



Interdisciplinary Teaching and Learning Opportunities and the Development of Inquiry-Driven Undergraduate Researchers: Experiences from a Multidisciplinary Honors Program

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Introduction

There is no question of the value of undergraduate research for student success (Girves et al., 2005; Kuh, 2008; Lopatto, 2010). Infusing undergraduate research across the curriculum is challenging, but there have been substantial shifts across institution types to encourage undergraduate research outside of classroom-based activities (e.g., Davis & Jacobsen, 2014). This kind of broader institutional diffusion of undergraduate research will allow for more interdisciplinary research partnerships, as students will have greater access to faculty who may be willing to mentor their research projects (Davis et al., 2016).

Undergraduate research mentor-mentee relationships are critical to the success of the student research process. Higgins and Kram (2000) describe the evolution of mentoring and the importance of developing “relationship constellations,” in which the idea of mentors is reconceptualized as a “developmental network” consisting of multiple mentor-mentee relationships across a wider array of topics that ultimately develop the “protégé.” Baugh and Scandura (1999) found that having multiple mentors often leads to positive mentee development. The integration of undergraduate research into the university curriculum provides one example of how this concept of mentorship is operationalized. Gardner and colleagues (2014) build on Higgins and Kram’s (2000) model of developmental networks, connecting academic/intellectual socialization to interdisciplinarity within the academy. Higgins and Kram’s (2000) developmental networks are argued to be the mechanism through which students are socialized in new ways to approach their field of study or, more generally, life. The intensity of the training when exposed to interdisciplinary curriculum often leads to joint publications and a deeper collaborative relationship (Mullen, 2000). Further, collaboration between professionals, teachers, and professors increases the implementation of collaboration and mentorship within the classroom (Shachar & Shmuelovitz, 1997; Mullen, 2000). It is critical, therefore, to create environments where students can interact with faculty who are excited about research and willing to facilitate that experience (McWey, Henderson, & Piercy, 2006). This interaction is most easily facilitated inside the curriculum, specifically interdisciplinary curriculum (Barković, 2010; Legler, et al., 2010; Newell, 1992).

One example of institutional implementation of undergraduate research as a curricular innovation occurred in the last decade at George Mason University. George Mason University instituted the Students as Scholars program as part of the university’s Quality Enhancement Plan, a required component of the reaffirmation of accreditation through the Southern Association of Colleges and Schools Commission on Colleges (see Davis & Jacobsen, 2014 for more details). The Students as Scholars program was a transformative five-year plan to enhance undergraduate student learning

through fostering a culture of student scholarship at the undergraduate level. Student scholarship at Mason refers to “the process of generating and sharing knowledge or creative works, including both undergraduate research and creative activities, appealing to a wide range of undergraduates and their faculty, staff, or graduate student mentors from disciplines across the institution” (Davis & Jacobsen, 2014, p. 18). The student learning outcomes associated with the Students as Scholars program were “organized to build on increasing levels of engagement as undergraduates progress through their time at the institution, beginning with the discovery of how knowledge is generated through scholarship, then engaging in the process of scholarly inquiry by articulating a question or situating scholarship within a broader context, and culminating in the creation and communication of a scholarly or creative project that may or may not be connected to a faculty member’s ongoing research activity” (Davis & Jacobsen, 2014, p. 18). A key goal is to infuse undergraduate scholarship across the curriculum so that students are exposed to the process of producing scholarship in almost every class they take during their undergraduate career.

As a mechanism of demonstrating a long-term commitment to undergraduate research as a curricular innovation through the Students as Scholars program, Mason created the Office of Student Scholarship, Creative Activities, and Research, or OSCAR (<https://oscar.gmu.edu/about-us/>). This office supports students and faculty who seek to engage in mentored research opportunities between faculty (which could include graduate students as well) and undergraduate students. This support includes funding for research, connecting students and mentors, and a recognition of outstanding student scholarship and faculty mentorship. Students apply for grant funding to support their scholarly or creative activities through the Undergraduate Research Scholars Program (URSP) administered by OSCAR. As this is a competitive process, not all projects or students are funded in any given funding cycle. This process provides students the opportunity to work with their mentors to create effective grant proposals.

It is within this context that the mentoring relationship between Tucker Collins and Dr. Shannon Davis originated. In Fall 2016, Tucker Collins was a first-year student in the Honors College at George Mason University majoring in Kinesiology and Shannon Davis was Associate Professor of Sociology teaching one section of Honors 110 Research Methods. The Honors College at George Mason University was launched in 2009, transforming the Mason Honors Program into a unique opportunity for high achieving incoming students to be immersed in a culture of inquiry-based learning (<https://honorscollege.gmu.edu/why-honors/our-history>). A signature course in the Honors College is Honors 110. This course brings first semester undergraduate students together under the guidance of a faculty member from any discipline in the university for hands-on guidance through the first stages of the knowledge creation process. Honors 110 predates the Students as Scholars Quality Enhancement Plan (QEP) and the construction of OSCAR but is an example of the kind of curricular innovation encouraged through the Students as Scholars program. As a result of the coursework completed in Honors 110, Tucker was able to develop a burgeoning personal interest in the social history of Black artists in the United States. Beginning with the course assignments, and later supported by research funding from the OSCAR at Mason, Tucker’s interest in the social history of three Black artists led him to complete his research through primary data collection, present his work at a regional sociology conference, and choose to add Sociology as a minor.

This article describes the class where Shannon and Tucker met, providing the background for how this interdisciplinary research mentorship developed. After Shannon describes the class, Tucker documents his experiences as an undergraduate researcher. We conclude the article with some thoughts on the possible benefits of intentional interdisciplinary teaching for undergraduate researchers.

Shannon's Experience Teaching Honors 110

As a sociologist, one of my favorite things to do is to teach people how to do research. I love watching students grow through the inquiry process. Ever since I joined George Mason University in 2006, I have taught students how to design a research study in at least one course per year. In most of these classes, I have taught sociology students who asked sociological research questions. In 2016, I was afforded the opportunity to teach Honors 110, the research methods course for the Honors College. This course is set up using a common syllabus with common assignments. Even with this common structure and set of assignments, there is substantial variability by instructor in the delivery of course content. Faculty have flexibility in the assignment structure and how class time is used. However, because all incoming first year students admitted into the Honors College take Honors 110 as a cohort, there is an expectation that all students have a similar experience in the course regardless of the instructor. Another key component of Honors 110 is the expectation that students are exposed to and are able to differentiate across multiple perspectives as applied to the research process. Multiple perspectives could encompass differing theoretical frameworks that are applied to specific research concepts or different research techniques that are deployed to attempt to answer questions. Within Honors 110, faculty are encouraged to expose students to multiple perspectives through the interrogation of a common reading but also to teach students to seek out multiple perspectives within the existing research literature on a topic of their choice. When I taught Honors 110 in 2016, my course included 24 students whose research interests varied across at least a dozen different disciplines. Students' interests ranged from equine training, to robot building, to the effect of music therapy on children, and to the continued evolution of the human species. In this course, I needed to teach each of these 24 students how to read the research literatures with which their own work would be engaged in intellectual dialogue. I also needed to teach them how to map multiple ways of thinking around their question so that they could develop an understanding of the extant scholarly conversation and the scholarly debates. They further needed to learn how to use evidence to make claims regardless of the perspective that one speaks from. The required final product was a feasible research design that could be deployed to answer the students' research questions (should they have access to the appropriate resources).

Tucker was in this class. While Tucker introduced himself as a Kinesiology major, he was drawn to a research question that had developed out of personal interest in his adolescence. Tucker had spent a lot of time in art museums and expressed an interest in understanding the experiences of the artists whose work he had admired. In particular, he was curious about the experiences of three Black male artists who occupied an important space in American art history but from his perspective were not well known as artists. Tucker was curious as to why Aaron Douglas, Jacob Lawrence, and Jean-Michel Basquiat were not readily identified as American artists and why their style of art had not become more influential in the American art scene. As a sociologist, I saw this question as one that was about the social structural arrangements of culture and race in the early 20th century rather than a question of art history. I encouraged Tucker to begin reading about the artists themselves and their experiences. I also encouraged him to read literature on how cultural shifts can occur within a society as well as research documenting the processes that elites used to prevent cultural shifts from occurring. Tucker's research proposal situated his question at the intersection of cultural sociology, race and ethnic relations, and American history. The materials that Tucker proposed that he would need to be able to answer his research question were largely composed of primary documents either written by the artists themselves or art critic materials that were produced during the artists' time that they were producing their art. Tucker's final project proposed an analysis of these primary documents and an analysis of the cultural landscape surrounding the artists during their lifetimes.

After completing Honors 110, Tucker applied for funding from the Undergraduate Research Scholars Program (URSP), Mason's undergraduate research program housed within OSCAR, to enable him to

collect and analyze the primary documents that would allow him to answer his research question. In addition, Tucker needed time to be able to engage with these materials and analyze them for patterns. Tucker was awarded funding to cover his research expenses over the course of one summer. I agreed to serve as his research mentor on the project. Tucker will describe his experience in the course, the URSP, and his subsequent research opportunities below.

One of the most important contributions to Tucker's thinking and development of his project came from his experience in the interdisciplinary Honors 110 course. Not only did Tucker have a professor teaching him about research whose research interests were vastly different from those of the faculty in his major, but he was sitting in a classroom full of students who were participating in inquiry-based learning. Their inquiry however was not so singularly focused on a topic within a major or a discipline. Instead, they were singularly focused on learning how to engage differing points of view and differing perspectives within the research process in order to develop stronger research questions and better-informed research designs. The interdisciplinary nature of the class of the students in tandem with the core focus of the course on learning from multiple perspectives facilitated Tucker's subsequent completion of his research project and eventually adding Sociology as a minor, despite the fact that he walked into the University knowing that he would be a Kinesiology major. Having the course intentionally place students into the situation where they had to navigate the research process and be able to explain it to someone outside of their discipline was a critical step in each student's ability to develop a strong research proposal. In Tucker's case, he had to be able to explain his research question as an empirical question and explain his proposed research design to students both within majors like his own and majors that were quite different from his. And importantly, any research that he had been reading or would be reading or his major had only tangential similarities with the scholarship that he was reading to allow him to answer his research question in Honors 110. Therefore, the skills acquired in the interdisciplinary classroom became critical to Tucker being able to complete his research project.

Tucker's Experience in Honors 110 and Beyond

As an Honors College student at George Mason University, one of the first classes that you take is Honors 110: Research Methods. It was in this class where I first met Dr. Davis and where I was introduced to undergraduate research. The first few weeks of Honors 110 are spent on examining how research works and learning how to create a research project. The latter portion of the semester is spent on formulating your own research question, doing background research, writing a paper, presenting your work to the class, and ultimately being part of a poster presentation with the entire Honors College. For many first-year students in college, the idea of a research methods class is something akin to a chore. However, within the environment of Honors 110 and Dr. Davis teaching it, the class is made to feel like something much more yet deeply fascinating. Furthermore, the class is a motley crew of interests and majors (I was a Kinesiology major and others were Psychology or Engineering majors), and the collection of these varying perspectives created an amazing environment within which to come up with and explore research questions. Without this environment, I do not think I would have come up with my initial research question, nor would I have been able to do what I did with it after the class ended.

The creation of my research question honestly came about with my failure to read which assignments were due for Honors 110 during a particular week of class. I remember Dr. Davis saying that she would go around the room as we would read her our questions and she would provide feedback. She was listening to the questions of students one row in front of me when I scribbled down my question. My initial question was *how might art created by minorities change the perspectives held by the white majority?* This initial question was an amalgamation of the topics that I had been thinking about for a while and had developed throughout my experiences growing up. Dr. Davis listened to my question and, to my surprise, stated that it was a good question, but then also

pointed out the intersectionality of what I was interested in, from both a general and disciplinary perspective. From that point forward, Dr. Davis and the Honors 110 class really fueled my excitement for pursuing undergraduate research and especially to further learn how to view the world using this intersectional lens.

Towards the end of the semester, Dr. Davis told me that if I was interested, we could take my research project further at Mason through the programs in OSCAR. The following semester, in January, I applied for a summer research grant for individual undergraduate research with OSCAR at George Mason. I was one of a few students who received one of these grants. Over the summer between my freshmen and sophomore years, I dove into online databases, the vast catalogue of resources at the Archives of American Art, and other places that would keep records of newspaper articles or documents on Aaron Douglas, Jacob Lawrence, and Jean Michel-Basquiat. Since the study was looking at each of their individual experiences in the art world and examining the evolution of each artist's time in this world, I had to read what was written about them and by them. This aspect of the study turned out to be easier than I thought. There was a lot written by each artist, a fact which acknowledged how prolific each artist was during their time, although what was written about them did not translate into their becoming more influential. The funding from OSCAR allowed me to travel to gain access to the primary documents in the Archives, a part of the research process that was interesting by itself. Working on this research over the Summer as part of OSCAR also reinforced the value of interdisciplinary research at Mason. Every two weeks, all students funded for summer research gathered for a seminar that was led by OSCAR staff. These seminars allowed for us to hear what we were all researching and talk about our research process. These discussions were important because they emphasized the similarities in how we were going about our research but also allowed us to gain different perspectives on what is research and how to conduct it across different disciplines. This further improved my ability to examine my own research question and data from an interdisciplinary point of view.

The Evolution of Tucker's Honors 110 Project

While I focused on the experience of three Black male artists in the United States, I came to realize that I was really using my research project to examine how racism takes form in culture. With this, there is also a second, but equally important, interest to see how racism changed overtime within the context of the 20th century. The idea to examine these things through the lens of art history and the experience of Black artists came from being exposed to art at a young age. My mother taught history and art history, so my childhood was spent with books on art, in museums, and with many lessons on varying styles of art. With this upbringing, I have always been interested in how art can invoke changes in society, and more broadly, create "culture". The combination of this background along with my own personal interest in how racism develops and changes within a society led me to think about how Aaron Douglas, Jacob Lawrence, and Jean-Michel Basquiat were understood as artists. I was surprised that few people knew about their contributions and suspected that racism was a reason why. Because art is an expression of culture, this question allowed me to study something I had been curious about for a while. And as it turns out, the question was an interdisciplinary one, because it combines a sociological approach with an art history lens.

Due to the interdisciplinarity of the question, I was able to learn how to examine a topic through the lens of multiple disciplines. One thing I learned early in the project was that the general framework of utilizing research methods case studies in one discipline (i.e., sociology) to examine an issue or question that is maybe outside of that discipline (i.e., racism in the creation of 20th century art) is both challenging but rewarding. In my project I had to learn some of the research techniques of sociology, techniques not taught in my Kinesiology major. I had to figure out which data sources would be appropriate as evidence to analyze for my question, how to access them, and then how to actually analyze the data. The approaches I learned in completing the project I first proposed in

Honors 110 were very different from those I learned in my courses that were required for my Kinesiology degree.

To begin, I had to collect data. I decided I would try to find art critic reviews of Douglas, Lawrence, and Basquiat, as well as their own writing about their experiences as artists. To find these sources, I spent a lot of time going through online databases not only to find writings, but to also to gain leads on primary sources not available online. I ended up visiting the Archives of American Art in Washington, D.C., to look at published art reviews and interviews kept in their files. I viewed many reels of microfilm containing writings, reviews, and interviews of the three artists. My journey of collecting data also led me to the library at the Virginia Museum of Fine Art and the Library of Congress for magazine and newspaper articles.

In the end, I performed a qualitative content analysis of primary textual sources about the three artists. The bulk of the sources used in the study were newspaper articles and journal articles written by predominantly White art critics, although some of the texts were written by the three artists themselves. The content analysis was made up of 40 sources that I collected. Fourteen (35%) of the sources contained diction that highlighted the commodification of Black artists. Twenty two (55%) sources contained diction that fell into the overarching group of racism. Fifteen (37.5%) sources were placed into the group of the commodification of Black Art. The data analysis utilized NVivo, a software package that allows for analysis of textual data. The sources were all converted from PDF format into Optical Conversion Scans (OCR), which once scanned, were entered into NVivo. My first step was then to reread each source, focusing on common themes based on my own thoughts. Once these themes or general ideas were decided upon, they were set as nodes within NVivo. These nodes simply allow for words or phrases from each source to be “coded” or categorized into whatever category the node stands for. For example, words like “primitive” would be coded (categorized) by myself and then organized into the node titled “racism” through Nvivo.

Performing interdisciplinary research within a sociological lens differed from the research done normally in my primary field of study, Kinesiology, in a few ways. Within Kinesiology, much of the research data used in a study comes from monitoring a sample of people performing a physical movement or exercise in general. Of course, this differs greatly from the study I performed, which revolved primarily around understanding and finding data from written works. Furthermore, most kinesiology studies are performed in controlled areas of study (i.e., a lab). Whereas in the field of sociology, data collection is performed within the outside world where the findings are more nuanced due to the fact that the focus of study revolves around humans and society. While conclusions drawn from within kinesiological studies are nuanced within the field, the means to come across those findings are slightly more linear than what occurs within sociology and the social sciences at large. At the end of the summer research term, I presented my findings at a poster presentation on campus at the Celebration of Student Scholarship, an undergraduate research conference organized by OSCAR. This was insightful as I was able to celebrate the completion of my research alongside other student scholarly projects, including the other URSP-funded projects, at this conference. This interdisciplinary conference was the first time I presented my actual findings and had to do so to a wide range of other undergraduate researchers. This experience opened my eyes to understanding how conferences can expand the boundaries of research in general. I was able to see how learning about other people's studies could allow me to examine the topics within my own research from alternate contexts.

Following the Celebration of Student Scholarship, I continued working with Dr. Davis on my project. I worked with Dr. Davis throughout the following academic semester to complete a manuscript for submission to a peer reviewed journal for undergraduate research. I submitted the paper for review at the end of the term. Also during this term, Dr. Davis suggested that I submit my poster for possible

presentation at the Southern Sociological Society annual meeting (held that year in New Orleans). Dr. Davis explained that she would be attending, as would other faculty and Mason students (both undergraduate and graduate). I took her advice and submitted my project. The following semester, I travelled to New Orleans with Dr. Davis and a group of GMU Sociology program faculty and students to present my research. While there, I was able to observe how research in sociology is conducted by students at other universities and examine the differences in how other students are taught how to do research within that discipline. This was insightful as it gave me a more complicated framework through which to compare to research in my own major (by now I had decided to minor in Sociology alongside my Kinesiology major). In this setting, I was able to observe how sociologists digest and expand their knowledge through observing contemporary research in real time. This broadened my understanding of how vast sociological research is outside of the classroom and how it applies to the outside world. I learned that much of the undergraduate research on display showed many insightful findings at a very local level in close proximity to their undergraduate education, like mine. However, this also taught me that undergraduate research can easily become something taken beyond undergrad. Much of the research on display was going to be developed further into a Ph.D. work and much more.

The most important thing that I learned in those two years working on my research project was that I was able to do all of this because of the interdisciplinary nature of my education at Mason. While I was learning about research in my major, the experiences that I have documented here were done outside of my Kinesiology major. The project began in my Honors 110 class, an interdisciplinary research methods class, and then was completed by working with a professor in Sociology. I became interested in the discipline of Sociology through my research project and added it as a minor. This experience helped me further expand my understanding of my major and other health fields because of the emphasis on research. I learned through experiencing different ways of answering different kinds of research questions and looking for patterns with different kinds of data. In addition, this experience outside of my major expanded my understanding of the world overall, exactly what I wanted to do when I was in Honors 110.

Taking on this minor and diving into this field of study provided a good change of pace from the world of kinesiology, it also further provided a wider context for my major studies. The fact that my primary discipline is based in the body and human movement meant that sociology allowed me to see the importance of understanding how humans, as social creatures, interact. The fitness and wellness industry is gradually shifting toward the mantra that movement is a social interaction that brings people together. My sociological research allowed me to think about how cultural institutions (beyond art to include fitness and wellness) have been white-centric. This key lesson has pushed me to want to use what I have learned from both my major and my minor to make health and wellness more accessible to communities not represented within the field. The research that I completed broadened my understanding of how racism and racist practices are maintained through human interaction. My interdisciplinary major-minor pairing, and especially my sociology minor research, means I can say without a doubt that I had a truly well-rounded education.

Connecting Interdisciplinary Research and Undergraduate Research

The key contribution of this dialogue is to emphasize the value of interdisciplinary research opportunities for undergraduates. Interdisciplinary research (IDR) is important because it expands the conceptual frameworks through which students are taught and are directly taught to become contributors within. Theoretical and empirical questions vary across disciplines, as do the typical approaches that disciplines take. And while there is strong evidence that disciplinary training is the bedrock to developing strong critical thinking skills (Jacobs, 2013), IDR brings together approaches to understanding the world in ways that mirror how the world is experienced (Dodson et al., 2009). IDR allows for the development of questions and approaches to answering questions that draws

upon multiple perspectives, allowing for big problems to be addressed more thoroughly. The interconnectedness of IDR provides avenues for people to research niche topics, for example, as they could potentially apply to “core problems of society” (Rhoten & Parker, 2004, p. 2046). Furthermore, IDR and interdisciplinarity occur through the social process of learning and acquiring the skills to integrate other disciplines (Barković, 2010). The multiple perspectives included in this learning process further teaches students how to solve problems and interact within the world. Scholarship has documented that while differing areas of study might appear not to hold similarities, the patterns of collecting and processing information and the intellectual operations specific to any one discipline can potentially yield new outcomes when applied to another (Borrego & Newswander, 2010). The dyads and teams working within interdisciplinary systems allows for the expanding of discipline-specific topics and ideas due to this collaboration of individuals from varying areas of study (Davis et al., 2015, Barković, 2010). And more importantly, students are trained to think as an expert (within their discipline) in a team where multiple experts are needed for success.

Indeed, IDR is a way to facilitate the education of undergraduate students. Bauer and Bennett (2003) found that “all respondents with undergraduate research experience” saw improvements in their “science/math/logic/problem solving skills and their humanities/verbal skills” (p. 13 & 17). Relatedly, Kuh (2008) notes that undergraduate research is so useful because it involves students to actively engage with questions and empirical observation. This wrestling with a question and data within an environment where the answer is not always important is a key factor in why undergraduate research affects student learning. Hunter (2011) states that “[teaching] students to investigate and think critically ... is one way the faculty can prepare them to be engaged and critical stakeholders in the institutions...” (p. 41). Undergraduate research teaches students to think critically and engage with the world around them. And undergraduate research that incorporates multiple perspectives or forces a student to approach a problem differently than their major discipline would have them, would only amplify the specific skills taught and learned in the undergraduate research process (Misra et al., 2009).

IDR among undergraduates may reflect a student drawing upon multiple perspectives to answer a research question. However, a frequent method through which undergraduates engage in IDR is through the choice of a research mentor. Davis et al. (2015) found that even when undergraduate students are mentored by someone in a different formal discipline, they often collaborate with faculty within the same general field (e.g., psychology and biology or bio-engineering and electrical engineering). Rarely did students have a mentor from a vastly different discipline than their own. Perhaps for this reason, Bradley and colleagues (2017) note that mentorship within IDR at times takes the form of having multiple mentors due to the possibly greater support of student inquiry. While not all IDR would require multiple formal mentors, IDR often requires the student to reach out to other professionals for guidance regarding the topics they are examining. Davis- Kahl (2012) highlights the importance of students being able to work with a variety of mentors, especially in the research process, as there are different norms within disciplines regarding transparency of the research process. For students to become successful researchers, they need to learn about publishing outlets, library resources, and professional associations, among other key professional knowledges. Working with multiple research mentors increases the likelihood that students will gain access to this informal knowledge, even if it is not within their own primary disciplinary field.

Our experience at Mason reflects one way in which IDR can be embedded in the curriculum for some students across the board and offers insights into how others may be able to do this kind of research as well. OSCAR’s website states, “Student learning is enhanced through a process of scholarly inquiry, where scholarship is valued as core practice of the Mason learning experience” (DeMaio, 2017). Students funded through OSCAR must have a research mentor and there is no requirement that this mentor is from the same discipline as the student. Indeed, the OSCAR website provides

contact information for faculty who have worked with undergraduates in the past and would be willing to work with them in the future, enabling students to connect with possible mentors outside of their discipline. The Students as Scholars initiative has infused the curriculum with inquiry-based learning for all students (Davis & Jacobsen, 2014), encouraging all students to engage in the high-impact experiential learning that occurs in undergraduate research. However, within the Honors College, all students are not only exposed to inquiry-based learning from their first semester, they take these courses from faculty who hail from across the university. Further, other inquiry-based courses are scaffolded into the expected program of study for all Honors College students regardless of major. In this fashion, students are in inquiry-driven coursework outside of their specific major across their undergraduate career.

Looking Ahead

The approach taken by the Honors College at Mason, exposing students to inquiry-based learning outside of their major disciplines, may be challenging to implement in large colleges/universities. However, the approach of the Students as Scholars program and others like it can make a critical difference in encouraging interdisciplinary research. Providing access to faculty scholars willing to work with undergraduates outside of their discipline is a key contribution of offices like OSCAR. They bring together students from across disciplines to learn about research, celebrate those research successes, and support the students' research outside of the classroom environment. Other programs like OSCAR also provide options for other universities to examine like Emory's On Recent Discoveries by Emory Researchers (ORDER) program which provides "a series of multidisciplinary, team-taught seminar courses for freshmen and seniors" (Kaiser, et al, 2014). Not only do programs like OSCAR and ORDER increase the likelihood of the intellectual development of that student, but it also increases the likelihood of interdisciplinarity. Whether the full curriculum is infused with inquiry-based learning from an interdisciplinary perspective or students are afforded that opportunity as something outside of a classroom experience (or even a course-integrated research experience), interdisciplinary research exposes students to new ways of thinking. And as integrated teams made up of content experts are becoming more central in 21st century companies, having experience in this kind of teaching/learning/working environment may become even more important in the future (Rainie & Anderson, 2017).

Going forward, universities should look into developing general education courses such that students are more likely to interact with others outside of their respective areas of study, especially if those courses can be inquiry-based. Access to a variety of professors and modes of thinking through general education early on in a student's university career allows them to develop different kinds of questions and approaches to learning. This approach is not unique to Mason (see Flaherty, 2018 and Stamp et al. 2015 for other examples). As Tucker's experience highlights, having to complete inquiry-based courses outside of the major not only gave him more insights into the work done in his major but also introduced him to a minor that he may not otherwise have found. By being surrounded by other students who were interested in studying different topics, students were automatically engaged in classroom discussion at the intersections of disciplines. Teaching in this kind of interdisciplinary space around a common theme of the pursuit of answers to research questions affords opportunities for interdisciplinary learning about how research is performed, who can and should be engaged in research, and the development of new research interests and partnerships. For Tucker, his academic career was indelibly altered by being in such a space, taking the Honors 110 class with Shannon. This kind of transformation through the expansion of intellectual opportunities are central to undergraduate research. The creation of well-rounded scholars of the future will depend on more interdisciplinary opportunities like this to occur for more students.

Our experiences have led us to conclude that there are specific benefits for students, faculty/mentors, the university, and higher education overall from this sort of interdisciplinary inquiry-based curriculum. For *students*, whether the full curriculum is infused with interdisciplinary inquiry-based learning or they are afforded that opportunity as something outside of a classroom experience, interdisciplinary research exposes them to new ways of thinking. Koenig (2014) states that his research experience not only provided him with research skills, “but also the opportunity to improve skills that are transferable to my career” (p. 225); Tucker’s comments echo this sentiment as well. Students are better equipped for the changing economic landscape by having a deeper toolkit from which to draw when approaching problems.

Faculty who find themselves teaching in introductory courses like Honors 110 or general education courses available to all students have the opportunity to build their own interdisciplinary training by learning from the student in their classes. Inquiry-based learning in classes filled with students from across disciplines is the perfect approach to teaching for the life-long learners among the faculty. Student contributions to the class also enrich faculty knowledge. McWey and colleagues (2006) conclude that educators can create research-friendly environments through cooperation and collaboration with their students, regardless of the educators’ primary field of study. Interdisciplinary mentorship pushes faculty outside of their comfort zones and helps them improve their teaching practice.

Universities benefit from interdisciplinary undergraduate research regardless of whether it is course-based. Undergraduate research is a high-impact practice and interdisciplinary teams are going to be a norm of future work environments. Students who engage in the kind of course-related inquiry-based interdisciplinary learning like Tucker’s will be well prepared for post-graduation. And while it is likely universities will gain reputationally from producing highly skilled interdisciplinarity trained graduates, the educational environment that centers on inquiry at all levels will be the clear winner in this scenario.

Indeed, *higher education* can benefit from a stronger embrace of the historical liberal education model, where interdisciplinarity was the curricular cornerstone of college/university. Skills training infused with critical thinking, inquiry-based learning, and peers whose perspectives are different from one’s own is worthy of investment, for now and for the future.

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