"I didn't think students like me got opportunities like this": Using the RSD Framework to Address Equity Gaps in Undergraduate Research

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Abstract

The benefits of participating in undergraduate research (UR) are most pronounced for students from traditionally underserved groups (underrepresented minority, Aboriginal, low-income, and/or first-generation students), yet access to UR in many parts of the world favors economically advantaged students with family legacies of higher education. Scaffolding research throughout required components of the curriculum is key to addressing those equity gaps. A professional development workshop with the goal of broadening access to UR was offered at eight diverse universities and three national conferences in the United States. Participants were introduced to the Research Skill Development (RSD) Framework as a means of developing students' research skills in fair and transparent ways. They used the model to draft learning outcomes and pedagogical strategies that would apply universally across their programs. Using the RSD Framework impelled the participants to make evident how the process of inquiry and research can be undertaken by all students in their program, thereby breaking down the divide in access to UR.

Introduction: Benefits of UR for Students from Underrepresented Groups

The well-established benefits of participating in undergraduate research (UR)—including higher rates of persistence and degree-completion, academic achievement, self-efficacy, and analytical and

communication skills—are most pronounced for students who have been underrepresented in higher education around the world: students who are racial and ethnic minorities, Aboriginal, low-income, and/or first-generation. Supportive relationships with professors and the advantageous opportunities afforded by participation in UR, such as presenting and networking at conferences, are particularly beneficial for students from historically underserved groups (Brownell & Swaner, 2010; Gregerman, 2009; Jones, Barlow, & Villarejo, 2010; Kinzie, Gonyea, Shoup, & Kuh, 2008; Kuh & O'Donnell, 2013; Linn, Palmer, Baranger, Gerard & Stone, 2015; Locks & Gregerman, 2008). Such mentorship and exchanges build what Bourdieu (1986) termed *social capital*: the resources accrued through networks of influential relationships.

Yet in many institutions of higher education, access to UR still favors economically advantaged students with family legacies of higher education (Carpi, Ronan, Falconer & Lents, 2016; Finley & McNair, 2013; Osborn & Karukstis, 2009). This paper lays out the benefits of more inclusive participation in UR and the barriers that prevent underserved students from gaining access. It then explains how university faculty in the U.S. are using the Research Skill Development (RSD) Framework as a tool for including diverse students in high-impact UR.

Biases and Structures that Impede Equitable Participation in UR

Even though awareness has been growing for years about the effectiveness of diverse research teams and the power of UR to improve outcomes for underserved students, the students born into vast social capital (i.e., to parents with high degrees of educational attainment and income) are still disproportionately more likely to participate in UR. Especially in North America, UR opportunities have long been offered to the highest achieving students as a chance to work like junior colleagues with

professors in closely mentored collaborations. To take on such a prized opportunity, students need to excel academically, demonstrate interest in the professor's scholarship, and volunteer substantial time outside of class to contribute to the research. Most undergraduates, and certainly those with employment and family responsibilities in addition to their studies, are left out of such scenarios. The norm in the U.K. and Australia for students to engage in authentic research as part of their curricula has not been common practice in the U.S. and Canada. While many faculty in North America assign papers and projects that require library research, they tend to reserve opportunities for original discovery for a small number of top students.

A problem with that North American paradigm of UR, besides that few students can participate, is that professors may hold unconscious biases about who is prepared for scholarly work and/or who would be able to accept unpaid research positions. Researchers have shown that around the world people tend to choose collaborators with whom there is the smallest perceived "social distance," or cultural and behavioral difference (Neeley, 2015; Wagner & Muller, 2009). We humans form groups "fastest and easiest with people most like [ourselves]. Deep-seated biases make [us] more trusting of those who look most like [us], who think like [us], or with whom [we] have the most in common," including race/ethnicity, gender, and class (Wagner & Muller, 2009, p. 1). For example, higher education faculty/staff tend to value *independent* social norms—students acting of their own volition, independent of others' expectations, and making an impact on the world (Stephens, Fryberg, Markus, Johnson & Covarrubias, 2012). Those values align with how Western students of middle- and upper-class backgrounds are often raised, imbued with a sense of self-worth, individual preference, choices, and control over their own lives; they have had enough resources to exercise personal decisions. Indigenous and working-class students, on the other hand, are more often raised with *interdependent* social expectations (Stephens et al., 2012). They have limited resources and fewer opportunities than their

more affluent peers to exercise preferences and control. The implications are that students from underserved groups not only lack the social capital to access competitive academic opportunities, but also may have cultural and familial values fundamentally at odds with their professors' expectations (Stephens et al., 2012).

Pragmatic concerns also present barriers to UR for low-income students. The summer months, when many professors make the most progress on their scholarship, are also when many students work longer hours to pay for school. Students most likely to volunteer on a research team have less pressing need to work for pay. Such ingrained assumptions and norms indicate why students from traditionally underserved groups have disproportionately low participation in UR (Finley & McNair, 2013).

Scaffolding Research in the Curriculum for All Students

Broadening access to UR requires considerable investment of institutional resources as well as individual and collective efforts of faculty and staff (Carpi et al., 2016; Finley & McNair, 2013; O'Donnell, Botelho, Brown, González, & Head, 2015). Among those investments, the most significant is scaffolding research in the curriculum. Healey and Jenkins (2009) made the case that "all undergraduate students in all higher education institutions should experience learning through, and about, research and inquiry ... through a research-active curriculum" (p. 3). The reason is simple but powerful: when authentic research is a required component of the curriculum that all students take, all students gain access to the experience and its benefits.[1] Especially because the benefits are most evident when students experience

[1] Obviously, this point depends upon fair and non-discriminatory admissions policies and inclusive environments in individual programs—matters of extensive research and practice in their own right. It must also be acknowledged that for many so-called equitable opportunities, participants with more social capital have greater degrees of access and accrue more benefits. Program administrators need consistent vigilance and diligence to address equity gaps.

research in an inclusive, scholarly, knowledge-building community, the classroom offers a promising setting for UR (Brew, 2006).

Although UR experiences in the classroom have not been customary in North America, that is changing. This is especially true as some professors and UR program directors, motivated by a "moral imperative" (Malachowski, 2003) to increase access to UR, have been leading workshops and publishing guidelines on research-rich curricula (Karukstis & Elgren, 2007; Shanahan, 2011, 2012). Since 2005 I have been leading professional-development workshops in the U.S. and Canada with the goal of broadening access to UR for diverse groups of students by embedding research in core and major curricula. Although most workshop participants have shown openness to embedding authentic research opportunities in their courses, they have consistently asked for examples and guidance for how to carry it out in practice. So my workshops of the last few years have been based on principles of the Research Skill Development (RSD) Framework (Willison & O'Regan, 2007). At eight diverse universities and four international teaching and learning conferences in the United States and Canada, I have used the RSD Framework not only as a map for developing students' research skills in the curriculum in fair and transparent ways, but also as a form of social capital—a shared understanding of values in the academy to which all students have access. Professors who use the model to draft learning outcomes and pedagogical strategies that apply universally across their programs are encouraged to share the RSD Framework with their students—to walk them through the stages represented on the *x* and *y* axes, and to identify where they are in their research skill development, what they have already mastered, and where they are headed next. Using the RSD Framework impels faculty to make evident how the process of inquiry and research can be undertaken by all students in their program—in effect, providing students with a valuable social-capital resource and breaking down the divide in access to UR.

Resistance to Embedding UR in the Curriculum

In facilitating these workshops, I have encountered two main points of resistance to UR in the curriculum—to which, fittingly, the RSD Framework has been a constructive tool for response. The first challenge has come from professors who claim that research is already embedded in their curricula because their students are required to write research papers or conduct laboratory experiments. The term "research" takes on many different connotations, so explaining what is meant by high-impact or "authentic" UR is essential. Osborn and Karukstis's (2009) four characteristics of UR help mitigate the claim that any research conducted by undergraduate students is "undergraduate research." They contend that authentic UR is (a) *mentored* by a faculty-scholar, who does not merely assign and grade research projects, but guides the process, structures the stages of research, and provides frequent feedback; (b) *original*, in that student-researchers are seeking to create or discover new knowledge, even if modest in scope and more "new to the student" than to experts in the field; (c) *disciplinarily appropriate*, in that student-researchers use the methods, tools, ways of knowing, forms of evidence, etc. that scholars in the field employ; and (d) *disseminated*, because what distinguishes a "scholar" or "researcher" from a student completing a run-of-the-mill assignment is the exercise of sharing results with a community of practice—in order to exchange findings, respond to questions, and refine one's thinking.

I have found that those criteria of authentic UR line up well with the RSD Framework. Its *y* axis conceptualizes the research process from start to finish, regardless of the researcher's experience or academic discipline; all researchers (a) embark in the investigation, (b) find information, (c) evaluate the information and their selected research process, (d) organize information and manage the research process, (e) analyze/synthesize and apply new understandings, and (f) communicate new knowledge

(Willison & O'Regan, 2007). Those stages reflect *original*, *disciplinarily appropriate*, and *disseminated* research as called for by Osborn and Karukstis. Their other criterion of high-impact UR—that it is *mentored*—is supported by the RSD Framework on the *x* axis, which lays out researcher development across a five-level continuum of student independence (and of mentoring responsibilities), from Level 1 (low level of autonomy with highly prescribed tasks) to Level 5 (high degree of autonomy with open-ended, student-initiated tasks; Willison & O'Regan, 2007).

The other form of resistance to research embedded in the curriculum is the assumption that capstone/dissertation/thesis requirements constitute adequate UR experiences. In many institutions around the world, students complete a culminating research project, which would on its own meet Osborn and Karukstis's (2009) criteria for authentic UR: mentored (sometimes even one-on-one), original, disciplinarily appropriate, and disseminated (usually in a thesis defense or campus symposium). While a culminating research experience can be a powerful and beneficial opportunity for students to pursue a question of compelling interest, students cannot learn to engage successfully in such a process in one course (Harkness, 2007). The purpose, scope, and process of research are unclear without a scaffolded curriculum leading up to it (Harkness, 2007; Shanahan, 2011). Those who enter the university with above-average skills (i.e., those with the most social capital and best secondary-school preparation) are naturally more likely to succeed in one-off research projects than are students without that preliminary formation. Simply adding a capstone requirement as UR in the curriculum can actually reify the divide between privileged and underserved students. Using the RSD Framework, however, to plan well beyond a single capstone and scaffold each stage of UR from a student's first semester to final semester, promotes student success more justly.

Conclusion: RSD Framework as "Structured Intervention"

Equitable participation in UR in the curriculum "can be achieved through structured interventions" (Healey & Jenkins, 2009, p. 3). The RSD Framework provides that structure by guiding decisions about (a) which skills are important outcomes of a program; (b) where those skills are appropriately introduced and reinforced; and (c) how to design curricula at the course and program levels to develop those skills effectively (Malachowski, 2003; Shanahan, 2012; Willison & O'Regan, 2007). The RSD Framework helps all students develop research skills by laying out agreed-upon learning outcomes and pedagogical strategies that apply universally across a program. It transparently shows how the process of inquiry and research can be undertaken in any degree program—the very opposite of boutique research opportunities for a few lucky students. Research scaffolded across the curriculum offers equitable access to UR, including for students without the social capital, free time, and accumulated skills to take on extra work. It breaks down the divide between students who can afford to take on co-curricular research experiences and those for whom anything beyond course requirements seems impossible. A first-generation student who completed a personally meaningful, significant research study at the culmination of a scaffolded curriculum captured the change best when he said, "I didn't think students like me got opportunities like this." The RSD Framework is key to ensuring they do.

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