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The authors, a sociology professor and a librarian, draw attention to the relatively limited contribution of librarians to the field of engaged scholarship (ES), which they demonstrate through a review of relevant literature. They contend that the limited contribution of librarians is not the outcome of librarians being consciously excluded from ES projects by faculty. It is their point of view that ongoing exclusion of librarians reflects a lack of awareness among faculty regarding a recent shift in library science referred to as embedded librarianship (EL). Using examples from the EL literature primarily about undergraduate research experiences, the authors identify a viable role for librarians in ES, particularly in instances where enhancing the “information literacy” of students, research assistants, or community members is a learning or research priority. This reflective essay provides readers an opportunity to reflect on how—when and where appropriate—librarians might contribute to ES.

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Land-grant extension is an ongoing example of higher education outreach and community engagement. Population, food, climate, and geographic isolation all factor into the importance of producing
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65 A Grateful Recollecting: A Qualitative Study of the Long-Term Impact of Service-Learning on Graduates

Ann Fullerton, Vicki L. Reitenauer, and Seanna M. Kerrigan
Portland State University

Service-learning practitioners design community engagement activities to affect students in powerful and even transformative ways. This qualitative study explores the long-term impacts (3-16 years after graduation) of participation in a senior-level service-learning course. Through interviews with 20 randomly selected participants, the researchers explored whether and in what ways graduates continued to experience impacts from the course, including those that have become interwoven with other life experiences or have catalyzed altered perspectives and/or actions. Graduates were first asked to identify their most significant learning experiences in college in order to gauge the relative importance, if any, of the service-learning course in their college education. Then graduates were asked to recall their experiences in the course and to share what impacts those experiences had at the time and in the intervening years. Findings are discussed through the lens of transformational learning processes and outcomes.

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University of Oklahoma

Dewey’s concept of enabling children to explore based on their own interests has evolved into investigations and projects using methods of exploration, experimentation, and discovery—three tenets of service-learning. Using mixed methodology, the authors examined the implementation of service-learning in a teacher education program. A total of 155 preservice teachers participated in this study over a 5-year period. Results indicated that preservice teachers believed that their service-learning experiences provided a valuable contribution to the development of pedagogical skills, as well as fostering self-actualization and social-moral development. They also rated the
importance of service-learning highly in pedagogical, self-actualization, and social-moral development.

Maximizing Future Potential in Physics and STEM: Evaluating a Summer Program Through a Partnership Between Science Outreach and Education Research
Zachary Constan and Justina Judy Spicer
Michigan State University

Global competitiveness of the United States is often suggested as a key outcome of developing a capable science, technology, engineering, and mathematics (STEM) workforce, a goal supported by many local, state, and national programs. Examining the effectiveness of such programs, however, may require assessment techniques that are outside their organizers’ expertise. The physicists conducting the physics outreach program in the current study partnered with education researchers at the same university to achieve a more thorough measure of program effectiveness while also demonstrating how such partnerships represent an opportunity to add rigor to current evaluation. The resulting analyses demonstrated that participants in the outreach program (a) were more likely than nonparticipants to pursue an education and career in STEM, (b) were able to define and execute plans to solidify a strong foundation for pursuing a career in STEM, and (c) persisted in pursuing education in STEM after high school graduation.

Programs with Promise

Evaluation of Student Outcomes After Participating in a Medicare Outreach Program
Joshua C. Hollingsworth, Benjamin S. Teeter, and Salisa C. Westrick
Auburn University

This article describes the development of a service-learning project and analysis of student pharmacists’ participation therein. Using a mixed-methods approach, this study analyzed student pharmacists’ knowledge and attitudes after volunteering in the inaugural Medicare Outreach Program, a collaboration between the School of Pharmacy and State Health Insurance Assistance Program (SHIP) in which certified student pharmacists assisted Medicare beneficiaries with Part D plan evaluation and selection. Although results did not show a statistically significant difference in knowledge gained by students who volunteered ($n = 71$) compared to those who did not ($n = 72$; $p = 0.57$), thematic analysis of volunteering students’ reflections did reveal that they found their volunteering efforts to be meaningful learning experiences. Six major themes were identified overall showing that the program, which was designed to benefit SHIP and the community, also had a positive impact on students’ attitudes. Accordingly, the program’s sustainability plan is also discussed.
Community-driven design is a current movement in the forefront of many designers’ practices and on university campuses in design programs. The authors examine work from their respective public state universities’ design programs as examples of best practices. In these case studies, the authors share experiences using community-based design processes, local or global, with their design students. Goals of these two case studies include understanding the varying context and the cultural implications provided by diverse academic and geographic landscapes. In one case, students traveled thousands of miles to experience a different culture; in the other, students traveled across the tracks and down the street for cultural diversity. The comparison of the two suggests that although the site conditions were divergent, the boundary-spanning methodologies provided similar outcomes among students, faculty, and community partners.

As a requirement for a federal neighborhood revitalization grant, the authors trained resident interviewers and coordinated the conduct of more than 1000 door-to-door interviews of a stratified random sample. The targeted area was a multiethnic, lower income neighborhood that continues to experience the effects of past segregation. Monitoring and pivots to the training procedures are described within the context of community development and capacity-building theory. Including local participation in the interview process yielded enhanced collaborative participation in decision making on the part of interviewers and interviewees. Resident contribution to community development is described within the framework of advocacy and consultative participation.
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From the Editor...

Embedding Engagement in Higher Education and Communities

In a beautiful opening essay for this issue, Paul Pribbenow, president of Augsburg College in Minnesota, offers a meditation on why place matters for higher education. From both a theological and a practical perspective, he documents Augsburg’s abiding commitment to place as the center of its academic mission and public purposes. He affirms that Augsburg “believes that it is called to be generous and faithful in its place.” As Pribbenow describes, Augsburg has more than a story: It has a saga, formed by the sort of people, programs, and values that define an institution, anchor it in its place as an indigenous community, and provide the foundation for its future. Augsburg’s saga has led it to its role as a 21st-century urban settlement, a place-based institution rooted in a particular neighborhood, seeking to serve its neighbors and neighborhood in mutually beneficial ways (Pribbenow, 2014). Augsburg strives to be “sticking” in its place through authentic work in teaching and learning, being actively present as a neighbor, and taking on “public work,” supporting social justice and community-building. Pribbenow encourages us to ask ourselves how we can be “even more generous and faithful in our whereabouts and place.”

Other articles in this issue take up this challenge of embeddedness and the evaluation of embeddedness. Rowland and Knapp, a sociology professor and a librarian, point out, through a review of literature, the relatively limited contributions of librarians to engaged scholarship. They advocate for “embedded librarianship” to enhance the information literacy of all those involved in engaged scholarship—faculty, students, research assistants, and community members.

Evaluating the embeddedness of higher education as a public good is discussed by Collins through a study of land-grant extension and its diffusion of knowledge for the public good. He clearly points out the difficulty in documenting and evaluating the construct, particularly the “inherent tension between the demand for accountability and the absence of reliable methods to demonstrate impact for public good.”

What about embedding civic engagement into one’s life after college? Fullerton, Reitenauer, and Kerrigan’s research focuses on the long-term impact of participation in service-learning courses. Their findings confirm that outcomes of service-learning experiences are formative and continue to be realized long after
class is concluded, resulting in “shifts in perspectives, skills, and approaches, that . . . could be called positive, justice-enhancing changes. . . .” Indeed, the subjects of this study expressed gratitude for the opportunity to further reflect on their service-learning experiences of 3 to 16 years previously.

In another study of the effects of service-learning, John Dewey’s theories of social-moral development, pedagogy, and self-actualization served as a lens for investigating the import and impact of service-learning experiences as part of fieldwork in an early childhood teacher education program. In their research studying 155 preservice education teachers over 5 years of programming, Lake, Winterbottom, Ethridge, and Kelly found Dewey still vividly relevant in today’s standards-driven educational systems.

Constan and Spicer examined the results of using outreach to embed career options in precollege students’ experiences. Their article tells how a science, technology, engineering, and mathematics (STEM) outreach programmer partnered with an educational effectiveness researcher to rigorously assess the outcomes of programs that increased participants’ likelihood of pursuing an education and career in STEM.

Medicare Outreach Program, a collaboration between Auburn University’s Harrison School of Pharmacy and the State Health Insurance Assistance Program (SHIP), is featured as a Program With Promise. In this program, certified student pharmacists assist Medicare beneficiaries with Part D plan evaluation and selection. Hollingsworth, Teeter, and Westrick document results for SHIP, the community, and students to evaluate the program’s embeddedness or sustainability.

Two Personal Stories are related in this issue. Hicks and Ison Radtke examine community-driven design cases embedded in their respective university design programs. Although grounded in very different sites—one local and the other international—they found that “boundary-spanning methodologies” provided similar outcomes. Back and colleagues relate keen lessons learned by the research team from Texas Tech University as they trained and embedded resident interviewers to conduct over 1,000 door-to-door interviews of a stratified random sample. This article will be helpful for those performing similar activities to meet grant requirements.

The books reviewed in this issue also reflect the embeddedness of community-engaged scholarship within and across academic disciplines and diverse communities. In *Community-Based*
Archaeology: Research with, by, and for Indigenous and Local Communities, author Atalay argues that for philosophical and practical reasons, archaeology must benefit not just archaeologists but communities as well. The book features five cases of community-based participatory research (CBPR) projects that exemplify the approach. Reviewer Vega notes that CBPR is about “decolonizing scholarship and collapsing traditional barriers between scholars and the public. . . .” Coming from Canadian scholar-practitioners, long experienced in CBPR in partnership with indigenous First Nations, is a new edited volume on the topic thoughtfully reviewed by Elizabeth Tryon.

Revisiting boundary spanning, the topic of JHEOE’s 18(3) special issue, Parish brings us a fresh review of Ernst and Chrobot-Mason’s Boundary Spanning Leadership: Six Practices for Solving Problems, Driving Innovation, and Transforming Organizations. The practices—buffering, reflecting, connecting, mobilizing, weaving, and transforming—offer methods for administrators, faculty, and community leaders to embed community engagement as a strategy for “reframing boundaries, weaving work and spaces together,” and enhancing teaching, learning, and scholarship. Finally, the book Experiencing Service-Learning, reviewed by Glenn Sterner, uses the unique vantage of undergraduate and graduate students to assist students in making deeper meaning of their experience in communities, faculty members in understanding service-learning from the student perspective, and community members in recognizing their powerful role in the student experience.

As physical entities, institutions of higher education are geographically embedded in their neighborhoods. Practicing engagement means taking critical steps outside the ivory tower to actively embed ourselves in our communities. We thank the authors, peer reviewers, and associate editors of articles in this issue for advancing the understandings that enable us to embed through our practices and policies as scholars, students, practitioners, and community members.

With best regards,

Lorilee R. Sandmann
Editor

References
Generosity and Faithfulness: A Meditation on Why Place Matters for Higher Education

Paul C. Pribbenow

Campus Compact Presidential Essay

The intrepid Norwegian-American immigrants who founded Augsburg Theological Seminary (now Augsburg College) almost 150 years ago chose as the institution’s founding motto a simple claim from the New Testament Gospel of John: “And the Word became flesh” (John 1:14, NRSV). That has made all the difference for Augsburg’s abiding commitment to place as the center of its academic mission and public purposes.

Allow me to explain why. First is the theological claim in that simple passage. The gospel writer points to an incarnational proclamation: God came into human history, lived among us, and loved the world. In theological terms, this incarnation is the ultimate act of generosity and fulfills a covenant promise first made in the Hebrew scriptures. In other words, in this passage from John, we proclaim that God is generous and faithful on the ground, in our midst, and in the places we inhabit.

Enough theology. There follows from this theological claim a very real practical guide to life in the world for God’s people. If God has been generous and faithful to us, the only fitting response is for us to be generous and faithful wherever we are found. In this way, John 1:14 stands the test of time as a guide to Augsburg’s deep commitment to place as a source of its mission and identity. Place matters for Augsburg as it lives out its academic mission in service to the public good. Augsburg believes that it is called to be generous and faithful in its place.

My teacher, Martin E. Marty (2003), taught me that colleges are indigenous communities. That is, they are native to a particular place. They are native to a particular environment and to a particular set of values and practices that define the institution. And that means something for the way they live their lives; it means something for the ways in which they understand what it means to be faithful and generous with their place and values and presence.

As an indigenous community, Augsburg lives out its faithfulness and generosity in a particular place—a neighborhood called Cedar-Riverside in the heart of Minneapolis, Minnesota—that has been its home for 145 years. It is a neighborhood of Native peoples...
and immigrants—currently, primarily Somalis and Ethiopians, but over the years Scandinavians (our founders), Vietnamese, Koreans, and others. And with these Native and immigrant neighbors we share in what I call the saga of our life as an urban settlement (Pribbenow, 2014).

What is a saga? My understanding of the concept of saga comes from research done by Burton Clark on what it is that creates a distinctive character and identity for colleges and universities (Clark, 1970). A saga is more than a story—all of us have stories. A saga is more of a mythology—a sense of history and purpose and direction told in vocabulary and narrative that accounts for a community’s DNA—its essence, even. A saga abides in the sort of people, programs, and values that define an institution.

Clark contends that not every institution has a saga. Sometimes that is a function of not being true to founding values; at other times, it can be occasioned by a change of location or core mission. Other institutions have still not found a way to link their pasts, presents, and futures in a coherent narrative.

Augsburg College’s saga runs deep in the culture and meaning of our work together. An exploration of Augsburg’s history reveals several themes that are central to our saga: an immigrant sensibility shaped in an urban neighborhood, freedom through faith to ask tough questions and engage otherness, a moral commitment to access to quality education for all, and the vocational aspiration to be neighbor to and with each other (Augsburg College, 2008). Together, these themes inform Augsburg’s identity and its abiding commitment to faithfulness and generosity in its place.

These themes also provide the foundation for seeing Augsburg as a 21st-century urban settlement, a place-based institution settled in a particular neighborhood, seeking to serve its neighbors and neighborhood in mutually beneficial ways (Pribbenow, 2014). In fact, we have articulated our calling as a college in this way: “We believe we are called to serve our neighbor” (Augsburg College, 2015). In that simple formula, we name our commitment to the inextricable links between faith, education, place, and service to and with neighbors.

The novelist Wallace Stegner once wrote that the American psyche is in tension between what he calls “the boomers”—those who go into a place, use it up, and then leave—and “the stickers,” those who settle in a place and work to renew it and make it better (Stegner, 1992, p. xxii, 4). Augsburg is committed to “sticking,” to staying and settling in. At Augsburg, we accompany and settle alongside our neighbors. We pursue education in our place, equip-
ping each other for lives of meaning and purpose. We welcome each other in our place, sustaining a community of hospitality and mutual respect. We love and are faithful to the place that has been our home for almost 145 years.

How do we live out this commitment to “sticking” in and with our place? We begin with the wise words of poet and essayist Wendell Berry, whose work I return to often for guidance, in his prose poem “Damage”:

No expert knows everything about every place, not even everything about any place. If one's knowledge of one's whereabouts is insufficient, if one's judgment is unsound, then expert advice is of little use. (Berry, 1990, p. 5)

I sometimes think about this quote when talking with all the experts who are happy to offer their advice (for free and for a fee!) about running a college. Our responsibility as “stickers” is to have knowledge of our whereabouts; otherwise, all the experts in the world will be of little use. If we don't know our place, our mission, our history, how can we expect to enlist others in pursuit of our aspirations? We know and care about our whereabouts so that we can be generous and faithful.

There are three simple aspects of our whereabouts, three ways in which place matters and in which faithfulness and generosity are practiced, that are at the heart of Augsburg’s mission and identity. Perhaps the central focus of our whereabouts is that wherever Augsburg College is found—in our neighborhood, in the city, or around the world—our most authentic work is learning and teaching. And the wonder of learning is that it involves acts of generosity and faithfulness in its every detail—from teachers who teach what they love; to students who seek to learn out of curiosity and passion; to texts that bear the wisdom of the ages for our reflection; to conversations that help us pay attention to the Word, to each other, and to the world.

One of the joys of my life at Augsburg is teaching the senior honors seminar each spring. In the classroom, I witness the generosity of what educator Parker Palmer (1998) has called “the grace of great things” (p. 107), the gathering of a community around important issues and problems—great things! I think about a recent course I taught on homelessness and affluence—on income inequality—and how students wrestled with issues of justice and compassion and the social realities of inequity and people living
with both too little and too much. These issues were both studied in the classroom and experienced in the neighborhood. And around these difficult issues, we found the grace of great things, the generosity of learning from and with each other, and the connection to our place in the world.

For the Augsburg community, the commitment to teaching and learning and the connection to place are grounded in our mission statement, wherein we say that “an Augsburg education is… shaped by its urban and global settings” (Augsburg, 2010). That mission is part of a historic narrative that led the college in the 1960s to view its urban location as an extended classroom and to choose not simply to be located “in the city” but to embrace what it means to be “of the city” (Chrislock, 1969, 235). This important distinction sets a foundation for curricular and cocurricular programs that see our place as central to our academic mission and experience.

A second aspect of our whereabouts is the way in which our neighborhood and city is a place that demands our presence as neighbor. This particular neighborhood—much changed since 1869, when the Scandinavian founders of Augsburg lived nearby—now calls for us to be neighbor to those of very different backgrounds. And democracy still is practiced in this place with our neighbors. Education still happens in this place with learners and teachers all around us. Engagement and service still are at the center of our lives with each other in this place. Sustaining this urban place, this urban environment, is an act of generosity and faithfulness—for our diverse neighbors, for our diverse selves, for the whole of creation, now and into the future.

One of my favorite programs at Augsburg is our Campus Kitchen. Campus Kitchen’s core work is led by students who collect leftover foodstuffs from our cafeteria and area restaurants, then prepare and deliver to our neighbors more than 2,000 meals a month. It is good and important work. What I have seen in the past several years, though, is that our students have not been content simply to stay the course. They have focused their attention on the important role that food plays in our lives—as sustenance for our bodies, as fellowship for our community, as politics and economics in our neighborhood and world. And the results are staggering—yes, thousands of meals prepared and delivered, but also community gardens on the edge of campus that bring together neighbors and students and children; a farmer’s market on campus, which involves relationships with organic farmers from across the region; composting of leftover everything in the cafeteria; and most recently, the opening of a food pantry on campus for students who
go hungry. Here is an example of generosity and faithfulness in our place, attention and respect and concern for all of us who inhabit this neighborhood.

Our presence here cannot be passive or defensive. It must embrace the challenge of an indigenous place, loving and caring for the land, the river, the environment, and the people. Our Augsburg colleague Jay Walljasper (2006), a senior fellow in the Sabo Center for Democracy and Citizenship, quotes Mexican novelist Carlos Fuentes, who says, “The citizen takes his [sic] city for granted too often. He [sic] forgets to marvel” (p. 7). We are generous and faithful in our place when we don’t forget to marvel at all that is being done in our midst and all that we are called to do in return!

A final aspect of our whereabouts I want to lift up is our commitment to our broader role in what I call our “public work,” positioning the work of the college community in the context of claims for social justice and community-building. Higher education institutions long have privileged their academic missions and often have found ways to care for their immediate environs through student service and civic engagement programs. But I want to argue that a commitment to generosity and faithfulness in place demands more of us. It demands bringing our many resources—intellectual, moral, and human resources—to bear in addressing the strengthening of democratic institutions and civic life.

Our public work at Augsburg is best exemplified by our leadership in the anchor institution movement in the Twin Cities of Minnesota. Augsburg has come together with sister higher education institutions, with major health care organizations, and with regional public agencies to understand how our self-interests as institutions can combine to create shared value for the neighborhoods along a new light rail transit line. We now are engaged together in shared purchasing to support local businesses; workforce development, encouraging the hiring of local companies and individuals; and place-making, helping to create healthier and more sustainable neighborhoods. The results thus far illustrate positive economic impact on the region, but perhaps more importantly, they show an intentionality about how the place we share can be strengthened through our collective efforts. This is not charity; this is a network business model that serves all of us and at the same time creates a more robust and vital civic life.

This is about paying attention to our place in ever more sophisticated and effective ways, recognizing that our ability to scale these sorts of place-based initiatives means that our underlying commit-
ment to our place can be extended and made even more central to our work as a college. As Rutgers University–Newark chancellor Nancy Cantor (Cantor & Englot, 2015) pointedly challenges us, colleges and universities must be “citizens of a place, not on the sidelines studying it” (p. 75).

I’ll end with another brief quote from Wendell Berry (1990), who, a few years after writing “Damage”—when he clearly was skeptical of our abilities to care adequately for our places in the world—wrote “Healing” to point to a more promising way:

The teachings of unsuspecting teachers belong to the task and are its hope. The love and work of friends and lovers belong to the task, and are its health. Rest and rejoicing belong to the task, and are its grace. Let tomorrow come tomorrow. Not by your will is the house carried through the night. Order is the only possibility of rest. (p. 13)

“The Word became flesh” thus is both a theological and a practical claim for Augsburg College. In response to the many gifts we have been given, we ask how we can be even more generous and faithful in our whereabouts and place. We accompany and settle alongside our neighbors, even when we come from very different cultures and religions and experiences. And together we are creating and sustaining a safer, healthier, more vibrant place where generosity and faithfulness abound. I think our founders would be proud.

References


**About the Author**

Paul C. Pribbenow is the 10th president of Augsburg College, Minneapolis, Minnesota. His research interests center around ethics, philanthropy, and American public life. He earned his Ph.D. from the University of Chicago.
REFLECTIVE ESSAYS
Engaged Scholarship and Embedded Librarianship

Nicholas J. Rowland and Jeffrey A. Knapp

Abstract

The authors, a sociology professor and a librarian, draw attention to the relatively limited contribution of librarians to the field of engaged scholarship (ES), which they demonstrate through a review of relevant literature. They contend that the limited contribution of librarians is not the outcome of librarians being consciously excluded from ES projects by faculty. It is their point of view that ongoing exclusion of librarians reflects a lack of awareness among faculty regarding a recent shift in library science referred to as embedded librarianship (EL). Using examples from the EL literature primarily about undergraduate research experiences, the authors identify a viable role for librarians in ES, particularly in instances where enhancing the “information literacy” of students, research assistants, or community members is a learning or research priority. This reflective essay provides readers an opportunity to reflect on how—when and where appropriate—librarians might contribute to ES.

Introduction

March 25, 2014, marked the inaugural Engaged Scholarship Symposium at the Pennsylvania State University. Organizers encouraged faculty to provide their students with more “out-of-classroom academic experiences that complement classroom learning,” such as undergraduate research, community-based learning, internships, and capstone experiences (i.e., engaged scholarship, also referred to in the literature as community-engaged scholarship; in this article, we will call it engaged scholarship). Engaged scholarship (ES) faculty shared their experiences and fielded questions from the audience. Curiously, after a full day of programming, the library was not mentioned—not once—and that observation prompted this reflective essay.

The authors draw attention to the limited contribution of librarians to ES, which they demonstrate through a review of articles in the Journal of Higher Education Outreach and Engagement (JHEOE) and relevant literature from numerous disciplines. In the rare instances where librarians appear in ES literature, they are usually portrayed in a quiet supporting role, for example, as
archivists for or curators of ES projects. However, ES faculty are not consciously excluding librarians; rather, this de facto exclusion reflects a lack of awareness on behalf of both faculty and librarians regarding a recent trend in library science called embedded librarianship (EL). Using examples from the EL literature primarily about undergraduate research experiences, the authors identify a viable role for librarians in ES, particularly in instances where enhancing “information literacy,” that is, “the set of skills needed to find, retrieve, analyze, and use information,” is a learning or research priority (ACRL, n.d., para. 1). This reflective essay, therefore, provides readers an opportunity to reflect on how librarians might contribute to ES when appropriate.

Engaged Scholarship

The scholarship of engagement is primarily discussed in literature on higher education; however, a review of the broader literature in the social sciences and humanities also reveals the widespread appeal of ES. With emphasis on librarians, the authors reviewed the entirety of the Journal of Higher Education Outreach and Engagement (JHEOE) in view of its mission as “the premier peer-reviewed, interdisciplinary journal to advance theory and practice related to all forms of outreach and engagement between higher education institutions and communities” (JHEOE, n.d., para. 1). In addition to their special attention to articles in JHEOE, the authors also surveyed literature beyond journals devoted to ES. These particular articles—52 in total—were selected because they have the highest citation ratings in their respective disciplinary areas. The criterion of citation rating (i.e., a count of the number of times an article is cited in the scholarly literature) is an imperfect measure of impact; however, it is a valuable proxy when considering articles across disciplines that may not share common standards of impact; in this context, citation ratings become a viable criterion for article selection. A wide variety of disciplinary areas were represented in the broader literature, including the following:

- African studies (Isaacman, 2003; Mahlomaholo, 2010)
- communications (Barge et al., 2008; Barge & Shockley-Zalabak, 2008; Cheney, 2008; Deetz, 2008)
- community research (Cuthill, 2010; Norris-Tirrell, Lambert-Pennington, & Hyland, 2010)
• criminology (Uggen & Inderbitzin, 2010; Weber & Bowling, 2011)
• cultural studies (Ang, 2006)
• higher education (Hodge, Lewis, Kramer, & Hughes, 2001; Vogelgesang, Denson, & Jayakumar, 2010)
• human resources (Franz, 2011; Gelmon, Ryan, Blanchard, & Seifer, 2012; Glass, Doberneck, & Schweitzer, 2011; Tsui, 2013)
• information (technology) studies (Medaglia, 2012; Mueller & Lentz, 2004)
• international education (Shultz, 2013)
• Latin American studies (Webber, 2007)
• law (MacKinnon, 2010)
• medicine (Calleson, Jordan, & Seifer, 2005)
• management (Kenworthy-U’Ren, Van de Ven, & Zlotkowski, 2005; McKelvey, 2006; Van de Ven & Jing, 2012)
• marriage and family studies (Small & Uttal, 2005)
• organizational analysis (Van de Ven, 2007)
• policy studies (Schneider & Sidney, 2009)
• political science (Farr, Hacker, & Kazee, 2006; Gearty, 2007; Robinson, 2000)
• psychology (Bartlett, 2011; Finkelstein, 2002)
• public administration (Bushouse et al., 2011; Martin, 2010; Orr & Bennett, 2012)
• science and technology studies (Phaneuf, Lomas, McCutcheon, Church, & Wilson, 2007; Woodhouse, Hess, Breyman, & Martin, 2002)
• social justice/responsibility (Kearins & Fryer, 2011; Stanton, 2008)
• social research (Torre & Fine, 2011; Van de Ven, 2007; Waddington, 2011)
• social work (Fogel & Cook, 2006)
• sociology (Kleidman, 2006; LaMarre & Hunter, 2013)
• speech studies (Hartelius & Cherwitz, 2010; Pollock, 2010)
• sport studies (Schinke, McGannon, & Smith, 2013)
• teaching (Peterson, 2009)
• trust studies (Ping Li, 2011)

This list is not exhaustive, but it captures an array of disciplinary areas. A review of these materials follows.

**JHEOE**

Since 1996, only one piece in the fields we surveyed has featured a library or librarian as its central topic. The reflective essay “A University Library Creates a Digital Repository for Documenting and Disseminating Community Engagement” (Miller & Billings, 2012) deserves special attention, as it is the only article published by JHEOE that has specified a role for libraries in ES.

The essay is about a digital repository at the University of Massachusetts Amherst. A portion of the repository, ScholarWorks@UMass Amherst, is set aside for housing digital materials from community-engagement initiatives. According to Miller and Billings (2012), “this innovative application of library science” (p. 109) supports assessing and tracking engagement; the repository helps establish “institutional mechanisms for documenting and disseminating information about community engagement” (p. 111), which facilitates promotion and tenure decision making among faculty and constitutes a resource for administrators to measure their success on mission-critical goals regarding engagement.

One-dimensional types of ES assessment measures, such as number of student credit hours logged in the field or amount of external funding obtained with or for community partners, are no longer sufficient to document the dynamic relationships that faculty build with community partners. Administrators, therefore, need more centralized resources to capture the scope of ES across units and leverage new opportunities from those already gained. External forces are also at work. Since 2009, universities seeking the Carnegie Foundation for the Advancement of Teaching’s (2015) *community engagement* classification are required to demonstrate their ability track, campuswide, community engagement activities. The combination of external and internal pressures makes digital publishing and archiving an appealing technique for supporting ES on campus. Thus, although
[t]he traditional role of the library in the academic enterprise has generally been one of disseminating the results of academic work through the acquisition of books and journals…. [l]ibrarians have partnered with faculty members to build and maintain teaching and research resources in either print or electronic form. (Miller & Billings, 2012, p. 112)

Archiving ES activities in digital repositories becomes a natural extension of the role libraries have traditionally played in academic environments.

As intellectual property rights change and as faculty host more of their unpublished research online, it becomes imperative that faculty work with librarians to host their work in accessible institutional repositories, such as ScholarWorks@UMass Amherst, in order to “retain the right to distribute their own works more openly” (Miller & Billings, 2012, p. 114). “Recognizing the collaborative potential between emerging library technology and community engagement,” Miller and Billings write, “is a significant innovation” and “a functional step toward effective demonstration of collective impact” (p. 117). Still, barriers exist: Faculty would be required to devote significant time to uploading materials, and administration must properly reward faculty for this work.

Miller and Billings’s article offers one vision for how ES faculty and librarians might collaborate. Librarians support ES faculty; support comes after ES faculty return from the field flush with materials for the librarian to diligently store and organize. Thus, librarians are—somewhat ironically—only indirectly engaged in ES.

Although it is unfair to depict Miller and Billings as the sole representatives regarding how librarians fit into ES, their work is the sole guide in JHEOE, and therefore acts as something of a bellwether. There was once another way. In the inaugural issue of the Journal of Public Service & Outreach, which would later become JHEOE, Younts (1996) stated that “[u]niversities and colleges are becoming more aware of their responsibility to extend knowledge and expertise to society” and referred to this function as the “third mission of the academy” (p. 2). Disseminating knowledge is a mission priority for librarians. Younts also indicated that “analyzing critically the importance of interdisciplinary collaborations” (p. 7) was a foundational concern for the journal, which is yet another area of expertise in library science. Neither of these two roles appears to have crystallized for librarians.
Broader Literature

A review of the broader literature confirms that academics view librarians as having a limited role in ES. In general, the library is mentioned either in passing or as a passive storehouse for field materials. The most positive vision of librarians is related to instruction, a theme absent in the Miller and Billings (2012) piece. According to Doberneck, Glass, and Schweitzer (2010; see also Glass et al., 2011, p. 12), librarians play a role in “publicly engaged instruction” under

\[ \text{instruction—noncredit—managed learning environments.} \]

Scholarly resources designed for general public audiences that are often learner-initiated and learner-paced (e.g., museums, galleries, libraries, gardens, exhibits, expositions). (p. 23)

Providing the public with resources and firsthand instruction constitutes a way for librarians to participate in ES; however, these lessons are to be aimed at the “general public,” so college-based service-learning, undergraduate research, and community-based learning courses appear not to be included. In fact, instruction is the only active role specified for librarians in the broader literature on ES; the rest are passive or implied.

As noted, more passive depictions of libraries persist. Cheney (2008), for example, mentions the library, stating that “we have prominent, theoretically informed scholars among us whose work is as much in the streets as it is in the library” (p. 281). The rare mention of the library is noteworthy; however, on balance, this passing mention functions to reify the cultural boundary between the librarians back home and the faculty engaged in the field. Again, the faculty is active; librarians are passive.

Consistent with Miller and Billings (2012), the librarian is the curator of ES materials. Norris-Tirrell et al. (2010), in research on metropolitan revitalization, noted that “the project developed a community archive at the local public library and a manual for community groups interested in creating participatory video ethnography/oral history programs with youth” (p. 182). The piece did not specify whether any librarian contributed to the establishment of this archive at a local community library. If the role of the librarian is that of curator in ES, then logically the role of the library becomes a storehouse for ES materials.

Pollock (2010) also depicted the library as a kind of “bank,” this time, like Miller and Billings, as a digital repository. She mentioned
Engaged Scholarship and Embedded Librarianships

libraries twice in her work on collecting oral histories, presumably in North Carolina, of desegregation efforts. Pollock (2010) stated that

we now have the ability to make these interviews available “jukebox” style to anyone who wants to listen; to accommodate people who drop in to offer a life history or to donate family archival materials (some dating to the Reconstruction) to our digital library bank. (p. 463)

She also reported on a library collection at a church, St. Joseph’s, wherein an “eleven-year-old daughter of the church’s pastor is organizing the six hundred volumes that now comprise the John ‘Yonni’ Chapman Memorial Peace and Justice Library” (Pollock, 2010, p. 464), the volumes being digital recordings primarily by local children. To her credit, Pollock nicely balances her depictions of libraries as passive banks with a picture of libraries as supportive and lively places in the community. Still, the role of librarians either is absent or goes unmentioned.

M. Smith’s work epitomizes the passive librarian. Smith (2011) interrogated the gap between academics and practitioners, identifying the library as stuck between the two; he wrote that

[a]cademic journal subscriptions have become increasingly expensive, causing many libraries, especially university libraries, to discontinue subscriptions. Few human service agencies can afford subscriptions to all publications in the field. (p. 88)

The library is hamstrung between the needs of the community, which it struggles to meet, and the needs of the academic publishing world, which require funding to support active faculty. Later, Smith (2011) provided the quintessentially passive role for libraries, which does not even involve librarians: “It is the responsibility of the faculty member to ensure that all collaborators have access to university resources: data, libraries and journals, technology, and students” (p. 94). In this way, librarians appear to be—if unconsciously—actively uninvited. There is another way, however; it is to embed the librarians in ES.

**Embedded Librarianship**

Embedded librarianship (EL) is the subject of a growing literature and is generally considered one of a number of viable
options for the future of the librarian as a profession (Becker, 2010; Dewey, 2006; Knapp, 2012; Knapp, Rowland, & Charles, 2012; Siess, 2010). Although the term itself dates back only to the early 2000s, the embedded librarian concept (i.e., a librarian partnering with researchers outside the traditional library environment) dates back to the 1970s, with medical librarians taking the lead (Shumaker, 2009). Other terms in use for similar arrangements are “informationist” (Cooper, 2011; Davidoff & Florance, 2000; Rankin, Grefsheim, & Canto, 2008; Thomas, Bird, & Moniz, 2012) and “clinical librarian” (Brady & Kraft, 2012; Kesselman & Watstein, 2009). The EL model can be viewed as an effort to meaningfully engage with faculty members and undergraduate students.

It is important to recognize, however, that “being embedded” can be defined in different ways. Librarians have embedded in research-intensive classes in order to provide assistance to students over a longer period, becoming a regular part of the class so that they can get the overall picture of what the students are working on. Librarians have also been embedding themselves in online courses via course management systems (Bennett & Simning, 2010; Kesselman & Watstein, 2009). By actively providing office hours and reference services outside the library, librarians are assuming a new role rather than passively waiting in the library to be called upon—their traditional role as commonly understood (Clyde & Lee, 2011). In addition to embedding with undergraduate classes, librarians are also becoming more involved in primary research by integrating into teams of researchers, which serves as another route to contribute to ES, provided the research being conducted engages the community in scholarly ways (Kesselman & Watstein, 2009; Robinson-Garcia & Torres-Salinas, 2011; Shumaker, 2012).

The educational imperative of librarians, embedded or not, is teaching students the concept of information literacy. Definitions of information literacy have changed over time and are commonly debated in library circles; however, the most generally accepted definition is that offered by the Association of College & Research Libraries (2000):

Information literacy forms the basis for lifelong learning. It is common to all disciplines, to all learning environments, and to all levels of education. It enables learners to master content and extend their investigations, become more self-directed, and assume greater control over their own learning. An information literate individual is able to:
- Determine the extent of information needed
- Access the needed information effectively and efficiently
- Evaluate information and its sources critically
- Incorporate selected information into one's knowledge base
- Use information effectively to accomplish a specific purpose
- Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally. (p. 2)

Essentially, librarians are trying to teach students how to learn effectively and efficiently, which is important for any student, but even more so for students in ES.

**Librarians’ Limited Opportunity to Contribute**

Although academic librarians are enthusiastic supporters of information literacy standards (e.g., *Association of College & Research Libraries, 2000; SCONUL Working Group on Information Literacy, 2011*), they often have limited access to students in a classroom environment and especially limited access to students in special curricular arrangements such as independent studies or undergraduate research experiences which, critical to this essay, tend to define the scholarship of engagement. Some institutions offer established library orientation programs for students; others do not. This lack of consistency leaves librarians in the difficult position of “selling” course instructors on the benefits of library instruction for them, their classes, and their students.

Teaching opportunities for librarians usually involve a single in-class session, typically to an introductory or lower division course, with little or no opportunity to reinforce or assess student learning with an assignment afterward or a course reading beforehand. For example, even in innovative research-based first-year seminars, the goal of “enhancing [students’] internet and library research skills” translates to a relatively straightforward single “lecture given by a reference librarian” (*Firmage, Tiegtenberg, & Cole, 2007, p. 89, 94*). The upshot is clear: The librarian is left to teach, as quickly as possible, the bare necessities of how to use their institution’s library system and if time permits, discuss the benefits of
scholarly journals and show students how to navigate a handful of specific online databases.

Mainly, librarian instruction is treated more as an occasional add-on to traditional courses than as routine engagement of the librarian in practical day-to-day situations involving information literacy (Smith, 2007). Additionally, these one-time teaching arrangements are typically scheduled around the needs of the course instructor, sometimes as overt “filler” for when they must be away from the classroom, for example, to attend an academic conference. With so many aspects of the instruction outside the librarian’s control, it can be difficult for librarians to have an impact on students. There is an implicit message that library skills are crucial on paper but are an add-on in practice, and that one visit from a librarian is sufficient for students to “get” information literacy. A tangible benefit of embedding partnerships is that the librarian can have a greater voice in how (and when) their efforts are utilized.

**Embedding as an Alternative**

Librarians are increasingly dissatisfied with this one-shot model of instruction (Mery, Newby, & Peng, 2012). As an alternative to business as usual, embedding librarians into seminars held in the library, as well as the classroom, would afford them the opportunity to impart information literacy to students at a far deeper level than what might be accomplished during a quick rundown of the library’s resources. Librarians can offer multiple, compounding lessons on the ethical consequences of plagiarism or the benefits and pitfalls of using crowd-sourced information hosted by sites like Wikipedia. After all, information literacy skills lace together nearly any lesson in the natural and social sciences, especially with regard to student research opportunities. The literature documents instances of librarians entering the classroom to teach entire credit courses themselves (Li, 2012); assisting subject faculty with assignment design (Kirkwood & Evans, 2012; Kobzina, 2010); and providing detailed, discipline-specific library instruction (Ferrer-Vinent & Carello, 2011).

There are those who advocate embedding both librarians and undergraduate research experiences into the college curriculum (Hagel, Horn, Owen, & Currie, 2012; Husic & Elgren, 2003). This solution benefits all parties. Librarians gain an opportunity to increase their student impact, students gain important skills in learning and research, and teaching faculty gain valuable partners in the ES enterprise. It is worth noting that the terms “undergraduate
research” (UR), “undergraduate research experience” (URE), and “mentored research” are used to describe a concept substantially similar to ES. Each of these terms can describe students, usually with faculty guidance, engaging in their own original research—experiments, archival research, mathematical investigations, and so on—with potentially publishable results (“About CUR,” 2011). Stamatoplos (2009) astutely observed that information literacy “either seems to be assumed or ignored” by teaching faculty in undergraduate research, noting the irony that undergraduate researchers “may have greater and more complex overall need for quality information and evaluative skills than the average student engaged in course-related activities” (p. 239). Smith (2007) argued that “efforts to teach and develop information skills should [also] be integrated throughout undergraduate programs” (p. 137), including but not limited to undergraduate research experiences.

A good model exists at the Massachusetts Institute of Technology, in its Terrascope first-year experience. Students are split into teams, and “a librarian [is] assigned to each team by a member of the MIT libraries,” where librarians are reportedly seen as “invaluable in identifying and locating resources that will be useful to the team” (Epstein, Bras, Hodges, & Lipson, 2007, p. 71). Additionally,

in the class [librarians] also play a strong role in helping students evaluate the text that will ultimately appear in their… [projects, and]… [l]ibrarians review these drafts and identify problems in sourcing; in some cases they also review some of the source material themselves to ensure that students have interpreted it accurately. (p. 71)

Another example worth considering is a web-based information literacy unit developed at Royal Roads University Library for master of business administration students learning online; according to McFarland and Chandler (2002), “success” depended on the “collaboration of librarians with business school and instructional design staff” (p. 115). For librarians interested in embedding in academic activities associated with ES, Hoffman and Ramin (2010) provided a set of purported best practices. Also on library engagement more generally, see Thomas’s (2013) programmatic and colorfully titled work “Getting in Bed With Our Customers: How Did We Embed Our Services to Push the Library Mission at Vaal University of Technology.”
Faculty Reluctance—A Barrier to Library Contributions?

Research on faculty working side by side with librarians is scarce, and support for understanding why faculty might be reluctant to do so is even more scarce. The matter, however, can be mapped out, and perhaps no scholar has reflected on this concern more than Stamatoplos (2009), who wrote:

Because independent undergraduate researchers generally operate outside the formal curriculum, they can fail to recognize the potential value of interaction with librarians. Though many such researchers likely use libraries and librarians to some degree during their work, the information aspects of their work would certainly improve with greater understanding and formal attention by librarians. Also, faculty members may not instinctively refer their research protégés to libraries or librarians in the same way they might in a course environment. They may feel fully competent to manage their research students’ information and library skills alone, while being themselves unaware of the assistance and value a librarian can bring to the collaborative research process and the student’s knowledge of information resources. As for librarians, since such research is largely separate from coursework, it can be practically invisible because their focus is on supporting the formal curriculum. Therefore, they may exclude it from formal library services or programming and unintentionally neglect or underserve undergraduate researchers. Libraries may currently serve the undergraduate research community incidentally through existing services; however, this is too important an area not to consider and target it specifically when appropriate. (p. 239)

Although it is not possible to make strong concluding remarks based on this quote alone, it does not appear that faculty are actively avoiding the aid of librarians in the conduct of ES. This is a two-way street. Librarians need to make their services and willingness known to ES faculty; ES faculty need to reach out—when and where appropriate—to their library support.
Conclusion

In this reflective essay, the authors, a sociology professor and a librarian, began by drawing attention to the limited role of librarians in ES through a literature review, which was then juxtaposed with a recent trend in library science referred to as EL. Librarians often have limited access to students in a classroom environment and especially limited access to students in special curricular arrangements such as independent studies or undergraduate research experiences, which, critical to this essay, tend to define the scholarship of engagement. Using examples from the EL literature primarily about undergraduate research experiences, the authors identify a viable role for librarians in ES, particularly in instances where enhancing the “information literacy” of students, research assistants, or community members is a learning or research priority. In the end, they contend that the limited contribution of librarians does not result from conscious exclusion of librarians from ES projects by faculty. Instead, ES faculty might not know about the recent shift toward embedding librarians and what that might mean for ES; likewise, EL is so new even to library science that librarians might not have made their services and potential contributions known to ES faculty. Hence the utility of this essay for opening up such discussion.

References


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RESEARCH ARTICLES
Land-Grant Extension: Defining Public Good and Identifying Pitfalls in Evaluation

Christopher S. Collins

Abstract

Land-grant extension is an ongoing example of higher education outreach and community engagement. Population, food, climate, and geographic isolation all factor into the importance of producing and facilitating agricultural knowledge. This qualitative study took place in a geographically isolated region with potential food security issues to highlight the function and role of agricultural extension as a provider of public good. A key component of the study includes the limitation of evaluation methods in documenting extension as a public good.

Introduction

The flow of knowledge between researchers and practitioners is an essential component of higher education’s contribution to society. Researchers learn from practitioners, develop new forms of knowledge and innovation, and then extend the knowledge back into the practitioner community. Although knowledge extension occurs in many forms, agricultural extension represents the first type of extension utilized in U.S. higher education. The study for this article took place in the setting of agricultural extension work, which is a very broad category that includes a robust number of programs and topics. As a result, the terms extension, agricultural extension, and cooperative extension are used interchangeably. They are all meant to identify the work of connecting university-based research and service with the surrounding community. Land-grant agricultural extension is a crucial element in providing education for the agricultural sector, both formally and informally, and connecting research-based developments to farmers. Through agricultural extension, the development of land-grant institutions eroded the elitism of the ivory tower. With this erosion, universities were connected to food-producing communities in new and innovative ways and were recognized as providing broad public benefits.

For several decades, critical theorists have maintained an argument for the centrality of the university as a producer of public good through the performance of research and the exchange of critical perspectives (Marginson, 2007; Pusser, 2006; Slaughter & Rhoades, 2004).
Public good is generally defined as the well-being of society or a benefit thereunto. Articulating the centrality of the public good mission proves to be an easier task than understanding the degree to which the mission is being fulfilled. According to Bowen (1977),

The outcomes from research and public service cannot be measured with any precision, and so conclusions will inevitably be subjective and judgmental. It is possible, however, to describe these activities in some detail. Indeed, a mere recital of them strongly suggests they yield important benefits. (p. 291)

The results of this study reflect three guiding questions: (1) What is the perception among extension faculty and community partners regarding the purpose, function, and potential for public good of agricultural extension? (2) What role does evaluation and assessment play in a sector that was developed for broad public benefits (a notoriously difficult mission to measure)? (3) How is value understood and described as it relates to the impact of extension programs? The findings of the study include an in-depth description of the function, value, and perception of land-grant extension and the role it plays in producing public benefits. Furthermore, this article demonstrates the pressure to assess and evaluate the most crucial component of extension (public good), which is in fact difficult or even impossible to measure with precision.

Due to the difficulty of measuring public good, it is a challenge to frame higher education’s social impact in broad terms that validate collaboration and partnerships with other institutions and individuals. It is also a challenge for higher education institutions to act in accordance with a mission to serve society. Wider recognition of a narrative reflecting higher education’s support of public good has the potential to increase retrenchment in public support with implications for financial, political, educational, and civic sectors of higher education and society (Kezar, Chambers, & Burkhardt, 2005).

The agriculture sector, universities, and many other operations are faced with pressure to do more with less. Growing populations (which increase the need for food production) and increasingly scarce water resources have led to the phrase “produce more crop with less drop.” Funding reductions from state and federal sources are placing budgetary pressures on public land-grant universities. At the same time, all aspects of the university, including all forms of extension, are being asked to produce evidence to demonstrate
their value. The assessment movement is a reality for all aspects of the university, and especially for units with diverse sources of funding, like grants and guaranteed federal funds. This study considers the intersection of the public good mission and the pressure to evaluate and substantiate value.

Qualitative methods were used to examine the role and impact of agricultural extension as a public good in a state with high levels of food imports and to understand how partners in the community (typically farmers) and university faculty perceive the work of extension. Hawai‘i presents a potentially significant food security scenario, as 90% of the food in the state is imported. This situation makes Hawai‘i a good location for studying the intersection of land-grant extension, public good, and the ability to evaluate or measure public good.

The design of the study involved 52 individual interviews as well as 24 site visits to farms, extension offices, field days at demonstration farms, and other relevant locations. In an era of austerity, this study investigated whether evaluation methods effectively determine and communicate the broadest and deepest benefits of this historical mode of education. Although the parameters of this study focus on a particular model of extension, the findings may be useful for multiple modes of extension and university outreach that are focused on providing public benefits. Findings from the study are organized around the following themes: the perception and function of extension, evaluation, understanding value, and the future of extension. Collectively, these categories highlight the challenges facing extension as a component of the public land-grant university.

**Literature Review**

**Public Good**

The notion of public good(s) or contributions are contested and considered problematic, as the notion shares space with common good and public interests (Mansbridge, 1998; Pusser, 2002). Marginson (2012) distinguished between public goods (plural), public good (singular), and the public sphere. Public and private goods are objectivist economic terms, distinguished in character by Samuelson (1954). Whereas private goods are benefits accruing to an individual, public goods are free of exclusion and rivalry, which means they can be consumed by an infinite number of people without being depleted (e.g., clean air or comprehension
of a mathematical theory). Information and knowledge are public goods produced in higher education, the latter of which has been identified as an almost pure public form (Stiglitz, 1999). The notion of public goods is more closely associated with social rates of return (McMahon, 2009). For example, Plastina and Fulginiti (2012) estimated a 27% rate of return on public agricultural research in the 48 continental United States. The percentage is a return on investment in the form of publicly available goods.

Public good (singular) is more normative and collective in emphasis, a wide-ranging concept that is covered and maintained by various literatures (Calhoun, 1998). The singular public good is often linked to higher education as a process of democratization and human development (Marginson, 2012). For example, if higher education plays a role in promoting public good, it ought to be open, equal, and purposed for a larger community beyond colleges and universities. In the case of land-grant extension, a primary purpose is to serve the agriculture sector and the broader population that ultimately receives food from that sector.

Habermas (1989) located the public sphere as a forum and space for civil discourses—spaces where people meet, communicate, and form opinions on contemporary issues. Higher education has served as a medium for public transformation and a space for debate and contention (see broadly Rhoads, 1998). Pusser (2002, 2006) argued for continued attention to the preservation of the university as a public sphere, especially in the wake of political and economic forces that shape higher education. Increasingly restricted space for dialogue and open exchange of ideas are symptoms of deeper problems that undermine the potential social and cultural contributions of the university (Rhoads, 2011).

With limited ability to measure public good, the value of and any consensus around higher education as a public good occur in public perception, policy, and debate. Various conditions affect the degree to which public good and goods emerge in higher education (Marginson, 2012). Pusser (2002) identified the land-grant movement as an often-cited condition that promotes public good through public investment in higher education. Land-grant institutions widened the scope of university disciplines to perform research and apply its results, which led to a social contract for research (Feller, 2000; Pusser, 2006). With resources and a broad sanction from the federal government, a set of institutions began producing research for the common good and trained teachers, civil servants, engineers, and agronomists. However, the evaluation and perception of university connections to public good present a problematic nexus
and a central issue for the study of land-grant extension. Franz (2011, 2014) wrote extensively about the history and function of public good and the need to articulate its value. Although accountability, evaluation, and the political process are essential to public good, they constitute an imperfect apparatus for recognition. The difficulty associated with recognizing the collective benefits created in higher education (e.g., agricultural extension) can render them “invisible, undefended, and underfunded” (Marginson, 2012, p. 16).

Higher education institutions need a “larger purpose that underpins their existence” (Marginson, 2012, p. 8). Publicly owned institutions are more open to democratic policy involvement and are more likely to practice a collective approach (Marginson, 2007). Given that hierarchy and market competition tend to produce private goods and that public goods can be appropriated to private goods, the public nature of higher education is in question. There is an ongoing need to measure public benefits and to communicate the macro historical impact of higher education that has eluded a clear definition. Today, assessment and evaluation are the accepted approaches to measurement.

**Land-Grant Extension**

The Morrill Act of 1862 granted federal support to states in order to develop college curricula that included agricultural instruction. Over time, the state land-grant colleges and universities evolved into new types of universities. These institutions developed the ability to deliver practical instruction and services as promoted by populist and egalitarian advocates in the nation. A second Morrill Act was passed in 1890 to provide additional support and to include previously excluded populations.

The land-grant idea is connected to a shift in access from the privileged to the working class, a transformation in the curriculum from the liberal to the useful, and a reorientation in purpose from theoretical knowledge to applied knowledge. However, land-grant institutions have also produced unequal benefits along racial and rurally segregated lines. Funding inequities for Historically Black Colleges and Universities (HBCUs) have been extensively chronicled and criticized as the antithesis of the purpose of land-grant institutions (Berry, 1977; Collins, 2012; Hightower, 1973; McDowell, 2001).

The land-grant model flourished with its tripartite emphasis on instruction, research, and extension: the idea of making the production of knowledge created through research available to the
surrounding community. In 1914, the Smith-Lever Act created the Cooperative Extension Service. The act did not invent the idea of extension, as institutions that were given land grants in the 1862 and 1890 Morrill Acts began extension work soon after they were established. According to Hightower (1973), the extension movement was a reflection of a need to

> [t]ake the teachings of the college and the research of the experiment stations directly into the rural areas for the benefit of the people there... to go to people where they were, to help them solve problems they were facing in their work, in their homes and in their communities.

(p. 13–14)

In the field of agriculture, this movement consisted of applying the scientific approach to farming. Bogue and Aper (2000) noted that this new connection resulted in increased agricultural productivity. Extension implemented appropriately is an effective way to engage the community and fight rural poverty (Mayes, 1992).

Berry (1977) described the purpose of the land-grant institutions as one that combines agriculture and education to preserve the land and the people. There is a growing perception that land-grant institutions have abandoned their initial role of providing education to the working classes and connecting research and service to rural communities to instead serve the interests of agribusiness (Hightower, 1973; Young, 2001). Institutions that try to mirror elite research institutions and focus less on the diffusion of knowledge or cater to large businesses that provide significant funding are susceptible to critique. Even amid criticism and mission threats, the land-grant extension function is incredibly unique in the history of higher education and maintains the highest levels of knowledge diffusion and outreach of any college type in existence today.

The role of the land-grant institution is deeply connected to the ways in which postsecondary institutions can contribute to society. Marginson (2012) asked: What greater good would be lost if higher education ceased to exist? The answer lies in the connection to public purpose. Public good should tie universities into a larger process of democratization and human development and avoid “empty self-marketing claims about the social benefits of education or research with no attempts to define, identify, or measure the alleged benefits” (Marginson, 2012, p. 9).

According to McMahon (2009), the largest and most important social benefit of higher education emerges from the creation and
dissemination of new knowledge. Often, research results and new knowledge cannot be absorbed, utilized, or implemented without specific and extensive training. The impact of agricultural extension is a key component of the land-grant contribution to public good. However, this benefit is most often captured in macrolevel studies as opposed to program evaluation, as demonstrated in the following section, which also explores the centrality of extension.

**Evaluation and Assessment**

Agriculture is an avenue in which land-grant institutions promote economic growth. As a vocational sector, agriculture is the primary source of income for roughly 2.5 billion people in the developing world (FAO, 2003). The poorest half of the population benefits more from agricultural growth than any other economic sector (UN, 2008; World Bank, 2007). Despite macrolevel evidence for the impact of agriculture, there has been a decline in public spending on agriculture since 1980 (Akroyd & Smith, 2007).

Agricultural extension can positively contribute to the welfare of farmers and other people living in rural areas (Alston, Wyatt, Pardey, Marra, & Chan-Kang, 2000). Anderson (2007) noted that agricultural extension is a set of organizations and activities working to support engagement in agricultural production to “solve problems” and harness information and skill so that people can “improve their livelihoods” (p. 6). The central focus is to increase farmers’ productivity and income. Extension can increase the pace of knowledge and technology transfers and assist in improving farm management practices (Feder, Murgai, & Quizon, 2004). In addition, extension services are crucial components in the two-way information flow between farmers and scientists (Anderson, 2007).

The current economic condition in the United States, competing government bodies, increased privatization, and a negative political climate all present serious threats to the future of extension (Hoag, 2005; King & Boehlje, 2000), despite its impressive returns. For example, agricultural productivity increased about 2% per year in the latter half of the 20th century. Even without increasing inputs, output increased by 150% over this 50-year period (Hoag, 2005). Although this productivity was financed with tax revenue, the recognition of such high returns is sparse and disconnected from the assessment and evaluation movement.

Waddington, Snilsveit, White, and Anderson (2010) noted that rigorous impact evaluations of agricultural extension programs are infrequent. This infrequency is due to the complexity
of assessing interventions that include a wide range of factors that impact agricultural outcomes (e.g., climate/weather patterns, input and supply costs, market trends, and farmer aptitude). Alston et al. (2000) compiled a comprehensive review of the economic returns to agricultural research and development. Results of the analysis demonstrated an average rate of return of 47% for research and extension investments, with a higher rate for extension-only investments (80%). As with many extensive reviews, the methodology of the studies is wide-ranging, highlighting the difficulty of assessing influence for interventions with no comprehensive, collaborative framework or method.

In comparison to extensive rate of return analysis and meta-analysis, the institutional level of evaluation and assessment presents a more microlevel view of extension. Program-level evaluation is a determination of the extent to which programs achieve their goals and objectives. Program evaluation is also used to assess merit or worth. The idea of merit includes providing stakeholders (e.g., politicians, government officials, university officials, and community members) information that will contribute to evidence-based decisions about extension’s present and future status (Worthen, Sanders, & Fitzpatrick, 2004). In practice, Douglah (1998) noted that it is important for extension professionals to recognize the importance and complexity of program evaluation in a way that moves beyond postactivity surveys, but also involves asking questions about program design, how information is delivered to its intended audiences, and the extent to which the program is producing desired results. Given the attention placed on validating investments, public officials, donors, and administrators are expecting more formal program evaluations. Douglah (1998) noted, “The more resources (time, energy, money) you invest, and the more critical thinking processes you employ, the more formal, and consequently more credible, your evaluation will be” (p. 3).

The extension logic model includes the following components: (1) inputs: staff, money, and partners; (2) outputs: activities and participation; (3) outcomes: short-, medium-, and long-term changes in behavior or action that produce a change in results (Taylor-Powell, Jones, & Henert, 2003). The highest standard for assessment and evaluation is to be outcome-centered. The highest level of achievement for assessment and evaluation is to be outcomes-centered, as opposed to inputs- or outputs-centered. This standard, however, is the most difficult aspect of any evaluation, as it involves demonstrating a causal relationship between a program and a result.
Although the evaluations noted in the preceding paragraphs focus on extension, a variety of internal and external pressures are calling for evidence to “prove” the impact of investments in higher education programs. Legislatures and government agencies are increasingly observing institutional practices and then becoming involved in institutional decision making. This shift is true not only for extension, but in many programs and departments at higher education institutions. The larger issue at stake for extension is the distance between measurement tools and recognition of a contribution to public good.

**Methodology**

This qualitative study used qualitative tools to better understand the role and value of extension. Case studies are typically explored within specific parameters and help elucidate details of the site that may be applicable to other settings (Yin, 2003). This case is about agricultural extension in Hawai‘i, an isolated state that imports 90% of all food. Given Hawai‘i’s potential food security risk, the value of knowledge produced for the agricultural community is extremely relevant, making the island state an ideal setting for the study. In this setting, agricultural extension agents at the University of Hawai‘i at Mānoa (UHM) and farmers played the largest role in the knowledge exchange and were the primary participants in the study. On a global level, Hawai‘i may be a microcosm for examining the role of agricultural extension in places that are highly dependent on imports and therefore vulnerable to the adverse impact of natural disasters and economic instability of food prices. The methodological emphasis is on the voice of the participants, and the primary intent is for their words, descriptions, and frameworks to build a perspective on the role of extension, evaluation, and the essence of public good.

Given that perception and understanding are key elements of realized public good, the research questions are as follows: (1) What is the perception among extension faculty and community partners regarding the purpose, function, and potential for public good of agricultural extension? (2) What role does evaluation and assessment play in a sector that was developed for broad public benefits? (3) How is value understood and described as it relates to the impact of extension programs? Given the first research question, the relationship between the university and the community through the role of extension in the life of farmers and growers was a large focus of this study. As a result, the participants in this study include both faculty and farmers. University faculty included
instructors, researchers, specialists, and extension agents. Each farmer quoted in the study has been involved in some way with extension services. This study was approved by the Institutional Review Board.

**Data Collection**

Using qualitative methods, a variety of sources of evidence were used (e.g., direct and participant observation, interviews, and document analysis). Over the course of 7 months, a total of 52 interviews were conducted at multiple locations. Thirty-six interviews were conducted with university faculty (agents, specialists, researchers, and instructors). All participants were asked open-ended questions about the nature of their work and the value of extension. Interviews were recorded (with permission) and transcribed verbatim. These interviews coincided with 14 visits to extension offices, field experiment stations, demonstration farms, and other relevant locations in every county of the state. Field activities included 10 farm visits, interviews with 16 growers, and conversations with another 10 growers at field day events at demonstration farms. Two of the farmer interviews were recorded (with permission) and transcribed verbatim. Recording was not feasible for the other interviews due to their settings. For example, speaking with many of the growers required on-the-farm activities like cleaning onions, pulling cabbage, or walking through fields. These farm visits were also considered participant observation. During the visits, handwritten notes and memos constituted the data collection method. Multiple visits to farms helped to establish rapport, and careful attention was given to respecting the busy lives of farmers. To better understand how participants construct reality and think about the topics presented, each interview was flexible in format. Each participant was assigned a coded designation (e.g., A1) to maintain anonymity.

**Analysis and Trustworthiness**

The data analysis procedure used in this study was cyclical in nature, as it was “organized chronologically, reviewed repeatedly, and continually coded” (Creswell, 2003, p. 203). Pattern analysis was utilized to identify major patterns within the findings and match them with predicted patterns (Yin, 2003) based on the frameworks mentioned in the literature review. These frameworks centered around the concept of public good as it relates to the role of extension and evaluation. All interview transcripts, field notes, and
memos were uploaded to a qualitative coding program (Atlas TI) to apply the consecutive rounds of coding and to organize the emergent patterns. The analysis involved “sorting out the structures of signification” (Geertz, 1973, p. 9).

Throughout the data collection and analysis process, various measures were used to ensure the trustworthiness of the findings from the perspective of the researcher as well as the perspectives of the participants. The first measure, triangulation, is evidenced in the multiple vantage points within the case study. Triangulation is the use of multiple theories, data sources, and methods to evaluate a phenomenon (Denzin, 1970). Denzin identified three types of data triangulation (time, space, and person), all of which were applied in this study. The central focus of the study was evaluated at different points in time, with participants holding different roles and perspectives, and in various geographic locations.

Finally, discrepant findings running counter to the themes are presented as part of the inductive analysis strategy. Faculty and farmers from various backgrounds typically provide perspectives that do not necessarily coalesce. The analysis included a search for discrepant responses. The presentation and discussion of contrary information adds an element of authenticity to this investigation and allows a better reflection of the complex reality of different perspectives.

Findings

Four dominant themes that are relevant to the research questions emerged in the interviews. The following sections cover the perspectives on the role and function of extension, evaluation/assessment, value, and the major challenges for agriculture and extension. Each theme represents the sentiments of faculty at UHM and farmers around the state. Thick, descriptive quotations are used to highlight each theme in the findings.

The Role and Function of Extension

Although university extension has a long and notable history (largely due to the land-grant legislation), the role of extension is often unclear. This absence of clarity exists not only in the public’s perception, but also within university communities. Public land-grant institutions’ connections with their original mission range from strong to vague, with the latter reflecting a focus more on the historical record than current institutional identity. Given that public good relies upon recognition, the lack of clarity about this
The role of a university is typically perceived as an environment where students obtain a degree that leads to more income and a better life (an individual return on investment). However, extension has such a strong community connection that it often exists outside the typical conception of the role of a university. When the role of extension is considered minor or is overlooked, the gap between the “academic world” and the “real world” is larger.

Extension agents and specialists characterized extension as a unique space that connects academic knowledge with practical purposes. One extension agent noted:

> The whole idea of extension is that there’s always information here at the university that people out there need. However, with so much information out there, people don’t always know what they want or need. So they have somebody that comes along and can actually just spell out for them or be able to analyze their problem.… I like it because it’s taking all of that research and actually putting it to good use.

Another agent said, “We translate scientific information into usable information for the general public and that’s a fairly unique service provided by cooperative extension.… Other state agencies do have people out in the field but they tend to be regulatory” (A1). Extension is a university-based service, funded by the public through tax revenue. However, as noted by the agent in the preceding quote, there is an important distinction between university extension and state agencies that have a regulatory function. Several farmers in this study noted how the extension agents actually helped them deal with what they described as “overbearing”
regulatory challenges that threatened their ability to function in a way of life that has very small financial margins. This benefit is yet another one that may be difficult to capture or categorize.

In terms of public good, both the generation and diffusion of knowledge are key claims for higher education (Marginson, 2012). Many universities are focused on harnessing knowledge for patenting and profit (Slaughter & Rhoades, 2004). Several of the faculty with extension duties noted that research products from public universities “should be in the public domain.” One extension agent observed, “We don’t sell knowledge—we are not crop consultants.” This approach fits within the notion that knowledge creation at public universities should be used for public good, as advocated by Marginson (2012) and Pusser, Kempner, Marginson, and Ordorika (2012). Slaughter and Rhoades (2004) described a public regime that stands in opposition to the academic capitalist regime. In the case of extension, funding is increasingly scarce for many projects and staff hiring. In the academic capitalist regime, diversifying revenue through patenting and privatizing is a rational response. However, given the history of diffusing knowledge from public universities, one extension agent explained:

I know we’ve been under pressure a lot to patent stuff. My own philosophy is I’m not going to patent anything. It is government money and my role has always been to transfer that information…. If it [patenting] becomes the job—I just can’t see myself doing it.

Another faculty member noted:

Every database we’ve ever produced, we have made available on the web for free…. I don’t care if they say it’s from us. It’s out there. It’s yours. That’s why we put it up on the website. It’s not hidden from anybody.

This sentiment reflects the majority response from faculty, demonstrating their opinion that the university operates within the public good framework. One discrepant response to the general public good regime approach of diffusing knowledge was the previous patenting of new conventionally developed varieties of taro, a meaningful crop to the native population. Following the patenting, farmers and natives protested until the patents were relinquished and any revenues were returned to the growers.
Food producers (including farmers, ranchers, and fishers) have to fulfill many roles in their line of work. One vegetable grower noted, “A farmer has to be an entomologist, know soils, and be a mechanic, plumber, marketer, an expert on land and water rights—a jack of all trades.” This need to be a “jack of all trades” was attributed to the small financial margins in food production and the inability to hire someone to complete a specialized task. Accordingly, the more farmers have to do, the more areas extension agents serve. One agent explained that what “a lot of people don’t realize is that we don’t specialize in one particular thing.” Although many have an emphasis on fruits, vegetables, landscape, or livestock, according to the same agent, “that is just where your emphasis is—you have to know how to do all the other stuff, be multifaceted and able to answer all of the questions, not just in one particular crop or another.” Field visits included accompanying agents for a day’s work, allowing observations of many of these multifaceted requirements. On one particular day, an agent visited a farmer’s home to consult about new crops to plant, then drove out to the farm for some observation, picked up items from an agricultural supply store that had been requested by participants in a beginning farmers program, evaluated pest damage on another farm, and collected soil samples from another farm. These experiences provided a brief but important insight into the varied work required of the agents and the connection to their constituents—an essential element in the overall description of the role of extension in public good (as indicated in the quote from Bowen, 1977 in the Introduction).

Limitations in Evaluation and Assessment

As noted in the literature review, evaluation and assessment is a key component of publicly funded programs—especially in education. When asking extension agents if and how they are required to measure their outcomes and evaluate their impact, they all said yes and affirmed the difficulty of executing this task. For example, one agent responded, “It’s really hard, because the growers also forget quickly. You solve their problems and they’re happy and then they have another one, right? Even if I solved that one, they are always spreading fires.”

Other agents noted that the complicated nature of evaluation is an ongoing issue and that as their personnel numbers are decreasing, the pressure to evaluate is increasing. Time spent evaluating also equates to time spent away from the field. Expertise in evaluation was also noted as an issue because outputs are often
being measured as opposed to outcomes: “How many journal articles did you produce? How many people did you contact? How many workshops did you put on? How many people showed up?” Only now are we, relatively speaking, starting to measure impact.” Ultimately, frustration or even confusion was evident. The descriptions from growers, community stakeholders, and extension personnel strongly indicated a diligent work ethic, transfers of knowledge, and receptive partners in the agricultural community. However, ultimately, there are shortcomings in finding ways to evaluate systems to prove what was happening:

The last three years have been difficult trying to qualify major deliverables…. The challenge is figuring out how many people adapted the technology. For example, I did a workshop Saturday for teachers who wanted to benefit from incorporating aquaponics in school gardens. So I gave a presentation to 50 teachers. I don’t know how many are going to adopt or utilize what information I gave them. I know how many people contact me. I do site visits. I gave the information to 50 people, but I don’t know how many people are going use it.

More methods of evaluation are becoming available, as evidenced by logic models and an increasing number of conferences to train evaluators and share ideas. A key point made by the extension agents (and noted in the literature) is that assessment requires both time and resources. There may be a law of diminishing returns in terms of how much expertise in evaluation should be required for programs that are already functioning in financially austere environments.

Evidence from the literature demonstrates that when adding a new technique, technology, or piece of knowledge to the growing environment, better practices should yield better results. The complications of attributing a growth in production, change in health benefits, or increase in income are extensive. An agent explained the difficulty in these terms:

It’s really hard because the growers aren’t willing to disclose financial information. It is hard to track even a change in knowledge. If you see them adopting some of the things that you’re recommending… I think I’d take that as a sign. If they didn’t see value in what we were doing they wouldn’t show up and they wouldn’t modify
the things that they’re currently doing unless there’s some increase in production or there’s some benefits to them that makes sense.

A change in behavior is a key sign of impact on outcomes, but formally documenting such a change remains difficult.

The issue of cause and effect further complicates measurements of change. Even if growers alter behavior, other third-party factors like farmer ingenuity and knowledge are not typically accounted for in evaluation logic models. In addition, there are considerations of immediate and long-term impacts. The longer the outcome is measured, the more difficult it is to capture and isolate cause and effect. An agent at UHM expressed confidence in extension’s influence and noted:

We believe we have no way of proving this; it has to do with the readiness of our clientele. People have the skills, so here is an anecdote. You might be 25 years old, a mother of three or four kids, single parent and in a domestic violence situation, you come to our class, our group sessions, and you do very well but you don’t use it but until five or six years down the line when you’re ready. If you have those skills, you can start budgeting and purchasing.

One purpose in evaluation is to be able to make evidence-based decisions and to avoid mistakes and repeat successes. However, the general feeling from those participating in the study is that the call to evaluate is complex, difficult, and may not actually capture the best aspects of extension services. This challenge is further explored in the next section on the theme of value. One discrepant response from the aversion to the requirement to evaluate was a small group of agents and one farmer who advocated that there must be some way to know what programs and forms of outreach are effective. Although crude, standard evaluation and logic models were considered by the minority of participants to be an imperfect but necessary tool.

**Value and Impact as Public Good Descriptors**

The question of value in terms of agricultural extension moves beyond the methods of evaluation. All food producers in the region deal with different challenges with respect to weather conditions, elevation, pests, and resource levels. Furthermore, farmers vary in
their experience levels and prior knowledge. When there is a new pest or problem, a new farmer, or a new technology or product to be introduced, extension has the largest impact. For example, one medium-sized aquaponic fruit producer noted that when they first started the project, they killed all of the crop twice and the fish once.

The plants were dying... I thought it was too hot in here [the greenhouse]. He [the extension agent] took samples and did tests and came back and said it was pythium and we were kind of like, “What the hell is that?” It is a root fungus that comes with the plants. If it is in the soil it is minor, but when it hit the water it just goes everywhere, so it was killing everything. So we were pulling our hair out. We killed the plants twice and he says you can put potassium silicate in it. We tried it and instantaneously there was no longer a problem.

This particular farmer was producing high-quality fruit, expanding to a third large greenhouse, and selling everything he grew. The farmer noted, “I do not know what we would have done without the extension services.”

A tea grower noted that tea is a relatively new crop for the region, and working with extension was a very collaborative “two-directional process” with lots of information sharing between extension and the farmers. Given the newness of tea, the transfer of knowledge was key when trying to generate an entirely new industry. The demonstration farm with tea, central location to coordinate the facilitation of knowledge, and increased collaboration created a new industry with greater ability to process and sell. A well-known medium-sized lettuce grower commented at length about how his view of extension changed as he saw the value emerge:

I have been farming all of my life and have been aware of the extension service for 35 years. There is a general feeling from other farmers that the extension service is not all that important. This is a negative feeling toward extension asking, “How do they know anything? After all, they don’t farm themselves.” I had this feeling at points in my life as well. The key to success is “learning after you think you have learned everything.” Today, my feeling about extension is very different; I now think it is
very essential to the success of agriculture. My negative feelings were because of the academic versus practical division. How could they help a practical farmer when the two worlds cannot mesh? I am a product of a new generation and see how critical extension is to offer an academic perspective, especially for farmers who did not get that kind of education or background. Extension is important as science advances.

The researchers asked the same grower how extension might be better, and he mentioned that it “depends on the client base” and expanded more on the valuable role agents play in the life of a farmer:

Utilizing extension services can help tackle a problem more quickly with more people working on it. Those who do not are missing out on a valuable resource—for whatever reason they are handicapping themselves. The labs, entomologists, and other things are a problem-solving department that enhances efficiency exponentially…. There are so many products now, if we can shorten the learning curve, that equals money. I hope others can see the value and importance of the future. When we have to produce more food on less ground with rising costs, it will be a challenge, and we need every advantage, which includes extension services.

This farmer’s extensive commentary highlights the role of perception among stakeholders as it relates to recognizing the value in extension services.

Many more examples of the value of extension emerged in this study, including the implementation of aquaponics programs in prisons and hospitals to engage prisoners and patients in a healthy and prosocial activity that created more sustainability for the institutions. There were multiple examples of extension agents demonstrating how a $25 soil test saved farmers a great deal of money by reducing fertilizer purchases. A demonstration at an experiment station addressed a new issue for tomatoes in the state. An extension agent described the purpose of the event:

New viruses and new diseases come in and we had to team up with some other researchers at UH and the specialists and come up with a plan ‘cause growers weren’t
able to produce tomatoes like they were I guess before the virus came in. So, there’s a team that works together on this tomato leaf curl virus and we contacted seed companies. We were able to bring in some seeds from the mainland, put a few trials in, and then turn around very quickly to have a field day so that growers were able to see that there were resistant varieties available and that they could modify their operations to combat this virus with some other resistant varieties in addition to their commercial type of operations. So, it’s a good partnership between the extension guys, the research guys, and then we also keep in communication with the statewide agent so that they know what we’re doing and so they can spread the word to their growers.

Tomato growers in attendance expressed their appreciation for the event and left with information and samples to take back to their farms. Other examples with high degrees of value where extension reached out to the community included health and diet promotions, home gardening programs, and other diverse services.

One discrepant response came from a farmer working on one of the larger organic farms in the region. The grower noted that too many extension agents exclusively work with large, conventional farms. In response to requests for assistance, the farmer indicated that a grant would need to be secured to initiate a project on his farm. This grower said, “How many times do we have to pay for this service? We pay for the institution through state taxes, the landgrant work through federal taxes, and now in order to do an experiment on my farm, there needs to be another source of funding?” Despite the complaint, the farmer worked very closely with and was supportive of an extension agent who dedicated his time to organic methods.

The value of extension is deeply connected to the idea of higher education as a public good that provides social benefits. For example, one extension specialist contrasted the nature of the public versus private model in relation to value:

[In] private models, you go get your own money, work on patents, and the focus on universities is to generate patents and generate products to run on.... The role of public institutions is to produce public research and address those questions that are going to impact the public life, quality of life, and things that private
industry is not going to address because there is not an immediate return on investment.... That is the role of public institution, public research, that’s why we exist. We’re supposed to do stuff that is potentially high impact with potentially low short-term returns, that’s what we’re here for.

Considering the function of agricultural extension to represent and contribute to public good, the specialist’s comparison to the role of the private sector is poignant. Perhaps the most valuable aspect of land-grant extension lies in its ability to provide something that other institutions will not provide.

**Challenges and the Future of Extension**

The previous theme leads into two related challenges: food security in the state and reductions in resources for the extension program. Food security for an isolated and heavily populated chain of islands is a tangible issue. According to food experts at UHM, 90% of the food in the state is imported. In the event of a crisis that prevented the importing of food, the state has only a 7-day food supply. As a result, the agriculture sector plays a major role in the balance of locally produced versus imported food. Extension agents work promoting new approaches for attracting more people to agriculture, especially in the midst of attrition among farmers:

Things keep changing as a farmer. There’s always these new pests, new chemicals to deal with the pests, new techniques, the laws change. All of these things, for a small farm in Hawai‘i, are overwhelming.... If you lose one or two crops in a season, that could be the end. The margins are too small and it makes it harder to survive as the costs of fuel and fertilizer go up and the profit margins go down.

Food production and security have much to do with economy of scale, according to one faculty member. Whenever it is less expensive to produce food somewhere else and ship it to the islands than it is to grow locally, consumers will favor the import. Until this cost difference shifts or a major crisis occurs, it is unlikely that the import balance will be altered. Nevertheless, extension personnel closely monitor the agricultural production capacity of the state and the potential challenges around food security, and food production is promoted. It is difficult to estimate the impact of a
service in light of a hypothetical crisis. However, the more pressing the issues of food security and local production become, the greater extension’s potential usefulness.

For extension to support these immense challenges, investment and resources are necessary. As noted in UHM annual reports and in interviews with faculty and farmers, with the reduction in funding, the number of personnel in the state has gone down. One faculty member noted:

The place of extension is something that has been especially called into question in the last few years. It’s one of these areas that when there are serious budget cuts, extension is kind of pushed to the forefront…. We’ve lost a lot of extension faculty and it has had some pretty dramatic effects on how we operate…. We are struggling to figure how to continue to serve clients who have come to depend on us in the past and reach out to new clientele, with changing demographics in the state and changing needs.

Six of the farmers in the study made note of the reduction in extension personnel. The farmers were able to cite how many people were working in the field 5 years ago, compared to how many are available now. Retirements have left unfilled positions, and faculty have taken on additional duties. Many specialists divide their duties between research, extension, and instruction. One specialist echoed the response of several others: “My duties are 65% research, 15% extension, and 20% instruction, but in reality, it is chaos because extension requires 100% of my time.”

The last facet of the challenges presented involves the perception of extension by various constituencies, including university officials:

I would say a majority of the university does not know or understand extension very well, and sadly that includes many of our upper administrators. I think that’s probably a common complaint in most land-grants with a larger mission. Let’s face it, most people and most colleges here [UHM] do research in addition to instruction and then have some kind of service component as expectations of their faculty, but really nothing quite like extension.
Beyond the boundaries of the university, the recognition of the role, function, and value of extension is crucial. The social benefits that emerge from the land-grant mission and the university role in public good are fully realized only when public perception exists. This challenge is major—extension is a facet of the university that provides some of the highest returns on investment but is often underappreciated and faces major funding reductions.

**Discussion**

In response to the research questions, the collective responses from extension faculty and farmers indicate that there is a nexus among the issues of perception, purpose, and public good. Assessment and the notion of value further complicate the state of land-grant extension in public higher education. There is a conceptual mismatch between the original mission of extension and the highly prescribed evaluation methods that attempt to measure the impact and value of this long-standing public good function. Measuring a function with a limited tool can produce detrimental results for universities and their programs. Consider the narrowly focused rates of return analysis used by the World Bank to measure higher education in developing countries (Collins, 2011) and the subsequent acknowledgment of its failure to capture the impact of broader benefits (TFHES, 2000). Funds had already been cut, and universities were saddled with massive challenges by the time policy makers acknowledged and reversed the economically uninformed analysis.

The extension agents’ observations about the perception and understanding of extension demonstrate a problem in the recognition of this public-oriented university service. The pressure to evaluate extension programs with narrow tools may exacerbate this problem and contribute to a greater disconnect from realized public good. The pressure was also reflected in comments from extension agents. However, most of the farmers involved with extension described, in detail, the ways in which they value and have benefited from agricultural extension. In turn, they are able to continue with local food production in a state that imports a vast majority of food. As opposed to a mere recital of the significant benefits, this analysis demonstrates an important disconnect for an increasingly pressed aspect of higher education. Decreased funding, staffing, and programs, and increased pressure to evaluate and assess impact with tools that ultimately do not capture the greatest public good is likely a looming quagmire for the progress of this historic university offering.
One hazard in the requirement to assess and evaluate is the time it takes away from performing extension and service work. Evaluation at its best can lead to smart investments of time and energy. It can help identify techniques, approaches, and areas that are most effective and others that are not working. At worst, evaluation can take significant time away from completing extension work, to the extent that the pool of evidence to evaluate decreases. The law of diminishing returns applies to extension and evaluation. Complexities in this regard can provide some caution against quickly implementing extensive evaluation systems. However, the push to evaluate is often related to funding. Threats to funding increase the pressure to adopt evaluation methods, even in the absence of evidence that such methods produce reliable results. For example, if evaluation does not adequately assess the monetary benefits achieved (as ultimately intended) or becomes another financial burden, then funding may decrease. Decreases in funding will push departments to seek funding from other places, notably the private sector. Increased influence from the private sector can drive the focus of extension away from the public benefits of higher education. The primary pitfall in evaluation is the inability to capture the public good component of extension, which is likely the most valuable aspect of the service. The degree to which evaluation should be considered useful in the future should reflect its ability to capture the public good components of extension.

Conclusion and Future Research

The history of extension demonstrates how land-grant institutions transformed the nature of higher education. The mission-based focus on breaking down the ivory tower and connecting research with practical application situates the university as a promoter of public good. Previous studies demonstrated that extension can indeed contribute to poverty reduction by diffusing new knowledge into communities that can benefit from new technology and techniques (Collins, 2011, 2012). Others have found that extension services contribute both public and social benefits (Alston et al., 2000). This study qualitatively demonstrated the impact and value of extension with several meaningful examples. Although food producers use extension at different levels and find the services to have varying degrees of utility, study participants indicated that knowledge diffusion enhanced the viability of food production. Its positive effect on food production capacity is exemplified by the accounts of assistance to new farmers with startup advice, solutions for dealing with pests and disease, and collaborative work
to produce knowledge about new crops for the region. In addition, faculty with extension-related duties demonstrated a strong dedication to the food-producing community and the public nature of knowledge produced at a public university. These narratives illustrate extension’s high value and contribution to the community. Although direct clientele are aware of this value, the degree to which the larger university community and the public are aware is questionable. Both the growers who place a great value on the service and the extension agents who are facing dwindling resources and support described their concern with this lack of awareness. On a global level, issues of food security highlight the state of Hawai‘i as an applicable case study for the importance of agricultural investment. If a natural disaster, an act of terrorism, or an economic crisis halted food imports, the state would have only a 7-day food supply. Investment in agriculture is critical to long-term food security, and the ability to prevent or alleviate a food crisis is at the core of public good. For universities, this investment should be at the forefront of the public engagement agenda.

Many of the educational and service units that are increasingly required to demonstrate their benefit or outcomes under the global assessment movement are overwhelmed with their core duties and are now faced with finding the time to assess. The role of assessment is important, but the transaction costs are high, and the validity of results is unknown. Future research could focus on the transaction costs of assessment and evaluation as well as the degree to which it captures the holistic value of the operation. Conducting a study on the public perception of higher education outreach and the degree to which public investments are seen as palatable would also make a significant contribution to the literature. Although studies have documented the difficulty in producing scholarship about public engagement (Peters et al., 2011), the most prominent barrier is legitimacy. Increased awareness and prevalence of publicly engaged scholarship and evaluation will aid in the substantiation of linking public good to the most prominent forms of educational outreach.

In the larger view of higher education, this particular case highlights issues that may also exist for other modes of extension (e.g., health care, sea grant, or space grant). The core of extension is related to the diffusion of knowledge for public good. In order to secure the support to offer such functions, outcomes must be documented. There is an inherent tension between the demand for accountability and the absence of reliable methods to demonstrate impact for public good. The gap between the intent and the ability to measure found in this case might be relevant to other programs
that exist to tie the university to public good. In theory, evaluation and assessment can be designed to capture information about any outcome articulated by the program; however, it is not simple to measure public good. Public good is not, and may never be, easily quantified and, according to some, can be assessed only by public opinion (Gutmann, 1987; Heyneman, 2012). The threat to sustained resources and funding in the absence of a recognized method of producing evidence about public benefits is the largest potential pitfall in the evaluation of university programs aimed at the public good. Potential reductions to higher education programs that generate the greatest social benefits are a threat to the public mission of universities and a misapplication of underdeveloped evaluation methods.

References


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A Grateful Recollecting: A Qualitative Study of the Long-Term Impact of Service-Learning on Graduates

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Abstract

Service-learning practitioners design community engagement activities to affect students in powerful and even transformative ways. This qualitative study explores the long-term impacts (3–16 years after graduation) of participation in a senior-level service-learning course. Through interviews with 20 randomly selected participants, the researchers explored whether and in what ways graduates continued to experience impacts from the course, including those that have become interwoven with other life experiences or have catalyzed altered perspectives and/or actions. Graduates were first asked to identify their most significant learning experiences in college in order to gauge the relative importance, if any, of the service-learning course in their college education. Then graduates were asked to recall their experiences in the course and to share what impacts those experiences had at the time and in the intervening years. Findings are discussed through the lens of transformational learning processes and outcomes.

Introduction

Service-learning practitioners operate with the intention of impacting students in powerful and even transformative ways through their engagement with community partners, and they ground programmatic decisions and pedagogical practices on this intention. Although many practitioners sense the power in service-learning while it is occurring—and may even have their own experiences of long-term impacts on both the personal and professional levels—the work of identifying and confirming long-term impacts on graduates has been a more challenging and nuanced task for researchers.

Over the course of the past several decades, increasing numbers of qualitative, quantitative, and mixed-methods studies have sought to identify the long-term outcomes of service-learning courses on college graduates. The current study adopts a fresh approach in qualitative method both to gauge the relative importance of one particular service-learning course within the full range of college learning experiences and to mine graduates’ recollections...
of that course for any long-term outcomes still being experienced up to 16 years after college completion.

**Literature Review**

**Long-Term Impact of Service-Learning**

Researchers have asked if the positive outcomes of students’ service-learning experiences in college have any lasting impact on graduates’ dispositions, attitudes, and behaviors (Billig & Furco, 2002) or subsequent civic life and community engagement (Astin et al., 2006). Quantitative studies suggest that college students who engaged in service-learning courses while in college were more likely to engage in community service after college (Astin et al., 2006; Astin, Sax, & Avalos, 1999; Fenzel & Peyrot, 2005; Wharchal & Ruiz, 2004). Graduates who participate in service during college may attach greater significance to prosocial values such as helping others in difficulty, promoting racial understanding (Astin et al., 1999), engaging in the community, and giving charitably (Astin et al., 2006). Graduates who participated in service-learning during college also reported that the experience helped them develop leadership, teamwork, and professional communication skills (Dvorak, Stewart, Hosni, Hawkey, & Nelson, 2011; MacFall, 2012; Newman & Hernandez, 2011). Service-learning courses that include reflection through writing and discussion are associated with more positive outcomes, not only during college (Astin, Vogelgesang, Ikeda, & Yee, 2000; Eyler & Giles, 1999; Mabry, 1998) but also years later (Astin et al., 2006; Fenzel & Peyrot, 2005).

Qualitative studies help us understand the significance and meaning that students ascribe to their service-learning course experiences (Polin & Keene, 2010). Although there are numerous qualitative explorations of the impact of service-learning courses during the experience or immediately afterward, studies exploring if and how course-embedded service-learning experiences continue to influence graduates years later are scarce. Kerrigan (2004) interviewed 20 graduates 3 years after they participated in a variety of required capstone courses in their senior year. Some graduates described how the experience had enhanced their communication and leadership skills, appreciation of diversity, and engagement in “border crossing” into new communities. Others gave examples of tangible professional skills that had contributed to their career development. Still others described a continuing sense of social responsibility and sustained volunteerism after graduation.
Laursen, Thiry, and Liston (2012) interviewed 24 alumni who had participated in a university-based K-12 science education outreach program 1 to 10 years after graduation. The majority of graduates described positive outcomes in personal development, career skills, teaching, communication, and management skills and reported enhancements of their understanding of educational issues within social contexts.

Graduates who completed immersive, international service-learning courses have also been interviewed years later. Kiely (2005) interviewed 22 graduates 1 to 8 years after they had participated in an international service-learning course that collaboratively organized community health clinics in Nicaragua. Thematic analysis revealed that each participant experienced one or more altered or new perspectives in the moral, intellectual, and/or spiritual domains. Bamber & Hankin (2011) interviewed 11 graduates 1 or more years after course-embedded international service-learning followed by local service-related activities. Of these graduates, 75% experienced altered or new perspectives, and 25% “were able to identify ways in which a transformed view of the world related to changes in their social action” (p. 201). Taken together, both the quantitative and qualitative studies indicate that service-learning courses in college can have a lasting impact on graduates’ perspectives, skills, and actions.

**Service-Learning Processes and Outcomes Through the Lens of Transformational Learning Theory**

Mezirow’s (1997; Mezirow & Associates, 2000) theory of transformational learning has been used to examine the learning processes and outcomes that can occur in immersive service-learning. Broadly, transformative learning involves educational experiences that change students’ frames of reference—that is, their ways of looking at and interpreting the world (Mezirow, 1997). Perspective transformation involves several nonsequential processes, including experiencing a disorienting dilemma, undergoing a critical assessment of assumptions, and eventually “re-integrati[ng] into one’s life on the basis of conditions dictated by one’s new perspective” (Mezirow & Associates, 2000, p. 22). The new or altered perspective transforms “our taken-for-granted frames of reference to make them more inclusive and open… so that they may generate beliefs and opinions that prove more true or justified to guide action” (p. 7–8).
Many caution that because individuals tend to ignore dissonance (Bamber & Hankin, 2011) and reject ideas that do not fit their preconceptions (Jones et al., 2012), service-learning courses do not necessarily lead to perspective transformation (Eyler & Giles, 1999), and altered frames of reference do not necessarily catalyze different actions (Bamber & Hankin, 2011). Further study of the long-term outcomes of service-learning is needed to better understand the connection among course experiences, shifts in perspective, and long-term developmental changes in views, skills, and/or actions.

In addition, a deeper understanding is needed to identify the course components that best embed processes resulting in lived experiences of immersion, dissonance, and reflection and how these may lead to transformative learning. In the study cited above, Kiely (2005) developed a transformative learning model for service-learning courses built upon Mezirow’s theory of perspective transformation. Kiely identified five learning processes that students experienced in an immersive international service-learning course: contextual border crossing, dissonance, personalizing, processing, and connecting. Jones et al. (2012) suggested that border crossing and dissonance in service-learning occur if a “constructive engagement with otherness” leads to a “deep lesson about connection across difference” (Jones et al., 2012, p. 203). Jones et al. (2012) and Nickols et al. (2013) have described learning processes similar or identical to those identified by Kiely (2005) in students during and immediately after immersive service-learning courses.

Qualitative research with graduates years after a service-learning course can shed light on what they experienced at the time and whether and how they believe these course-based experiences have subsequently influenced their perspectives and/or actions. Such research may further our understanding of the links between transformational learning experiences, new skills and perspectives, and the expression of these skills and perspectives through actions and other outcomes. Polin & Keene (2010) called for further qualitative research to understand “what students mean when they say service-learning experiences are transformational” and “what this means in their lives and to the way they made sense of their lives over time” (p. 23).

Researchers have offered several methodological cautions and suggestions for the qualitative study of service-learning. So as not to assume the presence of transformation, Jones et al. (2012) used open-ended interview questions to bring forth students’ own perceptions of their learning experiences. It is also important to ascertain, from the graduates’ perspectives, the significance of the
learning outcomes they describe (Chang, Chen, Huang, & Yuan, 2012). Finally, Bamber & Hankin (2011) noted the need to explore more deeply how graduates name and describe connections between new or altered perspectives and their subsequent actions.

**Purpose of the Study**

This study adds to and diversifies the growing literature examining the long-term impact of service-learning in three ways. First, in order to situate the possible impact of service-learning courses among the many learning experiences in college, the critical incident technique (Bycio & Allen, 2004) and critical event analysis (Bowie, Pope, & Lough, 2008) were modified for use at the start of the interview. Rather than beginning the interview with any reference to the service-learning course, graduates were asked to describe their three most significant learning experiences in college and the impact of those experiences since graduation. This allowed the researchers to explore the relative importance of service-learning among the many college experiences that graduates might recall.

Second, when graduates reported that service-learning had been an important experience, the interviewer explored more deeply how graduates now understand the change that occurred for them at the time and the aspects of the course that contributed to those outcomes. Third, when graduates described change that occurred immediately after the course, they were asked if that change had any subsequent impact in their lives and, if so, to provide examples. These course elements and the short- and long-term impacts students attributed to them were then examined through the lens of transformational learning processes and outcomes (Kiely, 2005).

**Description of the Immersive Service-Learning Course**

Portland State University has offered community-based and service-learning courses as an integral component of the undergraduate curriculum both in general education and across the disciplines for more than two decades. One of these courses is the General Education Capstone course, a senior-level service-learning course that completes students’ undergraduate general education requirements. In the capstone course, students participate in a six-credit service-learning course organized around a particular content area and partnering with one or more community entities. Learning objectives in each Capstone connect both to the content
of each distinct course and to the larger goals of the university’s general education program (communication, critical thinking, appreciation of the diversity of the human experience, and social and ethical responsibility). Most students may choose a Capstone in any area of interest within or outside their major, and many explore courses that will broaden their experiences and perspectives.

One of the first Capstone courses to be designed and offered—and the single longest-running Capstone at the university—is an immersive service-learning course called Learning From and About Persons With Significant Disabilities (LPSD) that is offered through a partnership between Portland State University and the Kiwanis Camp, Inc. of Portland, Oregon. The partnership was formed in 1972 as a practicum experience for teachers and in 1993 was expanded to support the Capstone course. The community partner and the university have a long-standing shared mission of continually evaluating and improving both the camp program for campers and the educational experience for college students. The university—community partner team carefully examines all student feedback each year and uses it to continually improve the course pedagogy. A cycle of continuous evaluation and improvement is critical in such intensive and immersive courses.

Since 1993, more than 3,000 students have completed LPSD. In the course, students prepare for and then spend 2 weeks as student-counselors for individuals with significant disabilities in an outdoor camp program. The majority of students who choose this course have never before formed a relationship with a person whom they perceive to be so “differently abled” from themselves. In the final reflections they complete for the course, many students have commented that the course was both one of the best and one of the most difficult things they had ever done, as they articulated the ways they accepted and met their responsibilities as student-counselors. On average, students completing more than 30 different undergraduate majors enroll each year. The university and the community partner have engaged in continuous evaluation and development over a period of more than 20 years to hone the learning and coaching strategies that allow the novice student-counselors to develop positive relationships with camper-participants while ensuring that student and camper needs are met.

Students prepare for their immersive direct-service experience through 3 days of training and engagement with readings. The intensive training session includes modules that increase disability awareness, develop counseling skills, address appropriate personal care and supporting communication techniques, teach strategies
for inspiring participation, and deepen capacities for effective relationship-building with camper-participants. Additionally, team-building activities help student-counselors form a community in which everyone supports each other to attain the camp’s central goal: to ensure that every camper-participant has a rich and enjoyable camp experience.

Students are organized into groups of eight student-counselors, who are coached and supervised by a counselor-supervisor (a master’s-level special educator) and an assistant counselor-supervisor. Each student becomes the counselor for one or two campers. The on-site faculty member checks in with each group and each student-counselor periodically, providing additional modeling, coaching, and problem-solving support as needed. All of the camp staff members have a dual role of providing the camp program for the camper-participants and being teachers and coaches for the student-counselors.

Reflection is woven through the course through small group discussions during the evening at camp and a pre- and postcourse written reflection paper. Students engage with readings in disability studies before attending camp, as they connect their lived experiences with both this theoretical material and their personal and professional goals. Reflection questions are grounded in the exploration of disability as a social construct (Ben-Moshe, Cory, Feldbaum, & Sagendorf, 2005) so that stereotypes regarding persons with disabilities are questioned rather than reinforced (Gent & Gurecka, 2001).

**Methodology**

**Design**

An interpretive qualitative research design (Maxwell, 2005) was selected to identify the main themes found within graduates’ recall of their learning experiences in the course and the later impact of those experiences in their lives. In order to situate the possible impact of this service-learning course under study among the many learning experiences in college, the critical incident technique (Bycio & Allen, 2004) and critical event analysis (Bowie, Pope, & Lough, 2008) were modified for use at the start of the interview, as described above.
Participants and Sampling

To ensure that the findings were representative of the experiences of the many students who completed the course, stratified random sampling was used to select participants, following the review and approval of the study by the university’s Institutional Review Board. Potential participants were identified within the university alumni database. As of 2013, over 3,000 graduates had completed LPSD, about 60% of whom were potential study participants because (a) they had given permission to be contacted by the university, and (b) their current contact information was available. The researchers’ goal was to interview 20 graduates from this pool, which previous studies of graduates’ experiences in service-learning courses suggested would be sufficient to reach saturation in the thematic analysis (Kerrigan, 2004). Stratified random sampling was used to identify 60 potential participants from three time periods (3–5, 6–10, and 11–16 years after course completion). Members of this pool were contacted until 20 participants had been recruited and had completed the scheduled phone interview.

Data Collection

Using the sampling strategy described, potential participants from each time period were randomly selected, called, and asked to participate in a 45-minute phone interview about their college experience. If a potential participant declined or could not be reached, the next randomly selected graduate was called. A thank-you in the form of a $20 gift card was issued to each participant after the interview. Interviews were audiotaped and transcribed for analysis.

Data Analysis

The researchers analyzed the data contained in the interview transcriptions according to the processes described by Creswell (1994). Each transcript was read independently by two researchers, who identified the predominant themes and coded the data according to these themes. Then, the two researchers met and compared the themes and coding of units of meaning in each transcript. Disagreements were discussed until consensus was reached. A third reader confirmed these themes through an independent analysis of the data. The team examined the themes for any connections between the findings and the transformative learning process and outcomes described by Kiely (2004, 2005) and others. The use of an audit trail, member checking during interviews, and debriefing
with colleagues enhanced the trustworthiness of the findings (Guba & Lincoln, 1989).

Findings

At the time of the interviews, four participants (20%) had completed the course 11–16 years prior to the study, eight (40%) had completed the course 6–10 years prior, and the remaining eight (40%) had completed the course 3–5 years prior. Eight participants self-identified as male and 12 as female. The participants had completed 18 different majors during college, from areas including business (25%), social sciences (20%), sciences (15%), fine arts or graphic design (15%), preeducation (15%), and speech and hearing sciences (10%).

Findings from the thematic analysis are organized into two main sections: (1) the significance of the service-learning course among learning experiences in college and (2) an overview of the findings related to the learning processes and outcomes. This overview subsumes descriptions of (a) the main themes related to the learning processes that occurred in the course and (b) the short- and long-term impact of the course on graduates’ perspectives, skills, and actions.

LPSD as a Significant Learning Experience

Of the 20 interviewees, 12 mentioned LPSD explicitly as one of their three most significant learning experiences in college. In other words, 60% of interviewees cited this service-learning course—which constituted six credits of the minimum of 180 required for graduation—as one of the three most significant learning experiences they had had as undergraduates. Of the eight interviewees who did not mention LPSD as one of their three most significant learning experiences, six made it clear that it had been a significant experience in response to the interviewer’s subsequent questions about their Capstone course. For example, one said, “[I]t was the most important experience of my life,” and four described it as a “fantastic” or “incredible” experience that had impacted their life since graduation. In all, 18 of the 20 interviewees—a full 90%—identified a service-learning course among their most significant learning experiences in their college education.
Findings Related to Learning Processes and Outcomes

When asked to recall and describe their course experiences, 85% (17 of 20) of the graduates reported, with great descriptive consistency, that they had followed an experiential arc during and after their time in LPSD, a trajectory that began in a disorienting dilemma, continued through a positive confrontation with “otherness,” developed into a recognition of difference and the need to modulate their interaction patterns to bridge those differences, and shifted into a heightened engagement with their own capacities as communicators such that they experienced a deeper understanding of and appreciation for human diversity. Interviewees repeatedly framed their learning experiences as “epiphanies,” describing, with piercing clarity, moments during the course that began in a frustrating attempt to connect with “the other” and ended with an undeniable connection having been established.

These moments of human-to-human engagement led to new and altered perspectives, skills, and/or actions. Specifically, 50% (10 of 20) of the graduates reported enhanced interpersonal and communication skills, 70% (14 of 20) described a deeper appreciation for human diversity related to dis/ability, 60% (12 of 20) described gaining a new perspective that human variation is typical rather than atypical, and 35% (7 of 20) described a newfound maturity and gratitude leading to a desire to serve. Examples and analysis of these data are provided in the next three sections.

The journey begins with a disorienting dilemma. A full 85% of graduates (17 of 20) reported that their journey began with an initial stage of extreme disorientation and discomfort. Since, as junior- and senior-level undergraduates, they were partnered with campers with relatively severe physical and cognitive disabilities and communicative challenges, there was no denying the differences that were present between LPSD student-counselors and camper-participants, and interviewees clearly remembered how grappling with these differences consumed them in the first few days of their immersion experience. Respondents repeatedly recalled these first days at camp as if they had taken place recently, instead of as much as 16 years before the interview. The fear of difference they described was deeply felt, and many interviewees emphasized that they had never engaged with persons with perceptible disabilities before this experience.
For example, one graduate, a marketing major as an undergraduate, admitted that his discomfort was so great in his first 24 hours at camp that he had wanted to leave:

We were assigned the kids who \textit{sic} we were supposed to work with for the first week of the 2-week program…. I have to admit, the kid I had, he was in a chair, and he had some disabilities where I had to work with him… in feeding him and in changing him and other sorts of basic activities…. [H]onestly, had I brought my own car there, I would have left…. [T]his is very shallow of me, [and]… I feel terrible admitting it, but I was like, “Gosh, I’m not cut out for this, I’m not this guy… I’m not this supportive.” It was the hardest thing I ever did…. But at the end of the week… it was probably the most rewarding thing I ever did, and I’m so much better for doing [it]…. It would have been so much easier for me to write a marketing plan, a business plan…. That would have been so much easier. That’s what I was trained in as a business major. Working with these kids at… [c]amp, it forced me to do things I would have never done.

In fact, several interviewees explicitly stated that they realized, upon reflection, that they had not previously considered persons with disabilities to be persons akin to themselves. This realization, painful as it was for many of the respondents, was also cited as deeply meaningful for their ongoing personal and professional growth postcollege.

Many respondents acknowledged the irony in having chosen this particular Capstone because it had seemed a fun and easy way to earn six credits. What they found instead was a profound engagement with their own fear and discomfort around difference, and the ways that engagement opened them up as human beings and allowed them to develop capacities they didn’t know they had.

\textbf{The epiphany: Being present and patient.} Graduates reported that they fundamentally had to change their typical fast-paced ways of being, doing, and communicating in order to connect with camper-participants. They couldn’t multitask, they couldn’t text, and they couldn’t juggle the multiple demands of their “normal” college life if they hoped to develop a relationship with the camper-participant they were responsible to for a week. From one moment to the next, they had to focus completely on communicating with
this particular human being in order to interpret the subtleties involved in addressing that person’s needs. Throughout the interviews, graduates overwhelmingly reported that they developed a new capacity for “patience” throughout their camp experience and that they have continued to use their enhanced ability to exhibit patience in both their personal and professional lives.

As one graduate emphatically stated, “I’ll repeat it again that patience was very, very dominant in terms of what I learned during my stay at [c]amp.” Another concurred, stating that his most important learning was

having patience both with myself and with other people. Things don’t often come fast, I think, when you’re working with that population, and we live in a society that is quick and here and now.… [I]t’s really hard sometimes to step back and have patience and to wait on things… especially with some of the people who have communication issues, to… try to figure out what they’re saying, instead of just making assumptions.

In addition to developing their abilities to be patient, graduates reported “being present” as a pivotal lesson in this course. In the following example, the marketing student quoted above remembered feeling that he would never be able to communicate with his camper, until a transformational moment occurred:

[T]he first two days, I have to admit… I was going, “I’m out of here, this is too hard, my guy can’t tell me when he’s hungry, he can’t tell me when he needs to be changed, he can’t even go swimming.”… But the third day… I’m feeding Tad, and all of a sudden, [he] reached out and grabbed my hand. And I was like, “He’s in there! Totally in there!” He’s telling me he wants more, and then he started interacting with me, and it was stuff that I was so, honestly, ignorant and naïve [about], right, it was subtleties in his face, because he couldn’t talk.… But then the third day I started to understand him, and I started to connect with him… [and] I was like, I like this guy!… [H]e knows I’m there, he knows I’ve got his back.… [W]e really connected on the third day.
This camper-participant reached out and touched the student-counselor, both literally and figuratively—in his own way demanding that the student see and be present to him. The interaction transformed both the student and the dynamic between student and camper.

Another graduate reported a similarly powerful moment:

There was a boy that had cerebral palsy that we took in a canoe. I was in the back, kind of holding him ... while his counselor... was in the front rowing.... I wasn't sure if he was really realizing that he was in the boat, and what was going on, because he was noncommunicative. And this bird, this eagle, started flying above us, and he was just tracking it with his eyes, and he got the biggest grin on his face. I was just like, wow, he is really taking in this moment, and he is able to experience this, and I know that something is registering.... It was just the most rewarding thing ever.

From an initial state of anticipation about a “fun and easy” Capstone course, to a disorienting confrontation with difference, to an experienced epiphany about the diverse ways that humans can connect to their world and each other, interviewees painted picture after picture of the ways they allowed themselves to be changed by the “live encounter” (to use Parker Palmer’s [2007] phrase) of their camp experience.

**Short- and long-term impact on perspectives, skills, and actions.** These learning experiences were associated with outcomes such as shifts in perspectives, development of skills and capacities, and the application of both through subsequent new actions. Eighty-five percent (17 of 20) of graduates described key ways their perspectives and/or skills had changed immediately after the course and went on to articulate and provide examples of how those changes had continued to impact their perspectives, approaches to life, and/or actions years later. Analysis of these outcomes revealed four main categories: enhanced skills for communication (50%); greater understanding and appreciation of human diversity (70%); nonjudgmental acceptance that human variation is typical, not atypical (60%); and newfound maturity and gratitude leading to a desire to serve (40%). Each of these four outcome categories is described below, with examples from the interview responses.

**Enhanced skills for communication.** Fifty percent of the graduates reported enhancing their communication skills as a result of
LPXD. Some reported recognizing the importance of listening and the expansion of this capacity through their interactions at camp, including learning to wait for another person to complete their thoughts and finish speaking, rather than assuming that they know what the other is going to say.

One graduate described a communication skill he learned and its importance to his work in a bank:

I learned a great deal about working with people…. I [am] now a lot more understanding and… willing to wait, because other people might not be at the same speed as I am… [I learned] that something important to one person might not be important to another…. I work in customer service, and this is actually pretty helpful sometimes.

Others reported that it was during LPSD that they learned not to make assumptions about people that preclude understanding, but instead to make sure that they have understood what another is saying:

One of the ways that [LPSD] has helped me… is… hearing people out, and… not making the assumption that… I got the full message, but really making sure that I did get the full message by trying to reinterpret … making sure that you’ve understood what they’ve communicated.

In addition to listening, graduates reported that they enhanced other nonverbal forms of communication through the particular opportunities that their work with persons with disabilities afforded them. Further, they recognized the importance of these nonverbal communication skills in their attempts at relationship-building with all persons. As one respondent noted,

I always make eye contact now, whereas I always stayed away from eye contact before…. I[’ve] found… you can reach anyone [through eye contact]…. I work at a clothing shelter every [week], and we do clothing drives for the homeless, and they’ll come to our door and ask for things like shoes and hats and gloves and sweat-shirts…. I find if you make eye contact… it just makes everything go more smoothly.
Respondents found this learning life-changing, as it not only allowed them to connect with camper-participants and peers in deeper ways than they had previously imagined, but it gave them both a skill and an awareness that they took with them after graduation. They stated that it changed their orientations toward their marriages, their families, their workplaces, their volunteering, and their daily exchanges with people in the world. Graduates gave examples of how they had continued to use their enhanced skills for communication in their work as a flight attendant, an accountant, a military officer, a social worker, and a teacher, and in the fields of customer relations, sales, and international marketing.

**Deeper understanding of and appreciation for human diversity.** Graduates’ reflections on their camp experiences made clear that LPSD enhanced their appreciation of the diversity of the human experience. Respondents learned about the population they were serving and came to value the gifts, abilities, and struggles of those persons. Graduates frequently described this course as their first encounter with persons with significant disabilities, and they articulated that and how they emerged from the experience with greater respect, compassion, and honoring toward persons with disabilities. In many ways, graduates understood the course as an immersion into a new cultural community, an opportunity for a border crossing of sorts, in which they engaged with persons they had never before encountered. They described the ways in which their “live encounters” with campers broke down the negative stereotypes and assumptions that had previously barred them from truly seeing and understanding persons with disabilities as persons similar to themselves. One graduate who framed the course in terms of a cultural border crossing stated,

> You build a friendship, and on top of that… it’s maybe a part of society you’ve never really touched on or been a part of. So it’s like you go into a foreign country, and meet an Italian person, [and] you get to know the culture. Similar in that sense.

Graduates also reported greater awareness of the social issues that surrounded these persons and their caregivers.

I think [the] impact of having someone in your life that has some sort of disability I never really understood before…. I was in charge of three kids for the entire week, and… it was really exhausting but also rewarding,
and it gives you so much respect for the parents who… take care of these kids 24/7…. [A]lso, [the campers] just impressed me so much. They were so smart! I was awed that I was able to get to know them… I definitely think before the experience… I was a little standoffish, it was kind of fear of the unknown, I didn't know quite how to interact with someone with a disability… [and] I realized that they’re smart and great people…. I still even e-mail with one of the girls that I had as a counselor there…. I think before I just didn't know what to think, or maybe made assumptions. There'd be people that would be in wheelchairs, and with cerebral palsy, and not even be able to speak, or not even be able to feed themselves, or go to the bathroom by themselves, but they could type out their thoughts… and they were funny and smart and completely with it. It just was kind of amazing to me… because once you actually open up and get to know the kids there, they’ll just blow you away.

Throughout the interviews, respondents confessed that, prior to the LPSD experience, they would have simply walked by persons with disabilities and not engaged with—or even really seen—them. As a result of the course, they now engage, and many reported having developed a deeper understanding of the human experience, a broader view of the world that could be gained only by having authentically engaged with a human being they had previously passed by.

The epiphanic moments they experienced at camp have generalized into changed behaviors in relation to persons with disabilities in their current lives:

I didn’t really know what to think of kids with disabilities [before]…. [I]f we were in a supermarket I might just walk by them and not say anything or notice them, but if we’re in a supermarket now and there’s a kid with disabilities and they’re smiling at me I’ll smile right back at them, and go up to them and say, “Hi, how are you doing?”

Not only does this graduate relate differently to persons with disabilities now, but she also may serve as a model for others shopping in the supermarket.
Graduates consistently remarked on how they gained an awareness of their chronic underestimation of persons with disabilities and how capable these persons were not only intellectually but also emotionally, relationally, and interpersonally. Interviewees reiterated that overcoming their assumptions changed them and that this change persisted over time. As one respondent noted, the course allowed students “to be with [persons with disabilities] in an experience outside of their home environment, outside of the school environment, outside of the day-to-day monotony routine experience, [and] you see their amazingness.” Again and again, interviewees spoke to their engaging in a process of overcoming previously held stereotypes and assumptions and how their doing so allowed them to meet the campers in their abilities, rather than in their disabilities.

These fresh perspectives also led to new ways of relating to and advocating for persons with disabilities when the opportunity presented itself. For example, during the course, students had learned how to communicate with persons with autism or physical disabilities who are nonverbal and use augmentative communication systems. Graduates working in service professions, such as a postal worker and a bookseller, described how, since LPSD, they have been able to communicate with their customers with disabilities who use various modes of communication. Another graduate spoke of how her experience with persons with autism made it possible for her to better support coworkers with children with autism and form a relationship with these children. A graduate who later became a college advisor described how her learning in the course made her more effective in supporting college students with disabilities. A graduate working as a mail carrier said that “when I come across persons with disabilities, I am more understanding of what they are dealing with, and I don’t treat them as a disabled person, just… as a human being… [who] maybe just needs a little more time.” Another respondent, who became an art teacher in a middle school, said:

I am a huge advocate for having all of the students that are in our building with disabilities in my classroom…. They are all welcome. Right now I have two students who don’t communicate at all, they are on feeding tubes, and they come in and some days it’s just for observation … looking around at what other kids are doing, and some days they [are] holding a paintbrush, or poking some clay… or help me pass out supplies, things like
that… I let the special education department know that they’re always welcome to enroll their students into my courses.… When you’re at [camp], you are thrown in with [children] with all different levels of disabilities… so it makes you… comfortable with all the situations.

**Nonjudgmental acceptance that human variation is typical/the norm.** Of the 70% (14 of 20) of graduates who reported gaining a deeper appreciation for human diversity, particularly in the realm of variable abilities, 12 went on to describe an even broader shift in their view of human variation in general. They said that immediately after the course and to this day, when they encounter a new individual, they “don’t judge a book by its cover” and they “try to understand where someone is coming from.” One graduate described how after the course, she no longer saw variations in how people do things or react to events as somehow negative or “less than” how others (who are perceived to be “normal”) act, and another realized that “everyone needs support sometimes, and that is okay.” These graduates began to view human variation in a new light, to see variation itself as typical rather than atypical. In this way, the graduates spoke to how they now expect to experience human variation and that this new awareness catalyzed a perspective shift that deepens their understanding of human diversity that creates, for them, a new norm.

Graduates went on to describe how they use this new perspective in their work, in their family relationships, and in the community. One said, “I try to be more accepting of everybody and try… to see what it would be like to walk in their shoes.” The graduate who now works as a college advisor noted that because she became aware of the consequences of prejudging people years ago during the LPSD course, she is more empathetic in her work with the diverse group of students she encounters today. Another graduate said that “when I am working with people or supervising them or engaged in customer service, I can’t assume I know where they are coming from. I need to give people some credit.”

An officer in the military said that the course experience contributed to his ability to lead because it allowed him to see for the first time that “everybody… [is] a bunch of grey shades.” After he became an officer and was charged with helping those under his command chart a career path, this insight gave him “more sensitivity to people in the army who might be passed over for certain positions.” He said that he is now “taking that [perspective] with me… as I enter medical school.”
A flight attendant described the ways her learning in the course offered her a fresh lens through which to approach situations:

I think it’s just having the awareness that you don’t necessarily know where someone’s coming from…. [N]ot assuming that you have a corner market [sic] on… why they are acting the way they are, because… it could be as simple as someone having a bad day, or as intense as their whole life…. How they are acting doesn’t necessarily have anything to do with you or what you are doing. So trying to meet them where they’re at and see where they are coming from and go from there.

A speech language therapist described what she learned and currently applies to her work this way: “It helped me to stop assuming the most negative thing, [to] broaden my horizons. Don’t assume a negative aspect; give people credit.” A social worker articulated what she gained from the course with these words:

It was a really good experience to develop skills for appreciation for what people can do when you think they can’t do anything… because the camp has everything a typical summer camp has… like horse riding and swimming, and at first I was thinking how is this gonna work? So many of them need help, like feeding [and] so many basic daily things that we take for granted … and then they all did it!

She then described how she applies this insight in her profession as a social worker:

You shouldn’t assume and you never know what someone can or can’t do…. [I learned about] being more open to letting people show me what they can do for themselves without me assuming that they need me to do something for them…. [That] doesn’t have to do with disabilities [alone, but has] to do with social work and things… in general. It’s easy to try and tell someone what to do instead of finding out what they want and meeting them where they’re at.

One particularly powerful example of a learning experience during the course leading to a new perspective and how that per-
spective was used later in the graduate’s life was expressed by this participant:

I [counseled] a 30-year-old autistic woman who was completely dependent on me [for personal care]... and it was extremely humbling. Had to do everything... When I first started, [I] couldn't believe I was having to do this with my time... Well, by the end of the week, I actually, for the first time since I was probably 5 years old, wet the bed at camp... I actually told my 30-year-old camper what had happened, and she gave me the biggest hug and said, “It’s okay, I wet the bed too”... I was so mortified that it happened to me, I didn't know who to tell, or what to do. But she just totally embraced me and said, “It’s okay”... That’s why I say it was the most amazing experience of my life. It just totally took me 360 [sic] to an adult. It was just amazing, overnight. ... I was so scared when it happened, but looking back, thank God that happened to me.... I have to say that was probably the ultimate moment, the one thing that I got out of my entire college career that I will never forget.... I would have paid a hundred thousand dollars just to have that experience happen to me, because it has meant so much on how I parent, on how I deal with my husband and my marriage, on how I deal with individuals at the church, at the clothes drive, my neighbors. ... Sometimes everybody needs to be taken care of. No matter how capable they are. No matter how stubborn, how strong-willed. Sometimes everybody needs to be told that it’s okay, no matter what.... Even if it’s [an] embarrassing thing, or the most awful thing... they just need to be told it’s okay... and sometimes that’s all it takes.

**Growth in maturity, confidence, and gratitude, leading to desire to serve.** Forty percent of the graduates described how the course experience helped them grow in maturity and confidence, shifting their perspectives about and/or approaches to life. One aspect of this shifted perspective was a newfound gratitude for their life circumstances and capabilities. These graduates described how they gained perspective and inspiration from the camper-participants. Graduates didn’t leave the camp simply feeling that they had served “the other,” but rather that they had been transformed...
A Grateful Recollecting: A Qualitative Study of the Long-Term Impact of Service-Learning on Graduates

by their encounters with another person and with themselves. As one graduate described it, “I felt I was getting a lot more than I was giving.”

Graduates reported that this shift in perspective and the overcoming of their initial fears provoked a clear sense of their gaining in maturity, as if they had reached a new milestone in life. Interviewees reported feeling more grounded as adults and more confident in their own abilities. One student remarked that the course, with its experiential, real-world context, prepared him for his professional life by reinforcing his sense of self-efficacy:

[Camp] showed you what you could do, what you could achieve even under really intense circumstances… [I]t shows you what you are capable of as a person, as a student, as an employee. [I]t pushed you to be something that you wouldn't necessarily have tried or accepted that you would have been able to do, if you had just jumped right into an employee-employer situation. So it kind of boosts your self-esteem, makes you realize how capable you really are as a contributing employee.

Another graduate recalled starting to think that “I can live my life better… to help other people.” Another reflected, “I grew as a person just from that experience.” Graduates wanted the interviewer to hear the importance of this in their lives, saying, for example, that the course “really opened my eyes and gave me a bigger perspective that I carry around what, 5 years after college?”

These graduates articulated that and how they developed a new kind of gratitude connected to this sense of perspective and maturity: for life, for their abilities, and for their opportunities to serve others. The confluence of these factors provided the catalyst to a powerful takeaway from the experience for these graduates: a desire to serve in the future, based in their newfound perspective and gratitude for the facts of their lives and the deepening maturity that turns their attention to the needs of others in their communities. One graduate described it this way: “It’s like you go into a foreign country. It educates you, it makes you appreciate the life you have… it makes you want to be a better person… and it makes you want and need to give back.”

In many interviews, respondents reported looking up to role models that they saw volunteering at the camp, and they expressed a desire and a commitment to serve others through their own volunteering. Many of the interviewees admitted that prior to
LPSD, they had not engaged in service to their community, and they reported that the course allowed them to find a way to engage in the community and develop a positive attitude toward service. One graduate, who had named LPSD as one of his most significant learning experiences in college, said,

> It was pretty impressive working with the community, getting the opportunity to actually volunteer, and [make] my impact outside of the University…. I found [the course] to be an outstanding interaction. Prior to that I really hadn’t had a lot of interaction with the community, volunteering and stuff like that. So I would say [it was] really significant.

This graduate was continuing to volunteer actively in the community 5 years after completing the course.

The example of other volunteers at camp (who were directly volunteering and not engaging in the experience for course credit) was highly motivating for many of the respondents, who explained how volunteers at the camp inspired them to consider how they might continue to be of service in the future.

> I would say it’s definitely been really neat to volunteer, [and] it pushed me into doing different volunteer activities…. I definitely wanted to volunteer after seeing all of the people that were up there, that weren’t doing this for their Capstone, that were just doing it to volunteer because, you know, they loved it so much. It definitely opened my eyes, and I thought, “What could I do that I would love this much?”

These graduates remarked that one of the most important impacts of LPSD for them was that it instilled a desire to engage in future service. One business major now working in marketing described how after graduation, he sought out and became a basketball coach with Special Olympics. Instead of focusing on, in his words, “what I’m going to buy next or what’s on TV” on weekends, he is doing something “really important to me.” He recalls that before the course, he didn’t look down on people with disabilities; he just never really looked at them at all. Now, in his relationship with the athletes on the team, he increasingly appreciates their personalities and their “capability… for affection and friendship” that enriches his life. He noted that the athletes on the team truly care
about him, not just who he is in relation to his work status and income, and thus are very important people in his life.

These graduates clearly understood how deeply meaningful and influential their service experience in LPSD had been on multiple levels in their lives. Much like the student quoted above, who said that she “felt [she] was getting a lot more than [she] was giving,” another student summed up his experience by saying, “I didn’t know that the person who benefits the most from service is me.”

Limitations

One limitation of the study involved the difficulty in contacting an equal number of graduates from each time period sought (3–5, 6–10, and 11–16 years after course completion). Since the university’s alumni database contained accurate contact information for significantly fewer of the graduates from the 11–16 years postcourse time frame, only four of the 20 interviewees represented graduates from this period. In addition, because this research focuses on a qualitative study of one course with its particular features and context, findings from this study may have limited generalizability to other service-learning courses at the most concrete level of shared best curricular practices.

Implications and Conclusion

One way the current study adds to the small number of qualitative studies on the long-term impacts of service-learning is by using methods recommended by previous researchers to address gaps in knowledge. Open-ended interviewing with time for interviewees to fully reflect and describe seemed to reveal connections between learning experiences, shifts in perspectives, and actions. In addition, the methodological choice to begin the interviews with a broad question about students’ most significant learning experiences in college proved useful for establishing the importance of the long-term impact graduates ascribed to this undergraduate service-learning course.

Graduates described their learning experiences during the LPSD course that reflect components of Kiely’s (2005) transformational learning model of service-learning. Graduates’ accounts reflect border crossing and the experiencing of dissonance as they realized they would need to be patient and present in order to establish communication with camper-participants. The ensuing relationship that formed was a “constructive engagement with oth-
erness” in which a “deep lesson about connection across difference was learned” (Parks Daloz, 2000, p. 110).

Through the experiential arc described, in which the camper-participants with significant disabilities were clearly the true faculty for the course, students experienced epiphanic learning moments that they believed were responsible for new skills and perspectives that had been affirmed in importance to them in the years since the course. The significance of these outcomes from a service-learning course for graduates was underscored by the fact that, when asked about their most significant learning experiences in college at the start of the interview, the majority of graduates initially named this course, out of the countless experiences they had in college, of their own volition. These findings confirm the assertion that many important impacts of service-learning are formative and realized long after class is over (Polin & Keene, 2010), reinforcing the critical importance of longitudinal and follow-up research.

In addition, prior research has been mixed regarding graduates’ abilities to describe how their transformed perspectives led to actions later in life. For example, Bamber (2008) reported that during interviews, “students struggled to articulate ongoing learning that had taken place, resorting to statements such as ‘it’s difficult to explain’” (p. 53). Consequently, Bamber & Hankin (2011) reported that, whereas 75% of their participants made statements that revealed perspective transformation, only 25% reported any actions that resulted from this transformation. They concluded that this was “evidence of an action gap whereby students do not draw upon perspectives that have been transformed to guide action” (p. 200). In the present study, however, when graduates described new or altered skills or perspectives, they were readily able to provide examples of actions that had resulted from this change.

We offer two possible explanations for this difference in participant responses. Previous studies of the long-term impacts of service-learning (Bamber & Hankin, 2011; Kiely, 2005) have focused on immersive international service-learning courses and asked whether students’ experience of perspective transformation had spurred them to action in relation to inequity and social justice. The current study also examined the impact of an immersive course that involved border crossing, dissonance, and reflection. This study, in which the interviewer responded to graduates’ responses with integral probes intended to elicit deeply held beliefs, evidences how students’ constructive engagement with difference, and the learning catalyzed by this engagement with difference, resulted in a long-lasting, appreciable, and memorable accrual of skills and
perspective shifts. Transformed perspectives and actions for social justice are very important learning goals, but the findings from the current study suggest that other important long-term outcomes of service-learning courses for graduates can be uncovered through an open-ended interview approach and thematic analysis. Further, allowing graduates to speak for themselves and their experiences in ways that were central to this study revealed shifts in perspectives, skills, and approaches that, in at least some cases, very well could be called positive, justice-enhancing changes—whether the graduates themselves would use that framing or not.

Overall, the researchers found it striking that the graduates were able to look back years later and readily identify and fully describe specific moments during the course where they learned something of value to them and, more importantly, easily link that to their current approach to life and human interaction. It’s as if a brief but powerful learning experience expanded into something much broader and more significant over the course of time. This is noteworthy for service-learning researchers because some of the more life-permeating impacts of this pedagogy may be revealed years later and through an individual’s open-ended reflection at a point in the future when that transformative kernel has had time to interweave with and be applied to subsequent life experience.

Indeed, one of the most notable aspects of the interview process for the interviewer was the number of interviewees who explicitly thanked the interviewer for the opportunity to again reflect on—indeed, to recollect, or “re-collect”—their experiences in LPSD. These graduates reported gleaning new insights from this fresh remembering, and they indicated that the interview process reignited a direct engagement with their learnings from the class. For the researchers, one of the more poignant and powerful takeaways from this project has been the value of long-term qualitative studies not only for the insights provided to practitioners and future students in service-learning courses, but for the immediate positive benefits to interviewees, who may continue to learn from long-ago experiences through renewed reflection.

The methods used and data gathered in this study may also have implications for the broader study of the long-term influence of college on graduates, which is vital for the ongoing evaluation and improvement of curriculum and pedagogy in higher education generally. As a complement to quantitative follow-up surveys of graduates, open-ended interviews with a small random sample of graduates may reveal what graduates found to be most impacting about their college education, which may differ from what faculty
and administrators intended as learning objectives and outcomes. Understanding the experiences of graduates, articulated in their own words long after the completion of those experiences, may provide surprising and useful information for curriculum design, delivery, and evaluation on the one hand, and big-picture pedagogical and programmatic renewal on the other.

References


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Reconceptualizing Teacher Education Programs: Applying Dewey’s Theories to Service-Learning With Early Childhood Preservice Teachers

Vickie E. Lake, Christian Winterbottom, Elizabeth A. Ethridge, and Loreen Kelly

Abstract

Dewey’s concept of enabling children to explore based on their own interests has evolved into investigations and projects using methods of exploration, experimentation, and discovery—three tenets of service-learning. Using mixed methodology, the authors examined the implementation of service-learning in a teacher education program. A total of 155 preservice teachers participated in this study over a 5-year period. Results indicated that preservice teachers believed that their service-learning experiences provided a valuable contribution to the development of pedagogical skills, as well as fostering self-actualization and social-moral development. They also rated the importance of service-learning highly in pedagogical, self-actualization, and social-moral development.

Introduction

Although John Dewey certainly has a prominent position in the history of education, one might nonetheless ask what influence his works have in the 21st century. In the face of growing of technology, requirements that educators comply with standards imposed by high-stakes testing, and political infighting over strongly held opposing viewpoints in first-world countries, we believe that Dewey’s (1916) theory that children need concrete and experiential activities in order to create an awareness of how they can contribute to and change society for the better is more relevant today than ever before.

The overarching theme of Dewey’s framework was his profound belief in democracy. He had a sociological opinion of the world that was evident throughout his writings. Dewey repeatedly made the case that learning is a social, interactive process and therefore, educational institutions should be places in which social reform takes place. He also posited that students find learning meaningful and applicable when they are allowed to take part in their own learning through experience and interaction with the
Dewey asserted that education should go beyond the acquisition of content knowledge and focus on learning how to live as a contributing part of civil society while still a student. In fact, Dewey challenged teachers to cultivate students’ capacities for what they could do to improve the conditions of others in order to have a life worth living (Fishman & McCarthy, 2010). Service-learning may be a tool through which teachers and teacher educators can apply Dewey’s theories in their classrooms.

Teacher education, and more specifically early childhood education, has a long relationship with the teachings of John Dewey. To this day, teachers can thank Dewey for practical learning centers in the classroom such as the pretend center, which might be a home, a restaurant, or a grocery store depending on the focus of study (Dewey, 1971). In the more progressive early childhood classrooms and centers, there will be a woodworking area with actual tools such as hammers, saws, and screwdrivers for children to create and build with wood. Many Reggio Emilia-inspired classrooms draw heavily on Dewey by using natural materials for children to explore based on their own interests. Investigations and projects are often the methodology teachers use to structure such explorations, experimentations, and discoveries. Service-learning can act as a natural extension of such projects through a focus on age-appropriate activities, the child’s interests, and the community in which the child lives.

Service-learning is both a theory and a methodology. It is experiential education that occurs over a period of time and requires interaction between the preservice teacher (PST) and the community (Corporation for National & Community Service, n.d.). Experiential learning is effective because, as Dewey asserts, knowledge has to be applied, and situational knowledge is easier to recall. This requires reflective thinking and inquiry, which Dewey calls the scientific method (Giles & Eyler, 1994). Additionally, experiential learning is reflected in the Common Core State Standards (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010) that many states in the United States are currently implementing.

Furthermore, higher education is being asked to renew its historic commitment to service-learning by accepting a leadership role in addressing society’s increasing problems and in meeting growing human needs (Jacoby & Mutascio, 2010). Understanding that service-learning promotes high-quality learning, federal and state governments are encouraging schools and colleges to promote this strategy. Although extensive research has been performed
on service-learning in middle and high school, there is minimal research with early childhood PSTs, elementary students, and children in the early childhood grades. Therefore, it is critical to show early childhood PSTs what a powerful tool service-learning is to use with children. Specifically, well-designed service-learning that combines meaningful community service with curriculum-based learning enables teachers to meet the academic needs of young children in meaningful ways. To ensure that PSTs understand and can effectively implement service-learning, it should be integrated and modeled within early childhood teacher education programs.

The purpose of this article is to specifically focus on the implementation of service-learning in a teacher education program in which PSTs are exposed to experiential activities by planning, implementing, and participating in service-learning projects in the local community. The research questions that drive this study are (1) what degree of support and what level of importance do PSTs attribute to service-learning while they are working in the field as part of a teacher education program, and (2) how do Dewey’s theories of social-moral development, pedagogy, and self-actualization impact their teaching?

Service-Learning

Service-learning is defined as a teaching and learning method that connects meaningful community service with academic learning, personal growth, and civic responsibility (National Service-Learning Clearinghouse, 2013). More specifically, the Corporation for National and Community Service (CNCS, n.d.), a federally funded U.S. agency that supports the practice from pre-K through higher education, states that service-learning combines service to the community with student learning in a way that improves both the student and the community. Service-learning is a method whereby students learn and develop through active participation in thoughtfully organized service that is conducted in and meets the needs of communities. Additionally, it involves coordination of a preschool, elementary school, secondary school, institution of higher education, or community service program with the community; helps foster civic responsibility; is integrated into and enhances the academic curriculum of the students or the education components of the community service program in which the participants are enrolled; and provides structured time for students or participants to reflect on the service experience.
Service-learning is divided into four different approaches (Kaye, 2004; Lake & Jones, 2008, 2012). In direct service, the interaction is person-to-person or face-to-face. Examples include field trips to visit a retirement center or hospital and cross-grade tutoring or mentoring. Indirect service provides service to the community but not to an individual. Projects might include planting a garden, writing letters, or drawing cards for the troops. Creating awareness of public interest issues is the focus of advocacy service. Students might be involved in making and posting Do not litter signs for their playground. The last type of service-learning, research service, focuses on finding, gathering, and reporting information. When students produce a book after researching and interviewing people who performed heroic acts after a local disaster, they are involved in research service.

The type of service-learning used should always complement and extend the academic content as well as match the developmental needs of the students involved (Lake & Jones, 2012). For example, preschool and primary students should be involved in direct service-learning. As preoperational thinkers, these students benefit from concrete experiences that focus on only one dimension of an event. Direct service-learning has a greater impact on students if they have face-to-face contact, thus receiving immediate feedback. However, if young students participate in an indirect or advocacy service-learning project, the teacher needs to facilitate as many concrete experiences as she can in order for the students to obtain that direct feedback. As students become concrete and abstract thinkers, they can be involved in planning and implementing all four types of service-learning. Older students are more capable of classifying objects and events, asking and answering “what if” questions, and thinking abstractly.

Whichever type of service-learning is implemented, it should strive to meet all of the service-learning standards established by the National Youth Leadership Council and released in 2008:

- **Meaningful service**: Service-learning actively engages participants in meaningful and personally relevant service activities.
- **Link to curriculum**: Service-learning is intentionally used as an instructional strategy to meet learning goals or content standards.
- **Reflection**: Service-learning incorporates multiple challenging reflection activities that are ongoing and
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that prompt deep thinking and analysis about oneself and one’s relationship to society.

- **Diversity**: Service-learning promotes understanding of diversity and mutual respect among all participants.

- **Youth voice**: Service-learning provides youth with a strong voice in planning, implementing, and evaluating service-learning experiences with guidance from adults.

- **Partnerships**: Service-learning partnerships are collaborative, mutually beneficial, and address community needs.

- **Progress monitoring**: Service-learning engages participants in an ongoing process to assess the quality of implementation and progress toward meeting specified goals, and uses results for improvement and sustainability.

- **Duration and intensity**: Service-learning has sufficient duration and intensity to address community needs and meet specified outcomes. (p. 1-4)

Although the service-learning standards stress more student involvement with the content and community, the pendulum in education has swung away from active, hands-on learning toward more traditional approaches due to No Child Left Behind (NCLB, 2001). Faced with increasing pressures to improve test scores and provide more intensive early intervention, many schools have adopted more didactic curriculum materials and pedagogical approaches. Teachers are required to adhere to these mandated approaches even though the National Association for the Education of Young Children (NAEYC) considers them developmentally inappropriate (Copple & Bredekamp, 2009). However, some early childhood educators have resisted implementing what they believe are inappropriate practices and have continued to teach following Dewey’s (1916) belief that education should engage children and expand their experiences.

**Young Children and Service-Learning**

Dewey (1916) emphasized the importance of informal and experiential education and held the conviction that children should come to school to be in a community that provides them with guided experiences, real-life tasks, and challenges that pro-
mote their capacity to contribute to society. Dewey referred to learning from experience as *nature’s way of learning*. Drawing on his contribution, therefore, schools should provide opportunities for students to apply their learning in the community and the world at large. Opportunities for service-learning give children a way to become involved in the community while learning fundamental skills and meeting the core objectives of the curriculum.

Educators who resist the trend toward more traditional or didactic teaching methods may feel justified in following Dewey’s approach to learning. His approach is in agreement with instructional positions of such organizations as the National Council of Teachers of Mathematics (*NCTM*, 2000), the National Committee on Science Education (1996), the National Council of Teachers of English (*NCTE*, 2004), the National Council on Social Studies in the Schools (2010), the National Association of Elementary School Principals (n.d.), and the Association for Supervision and Curriculum Development (1989). These organizations call for a greater emphasis on active, hands-on learning; conceptual learning that leads to understanding along with acquisition of basic skills; meaningful, relevant learning experiences; interactive teaching and cooperative learning; and a broad range of relevant content integrated across traditional subject matter divisions (*Zemelman, Daniels, & Hyde*, 1998).

There are many persuasive reasons for using service-learning as pedagogy with young children. It is consistent with recommendations for best practices by NAEYC (*Copple & Bredekamp*, 2009). This organization highlights the importance of direct and meaningful experiences for children. Service-learning allows teachers to design instruction for young children in developmentally appropriate ways. Additionally, service-learning is a form of differentiated instruction and allows teachers to design curricula using methods such as thematic or content integration. Possibly the most compelling reason for using service-learning in the early childhood classroom is that it can strengthen student learning. Beyond supporting the teaching of academic subjects, service-learning also contributes toward broader school goals such as character education. Research shows that academic learning, social and moral development, civic skills, and character development are all supported when children engage in service-learning projects (*Lake & Jones*, 2012).

In his 1916 book *Democracy and Education*, Dewey outlined his theories of morals. He asserted that moral and social conduct are the same, a contention that supports service-learning since it is also based on interactions and experiences with others. Dewey also
said that moral behavior is determined by a set of values learned from lived experiences. Furthermore, Dewey believed that moral education in schools rests upon the values that children bring to the educational setting and that these values stem from the children’s study of their own environments and communities. However, he did not believe that schools could directly teach specific morals. He claimed that by defining and teaching morals, schools define morality too narrowly. Moral behaviors should be based directly on interactions with others and are as broad as each individual’s lived experiences. Thus, schools should relate morality to actual conditions and problems facing the community. They can do this by engaging in service-learning.

Preservice Teachers and Service-Learning

Although not a new phenomenon, service-learning has emerged as a praxeology (reflection and action done in conjunction with others) that has considerable potential to support and improve teacher education programs in the United States. Because PSTs are faced with increasing pressures to implement standardized tests and provide intensive intervention, they have also adopted more didactic curriculum materials and pedagogical approaches. This shift has been especially difficult for teachers who strive to use experiential or constructivist approaches as posited by Dewey. As an instructional strategy, service-learning allows teachers and teacher educators to meet the needs of students while teaching academic standards (Jacoby, 1996). In response to new 21st-century teaching standards and enhanced field experiences, PST education candidates at universities throughout the United States have become increasingly engaged in academic service-learning projects, which offer the opportunity to increase content mastery and reinforce pedagogical skills through authentic community experiences. In the last two decades, service-learning has gained recognition as an effective pedagogy for involving students of all ages in their communities and for strengthening links between the classroom and real-world settings (e.g., Freeman & Swick, 2003; Lake & Winterbottom, 2009; Taylor & Ballengee-Morris, 2004). Service-learning, therefore, reinforces Dewey’s (1902) notion that school should serve “as a thoroughly socialized affair in contact at all points with the flow of community life” (p. 4).

Instructors working with PSTs have long known the importance of building relationships and making connections with children, peers, families, and the local community. Service-learning enables teacher education programs to emphasize both content and
social skills, or as Dewey described, feelings and thought (Fishman & McCarthy, 2010), in ways that increase the learning potential of all PSTs. Through service-learning, students are challenged to grow as learners and citizens. At the university level, service-learning is an approach to action-learning that is grounded in community–university partnerships in which PSTs provide services that simultaneously address community-identified concerns and meet key learning objectives (Seifer, 1998).

Recent studies have highlighted the increasing effectiveness of service-learning as a pedagogy with PSTs (Lake & Jones, 2008, 2012; Vogel & Seifer, 2011), and many teacher education programs have already begun to fully integrate service-learning (e.g., Florida State University, University of Oklahoma, and Ohio State University) (Kezar, 2005; Lewis, 2004). The task of transferring the epistemology of learned coursework to the praxis of teaching presents a challenge for PSTs because they enter teacher education programs with well-established images of how to do school (Vacc & Bright, 1999). Subsequently, after a short time in the field, PSTs often fall back on cookie-cutter recipes used by their more experienced peers or even folkways learned from their own educational experiences (Faircloth & He, 2011). Therefore, teacher educators may find it challenging to provide PSTs with experiences designed to develop the necessary skill sets, encourage more active learning approaches, and incorporate the recent Common Core Standards. However, this is not a new challenge. Dewey explained to educators that even though they would face many distractions, they must always keep their focus on the higher purpose of education by asking themselves how they can help their students earn a living and create a worthwhile life (Fishman & McCarthy, 2010).

A poignant concern for most PSTs is that they approach the classroom with a lack of analytical insight into the nature of the learner (Faircloth & He, 2011). In order for PSTs to develop the acumen required to challenge the more didactic, traditional, or standardized test-driven approaches to teaching and apply insights originating from the works of Dewey, as well as other constructivist approaches to learning, a more effective way of integrating epistemology and praxis is clearly needed. A possible nexus could be between PSTs’ experiences with service-learning and developmentally appropriate pedagogy.

Few attempts have been made to integrate service-learning into early childhood teacher education programs (Lake & Jones, 2008). Given that constructivist, experiential, and integrated instructional practices strive to make learning meaningful for the individual
child, Lake and Jones (2008) believed that service-learning projects and activities should be integrated into the early childhood curriculum. They argued that PST education programs could implement a cascading model, which involves university instructors teaching service-learning pedagogy to the PSTs who are actively involved in service-learning in local schools and community. Consequently, the PSTs then teach service-learning to the children in their field placement classrooms via the implementation of service-learning projects. Subsequently, the children teach others about service-learning through their community efforts and projects. This model aligns itself with the national reform efforts that emphasize curriculum restructuring and seek to establish even closer links between all types of curriculum, instruction, and assessment.

Dewey (1916) believed that experiential learning would foster an awareness of how students could contribute to and change society. Integrating service-learning in teacher education programs would thus have a positive impact on PSTs. For example, Freeman and Swick (2001) found that service-learning created a greater commitment to teaching and a deeper ethic of care. Earlier studies found that there was an increase of multicultural teaching strategies and sensitivity to diversity and issues of tolerance (Beyer, 1997; Boyle-Baise, 1998; Swick, 1999; Tellez, Hlebowitsh, Cohen, & Norwood, 1995). Moreover, PSTs engaged in service-learning strengthen their moral development (Beyer, 1997); become more politically aware and active in community service (Donahue, 1999); show an increase in their compassion and concern for others (Porthoff et al., 2000); and increase their development of empathetic characteristics and individualistic skills including empathy, leadership, self and societal reflection, confidence, and professional practice (Chambers & Lavery, 2012; Crowther, Ferguson, & Hann, 2008). Chambers and Lavery (2012) further posited that participation in service-learning projects encourages PSTs to display empathy as a direct result of working, playing, and reflecting alongside people who are marginalized in their community. Service-learning is a strategy for “bringing people together, of doing away with the barriers of caste or class or race or type of experience that keep people from real communion with each other” (Dewey, 1902, p. 84).
Methodology

Program Overview

Imagine students at a university redesigning the landscape of the college grounds or a group of students working with the homeless community or collaborating with local farmers to bring healthier food to the lowest socioeconomic groups in the community. These are examples of activities related to service-learning that have been conducted by the PSTs in the last few years. Such activities exemplify Dewey’s (1916) concept of learning from experience—nature’s way of learning. Service-learning experiences help PSTs connect university curriculum with service projects that deal with real community needs in a hands-on way. Additionally, by implementing service-learning in the classroom, PSTs can meet the needs of all children when they enter their profession.

Over the past 5 years, a university teacher education program at a large research university in the southeastern United States has been collaborating with the local school district through service-learning. The structure of the program requires a large amount of time in field-based classrooms. In March of their sophomore year, approximately 60 to 80 PST candidates apply to the early childhood program; 30 applicants are selected and admitted to the program for the following fall semester. Once admitted, the PSTs’ classes are sequenced, and they travel together as a cohort for the next four semesters, or blocks, until graduation. The PSTs are made aware of their acceptance into a program that integrates academic content and service-learning using a cascading knowledge-of-practice model.

In a cascading knowledge-of-practice service-learning model, teacher educators teach service-learning pedagogy to the PSTs who are actively involved in using service-learning in local schools. The PSTs then teach service-learning to the students in their field placement classrooms via the implementation of service-learning projects. Subsequently, the students teach others about service-learning through their community efforts. The integrated cascading approach offers students an opportunity to learn in a way that is most natural to them, as opposed to a segmented approach stressing isolated skills and concepts (Verducci & Pope, 2001). This model aligns itself with the national reform efforts that emphasize curriculum restructuring and establishes even closer links between curriculum and community.
Participants and Procedures

The total number of PSTs consenting to participate in this study was 155. The authors obtained IRB approval in 2006 and annually renewed the project through appropriate university channels. Data used in this study included a service-learning questionnaire, service-learning reflection, and focus group interviews. The questionnaire consisted of 32 items designed to allow students to assess their service-learning experiences (questionnaire included below). For each item, students were asked to select “the response that BEST describes your experience.” Each statement was rated both in terms of level of agreement (4-point scale from Strongly Disagree to Strongly Agree) and level of importance (4-point scale ranging from Not to Very).

The original questionnaire, developed by Conville and Weintraub (n.d.) and adapted by Lake and Jones (2012), did not differentiate between potential categories distributed throughout. However, we believed that the questionnaire items generally fell into three distinct categories: pedagogical skill development, self-actualization, and social-moral development. To confirm this suspicion, two of the authors independently coded each of the 32 statements into one of these three categories. Our initial ratings exhibited an acceptable level of agreement (78%). Disagreements were resolved via discussion. Moreover, each of the composites was submitted to a reliability analysis where alpha scores of higher than .70 signified acceptable reliability. We chose this type of questionnaire in order to align the methodology with the best instrument to describe the phenomenon that we were exploring (Yin, 2009).

Each PST responded in writing to 11 questions that targeted the effectiveness of their project, concepts and skills taught, children’s academic and social benefits from participating in the project, how the project supported the state standards, and specific products of the projects. During the focus group interviews, PSTs were asked several open-ended questions regarding their field placement and service-learning.

Similar data analysis was used for the reflections and focus group interviews. The authors began with a starter list of codes (Miles & Huberman, 1994). Two of the authors independently read through the data to get a sense of what the PSTs were saying. The data was reread, and evidence to support pedagogical skill development, self-actualization, and social or moral development was identified. The authors shared those findings with each other, triangulated the data with the results in Table 1, and performed the
final analysis (Hatch, 2002). To protect confidentiality, pseudonyms were assigned to the PSTs.

**Service-Learning Questionnaire**

Each preservice teacher completed the questionnaire by marking the response that best described their experience. Each statement was rated both in terms of level of agreement (4-point scale from *Strongly Disagree* to *Strongly Agree*) and level of importance (4-point scale ranging from *Not* to *Very*)..

1. To gain skills and experience that would be valuable in my career.
2. To complement what I was learning in the classroom.
3. To learn about myself.
4. To volunteer my time to help people.
5. To make a difference in issues of local, national, and/or global importance.

**As a result of my involvement:**

6. I developed a better understanding of the concepts important to be effective in this experience.
7. I understand the connection between the themes I have studied in class and this experience.
8. I learned to apply principles from my courses to new situations.
9. I gained a better understanding of my values and personal attitudes.
10. I gained a better understanding of my strengths and weaknesses.
11. I gained more self-confidence.
12. I was able to assess my own assumptions about social, political, and/or economic issues.
13. I am more tolerant of people who have different backgrounds and lifestyles than me.
14. I can cope more effectively with stress and real-life difficulties.
15. I am able to learn, understand, and respect professional and/or business standards.

16. I am able to understand and appreciate different cultural norms.

17. I improved my written communication skills.

18. I improved my verbal communication skills.

19. I enhanced my ability to lead a group.

20. I further developed my capacity for independent learning.

21. I enhanced my ability to understand different points of view.

22. I can work more effectively as a team member.

23. I refined my ability to articulate new ideas.

24. I increased my capacity to make moral/ethical judgments.

25. I am better able to express dissenting opinions.

26. I learned appropriate ways to deal with conflict.

27. I will apply what I have learned to other settings.

28. I will remain more informed about local, national, and/or international issues.

29. I will engage others in identifying and proposing solutions concerning social, economic, or political issues.

30. I will work to become an activist for causes that are important to me.

31. I plan to use service-learning as a way of teaching in my future classrooms.

32. I plan to stay involved with service projects and activities in the future and work to involve my family and friends.
Table 1. Summary of Survey Results

<table>
<thead>
<tr>
<th>Item Categories</th>
<th>Descriptive Analyses</th>
<th>Test of Difference from Scale Midpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Pedagogical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreement (α = .79)</td>
<td>3.48</td>
<td>0.35</td>
</tr>
<tr>
<td>Importance (α = .87)</td>
<td>3.65</td>
<td>0.40</td>
</tr>
<tr>
<td>Self-Actualization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreement (α = .81)</td>
<td>3.31</td>
<td>0.41</td>
</tr>
<tr>
<td>Importance (α = .85)</td>
<td>3.60</td>
<td>0.44</td>
</tr>
<tr>
<td>Social/Moral Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreement (α = .87)</td>
<td>3.46</td>
<td>0.40</td>
</tr>
<tr>
<td>Importance (α = .89)</td>
<td>3.61</td>
<td>0.43</td>
</tr>
</tbody>
</table>

Note. Due to missing data for some participants, N ranges from 138 to 149 for these analyses.

Results and Discussion

The findings reflected how the PSTs assessed the degree of support that service-learning provided them and its level of importance to them while working in the field as part of a PST program. The main results are presented in Table 1. Each of the six item categories (agreement and importance ratings for the three response categories of pedagogical, self-actualization, and social-moral development) represents an averaged composite where higher numbers indicate more agreement or higher importance ratings. Items were coded such that 1 was the minimum score and 4 was the maximum score (hence, the scale midpoint was 2.5). Each of the six composites was submitted to a reliability analysis where alpha scores of higher than .70 signified acceptable reliability. As Table 1 indicates, each of the six composites was acceptably reliable. Table 1 also includes means and standard deviations for each of the item composites. In each case, average ratings were significantly above the midpoint, indicating that students, on average, believed that their service-learning experiences had a positive impact on the development of their pedagogical skills, improved their self-actualization, and heightened their awareness of social-moral issues.

Pedagogical Skill Development

In focus group interviews, many PSTs expressed that the service-learning projects were the highlight of their semester. When questioned further, they explained that the service-learning projects allowed them to implement early childhood pedagogy as they
had been taught in their teacher education courses. They discussed how they were able to integrate the curriculum and utilize active learning strategies, which were a departure from their regular classroom curriculum.

More specifically, the PSTs shared in their reflections information on knowledge and practices. They stated that their students learned during the hands-on activities and that those activities brought meaning to the learning. For example, Olivia said of the gardening project, “The students benefited from the project by learning and seeing what a flower looks like, what it needs to grow, etc.” Another PST mentioned that the daily watering and maintaining the garden helped keep the knowledge and experience “fresh in their minds” (Maxi). Other PSTs used the idea of pollution with information on specific animals to further their students’ knowledge. They became aware of the environment and how the environment affects the animals that live there. One PST stated, “They have learned what the word endangered means and that the sharks could eventually be endangered if the ocean stays polluted.”

Using appropriate skills, such as communicating through writing letters, was another way that the PSTs taught content through service-learning projects. Jennifer noted how the “letters reinforced what the students learned about manatees throughout the week.” Vocabulary building was another skill that was developed through these service-learning projects: “A lot of the terms used like recycling, endangered species, and habitat were new to them” (Eileen). Each project had its own set of new vocabulary items on such topics as military terms, life cycle of the alligator, and community awareness.

These projects were well-designed service-learning experiences that allowed the PSTs to meet the required academic standards of young children in meaningful ways. Each project reinforced nature’s way of learning by providing opportunities for the children to apply their learning to the community while meeting the fundamental skills and core objectives of the curriculum (Dewey, 1916). Examples of service-learning projects that the PSTs used to enhance pedagogical skill development included gardening and letter writing. During these types of projects, the PSTs developed their ability to teach specific academic skills such as language and literacy, mathematics, science, and social studies.

**Gardening.** Through the gardening projects, the PSTs helped the children understand and participate in activities for the betterment of their community and school. These projects also helped
the children develop areas of sensory and motor skills by having them dig, plant, measure, nurture plants, and decorate planters for class or school beautification or so plants or flowers could be given away to others in need.

**Letter writing.** Letter-writing projects as a part of service-learning experiences included dictating, drawing, or writing cards and letters that engaged with different community members such as the troops, the farmers, the governor, the president, grandparents, and other children about content and knowledge learned in school. Both PSTs and students were involved equally through different mediums. For example, one child who had a visual impairment dictated her story into a tape recorder, and the teacher transferred her words onto her card.

**Social-Moral Development**

Because service-learning projects focus on a community need and include both academic and social objectives, the PSTs also discussed the benefits of teaching targeted social skills. They realized that it was more beneficial to be proactive and help children understand what was expected of them by modeling and teaching specific social skills than by reacting to negative behaviors when they occurred. PSTs also realized that as active learning increased, classroom management issues decreased. The specific teaching of social skills, along with active learning, created a more engaged environment with fewer discipline problems.

In their reflections, the PSTs noted a variety of social-moral skills taught or reinforced during the service-learning projects, such as working together cooperatively, helping others, encouraging, sharing, listening, empathizing, communicating, and responding appropriately to others. After a service-learning project on intergenerational relationships, Rae reported:

> Students were able to identify ways in which to help the community and explain why it is important to help others. Students talked about how proud they were to be able to help the community. We also discussed how they were able to share with the elders at the nursing home. The students were eager to do what they could on their own to help the community.

After a project on the potential dangers to animals of a polluted environment, Helen’s students
wanted to clean up our environment for the animals around our school ground. Some of the students used to throw their trash around the playground, and nobody would pick it up. Now the students look for litter to clean up instead of adding to the litter around the school and within our classroom. I realized that the students understand the importance of helping other people and animals. I feel that it is important to lend a hand to the community and teach students about it.

Abbie noticed that “the students are getting along more. The words ‘thank you’ have been used a lot more. I just see the students wanting to do nice things for each other.”

Dewey (1916) asserted that moral behavior is determined by a set of values learned from lived experiences that children bring to the educational setting and that stem from the children’s study of their own environments and communities. He believed that these behaviors should be based directly on interactions with others and that schools should relate morality to actual conditions and problems facing the community. The focus group interviews and PST reflections demonstrate service-learning’s ability to actualize Dewey’s vision of moral development. Examples of service-learning that the PSTs used to enhance social-moral development included working on endangered species and pollution and recycling projects.

**Endangered species.** During the implementation of the endangered species service-learning projects, the students learned about endangered animals, their habitats, reasons why animals are losing their homes, and what they could do about it. This was another way that the PSTs and the students were able to be involved with helping raise their community’s awareness. These projects allowed learners to be involved through a variety of modalities: making posters about the benefits of bats; drawing pictures; acting out the loss of the rainforest; using language to tell their schools, community, and families about sharks; and collecting food for the preservation of homeless cats and dogs.

**Pollution and recycling.** Both PSTs and students learned about the effects of pollution on humans and the earth while also studying recycling as a solution. These projects helped the students develop a consciousness of pollution and recycling within their own community as well as in their school. Through such hands-on activities as making classroom or school recycling bins, sorting recyclable materials, beach cleanup, sensory sorting, and
raising awareness via posters and school cleanup, all learners were involved with the project.

**Self-Actualization**

Teachers today are pressured to provide more traditional instructional approaches to the curriculum in addition to providing education that increases the students’ engagement and experiences (Zemelman et al., 1998). Most of the PSTs from this study stated that implementing their service-learning projects was the closest they had come to their vision of themselves as teachers. Instead of focusing on the traditional approach to teaching, active, hands-on learning was used in the service-learning projects. The PSTs described having fun with the children while learning was taking place, thus moving closer to self-actualization. They enjoyed watching the students become motivated and excited about the projects. “I have never seen students want to give up their recess in order to clean up trash, but every day we have filled up a paper bag with trash the students have found outside,” said one PST. Another PST remarked, “I feel that the service-learning project put fun back into school for them.” In regard to the learning that took place, another PST commented, “I think that it is a great way to teach content, standards, and social skills in an interactive and meaningful way. I could see how much the children enjoyed and learned from doing it when I was teaching.” To see what they have learned come to life helps boost their enthusiasm about the subject.

These service-learning projects exemplify the recommendations for best practices by NAEYC by providing active and meaningful experiences for children (Copple & Bredekamp, 2009). PSTs were allowed to design and implement instruction for young children using developmentally appropriate practices in lieu of the more traditional methods, thus engaging in praxeology that early childhood education holds as its standard. Examples of service-learning that the PSTs used to enhance self-actualization development included helping others who were not in a position to help themselves.

**Helping others.** The projects oriented toward helping others focused on food and clothing drives, children in hospitals, autism awareness, hurricane relief, and cancer awareness, and more. Through these projects, students and PSTs were exposed to people who had experienced an unfortunate circumstance, who were different from them in some way, or who had a need that these children could help with. These projects helped the students under-
stand what was happening in their community and in many cases, the PSTs learned about the differences of a child or children in their own classrooms.

As these projects from the three categories demonstrate, service-learning is based on real-life issues in which students and community partners collaborate to address and solve real problems and create transformations regarding the issues and the people involved. All parties—PSTs, students, and community members—benefited from the projects. Each project required the children to apply basic academic skills that are included in education standards. For example, many of the service-learning projects required both the PSTs and the students to engage in problem solving, collaboration, and perspective taking. The PSTs and the students had to utilize communication skills, extend their vocabulary, participate in shared research, read purposefully, refine and share knowledge through writing, speaking, and actions, build on others’ ideas, and articulate their own ideas. These are just a few of the standards that are addressed in Common Core for young children. What better way to learn academics than to apply them to real-life issues based on student interests?

**Conclusion**

This study examined service-learning with early childhood PSTs as an approach to learning, but it should be noted that service-learning can be effective for PSTs in any program. It can change PSTs’ approaches and views regarding disadvantaged people (Conner, 2010) because it helps them develop empathy and sensitivity to others (Chambers & Lavery, 2012) and to examine their preconceived ideas and stereotypes about those who are different from them. Service-learning experiences also help PSTs give attention to their thoughts and actions in order to become sensitive to the service recipients (Conner, 2010).

Service-learning provides PSTs, regardless of program area, with a pedagogy that meets the demands of a standards-driven educational system while still allowing children to participate in engaged meaningful learning that is concrete and experiential (Furco, 1996). It allows PSTs to apply what they have learned in their teacher education classes about experiential learning and appropriate practices.

The basic theory of service-learning is Dewey’s: the interaction of knowledge and skills with experience is key to learning. Students learn best not by reading the
Great Books in a closed room but by opening the doors and windows of experience. Learning starts with a problem and continues with the application of increasingly complex ideas and increasingly sophisticated skills to increasingly complicated problems. (Erlich, 1996, p. 11)

Service-learning experiences allow PSTs to grow both individually and professionally and help them to be change agents, thus moving closer to their ideal vision of themselves as teachers. Additionally, engaging in service-learning promotes leadership skills in children and PSTs and aids in the development of citizenship (Chambers & Lavery, 2012). It allows PSTs to experience the power that they can use, even through a small group's voice, to make changes in their community (Ethridge, 2006).

**Limitations and Future Research**

Service-learning is a methodology that requires educators, students, and community partners to work together for the benefit of all. This requires time, communication, and often branching out of one's comfort zone. There is no doubt that it is a time-consuming endeavor for everyone involved; however, the time invested is what makes it a meaningful learning experience. The field of early childhood education is in large part relationship-based and experiential; therefore, service-learning provides a way for early childhood teacher educators to actually practice what they teach.

A key area in which improvement needs to be made in the practice and research of service-learning is getting in-depth feedback from the community partners. Again, the amount of time it takes to obtain thoughtful, honest, critical feedback is a limitation that is often difficult to overcome. Future research could address this issue by stating the plan for assessment of the service-learning project upfront. Connecting the service-learning project to a grant that compensates community partners for their time might also be a way to address this issue.

The field of early childhood education would benefit from more examples of and research on direct service-learning projects. Children benefit greatly from face-to-face interactions with community partners. The opportunity for children to experience the environment of their community partners, such as assisted living centers, pet adoption agencies, and recycling centers, can make the learning experience even more concrete, engaging, and memorable. It is often difficult to arrange for direct service-learning projects.
due to transportation costs. Field trips within walking distance or applying for local education grants might be pipelines for achieving this goal.

In conclusion, there is no doubt that Dewey’s theories are still relevant in education today. Since Dewey’s time, society may have changed in ways beyond his imagination, but his focus on experiential learning, reflective thinking, and inquiry is in accord with the aims of education reform and the adoption of the Common Core State Standards *(National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010)*. Just as Dewey asserted that schools should establish an effective moral education environment by creating a genuine community life, service-learning can be the approach that connects his theory to practice. Teachers can combine the work and play of school through constructive, experiential, and active activities because they promote a constructive social-moral atmosphere. Service-learning will allow learning in school to be continuous with learning out of school, thus fulfilling Dewey’s vision of school and community working together to provide students with guided experiences, real-life tasks, and challenges that promote their capacity to contribute to society.

**References**


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Maximizing Future Potential in Physics and STEM: Evaluating a Summer Program Through a Partnership Between Science Outreach and Education Research

Zachary Constan and Justina Judy Spicer

Abstract

Global competitiveness of the United States is often suggested as a key outcome of developing a capable science, technology, engineering, and mathematics (STEM) workforce, a goal supported by many local, state, and national programs. Examining the effectiveness of such programs, however, may require assessment techniques that are outside their organizers’ expertise. The physicists conducting the physics outreach program in the current study partnered with education researchers at the same university to achieve a more thorough measure of program effectiveness while also demonstrating how such partnerships represent an opportunity to add rigor to current evaluation. The resulting analyses demonstrated that participants in the outreach program (a) were more likely than nonparticipants to pursue an education and career in STEM, (b) were able to define and execute plans to solidify a strong foundation for pursuing a career in STEM, and (c) persisted in pursuing education in STEM after high school graduation.

Introduction

Exposure to different types of careers can support students in developing a vision for their future and understanding the steps and choices necessary to achieve those careers (Hamilton & Hamilton, 2006; National Center for Education Statistics, 2011). However, many students may not successfully transition into their envisioned careers, especially professions in mathematics and science, despite being academically prepared. High school students who are unclear about their occupational futures may find that they over- or under-estimate the amount of education they will need for the type of work they wish to pursue and lack a strategic plan for accomplishing their goals (Csikszentmihalyi & Schneider, 2000; Sabates, Harris, & Staff, 2011; Schneider & Stevenson, 1999). Students may also lack role models and experiences that impart the knowledge and strategies needed to transition from high school to postsecondary education and to realize their career ambitions (Rosenbaum, 2001).
The years in which adolescents transition from high school to postsecondary education are particularly critical for developing ambitions and academically preparing for educational and occupational futures in the fields of science, technology, engineering, and mathematics (STEM). Several key policy reports in the United States have called for significant steps to increase the national STEM labor force (National Academies, 2010; National Science Board, 2010), and several initiatives and reforms are being implemented from preschool to college to encourage and inform students about opportunities in STEM. The National Science Foundation (NSF), a significant source of funding for strengthening the STEM pipeline, spent over $1 billion in 2010 on education funding (Gonzalez, 2012). Options for addressing STEM labor shortages are complex, but it is clear that STEM experiences should be integrated throughout the educational system (National Research Council, 2011). Although there is and should be significant attention given to closing gaps in the pipeline for those students traditionally underrepresented in STEM, there is also significant value in encouraging already interested and motivated students to realize their ambitions of pursuing a STEM career. This study evaluates the role of precollege outreach programs in the support and development of talent in STEM fields.

Uniquely positioned as a bridge between universities and students in elementary and secondary schools, precollege outreach programs can play an important part in meeting the growing demand for an increased labor supply in STEM. The goals of the present study were twofold. The primary objective was to examine one college-outreach program dedicated to STEM outreach, the Physics of Atomic Nuclei (PAN), which seeks to expose students to careers in nuclear science and offer them practical research experience. The secondary goal was to examine how the interdisciplinary partnership between an outreach program in science and researchers in social science can improve the thoroughness of the program's overall evaluation in regard to its standing and effectiveness while also contributing to the research base as it relates to the role of outreach programs.

The secondary objective was motivated by research that has shown a lack of STEM precollege programs that are able to carry out statistically appropriate evaluations. Such programs often struggle to demonstrate their ultimate impacts (U.S. Department of Education, 2007). Although the present study does not intend to provide an exhaustive review of collaborative evaluations conducted on precollege programs, a brief search conducted using Google Scholar with the keyword phrases “pre-college,” “evaluation,” and
“STEM” returned a mixture of different types of research studies appearing since 2008. The predominant mode of evaluating precollege outreach programs is the analysis of self-reported survey measures through either cross-sectional data collection or a pre-post design. These data can inform several areas in the evaluation of the outreach programs’ effectiveness, as many of these studies have suggested; however, such studies also have limitations, such as the subjectivity of participants. Additionally, current research designs have often not been able to accurately capture any knowledge or skill acquisition that reflects outreach participants’ experiences in the program. As a result, several studies also incorporated the use of an assessment to strengthen their program evaluation (e.g., Bogue, Shanahan, Marra, & Cady, 2012). A third mode of evaluation used to understand the impact of precollege outreach in STEM was the examination of undergraduate students who reported their participation in a precollege outreach program prior to college (e.g., Cohen & Deterding, 2009). These different modes of inquiry provide several perspectives into how students benefit from particular outreach programs. Ascertaining how a student would have responded without the treatment might theoretically be achieved by randomizing students to participate in these programs; such an act, however, could violate the very goals of the outreach. The present study used statistical methods to create a comparison group to examine how this program impacted its participants compared to nonparticipants.

To evaluate the influence of PAN on student participants, this study investigated three research questions: (1) What are the benefits of participation reported by the students?; (2) How do the PAN participants compare to a statistically matched sample from national data; specifically, what are the differences in educational and occupational interests conditioning on student characteristics?; and (3) What are the long-term implications for participants as reflected in follow-up data? Our multiple analyses offered evidence that students who participated in PAN were not only more likely to be interested in majoring in STEM than members of their matched comparison group, but that PAN gave them the knowledge, skills, and strategies necessary to successfully plan and pursue careers in physics and other STEM fields.

**Connecting Talented Students With Potential Careers**

To support national competitiveness in an increasingly technology-driven global economy, the U.S. government has invested
heavily in developing a STEM workforce to meet future demand. Students interested in pursuing careers in growing fields can meet this need. As adolescents plan their future education and occupations, knowledge of different careers can help them identify and take pragmatic steps to achieve their career goals (Rosenbaum, 2001; Schneider & Stevenson, 1999). However, this process of developing interests and pursuing the steps necessary to achieve career goals is not always carried out.

Of the students who finish high school academically prepared to pursue a variety of career opportunities, many never reach their occupational goals. Such students may falter because they lack access to the necessary information for developing a strategic plan to achieve their goals and may under- or overestimate the level of education they need (Schneider & Stevenson, 1999). The ability of students to attain their career goals can be impeded if they are not able to articulate and understand the appropriate pathways from secondary education through college and into a chosen career. This alignment of ambitions and the education required to attain them is especially important for students pursuing careers in STEM; in prior research, students have reported difficulty in identifying realistic strategies that would help them achieve their career goals, such as how to select coursework and extracurricular activities appropriate for STEM careers (Csikszentmihalyi & Schneider, 2000; Schneider & Stevenson, 1999). Parents and family are also important factors in the way students develop future goals and ambitions (Hossler & Stage, 1992). Like these students, parents and family members may lack information about the specific requirements, options, or courses needed for acceptance by more selective colleges or the preparation needed for specific STEM careers.

University-based outreach programs can supplement K-12 education in improving several student outcomes, especially in STEM, including interest, knowledge, skills, and the development of postsecondary expectations (National Academies, 2007). Some programs provide STEM-related professional development for teachers, leading to more effective instruction for students (Moskal & Skokan, 2011). Outreach through summer camps in particular can be a successful strategy to advance student outcomes in STEM (Foster & Shiel-Rolle, 2011). However, there is a dearth of studies that demonstrate their effectiveness in improving attitudes about and understanding of scientific pursuits.

Prior studies that have followed students from adolescence into adulthood showed that the selection of postsecondary institution, choice of college major, and interest in pursuing a career in STEM
were associated with being able to visualize oneself as a college student, transform interests into realistic actions, and create strategic plans (Schneider, Judy, & Mazuca, 2012). The current study used this framework of visualization, realistic actions, and strategic plans to understand how college-outreach programs can support each step in this transition process by (a) providing opportunities for students to visualize themselves as college students, often through on-campus experiences; (b) suggesting realistic actions and activities for students to hone their interests; and (c) supporting the development of strategic plans so students can successfully attain their educational and career goals.

**Physics of Atomic Nuclei Program (PAN)**

PAN is a precollege outreach program that informs students about careers in nuclear science and offers authentic research experiences for student participants. This program is a partnership between two NSF-funded entities: the Joint Institute for Nuclear Astrophysics (JINA) and the National Superconducting Cyclotron Laboratory (NSCL). JINA is a multi-institutional NSF Physics Frontier Center, a large collaboration between the primary partners of three Midwestern universities and other national and international partner organizations. JINA brings together nuclear experimentalists, nuclear theorists, and astronomers to collaborate on problems related to nuclear astrophysics. PAN is fully funded by JINA as one of its premier outreach programs, making it free to participants.

PAN is hosted by a world-leading rare isotope research facility located on the campus of a large Midwestern university. This nuclear laboratory hosts over 1,300 users from 35 countries and maintains one of the top-ranked nuclear science graduate programs. The lab contributes facilities; equipment; and additional faculty, staff, and students to support PAN. Hundreds of students from across the United States and some foreign countries have been attracted to PAN over its 20-year history. Throughout the program’s evolution, the primary goal has always been to build student interest and knowledge in the field of nuclear physics. Student participants are prospective future researchers and are treated as such.

Many precollege outreach programs focus on exposing students from underrepresented groups to STEM careers. PAN seeks and accepts students from such groups, but the nature of the program draws applicants who typically are highly intelligent, science-focused, and self-motivated. It is recognized that these students
usually have significant resources already, such as supportive and knowledgeable parents and access to advanced learning opportunities. Rather than introducing participants to science in general, PAN aims to support and channel their enthusiasm for science into potential college majors and specific careers in research.

PAN consists of an intensive week-long experience in the summer, featuring days packed with up to 12 hours of programming. Daily activities include one or two introductory-level lectures by JINA/NSCL faculty regarding current research, experimental methods, and detector technology. Each lecture is followed by a structured question and answer session where teams of participants can interact with the presenter. Through the students’ evaluation of what was clear and unclear in the presentation, the presenter obtains valuable feedback, and the students gain further clarifications. Before beginning any research in the lab, training sessions are held to ensure that participants can safely and effectively pursue the research program. Students then conduct a series of experiments using a $1 million scintillation detector. They learn to use this detector to identify the location of a radioactive source, gain experience with the data-acquisition software, and track cosmic rays as they pass through the detector. Through this sequence of steps, they build their knowledge and confidence until they begin pursuing research in much the same way NSCL users would, making it an authentic experience. Finally, students design and present a poster explaining their research at the capstone session of the program. This exercise teaches the student participants what content is appropriate for reporting results and familiarizes them with methods of presentation, both of which are fundamental and integral components of research at any level. Evening programs supplement the above activities by acclimating the students to campus life. These auxiliary programmatic events help the participants visualize themselves as college students in this field, engage in college-level work, and continue their development of strategic plans for postsecondary pathways and opportunities in physics.

Ultimately, PAN is intended to help students see themselves pursuing a research career by (a) promoting the importance of nuclear research; (b) teaching the discipline and current topics of nuclear astrophysics; (c) introducing students to undergraduate/graduate life at a university; (d) demonstrating the nature of pure science and research careers, particularly in nuclear science; and (e) fostering interest in nuclear physics/astrophysics.
Because JINA and NSCL receive grants from the NSF, pre-college outreach programs like PAN are intended to fulfill NSF’s Broader Impacts goals in these ways:

1. promote teaching, training, and learning by introducing nuclear astrophysics to new audiences;

2. broaden participation among underrepresented groups by recruiting more female students for the program;

3. enhance education partnerships by providing teachers and students with long-term support: assistance, materials, and further outreach opportunities;

4. disseminate information broadly by sharing it with the teachers of tomorrow’s scientists; and

5. benefit society by encouraging science literacy and knowledge of how nuclear astrophysics affects society.

PAN sought and earned approval from the university’s Institutional Review Board to collect student survey data and use it for improvement and research. Following all assent/consent and confidentiality guidelines, PAN has amassed many years of data about the effectiveness of the program through exit surveys and anecdotal evidence from alumni, but lacked expertise in assessing the success of the program relative to its goals. Some efforts to this effect have been made in recent years in collaboration with other precollege programs on campus. However, the program director and advisory committee recognized a need for a more detailed analysis to satisfy the NSF mandate, and thus formed a partnership with the College of Education at their university.

Over the past 3 years of this partnership, the survey instruments have been updated to not only include students’ self-reports of their experiences, but also new items drawn from national surveys that have been validated and will allow PAN participants to be compared to a control group—a necessary comparison for understanding the impacts of the outreach and for demonstrating evidence of its effectiveness.

**Method**

**Sample**

Because PAN intends to inspire students to study science at the college level, and particularly to give them experience in research
so they can make an informed decision about their future careers, the preferred candidates are those who show a clear desire and drive to pursue science. Students demonstrate this on their application by indicating such academic and extracurricular choices in high school as regularly enrolling in science and math courses, joining science-related clubs and similar extracurricular activities, committing to science programs and camps outside school, seeking out reading and other material to further their science knowledge, and applying to PAN as a way to investigate a science career. It is important to note that the application requires no GPA or test scores.

Applications must also include two teacher recommendations, which are rated by the following criteria: whether the teacher instructed the student in science/math; amount of interaction between the teacher and student; specific instances where the student has “gone the extra mile” to learn more; the teacher’s rating of how inquisitive the student is, particularly if the teacher cannot answer all of his/her questions; and the teacher’s rating of the student’s motivation, independence, and maturity.

As one of the few summer programs in nuclear science, PAN is quite popular for students who are seeking that specific experience. Due to budget and equipment limitations, the program can accept only 24 students per year. To help promote gender parity, an equal number of male and female participants are selected. It is generally (and usually correctly) assumed that students seeking out PAN have a keen interest in science but little to no background in nuclear astrophysics, and thus all students can begin their instruction from the same level of knowledge and be successful.

Table 1 shows the applicant pool from 2007–2012. Over those 6 years, the applicant pool increased in size, and the acceptance rate declined as the program became necessarily more selective. In 2012, 179 students applied for the 24 spots, leading to an acceptance rate of just 13%. Overall, consistent patterns of applicants can be observed from year to year: more males than females apply, there is generally a larger proportion of in-state students compared to out-of-state applicants, and White students make up the majority of the pool. Given the sharp increase in applications in later years, it is important to note that between the 2008 and 2009 programs, PAN organizers completely changed advertising strategies. Before 2009, PAN was promoted by physically mailing letters to in-state high schools, but in early 2009, it was featured in several teaching and physics magazines as well as through electronic media. This campaign reached a wider audience, and eventually PAN transi-
tioned from having only an in-state presence to gaining a broader national audience. This increased exposure created larger applicant pools and resulted in a more demanding selection process so that the admitted students tended to be highly self-motivated with extreme interest in science.

Table 1. Demographic Characteristics Applicants

<table>
<thead>
<tr>
<th>Application Year</th>
<th>Total Applications</th>
<th>Acceptance Rate</th>
<th>Gender</th>
<th>Race/Ethnicity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>M/F</td>
<td>W/B/H/A/M/O-O-S</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>47</td>
<td>51.06%</td>
<td>62%</td>
<td>38%</td>
<td>87%</td>
</tr>
<tr>
<td>2008</td>
<td>37</td>
<td>64.86%</td>
<td>73%</td>
<td>27%</td>
<td>86%</td>
</tr>
<tr>
<td>2009</td>
<td>91</td>
<td>26.38%</td>
<td>63%</td>
<td>37%</td>
<td>85%</td>
</tr>
<tr>
<td>2010</td>
<td>82</td>
<td>20.27%</td>
<td>60%</td>
<td>40%</td>
<td>55%</td>
</tr>
<tr>
<td>2011</td>
<td>127</td>
<td>18.90%</td>
<td>76%</td>
<td>24%</td>
<td>59%</td>
</tr>
<tr>
<td>2012</td>
<td>179</td>
<td>13.41%</td>
<td>76%</td>
<td>24%</td>
<td>49%</td>
</tr>
</tbody>
</table>


To allow for comparative analyses of PAN and these rigorously selected students, a comparison sample of students from a national data set, the Education Longitudinal Study: 2002 (ELS:2002) was used. This data set is a nationally representative longitudinal study designed to help understand the transition of adolescents from high school through postsecondary school and work. This data set represents the most recent available longitudinal study with postsecondary outcomes. Currently, three waves of data are available: the base year sample from 2002, when students were in the 10th grade; the first follow-up during their 12th grade year in 2004; and a second follow-up in 2006. In the base year, over 16,000 students were surveyed in over 750 schools. A restricted sample of students from this data set was used as a comparison control group; the selection of this sample is detailed in the following section.

Data and Analysis

Data in this study were drawn from a diverse set of sources, including student surveys, qualitative participant data, follow-up data from former participants (“PAN alumni”), and, for the comparison group, data from ELS:2002. To address the first research question of how students benefit from participation in PAN, multiple years of survey data were descriptively analyzed. Data collected on student survey instruments included (a) satisfaction
with PAN activities, (b) perceived benefits of their participation, (c) postsecondary and career aspirations, and (d) open-response items regarding the influence of PAN on their educational and occupational plans. To observe the long-term implications for PAN participants, follow-up data obtained from an online survey of PAN alumni was descriptively analyzed to ascertain whether participants continued in their pursuit of physics or other STEM-related majors in college and their current occupational goals.

Because of the select nature of PAN participants, to address the second research question of the program’s effectiveness on the outcomes of educational and occupational interests in STEM, a comparison group of students was created from ELS:2002 using propensity-score matching techniques. Participants with complete survey responses who participated in the PAN programs in 2011 and 2012 (n = 30) were matched to students from ELS:2002 data on a comprehensive set of variables that included gender, race, attitudes toward math and reading, parental education level, parent interaction characteristics, and postsecondary ambitions and behavior. The selectiveness of the PAN acceptance criteria created a very narrow group of students in the ELS:2002 sample that statistically met the criteria, such that a group of 38 students were identified as the control group using nearest neighbor matching and after covariate balance was achieved.

Results

Table 2 shows that not only did students enjoy the program, but over time, there was an increase in the percentage of students reporting that PAN influenced their interest in science, educational goals, and career plans. Participants had already self-identified as having an interest in science, so it is not surprising that they demonstrated high satisfaction with their research experience at PAN. Indeed, it proved difficult to measure changing attitudes toward science given that PAN participants already had greater interest in science than the average high school student.

PAN staff used survey feedback on specific PAN activities to improve programmatic components over the years and thus provide a better experience for students. Common trends from survey results drove two very important changes to PAN. First, participants highly valued the parts of the program that included contact with faculty and graduate students. PAN activities have therefore evolved to maximize opportunities for participant interaction with faculty and graduate students. The second highly valued aspect of
PAN was having an increasingly authentic research experience. Thus, new training sessions and experiments with the scintillation detector were introduced. The increased opportunities to work with faculty and graduate students in an environment providing authentic, hands-on research experiences help students visualize themselves as scientists and researchers. The visualization component is crucial to their experience, as it can illuminate areas of their own knowledge and skill development that they might need to improve through strategic planning while in high school, such as how they select their coursework.

### Table 2. Descriptive Analysis of Participants

<table>
<thead>
<tr>
<th>Percentage of students who agreed that PAN...</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased interest in science</td>
<td>79%</td>
<td>87%</td>
<td>83%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>92%</td>
</tr>
<tr>
<td>Influenced career plans or future course selections</td>
<td>68%</td>
<td>70%</td>
<td>96%</td>
<td>96%</td>
<td>100%</td>
<td>96%</td>
<td>88%</td>
</tr>
<tr>
<td>Provided overall enjoyment of the program</td>
<td>89%</td>
<td>96%</td>
<td>92%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>96%</td>
</tr>
</tbody>
</table>

Source: PAN Student Survey

Over the years, it has been common for students to report that their perception of research careers underwent a dramatic shift during PAN. Experiencing the life of a researcher for oneself proved to be a powerful catalyst, especially when there was a large difference between perception and reality. Being placed in the role of a researcher and developing relationships with current researchers allowed PAN participants to identify with a previously unknown or misperceived career. The experience thus supported the transformation of a participant’s general interest in science to a more specific and active one, wherein students began to visualize themselves in this career and were able to take strategic steps to become future scientists based on their personal experiences in the field. Open-ended responses from the PAN participant and alumni surveys were coded into two themes consistent with the visualization, strategic planning, and realistic actions framework: (a) their perceptions about careers in physics/STEM and their visualization of themselves as a future researchers and (b) the development of their strategic plans to pursue a career in physics/STEM.

One participant noted that “PAN made me realize how innovative scientists need to be, and to think outside the box.” A PAN alumnus refuted a common stereotype of a scientist working alone.
and in isolation: “My favorite part of PAN was the fact that it incorporated teamwork, lecture, and hands-on research; this allowed us to work all parts of our brain as it simulated a real world multifaceted research experience.” A crucial aspect of PAN is taking students who have an interest in science or physics and helping them develop that general interest into a career. One alumnus reflected on the influence of the program:

I think the PAN program was great! I knew I had a peripheral interest in science as a high school student, but PAN showed me that this interest was worth pursuing in college. Now I’m a graduate student in astronomy, and I think getting involved in science early on had a great deal to do with my career choice now.

Again, PAN students are already highly interested and motivated students, but PAN supports the sharpening of their focus in regard to defining next steps and creating strategic plans so that they can solidify a strong foundation for pursuing a career in STEM, particularly in nuclear astrophysics.

There were, however, a few alumni who noted that PAN led to the discovery that experimental physics was not for them. Such an assessment still helps students develop future educational and occupational plans in the positive sense, leaving open the possibility of work in a different area of science.

Table 3 provides a summary of the PAN alumni postsecondary interests. All of the former participants report planning to attend, attending, or graduating from college. Of the alumni who completed the follow-up survey, 87% planned to major in or were currently majoring in STEM, 40% planned to major in or were currently majoring in physics, and 40% had the educational expectation of pursuing a Ph.D. Although only 152 former participants were able to be contacted for follow-up, and not all of those contacted responded, these percentages still provide evidence as to the opportunities that participants pursue after high school.

Table 3. PAN Alumni Outcomes

| Planning to attend, attending, or graduated from a 4-year college | 100 |
| Planning to major in or majoring in STEM | 87 |
| Planning to major in or majoring in physics or astrophysics | 40 |
| Planning to pursue a Ph.D. | 40 |

Note. Data from the PAN Alumni Follow-Up Survey 2012.
Due to the highly selective nature of the PAN program, selection bias made estimating effects of the program challenging. Propensity score methods can provide one way to compensate for this bias. The primary advantage of using propensity score matching is that the likelihood of participating in PAN for nonparticipants (or students with similar potential to attend PAN) can be estimated given the characteristics of the PAN students (Schneider, Carnoy, Kilpatrick, Schmidt, & Shavelson, 2007). This essentially creates statistically equivalent groups of students that have equal propensities to be in the treatment group. Table 4 shows the similarities between the PAN students (treatment) and ELS:2002 students (control).

Table 4. PAN Participants and ELS:2002 Comparison Group

<table>
<thead>
<tr>
<th>Students</th>
<th>Significance Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PAN</td>
</tr>
<tr>
<td>Total number of students (n)</td>
<td>30</td>
</tr>
<tr>
<td>Student Background Characteristics (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>50%</td>
</tr>
<tr>
<td>Minority (Black and Hispanic)</td>
<td>10%</td>
</tr>
<tr>
<td>Student Educational Expectations (%)</td>
<td></td>
</tr>
<tr>
<td>Complete a master’s degree</td>
<td>13%</td>
</tr>
<tr>
<td>Complete a Ph.D.</td>
<td>87%</td>
</tr>
<tr>
<td>Student Attitudes and Behaviors (%)</td>
<td></td>
</tr>
<tr>
<td>Gets totally absorbed in mathematics</td>
<td>100%</td>
</tr>
<tr>
<td>Thinks math is fun</td>
<td>97%</td>
</tr>
<tr>
<td>Thinks math is important</td>
<td>97%</td>
</tr>
<tr>
<td>Born with math ability</td>
<td>43%</td>
</tr>
<tr>
<td>Gets totally absorbed in reading</td>
<td>97%</td>
</tr>
<tr>
<td>Thinks reading is fun</td>
<td>97%</td>
</tr>
<tr>
<td>Reads in spare time</td>
<td>93%</td>
</tr>
<tr>
<td>Parent Characteristics (%)</td>
<td></td>
</tr>
<tr>
<td>At least 1 parent holds a bachelor’s degree</td>
<td>87%</td>
</tr>
<tr>
<td>Parent frequently checks homework</td>
<td>0%</td>
</tr>
<tr>
<td>Student frequently discusses grades with parent</td>
<td>77%</td>
</tr>
<tr>
<td>Student frequently discusses courses with parent</td>
<td>67%</td>
</tr>
</tbody>
</table>
On almost all covariates, there were no significant differences between the groups. However, two variables did show significant differences between groups. One was the frequency of students’ discussing courses with their parents. PAN students showed slightly less frequency for this behavior, which may be due to differences in high schools between 2002 and 2012. Particularly in the state where this program is located, credits and standards have increased, so students have fewer choices regarding their course-taking. Currently, students must take 3 years of science and 4 years of math, including Algebra II. These more standardized coursework options might mean students have less reason to discuss course decisions with parents. The second variable that was statistically different was the number of postsecondary institutions to which students applied. We argue that this is not practically significant—a student who applies to seven institutions looks largely similar to one who applies to eight (with equal variance).

Given the statistically insignificant differences between these two groups, the final analysis used the treatment variable PAN to estimate the effect of participation using a logistic regression on the two outcomes: interest in STEM major (1 = yes and 0 = no) and STEM career (1 = yes and 0 = no). As reported in Table 5, PAN students’ likelihood of pursuing a major in STEM was almost nine times that of nonparticipants. For students who participated in PAN, the likelihood of desiring a career in STEM was eight times that of the control group of students. All models were estimated with robust standard errors, and student covariates were not used as explanatory variables for either model because these controls were used to create the groups. Sensitivity analyses using these background characteristics in the models only increased the effect

<table>
<thead>
<tr>
<th>Students</th>
<th>Significance Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PAN</td>
</tr>
<tr>
<td>Student frequently discusses college with parent</td>
<td>97%</td>
</tr>
<tr>
<td>Average number of postsecondary institutions applied to</td>
<td>8</td>
</tr>
</tbody>
</table>

of PAN; thus, the ratios presented represent the most conservative estimates.

<table>
<thead>
<tr>
<th>PAN Program</th>
<th>Major in STEM</th>
<th>STEM Career</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Odds Ratio</td>
<td>SE</td>
</tr>
<tr>
<td></td>
<td>9.99</td>
<td>6.95</td>
</tr>
</tbody>
</table>


**Discussion**

Evaluation of the PAN program is key for identifying strengths and weaknesses in implementation to improve programmatic features each year. Furthermore, such evaluation is critical to the funding and sustainability of outreach programs similarly aiming to strengthen the future opportunities of individuals in the STEM fields. PAN is an example of how outreach programs can specifically respond to the call to strengthen the pipeline of talent into STEM by helping students visualize, take realistic actions, and create strategic plans to pursue a career in physics and STEM. As described in this study, PAN provides students who are already highly interested in science with an experience that can solidify their interest into pursuing majors and careers in relevant fields. Similar students who are interested in physics and STEM who have not had such opportunities to gain insight into the field or hands-on experience in this career might fail to take the necessary steps to align their ambitions with postsecondary and occupational goals and may “leak” from this STEM pipeline.

This study presents possible evidence of the short-term and long-term impact of PAN on participants. In the short term, participants reported high levels of satisfaction with PAN and provided evidentiary support for how PAN encouraged the development and realization of their postsecondary and career goals. Comparing PAN students to similar students who did not participate in PAN illustrated the strong influence of PAN on the outcomes of pursuing a STEM major and a career in the STEM field. In the long term, a significant majority of PAN participants remain committed to pursuing a future in STEM. Although some alumni reported that PAN helped them decide not to pursue a career in physics or STEM, the program nonetheless supported the students’ develop-
ment of educational and occupational plans, though potentially in a different field of study.

It is worth noting that our findings are suggestive rather than conclusive about the effects of PAN. Although we argue that the statistical approaches used provide strong inferential evidence of the impact of PAN for participants, this study has several limitations. First, we acknowledge the selective nature of the application process and recognize that when selecting our comparison sample, we were unable to control for both the interest in physics specifically and the application process of attending PAN. This study was also limited by the small sample size of 24 participants each year. Although we were able to combine the previous 2 years of participant data, we also lost participants from the sample who did not complete all of the necessary pre- and postsurvey questionnaires. However, we argue that since these students are largely similar in background characteristics and interests, this response rate does not alter the overall analysis. Lastly, not all alumni responded to the follow-up survey. This shortage of alumni responses could contribute to an overrepresentation of PAN alumni in STEM because the alumni who continued to pursue physics or other related fields may be more likely to respond than those who are no longer interested.

Although the indication that PAN plays a role in students’ selection of STEM careers proves satisfying for the program organizers, both the process of assessment and its ultimate result will have profound impacts on the future of PAN and other similar programs. As stated earlier, the analysis of the data was significantly delayed by the inexperience of those who collected it. The identification of a control group for comparison with the PAN participants proved singularly difficult. The requirements for generating such a group and the kinds of comparisons available will influence the kinds of survey data that will be collected in subsequent programs. Organizers will actively seek assistance from assessment experts for subsequent analyses. Other, less established programs would benefit from such scrutiny much earlier in their tenure. The STEM precollege landscape is not suffering from a dearth of programs, but it may find extraordinary value and the affirmation of funding agencies in the pursuit of connections to education researchers and a data-driven evaluation. A sister program at a nearby university reproduces much of the same experience for their summer outreach program and will likely take advantage of lessons learned through this study.
PAN exit survey results have consistently shown that it is impossible to satisfy everyone. Over the years, many participants have questioned program choices and have made thoughtful suggestions. PAN organizers have always debated whether requested changes would truly maximize program impact or simply make the participants happier. The principles of faculty interaction and laboratory immersion will continue to drive decision-making for future changes as PAN evolves. The consistent support for these two aspects in survey responses and the way they have been cited by alumni demonstrate their effectiveness and will make it easier to sift through options for PAN in the coming years. Indeed, the process of assessing PAN has brought into sharper focus (a) who the target audience is and (b) the PAN strategy for reaching that audience. That this was made possible by a cross-campus partnership also suggests that arenas for many similarly productive collaborations are just waiting to be discovered.

Acknowledgments

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References


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