


CURQ Vignettes

Undergraduate Research in Support of Community Decision-Making

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As graduates are expected to demonstrate the capacities fostered by their undergraduate education, articulating the outcomes produced by higher education institutions is a high priority. One key effort is revitalizing liberal education through experiential learning. Such experiences enrich a student's learning experience, demonstrate to both employers and students the concrete skills nurtured by liberal education, and contribute to the local community. To provide these opportunities for students, Kwantlen Polytechnic University has created an educational policy incubator (<http://kpu.ca/kepi>). This program pairs students interested in educational policy with problems identified by community stakeholders. Under the supervision of a faculty mentor, each student collects and creates the knowledge required to address a given problem. Anya Goldin is, for instance, partnering with parent groups in the Canadian province of British Columbia to provide educational policy research so that parents serving on school advisory councils may be equipped to make informed decisions. In this way, students can obtain the widely acknowledged benefits of undergraduate research while building a record of success in applied workplace and community service contexts. 

doi: 10.18833/curq/37/4/3

Anyone Can Play: Forming Undergraduate Interdisciplinary Research around Video Games

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A student presents her research on changes in gameplay that Nintendo has introduced to its popular *Super Smash Brothers* video game in response to players who enter battle arenas but refuse to fight. Another student completes human subjects review documentation for an upcoming focus group that concentrates on games that encourage and promote lying as a winning strategy. Still another student works with a study participant who is playing an immersive game using Oculus Rift hardware. These students are all engaged in serious and significant undergraduate research, but they are not doing so within the context of a course—instead, these students are members of a project that began as an extracurricular research group at George Mason University that provides infrastructure and faculty support to fully student-led research projects on games. Students-as-Scholars (<http://oscar.gmu.edu>) provided initial funding for the project.

In the first phase of the project, which aimed to support mul-

tidisciplinary studies of video games with a particular focus on humanities theories and methods, the students decided to name their group Games-Engaged Analysis and Research Group (GEAR) and developed a logo, brand, and social media presence. From the outset, the project aimed to encourage student ownership and agency, and deliberately avoided a top-down model in which faculty would guide the research activities.

One unique aspect of the project arose from the students' desire to experience research as both exploratory and playful in its own right—rather than brainstorming to come up with a unified direction for large-scale projects, the students hosted public events where they pitched their various ideas, allowing for the growth of student identity and building interest in the initiative. These events sometimes coordinated with student research, inviting attendees to participate if they consented. Following this model allowed for student group-led projects and faculty mentoring of students with related ideas toward publication and further study. As the grant-funded project came to a close, the students applied for registered student organization status (which provides access to funding and additional resources) and are in the initial stages of developing an online academic journal as a means to publish their work and serve as a marketing tool for the group.

Leveraging student-researchers' shared enthusiasm for games allowed the faculty mentors to focus efforts on research design, methods, data collection, and formal processes such as informed consent, rather than assuming roles as subject-matter experts. This model, which privileges student-generated research questions, may serve as a productive model for extracurricular, thematic-based research efforts for other institutions that may wish to expand undergraduate research beyond classroom boundaries. 

doi: 10.18833/curq/37/4/4

Ensuring the Safety and Success of Dual-Enrolled Students Involved in Undergraduate Research through a University-High School Partnership


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FAU High School (FAUHS), one of four developmental research schools in Florida, is located on Florida Atlantic University's campus. FAUHS students complete 9th grade at the high school followed by full-time dual enrollment at FAU from 10th grade forward. FAUHS graduates typically earn three years of college credit, and some earn their bachelor's degree prior to their high school diploma. This "blurring of the boundaries" between high school and college is becoming increasingly prevalent and thus is relevant to the future landscape of higher education. As dual enrollment and re-

search-related outreach to high schools grow, so does the opportunity for highly motivated high school students to become involved in university-level, faculty-mentored research.

As the FAUHS accelerated academic path produces young college graduates, FAUHS administrators felt it was critical for the students to supplement their academics with meaningful co-curricular experiences that would prepare them for entry into competitive graduate programs. Thus the FAUHS Research Program was created in January 2015. The research program operates with similar goals and in close collaboration with the university partner, the Office of Undergraduate Research and Inquiry (OURI). Together, these partners help these exceptionally bright students find faculty research mentors and support them in their research endeavors. To prepare the students for research, the FAUHS Research Program provides a series of four 1-credit research methodology courses and individual mentoring. The courses develop the students' basic research skills (such as using scientific literature, understanding research integrity, and writing grant proposals) and support them as they navigate through their research experience. The synergistic relationship between OURI and the FAUHS Research Program has been key in identifying dual-enrolled researchers, who are usually minors, and in assisting them and their faculty mentors to take the few additional steps that will ensure the students' safety. OURI helps FAUHS students and their mentors meet the OURI safety and ethics requirements for undergraduates as well as adhere to FAU policies regarding minors working in potentially hazardous situations or in projects with lab animals. This usually involves parental notification and consent as well as some minor restrictions (such as restrictions on entering animal vivariums) depending on the scenario.

To date, dual-enrolled FAUHS students have coauthored eight peer-reviewed publications, including one in the *New England Journal of Medicine*; won 18 research grants; and delivered 44 presentations at research symposia that range from the OURI-hosted, FAU Undergraduate Research Symposium to national conferences such as the American Association for Cancer Research annual meeting. The support structure developed through the collaboration between OURI and FAUHS has opened up the world of undergraduate research to the dual-enrolled students while factoring in their age, unique academic path, and safety. With an additional layer of outreach, support, and oversight achieved through the collaboration between OURI and the FAUHS Research Program, more than 100 dual-enrolled students will experience some level of research this year, and many will go on to present and publish their findings. 

doi: 10.18833/curq/37/4/5


A Primarily Undergraduate Institution and a Research Hospital Collaborate on Research Initiative in Central Pennsylvania

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Bucknell University, located in Lewisburg, Pennsylvania, is a primarily undergraduate institution that graduates a large proportion of students each year in the social sciences, sciences, management, and engineering. Geisinger Health System, headquartered in the slightly larger town of Danville, PA, is a physician-led health-care system with a robust research organization. Five years ago, the two started a mutually beneficial collaboration known as the Bucknell Geisinger Research Initiative (BGRI). Thanks to the BGRI, Bucknell faculty and students gain access to researchers as well as real-world research problems and data, and Geisinger medical professionals tap subject-area experts and mentor talented undergraduates.

Bucknell students have worked with Geisinger researchers on problems in biomedical engineering, chemistry, computer science, mathematics, operations research, and sociology, to name a few. The key to launching this initiative was each partner recognizing the value of such a program. Strengthening relationships among researchers at the two institutions and producing high-caliber research results will be crucial to BGRI's future health.

As a number theorist by training, I have always struggled with convincing students to work on esoteric mathematics. Thanks to the BGRI, I have been working with the Data Science group at Geisinger for the past year. In highly integrated, multidisciplinary work, the students and I have been developing graph-theoretic methods to predict the onset of a particular condition in intensive care patients. The students and I have collaborated with physicians, experts in machine learning, bioinformaticians, and statisticians. Due to the applied nature of this work, talented students motivated to understand a slice of mathematics very deeply have flocked to this opportunity. This has resulted in the most rewarding undergraduate research mentoring of my career. 

doi: 10.18833/curq/37/4/2

Interdisciplinary Approach to Undergraduate Research in Education: Collaborating on the Development of a Practitioner's Textbook

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As many colleges of education predominantly produce future classroom teachers, programs can offer unique opportunities to assist preservice teachers' development as action researchers. For classroom teachers to produce effective lessons, best practice must inform instructional decision making. Edu-