill seminars

HIPs not in FEP (Capstone, Writing Intensive Courses and Service Learning) have been excluded from Table 1

References

[1] “High-Impact Practices,” *AAC&U*. https://www.aacu.org/trending-topics/high-impact

[2]“For Faculty | University of Arkansas High Impact Practices,” *hips.uark.edu*. https://hips.uark.edu/for-faculty/

[3] “HIPs: High Impact Practices | Teaching Innovation and Pedagogical Support,” *tips.uark.edu*. https://tips.uark.edu/hips-high-impact-practices