

PROJECT PROPOSAL

As a CUES Distinguished Fellow, I will grow the success of my Poverty in Tucson Field Workshop course (SOC397a), which is an engaged learning opportunity providing STEM-based learning for the social sciences in an applied setting, by developing a second course focused on designing solutions to social problems. In Tucson, poverty is a serious social problem, with more than a quarter of households in the city living below the poverty threshold and a third of all children growing up in impoverished households. As a land-grant university, we have a mission to serve the needs of the most vulnerable residents through our research, teaching, and outreach. The Poverty Workshop was designed to address these needs by providing an applied educational experience around the topics of poverty and inequality that provides STEM-based methodological training in survey research. While this class has been very successful in transforming traditional educational practices into engaged learning experiences, the time available in a single semester is limited and the 200-plus students who have taken the course frequently report wanting additional time to learn how we can create *social change* to alleviate poverty and its accompanying social problems.

Through the CUES program, I will develop and implement a second engaged learning course that will focus on using pedagogical innovations in human-centric design thinking to develop potential solutions to place-based inequality and poverty in Tucson. This course, tentatively titled "Tucson Community Cares" (TCC), will challenge students to work in small groups to develop these solutions through a creative and iterative process of assessing the problem, proposing possible solutions, and evaluating them. The course will be conducted in partnership with the Tucson Fire Department (TFD), which has been recently piloting a new community-based program to help alleviate a significant burden of non-emergency calls through the 9-1-1 system. TFD aims to develop community-level interventions that can address the root causes of vulnerable households' reliance on 9-1-1 for the basic of social needs. Together, we have proposed utilizing our undergraduate students to collect information on these vulnerable neighborhoods and to design and evaluate community-level solutions to problems related to poverty and social exclusion.

These types of courses are essential for developing innovative educational practices that provide our undergraduates with the real-world experiences and engaged learning opportunities that they are clearly seeking. Presently, undergraduate education is heavily lecture-based, encouraging students to become passive learners (Fox and Hackerman, 2003). In this learning environment, many students rely heavily on memorization of facts to pass tests (Brainard, 2007) and may fail to achieve genuine understanding of the subject matter. Research shows that students retain only a fraction of the information presented in the typical lecture. Rather than focus on the broader concept and process, undergraduates educated through this model tend to overestimate the importance of memorizing facts, dates, and outcomes over truly understanding the process. Hence, the traditional lecture is often not an effective way to help students master the basic scientific concepts essential to advanced study and work in STEM fields (Wieman 2007).

Instead, finding alternative approaches that encourage active learning are seen as better tools for enhancing STEM learning. Effective approaches to enhancing STEM learning have been shown to not be discipline dependent and can enhance learning outcomes across academic disciplines (Kuh et al. 2008; Pascarella and Terenzini 2005). In particular, I am interested in pedagogical approaches that link broad societal trends to individual experiences, which have been demonstrated to produce higher research orientations amongst undergraduate students (Keen 1996; Ostrower 1998). One such approach is the integration of undergraduate research

experiences into traditional curricula (Bauer and Bennett 2003; Russel et al. 2007). This “learning by doing” approach has been successfully tested and implemented in multiple settings across disciplines, including the social sciences (see Deem and Lucas 2006; Takata and Leiting 1987). Furthermore, evaluative research has shown that immersing undergraduate students in an engaging and professional research project has a positive effect on students’ decision to pursue a career in the sciences (Russel et al. 2007). Yet the successful implementation of these research experiences is usually done with individual students, such as through internships or senior theses. These require faculty to invest personal time and potentially modify their own research programs to accommodate the inclusion of undergraduate students, thus limiting the scalability of the individual research experience model (Zydney et al. 2002).

My innovation in undergraduate education is to integrate authentic research experiences into larger courses of 50-60 students that focus on the development of STEM-based skills such as data collection, analysis, and evaluation in real-world settings. This approach is intended to capture the students’ ‘sociological imagination’ that links their personal experiences in the scientific process with broader historical and social issues – an aspect that is often lacking in STEM education (Mills 1959). My current innovations in STEM education NSF-funded project is generating new assessment techniques for observing professional and personal active-learning outcomes that will help the STEM field, which currently struggles to fully implement active-learning approaches (Prince 2004). The Tucson Community Cares course will create a new opportunity for innovation in undergraduate education that combines the principles of active learning in the STEM field with human-centric design, an increasingly popular and creative approach to problem solving that is utilized in the nation’s leading educational institutions such as Stanford’s d.School and Duke University’s Innovation and Entrepreneurship Initiative. Human-centric design thinking breaks the problem-solving process down into three steps: Inspiration, Ideation, and Implementation (Brown 2009).

Inspiration involves learning more about the design challenge. In the course, students will learn about the nature of poverty and social exclusion in Tucson. Rather than learn from texts and lectures, students will participate in data collection exercises to interview community stakeholders and gain insights into the nature of poverty and begin thinking about solutions.

Ideation involves the challenging work of transforming the insights the students will have gained into the nature of the problem into tangible ideas. In this portion of the course, students will be reading about community-based interventions that have been successful in the literature and applying design-thinking ideas and exercises. Here is where the true innovation in their educational experiences takes place – instead of reporting on what others have done, students will be challenged to generate their own concepts. This task is designed to prepare them for their professional career trajectories, challenging them to become producers of knowledge instead of consumers. Mimicking the professional world, students will work in small groups and consult with experts in the poverty reduction field to develop their ideas.

Implementation will challenge the students to develop a professional-quality presentation on their solutions to be shared with TFD for evaluation and feedback. With funding through the CUES program, we can take this a step beyond presentation and provide a small startup fund for students to actually implement and evaluate their solution. This may take the form of informational booklets, intervention activities, etc. and should be feasible in a 2-3 week period.

Students are most often drawn to their majors not by content of the knowledge they will learn through their courses, but rather by the prospective careers and professional tool-kits conferred by those programs. In the social sciences, many students are seeking the knowledge and tools that will let them go out into the world and solve its myriad social problems. Yet our majors today provide much less content in *problem-solving* than we do in *problem-identification*, which is a common undergraduate complaint. Building on the success of the Poverty Workshop, I now aim to build on this innovation by integrating human-centric design thinking into how we prepare students for their professional careers. One core difference in teaching through design thinking versus a content-based approach is that in design thinking, failure is a plausible option, where not every proposal will succeed in the real world –an experience we all face in the real world, but often shield our students from by grading the memorization of knowledge and not the process of creating new ideas. The design thinking emphasizes group-based learning, innovation, and evaluation that mirrors the experiences students will face in their professional careers. By combining this approach and its hands-on lessons and assessments with readings in community sociology, I believe I can develop an innovative educational experience that will benefit undergraduates and the community.

Proposed Timeline: The proposed project will be implemented over the course of two years and be organized around 3 specific goals: #1) to integrate new technology into the existing Poverty Workshop and assess whether it improves student learning outcomes, #2) complete the development of the TCC course, and #3) assess student learning outcomes from the TCC course and make improvements for future offerings. For *Goal #1*, I will purchase 25 tablets to use for collecting data in the field in Spring 2018 (see the timeline in the budget section below). During the Spring 2018 semester, I will use a benchmark of observing improved student learning outcomes associated with the integration of technology and based on these, develop procedures for their full integration into the Poverty Workshop and TCC courses. For *Goal #2*, I will work with a graduate assistant in Summer 2018 to identify best practices in the teaching of design thinking and adapt them to the TCC course. Our benchmark here is the completion of a course syllabus with specific activities assigned throughout. In Fall 2018, the benchmark will be offering the course for the first time. For *Goal #3*, I will develop student learning assessments based on my current NSF grant for the TCC course and conduct pre- and post-evaluations. Based on these results – the benchmark for this goal, I will work again in Summer 2019 to improve the TCC course and complete a second course-development guide to share with colleagues and publish in the scholarly literature on engaged education. A second round of student learning assessments will also be conducted in Fall 2019.

Proposed Budget: Two years of support are requested to 1) enhance the current Poverty Workshop course and 2) develop the second Social Change course. This support will provide summer salary and a graduate assistant to prepare the course for Spring 2019. In addition, funds are requested to purchase computer tablets to transition the existing Poverty Workshop and enable the Tucson Community Cares course to collect survey data digitally.

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Evidence of Current or Past Scholarship

The innovative educational aspects my Tucson Poverty Project have been recognized by the National Science Foundation (NSF), which awarded a \$250,000 grant to support “Innovations in Social Science Learning: The Poverty in Tucson Field Workshop.” This award from NSF’s Division of Undergraduate Education addresses two of the agency’s core missions for improving undergraduate education: 1) improving the effectiveness of undergraduate STEM education and 2) supporting projects that have broad societal impacts. Through this grant, I am working to assess how engaged student learning, exemplified by our 100% Engagement Initiative, can be utilized to improve student learning outcomes including knowledge retention, motivation towards graduate education, and career preparedness. Based on the positive results, I am developing a manuscript for *Teaching Sociology* that will provide evidence-based examples for implementing project-based learning in the social sciences. A second manuscript focuses on transforming traditional methodological and statistical training to approaches that link undergraduate experiences throughout the full scientific method by personally meaningful data collection and analysis. This manuscript will be targeted at a more general teaching journal that reaches beyond the sociology community and will also be condensed into an editorial or commentary for publishing in an online teaching outlet such as the *Chronicle of Higher Education* or *Inside Higher Ed*. The Poverty Workshop centers on this interactive experience, providing an opportunity for engagement in a STEM field that puts real world data in the hands of undergraduates and challenges them to make sense of their own findings.

By improving the methodological approach to the training of social scientists, my assessment of two years of student learning outcomes from the current Poverty Workshop provides unique insights into the development of professional STEM skills and experiences into existing undergraduate curricula. In doing so, undergraduates can experience firsthand the challenges of data collection and management, which are often overlooked in many STEM educational programs and a potential cause of student frustration and withdrawal from scientifically rigorous programs. Based on my experiences in the Poverty Workshop, I believe we can challenge and empower undergraduates to develop the skills necessary to succeed outside the classroom. To help other instructors develop and integrate similar research experiences related to their fields, I am developing an evidence-based guidebook on how to implement this approach to engaged and applied learning that will be produced and shared broadly through my NSF grant. Additionally, I will share this guidebook with the UA community as part of a multi-day workshop hosted by the Office of Student Engagement at the UA to promote and grow our university-wide portfolio of engaged-learning courses and experiences.

In 2016, the College of Social & Behavioral Sciences’ (SBS) Magellan Circle awarded the Poverty in Tucson Field Workshop course with its annual Community Partner Award. This award honors collaborations between UA academics and regional community organizations that advance the goals of the university and SBS. As part of the community engagement mission of the Tucson Poverty Project, I also regularly engage with the Tucson nonprofit community on regional poverty and the data collection efforts and findings we have produced so far. In the last year, I have given presentations to Arizona Serves, the League of Women Voters, the Pima County Poverty Working Group, the United Way of Southern Arizona, Social Venture Partners, and the Community Foundation for Southern Arizona. In addition, I regularly consult with staff at the Tucson Daily Star on issues related to poverty and inequality locally. Several organizations, such as Habitat for Humanity Tucson, have reported modifying their service delivery based on our data. Through these partnerships, I have raised approximately \$65,000 from nonprofit organizations in Tucson to support the last four years of operating the Poverty Workshop, creating an important precedent that these types of courses can be locally sustainable.