Full Issue

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Cover image: Southern Utah University undergraduate Newman Kante, from Mali, helps lead an activity at the Experiential Learning Leadership Institute Conference in Flagstaff, Arizona, in June 2018. Here, he offers guidance in French to Pellissippi State Community College Acquisitions Librarian Jennifer Mezick and University of Tennessee Assistant Professor Holly Dean, who are attempting to apply to school and register for classes as an international student would.

Experiential Learning & Teaching in Higher Education
A Journal for Engaged Educators

Contents

A Note from the Editor

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Many readers of this journal will be familiar with John Dewey's oft-quoted statement from *Democracy in Education*, "They [effective teaching methods] give the pupils something to do, not something to learn; and the doing is of such a nature as to demand thinking, or the intentional noting of connections; learning naturally results." This statement serves to establish the theme for this issue of *Experiential Learning & Teaching in Higher Education*, which contains articles about how students acquire knowledge and skills when given the opportunity to learn naturally by doing—in particular, by doing things outside the classroom that "demand the intentional noting of connections."

The authors of the four pieces printed in this number share the results of their observations and research about undergraduate students who accepted the challenge to learn by doing. Two of the articles describe, from different perspectives, the experiential learning of undergraduates in teacher education programs; one reports on the students' reflections on their cultural immersion experiences, the other on the students' assessment of their projects working with elementary and middle school students on science fair projects. Another article presents the self-assessments of students who worked in the local community to remove invasive plant species from trails. And a fourth article reports on a cross-disciplinary study of student reflections on their service projects.

I myself recently had the opportunity to "give the pupils something to do" and "learning naturally result[ed]" in a wonderful way. Tasked with creating an experiential learning activity for a national conference, I called upon several international students, young men and women who came to my rural Utah university from China and countries in Africa, for help. These ten students' first languages are not English; they grew up speaking French, Swahili, local dialects, and Mandarin Chinese. The challenge I gave the students was this: as a team, we needed to create an activity in which conference attendees—mostly post-secondary faculty and staff—would

experience, as much as possible, what it's like to be a student at a university in another country for the first time.

In our first meeting, the African and Chinese students shared the frustrations, the loneliness, and also the joys they felt during their first weeks in the U.S. We found that the cause of the frustrations and loneliness was due in part to the language barrier and in part to the strange new culture. Interestingly, the joys came largely from the kindness of strangers. Together, as a team, we prepared a learning activity that would force conference attendees to become frustrated and to feel isolated: they were to assume the role of "foreign student." The activity the international students ultimately created required conference attendees to complete application paperwork, register for classes, and interact with "university staff," all in a language other than English. (The cover photo captures one of the international students interacting with a couple of conference attendees.)

What resulted from this activity was that conference participants gained a new perspective on the unique challenges international students face. They learned not by simply listening to international students speak about their experiences, but by going through the experience themselves. Likewise, the international students who prepared the activity gained skills in teamwork, problem-solving, and creative thinking. I myself learned that if we give students a challenge and hand them the reins, they will take them, and they will rise to the occasion.

This is the third issue of *ELTHE*, and it will be my last as the journal's editor-in-chief. It has been my pleasure the past couple of years to work with colleagues across the country to help collect and share the research and observations of academics dedicated to the practice of experiential learning. I leave editorship of the journal in the very capable hands of Dr. Earl Mulderink, who has served on the *ELTHE* editorial board since its inception. While I will no longer be the editor of this journal, I will certainly continue to be a reader of it, and I hope you and your colleagues will too.

Experiential Learning in Teacher Education: Increasing Awareness of Diversity Through the Immersion Experience

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ABSTRACT. Sixty-four years after the landmark Brown vs. Board of Education decision, schools, neighborhoods, and communities in the United States remain largely segregated by race and class. As a result, many incoming students arrive on college and university campuses with limited exposure to people from a wide array of backgrounds and identities. In this article, we examine how students enrolled in an undergraduate teacher education course, Multiculturalism and Education, learned from and reflected on an experiential learning assignment. The assignment, called "Immersion Experience," required them to have a brief experience in a cultural context that is different from their own. Through the assignment, students reflected on their own identities, values, and upbringing; learned about their stereotypes and beliefs about discrimination; and began to appreciate experience as a way of deepening their understanding of diversity. In an era in which undergraduates spend more of their time online, self-segregated and fractured by political beliefs and social identities and experiences, assignments such as the "Immersion Experience" help to create the physical, human encounters with difference that are vital for community and democracy.

Sixty-four years after the landmark Brown vs. Board of Education decision, schools, neighborhoods, and communities in the United States remain largely segregated (Lareau & Goyette 2014; Orfield, et al. 2016; U.S. Government Accounting Office 2016). As a result, many incoming students arrive on college and university campuses with limited exposure to people from a wide array of backgrounds and identities. Throughout higher education, there are ongoing initiatives not only to increase student diversity but to provide meaningful ways for students to engage and learn about multiple forms of difference as a critical component of living and working with others in a diverse world (Smith 2015). For example, in the field of teacher education, there have been focused efforts over the past two decades to recruit greater diversity among students pursuing teaching careers (Hrabowski & Sanders 2015; Ingersoll & May 2011). Despite these attempts, the composition of preservice teacher education programs remains largely white, middle-class, and female, while the K-12 population in the United States is increasingly diverse in terms of race, ethnicity, home language, gender identity, sexual orientation, social class, and national origin (National Center for Education Statistics 2015; United States Department of Education 2016).

In response to these demographic trends, undergraduate teacher education programs throughout the United States have used various pedagogical strategies to increase students' awareness of diversity, often requiring that students reflect on their own upbringing and privilege, participate in service-learning programs in poor, working-class, and minority communities, study abroad, write autobiographical reflections, and/or take part in cross-cultural simulations (Beaudry 2015; Chang 2015; Cruz & Patterson 2005; Gay 2013; Hildenbrand & Schultz 2015; Lee 2012; Marx & Moss 2011; Tinkler & Tinkler 2013). Another, less frequently used strategy is sometimes referred to as the "cultural plunge" which requires that students have short "plunge-like" experiences in groups and communities that are different from their communities of origin (Houser 2008; Nieto 2006).

In this article, we examine how students enrolled in an undergraduate teacher education course learned from and reflected on a similar course assignment, called the "Immersion Experience," that requires them to have a brief experience in a cultural context that is different from their own. Based on a qualitative analysis of reflection papers that students wrote after the Immersion Experience, we examine the following three research questions that guided this study: (1) how do students reflect on their own identities,

values, and upbringing in the context of their immersion experience; (2) what did students learn about their stereotypes and beliefs about diversity; and (3) what did students learn about the value of experience as a way of deepening their understanding of diversity?

In the balance of this article, we first discuss experiential learning and the context of undergraduate teacher education. We then discuss the course, and we briefly outline the history of the field of multicultural education, as well as the philosophical tenets and objectives of this class. In the following section, we describe the Immersion Experience assignment that students are required to complete and how we analyzed student essays, based on this experience, as a tool for understanding what students learned from the assignment. We provide excerpts and analysis from the essays to illuminate three themes: what students learned about themselves, what students learned about others, and what students learned about using experience as a way to deepen understanding. In the subsequent section, we include examples from student essays that demonstrate some of the limits of the assignment and the inevitability of variable pedagogical outcomes. In conclusion, we examine the value of experiential learning in undergraduate education and the critical role it plays in the continuation of community and democracy in an increasingly digital world.

Experiential Learning and Teacher Education

Experiential learning seeks to engage students, transforming them from passive recipients of knowledge to active learners who participate in a process of learning that involves reconciling different ways of seeing in and acting in the world, interacting with their environment, reflecting, and creating new knowledge (Kolb 2015). In practice, experiential learning includes a wide variety of pedagogical approaches, including service learning, study abroad, internships, and classroom and course-based experiential activities.

For example, teacher education usually includes field experiences, which expose students to diverse schools and classroom environments as an observer, assistant, or student teacher. Additionally, some programs incorporate service-learning components in which undergraduates interact with students from different backgrounds, usually in a school, afterschool, or community-based program (for discussion of this topic, see e.g., Hildenbrand & Schultz 2015; Gay 2013). Cross-cultural and poverty simulations are also used, though as Lori Browne and Susan

Roll (2016) discuss in the context of higher education more broadly, it is critical that educators who use these approaches engage issues of power and inequality or risk reproducing the very dynamics they hope to disrupt. For example, exercises such as the "cultural plunge" (Houser 2008; Nieto 2006) must be implemented carefully and with attention to the power dynamics surrounding the activity. In Neil Houser's (2008) version of the "cultural plunge" students are allowed to pretend to be a battered woman or someone who is homeless and begging for money on a street. For many students who have limited life experience, this approach to the cultural plunge may promote sympathy, pity, and compassion without their questioning the underlying issues of power and privilege (see Dolby 2012 for additional discussion). Thus, to avoid confusion with the cultural plunge, we use the title of "Immersion Experience" to describe this assignment, which is discussed in greater detail below.

Philosophically, the course draws on the intertwined themes of empathy and critical theory. Empathy asks students to move beyond emotions of sympathy, compassion, and pity, to a more complete understanding of the lives and perspectives of others (Dolby 2012). As we emphasize on throughout the class, empathy demands that we listen carefully and learn about others' lives before acting. For example, Nadine Dolby (2013) discusses a service-learning project that she implemented in a local high school, bringing together a group composed of undergraduates, high school students, and community members to work on a project to address community needs in a local neighborhood. One of the first, and most important, lessons for the undergraduates involved in the project was that their initial "solutions" to the identified community needs were rejected by the community itself; only with careful listening did the undergraduates involved in the project come to understand the drawbacks to their proposed solutions and how using empathy and listening would lead them to stronger and more long lasting outcomes.

The course is also situated within critical approaches to experiential learning, drawing on Joy Roberts' (2012) critical approach (or "current," as he refers to it throughout his book) for our philosophical understanding of experiential learning in this class. Concerned with social justice, the critical current is grounded in the intellectual history of the Frankfurt School and critical education scholars such as Freire and Giroux, centering the individual as the locus and active agent of change. As Roberts (2012) writes, in the critical current, "the individual is given tools of awareness to see through the distortion and act out in the world in a different way" (79).

Multiculturalism and Education: An Overview

Multiculturalism and Education is a required course for students enrolled in the teacher education program at our university. Because the course also fulfills a university core requirement, a small number of students who are not planning to complete degrees in teacher education also enroll. The course is taught in multiple sections of 20-25 students, with an overall course enrollment every semester ranging from approximately 120-150 students in recent years. The authors of this article have many years of experience teaching this course: Nadine Dolby is a professor of education and is the course coordinator for this class, and Jubin Rahatzad is a graduate student who regularly teaches sections of this class. Thus, while we reflect in this article on student essays from one semester, our analysis is inevitably embedded in our own experiences of the course for the past decade.

Multicultural education established itself as a field in the 1970s, though it has antecedents in the earlier intergroup and intercultural education movements (Dolby 2012; Grant & Chapman 2008). Over the past forty years, distinct philosophical approaches have evolved, reflecting different emphases and priorities. Christine Sleeter and Carl Grant's (2009) typology is the most prominent in the field and delineates five approaches: teaching the exceptional and culturally different, human relations, single group studies, multicultural education, and education that is multicultural and reconstructionist. While, as Grant and Sleeter's (2011) typology indicates, there are multiple accepted approaches to teaching multicultural education, this course is situated within the last approach (education that is multicultural and reconstructionist), and emphasizes the dynamics of power and privilege in society, with a focus on education for social justice and change (see, e.g., Adams, et al. 2013). Thus, for example, while a human relations approach to multicultural education might focus on cross-cultural awareness, our perspective and philosophy is centered on an understanding of the persistence of inequality in education that goes beyond cultural difference, and instead is concerned with multiple dynamics of oppression (see Dolby 2012 for additional discussion). The Immersion Experience assignment, discussed below, is one of multiple assignments for the course, which provides an historical overview of U.S. education, examines contemporary challenges of inequality, and addresses the role of the teacher in both helping individual students and promoting broader change.

The Immersion Experience Assignment: Learning From an Experience Outside the Classroom

This assignment requires students to attend an on or off-campus event sponsored by a U.S. minority or international group of which they are not a member. The assignment is centered in the philosophical belief that students with limited experience of cultures, races, and ethnicities that are different from their own cannot simply learn about diversity from a book or from random life experiences. Instead, students benefit from an experiential learning opportunity, followed by structured reflection and class discussion. Susan Blum (2016) argues that current college students learn best "in the wild," a term she uses to describe learning that occurs outside of formal structures, that instead happens through immersion in real world environments. Yet, as Andrea Paras and Lynn Mitchell (2017) remind us in their discussion of teaching intercultural competence through study abroad, "We cannot afford to simply hope that students learn intercultural competence through osmosis" (63). Thus, the "Immersion Experience" assignment combines an experience "in the wild" with a structured, academic framework that students must apply to be able to think about their experience and begin to understand how they can use what they learned through the "Immersion Experience" to ask different questions about the world and to venture further into new and often unsettling environments and contexts.

Students may attend an event on or off-campus: the event does not necessarily need to be in the local community, and occasionally students complete the assignment in their hometown, as their schedules allow. As the majority of the students enrolled in the course are first-year students, many choose to explore their new campus, and attend events sponsored by the five cultural centers on-campus, representing African-American, Latino, Asian-American and Asian, LGBTQ, and Native American cultures. In addition, students often attend on- and off-campus religious services of non-Christian faiths (primarily Jewish, Muslim, and Hindu). Finally, American students frequently attend events sponsored by international student groups on-campus, for example, activities coordinated by the Chinese calligraphy club. As the students enrolled in this course are generally new both to the university and to a diverse community, it is a valuable experience for them to explore the expansive range of student clubs, activities, and cultural centers on our

campus, as such exploration provides them with resources and experiences they can access for the duration of their undergraduate experience. At the same time, the assignment does not restrict students to campus, and some students also attend events in the local community. While the spectrum of possibilities varies with the season, in the fall semester, students attend outdoor festivals, such as a community Latino festival and a Pride Festival sponsored by the community LGBTQ center.

Students must attend events that are open to the public, must verify that outsiders are welcome (if there is any question about that), and must remain at the event for at least 90 minutes. They are never required to pretend to be a member of that group, and if asked, to answer honestly why they are attending.

In the short page paper due after attending the event, students are asked to reflect on how their social identities (gender, race, class, sexuality, and nation) shaped their experience, with particular focus on how they felt as members of a minority (and, as applicable, majority) identity. Students are also asked to reflect on the inferences (Senge 1994) they made about the event before attending and their analysis of those inferences after going to the event. For example, as students often have little previous personal interaction with specific minority cultures, they may make inferences about the type of clothing people might wear in that culture or how they (as outsiders) will be perceived. Finally, students must use deliberate thinking (Danielson 2009) as a mode of reflection and raise at least two questions about the event they attended that could help them to better understand situations and contexts that were new or confusing. As Lana Danielson (2009) explains, "With deliberate thinking, an educator purposefully seeks more information than the immediate context provides by, for example, revisiting theory, talking with colleagues, interviewing students or reviewing student records. The goal is to learn more to better understand the dilemma" (n.p.). As this is a preservice class, students are not in a context where they can be expected to be able to take specific actions (e.g., talk to students, colleagues, or parents). Instead, the assignment is designed to begin the process of forming "habits of mind" (Costa & Kallick 2009) in which deliberate reflection is viewed as a reasonable step to take when confronted with new circumstances, instead of immediately rushing to conclusions based on (often false) inferences and pre-judgements.

The "Immersion Experience" is embedded within an academic course and

is designed to meet, in part, standards prescribed by the accrediting agencies in teacher education (for example, Council on Accreditation of Teacher Education, or CAEP, and the Interstate New Teacher Asssessment and Support Consortium, or INTASC). As a result, the assignment does not specifically assess student acceptance or resistance to diversity and multiculturalism but instead requires that they immerse themselves in a situation that is unfamiliar and reflect on that experience.

One hundred eight essays from six sections of the course submitted during the fall semester of 2015 provided the data used in this article. The study was granted IRB exemption in August 2015. Demographic information (race and gender) of each student was recorded, and then names were removed from the essays before analysis. Seventy-six of the students (70%) were female and 32 were male. Ninety students (83%) identified as White, 6 as Latino/a, 4 as African-American, 4 as Asian, 1 as Asian-American, and 3 as mixed race/ ethnicity. To protect students' identities, all names used in this article are pseudonyms.

The data analysis for this research was based on what Amos Hatch (2002) classifies as typological analysis. In this approach, data is analyzed based on pre-existing research questions/objectives as opposed to a more inductive approach in which categories emerge from the data (Hatch 2002). Given that the course and the assignment had clear and well-defined objectives, we examined the data based on what students learned in these three areas: (1) students' reflection on their own identities, values, and upbringing; (2) students' learning about stereotypes and beliefs about diversity; and (3) students' learning about the value of experience as a way of learning about diversity and difference. Questions 1 and 2 are learning objectives for the course, thus in multiple class sessions before students complete the Immersion Experience, they are introduced to the concepts of understanding one's own identity and the pervasiveness of stereotypes in our society. Question 3 was specifically designed to assess how students valued/did not value experiential education as a way of learning about difference.

While this particular research project was designed to analyze qualitative data generated from a course assignment, there is certainly scope and opportunity for quantitative research on this class and in related courses on diversity and social justice throughout higher education. For example, in the field of intercultural education, the IDI (Intercultural Development Inventory) has become a common quantitative tool for assessing intercultural

competence. The IDI and related instruments are used in teacher education but most commonly in the evaluation of international/study abroad experiences. The IDI is generally not used for evaluation of domestic teacher education programs, particularly given the strictures of accreditation and teacher licensing requirements, which vary by state and often dictate curricular possibilities.

Student Reflections: Learning in the World

In this section, we quote directly from student papers to provide detail for understanding how and what students learned from the assignment. As the assignment also required students to discuss their inferences (before and after), those reflections are also used, as appropriate, in the excerpts below.

Learning About Myself

One of the most significant objectives of the assignment and of the course as a whole is for students to have the opportunity to reflect on their own values, upbringing, and beliefs in order to be able to understand that everyone is raised in a particular cultural and social context and that social identities, such as race, gender, class, religion, sexual orientation, and national identity, profoundly shape an individual's experiences and life chances.

For example, Emily, a white female, who attended an event at the Black Cultural Center on-campus, was able to reflect on her own upbringing in contrast to that of others: "This event opened my eyes. . . . It made me realize how sheltered my life has been. . . . My bubble is small and I did not know how small until I went to this event and heard about the hardships of community members here in Lafayette." Similarly, Brad, a white male who attended an event at the Islamic Center near campus, reflected on how his lack of personal experience with Muslims, and the influence of his hometown and church, led him to limited (and sometimes incorrect) inferences:

> I was brought up in a town and church that views Islam as a religious group of extremists that are lost in their ways. . . . For this reason it is not a surprise that some of my views towards Islam were highly skewed. When I actually attended the event, I couldn't have been more misinformed. Islamic traditions are actually surprisingly similar to the Christian

customs that I was brought up around. I learned many different things about this group that helped me discover that the perceptions that were ingrained in me were flawed. . . . Above all else, I learned that it is unwise to draw conclusions about a group before exploring and learning about their culture.

Another white male, Adam, wrote about how his views of Asians were influenced by the culture of his workplace during high school, but that his experience at a meeting of a Chinese calligraphy club helped him to rethink those beliefs:

Before I came to Purdue. . . I worked for a car wash here in town and we have a lot of horror stories with people of Asian descent. Mainly with them almost running us over or trying to have us fix their cars. So through my high school career I had a distaste towards people of Asian descent. . . . Then when I went to this culture class, that mindset was completely changed. Seeing them in this class made me realize that my inferences about their culture were completely wrong.

Finally, it is important to emphasize that it was not only white students who needed to consider the limits of their life experiences. For example, a student of mixed Latina and white descent, Sofia, who attended a religious service at the campus Hillel, wrote, "I never noticed that I see the world through my own cultural lenses."

As Carl Grant and Christine Sleeter (2011) and many other scholars have argued, learning about one's own perspectives and values is a critically important early developmental step in multicultural awareness—it is impossible to recognize and validate others' experiences and worldviews unless you are aware of your own. A further step, discussed in the following section, is to begin to question the assumptions and stereotypes that you have about others and to confront how those assumptions have led to erroneous beliefs.

Learning About Others

Because of limited personal experience with other cultures, students often draw on misrepresentations—from the media, school curricula, and

other sources—as authoritative sources of learning. Unfortunately, this often leads to the creation of stereotypes and false expectations and inferences. For example, a white female, Jennifer, had her stereotypes about African-American churches profoundly challenged when she attended an AME (African Methodist Episcopal) church service in the local community:

> One of the leading inferences that I made before attending the event sprouted as a result of the U.S. media portrayal of African-American churches on television. In all media renditions of an all-black church, I can remember observing a large group of people, sitting in a hot room, wearing puffy hats, waiting for a giant choir to stand on stage and sing. I selected these images as being true, and assumed that all black churches must be the same. This conclusion brought me to believe that I would be walking into a similar situation as portrayed on American television. This of course was not the case. There were no puffy hats, there was no choir, and air conditioning filled the room. In the aftermath of the event, I felt guilty in having made those inferences.

Another white female, Beth, who attended a meeting of the Japanese student association on-campus, had a similar experience: "As an American, I am used to thinking of Japanese people as calm and straightforward people who are always in control. …What I saw, however, was quite the opposite." Finally, a white female, Audrey, who went to an event at the Native American cultural center on-campus, was able to reflect on the incorrect assumptions she had about Native Americans, from what she had learned in her earlier schooling: "Before arriving at the event, I had several assumptions. First, I assumed the event would be outdoors. I suppose it was just something I had internalized about the way of Native American lifestyles."

Students also began to realize how practices and patterns of discrimination—and the simple experience of being a minority on an everyday basis—had shaped the worldviews of others. Connor, a white male who went to a service at the campus Hillel, was able to begin to understand that there are patterns of discrimination that he has not experienced in his life: "Ultimately, this experience helped me notice several things. For one, it made me realize how I have never truly been a minority until that moment. This meant that I have no idea how difficult the lives of others can be and all my guesses are too far from reality." Another white student, Amanda, who attended a High Holidays

service at Hillel, identified a customary practice that she now understood was discriminatory: "I found it so concerning to me that a teacher or department would schedule an exam on the day of a religious holiday. It would be unheard of for an exam to be on the day of Christmas or Easter. . .Why is it that the minority group was having to re-arrange their schedule so that they could both practice their religion and be a student?"

Thus, one of the most significant outcomes of this assignment is the opportunity that students have to interact with actual, live people from different backgrounds with diverse life experiences. Through requiring students to step outside of their daily patterns and routines, this assignment helps students to expand their worldview in a way that is extremely challenging—if not impossible—within the confines of a classroom.

The Role of Experience in Learning

Finally, this assignment provided students with a deeper understanding and appreciation of how important experience—even if psychologically difficult—can be to the learning process. Mary, a white female who attended a service at a Latino church, commented,

> Overall, this experience pushed me way outside of my comfort zone. This is something I rarely do because I like feeling comfortable and like to fit in. Although I was nervous and unsure at first, this experience ended up being rewarding and taught me a lot. I learned that to appreciate and acquire an understanding of other cultures, you have to be willing to put yourself in their shoes.

Another white female, Laura, who attended an event at the Native American cultural center, was also apprehensive about the assignment at first, but afterwards felt that it was a positive experience:

> I learned a lot about myself during this assignment. When I first heard about the assignment all I felt was overwhelmed and I didn't think I'd gain anything but butterflies in my tummy and bad nerves. Though in the end I gained a lot more than that and I think that's when you know that you just finished a good assignment, an assignment that really challenged you and made you think.

Often, initial reactions of nervousness, isolation, and fear were replaced by feeling welcome and included. Joseph, an African-American who attended an event at the Latino cultural center on-campus, reflected, "I felt so isolated at the beginning of the event, but thanks to the welcoming nature of the individuals there, I felt empowered. The strength of positivity and togetherness is one of the most powerful forces on this planet." Finally, Molly, a white woman who identifies as straight, had an unexpectedly positive experience attending an event sponsored by the LGBTQ center on-campus: "After attending the Rainbow Callout. . . I have gotten to experience something I have never anticipated doing before. . . I had a fantastic time and had many positive things to say. I believe going to an event like this, it helped me to grow as a person, and gain more tolerance."

It is important to emphasize that all of these students attended events that occur routinely in our campus and within the local community. Yet, fear of interacting with people from different backgrounds had prevented these students from going to activities that were educational and enjoyable and that created fresh possibilities for their lives through exposing them to new ideas and cultures. Without a course requirement, many students are unlikely to leave their iPad, phone, computer, and television to take a five-minute walk across campus, go into a building that is unfamiliar, and experience a different world.

Student Reflections: The Limits of the Immersion Experience

Most student learning from the Immersion Experience was consistent with the objectives of the assignment, and students were able to reflect on their own identities, learn about others' lives, and begin to understand the power and potential of experiential learning. However, for many students, this was their first substantial experience with difference, and their previous experiences and identities shaped some of their reactions and understandings. In some cases, students replaced negative stereotypes about a particular identity with a positive stereotype. Jenna, a white female who attended an event at the Black Cultural Center, wrote, "What I took away from the whole event itself was that the African-American culture is a very happy bunch of individuals. They try to make life the best for everyone, even those who do not belong, and show that they have so much compassion for everything and everyone." While of course it is encouraging that Jenna had an enjoyable

experience, it is important that she also realize that even positive stereotypes are problematic, because they are not accurate and deny individuals the full range of human emotion.

Students' religious beliefs also impacted their experiences at activities and events on-campus and in the local community. Given that many of our students are from rural Indiana, it is not surprising that their Christian upbringing and worldview would be a factor in how they made sense of their experience. Students sometimes had limited factual knowledge, which affected their interpretations of the events they attended. Theresa, who was raised Catholic, attended a service at the university Hillel. Yet, her experience there was shaped by her religious upbringing and her (mistaken) beliefs about Jews. As she wrote, "Apparently, the Jews were responsible for Jesus's death, which in result, led to the Christians' anger and years of dislike towards the Jews. This simple fact and event has caused a plethora of problems between different countries and regions." Another student, Katie, who identifies as a white Christian from a small town in Indiana, acknowledged her struggle at a local Hindu service: "I identify as Christian and it was hard for me to sit in their service and take it seriously. I asked myself time and time again if they really believed what they were practicing….I know it is important to be respectful and indeed I was, but it makes me very sad to know that Jesus died for ALL of us and there are still people today who don't know Jesus." Additionally, students from religious backgrounds often expressed reservations about accepting individuals who identify as LGBTQ. The essays sometimes reflected real and serious struggles to reconcile religious beliefs with personal tolerance. Ashley, who attended a community LGBTQ Pride festival, reflects:

> I personally feel men are meant to be with women and I believe this because of religious reasons, therefore I am heterosexual. . . . Overall, even though I am not overall open to the idea of people being with the same sex this was an eye opener for me. . . Gay people are no different than straight people so they should have equal opportunities as anyone else. I am proud to say that I live in a society that is accepting of more and more people by the year. We have come a long way from where we started and equality will continue to happen in the years to come.

Certainly, for most of the students in this course, the Immersion Experience

was one step toward a greater appreciation of diversity and difference, though for some, their tolerance will be limited to professional contexts only, because of the conflicts caused by their personal values and beliefs.

Reflecting on the Value of Experiential Learning

Unlike many other undergraduates, students enrolled in teacher education programs often have many options for real world experiences in classrooms through observations, field experiences, and student teaching. However, these opportunities generally focus attention on teaching, learning, and assessment, skipping over the pre-existing human dynamics that are ever-present in classrooms.

Many teacher education students have never seriously discussed their own social identities and how the realities of gender, race, class, sexuality, and nation shape their experiences every day. Moreover, as evidenced by the essays that students wrote after their Immersion Experience, many have no real, lived experience with people from different backgrounds; what they know is almost exclusively formed by the media and what they learn from their family and friends. Carrying this lack of understanding and pre-existing stereotypes into classrooms is of course detrimental to K-12 students, whose real world is considerably richer, more complex, and more nuanced than media representations.

While the Immersion Experience is only one short assignment, it has the potential to break down barriers to understanding worlds that are different from the student's own, and increasing empathy (Dolby 2012). For many of our students, it is the first time they have entered the multiple cultural centers on our campus (Black, Latino, Native-American, Asian, and LGBTQ). Some students actually believed that if they were not a member of that cultural group, they were not allowed to enter those cultural centers. They learn through this assignment that they are more than permitted to walk through the doors: they are welcome.

Additionally, growing evidence (Turkle 2015) indicates that current college students favor digital interactions over conversations with real human beings: screens increasingly control how they communicate with their peers. The ubiquitousness of online education also means that students prefer "learning alone" to communicating with actual people, in the flesh (Roberts 2015).

Thus, college students have little interest in or motivation to understand how other people live. Social and material conditions both enable and constrain possibilities. Certainly, students who graduate from college without having had meaningful interactions and experiences with people different from themselves are not prepared to contribute to our communities and to a greater society. By requiring students to experience others' lived realities (for a very short period of time), this assignment helps to eliminate some of the barriers students encounter in having face-to-face (instead of electronic) conversations and discussions with people from varying backgrounds.

The Immersion Experience assignment discussed in this article was developed specifically for a teacher education course. The readings that students complete before attending the event and the class discussion afterwards are largely focused on drawing out implications for teaching practice. However, the assignment can easily be modified to fit the goals and objectives of any undergraduate course concerned with diversity and difference. For instance, the assignment could be altered and used as a precursor to a study abroad experience, or as part of a course that focuses on the experiences of one U.S. minority group. While in our class we are specifically concerned with dynamics of power, privilege, and social justice, the assignment could be modified for use in a course focused on listening, cross-cultural communication, or perspective-taking, and could be used in multiple disciplines, including sociology, communication, and psychology. The Immersion Experience might also be used as a component of professional education in the fields of nursing, medicine, social work, business, and engineering. Finally, there is some evidence of the value of similar experiences in contexts beyond the classroom. Derek Black, a former white nationalist, for example, explains how his perspectives on race, religion, and difference were completely reversed through human interactions (Saslow 2016). While a college student, he was invited to join a group of Jewish students who met regularly on a Friday night for Shabbat dinner. The Jewish students knew that Black was a white nationalist, but thought that perhaps as the son of a leader of that movement, he had simply not had the opportunity to forge human relationships with people from different backgrounds. After many Shabbat dinners, Black began to question his upbringing and the white nationalist ideology, and today he is a prominent spokesperson for the value of diversity and difference in a democratic society.

Conclusion: Experiential Learning, Higher Education, and Possibility

Parker Palmer and Arthur Zajonc (2010), in their call to recapture the core of what higher education should be, foreground the importance of experience, reflection, and observation. They write, "Experience alone opens a door, but intellectual framing and reflection are required if meaning is to be made of the experience" (108). As humans, we are experiencing life continuously and are simultaneously making meaning of those experiences. Experience alone is not enough. In contrast, experiential learning provides students with a structured, scaffolded way to experience a reality that is new and often unsettling for them, to question their received beliefs and stereotypes, and to begin to embrace different ways of seeing and interacting with others. The immersion experience that students undertake in this course is one example of the type of learning, that foregrounds unscripted interactions in real world contexts. As Roberts (2015) argues, learning which emphasizes "live encounters" is critical not only to student learning but to the very foundations of democracy (165). In an era in which we spend more of our time online, self-segregated and fractured by political beliefs and social identities and experiences, assignments such as the "Immersion Experience" help to create the physical, human encounters with difference that open us to new perspectives and possibilities.

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A Model of Student Learning: A Cross-Disciplinary Examination of Student Reflections of Service-Learning Experiences

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ABSTRACT. The purpose of this study was to measure and analyze student service and engaged learning outcomes employing the qualitative tradition of phenomenology. This study was based on the "Five R" service and engaged learning framework. The population for this project included 565 students enrolled in sixteen different course sections (eight distinct classes) taught by twelve faculty members across six academic departments in three colleges/schools on the campus of a regional teaching university in the Intermountain West. The results yielded support for each "R" in the framework (reciprocity, reflection, rewards of synergy, responsibility, and reality), thereby supporting the validity of the framework across disciplines.

Over the past several decades, institutions of higher education have embraced the pedagogical philosophy of service and engaged learning, which involves collaboration with community partners and organizational clients to build partnerships and create value through real-world projects. The Carnegie Foundation defines community engagement as "the collaboration between institutions of higher education and their larger communities for the mutually

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beneficial exchange of knowledge and resources in a context of partnership and reciprocity" (New England Resource Center for Higher Education n.d).

An extensive body of academic literature over the past several decades has demonstrated the benefits of service and engaged learning for students, community partners, faculty, and institutions (Fairfield 2010; Litzky, Godshalk & Walton-Bongers 2010; Madsen 2004; McCrea 2010; McGoldrick, Battle & Gallagher 2000; Munter 2002). Indeed, service-learning has been lauded as a teaching approach that yields rich and impactful learning.

In spite of this, service and engaged learning studies have not explored the types of learning outcomes specifically represented by the "Five Rs" of service and engaged learning (reciprocity, reflection, rewards of synergy, responsibility, and reality (Workman & Berry 2010). In an academic environment that is increasingly characterized by competition for a decreasing pool of resources and an emphasis on value creation and return on investment, outcomes assessment and measurement of learning are critical. The purpose of this phenomenological study is to measure and analyze service and engaged learning outcomes in relation to the "Five Rs."

Review of the Literature

The theoretical underpinnings of service and engaged learning, the "Five Rs" (Workman & Berry 2010), will serve as the framework for this study.

Figure 1. "Five R" model of service and engaged learning
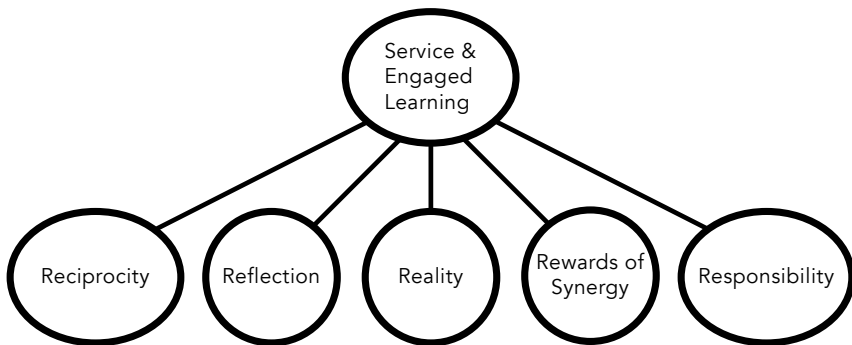
Reciprocity: Students, faculty, and community stakeholders collaborate as partners to exchange value. Teaching occurs reciprocally, with each partner contributing different types of knowledge to the experience. Students gain practical, hands-on experience with community partners as they apply academic theories and concepts, and partners learn from students as they see this application. Knowledge and expertise is exchanged for mutual benefit.

Reflection: The quality and quantity of reflection significantly impacts student learning (Sax, Astin & Avalos 1999). Reflection forces students to think deeply and ask questions, such as "What did I learn? How am I different after this experience? How would I do this differently next time?" Through reflection, students demonstrate important academic outcomes, including critical thinking, problem solving, the understanding of complex concepts, and cognitive development (Batchelder & Root 1994). In fact, it is often only when students reflect on their participation that they fully appreciate the richness of learning they have experienced.

Reality: Service and engaged learning connects the real world with the academic world (Rasmussen & Skinner 1997). When students participate in typical course activities, such as a case study where they need to generate feasible solutions to problems, they may discount the relevance of the activity because the events are historical or even invented, and do not impact them personally. On the other hand, when they are working with an actual firm and charged with developing feasible solutions, their experience is much more meaningful and motivating.

Rewards of Synergy: "Rewards of synergy" refers to the mutual benefits of collaboration. The interaction and cooperation between students and community members produce a valuable partnership, with rewards spanning from individual growth and learning to improvements for entire organizations. Students learn the core curricula of their courses, while community partners benefit from the application of these principles. Faculty also learn from working with students and clients, as all parties create creating value together. Overall, service and engaged learning enhance community and university relations (Braxton, Sullivan & Johnson 1997).

Responsibility: Just as the reality component of service and engaged learning heightens student involvement, students' responsibility also tends to increase as they assume obligations and use their business skills, talents, and knowledge to improve the communities in which they live and work. A greater sense of community and a strong sense of citizenship result, often contributing to moral development (Boss 1994). Service-learning also facilitates cultural and demographic understanding and reduces stereotypes (Conrad & Hedin 1991).

The literature on service and engaged learning has identified a number of learning outcomes. In addition to the positive impact of service-learning pedagogy on course completion and graduation (e.g., Gallini & Moely 2003; Lockeman & Pelco 2013; Reed, et al. 2015), research conducted across academic disciplines at a variety of educational institutions has demonstrated that service-learning pedagogy has a positive impact on personal, social, learning, and career development outcomes (Eyler, et al. 2001):

Personal Outcomes
- Positive effect on student personal development, such as sense of personal efficacy, personal identity, spiritual growth, and moral development
- Positive effect on interpersonal development and the ability to work well with others; leadership and communication skills

Social Outcomes
- Positive effect on reducing stereotypes and facilitating cultural and racial understanding
- Positive effect on sense of social responsibility and citizenship skills
- Positive effect on commitment to service

Learning Outcomes
- Positive impact on academic learning
- Improved ability to apply what is learned to "the real world"
- Positive impact on academic outcomes, such as demonstrated complexity of understanding, problem analysis, critical thinking, and cognitive development

Career Development
- Contribution to students' career development

Meta-analyses have demonstrated that service-learning increases learning outcomes irrespective of how the latter are measured (Novak, Markey & Allen 2007; Warren 2012). Research has also demonstrated that students learn both academic concepts and professional skills through service-learning projects. These concepts and skills include the following:

- Course content and technical concepts (Larson & Drexler 2010; McCrea 2010; Robinson, Sherwood & DePaolo 2010; Tucker & McCarthy 2001)
- Effective communication skills (Kenworthy-U'Ren 2000; McCrea 2010)
- Organizational strategy (Larson & Drexler 2010; McCrea 2010; Madsen & Turnbull 2006; Rehling 2000; Robinson, Sherwood & DePaolo 2010)
- Problem-solving (Madsen & Turnbull 2006; Robinson, Sherwood & DePaolo 2010; Zlotkowski 1996)
- Time management and networking skills (Litzky, Godshalk & Walton-Bongers 2010; Tucker et al. 1998)
- Analysis, synthesis, and evaluation (Litzky, Godshalk & Walton-Bongers, 2010; McCrea 2010; McGoldrick, Battle & Gallagher 2000)
- Consequences of decisions (Larson & Drexler 2010; McCrea 2010; Waddock & Post 2000)
- Cultural awareness and diversity (Keen & Hall 2009; Robinson 1999; Simons & Foster 2002)
- Teamwork; interaction, interpersonal, and communication skills (Madsen & Turnbull 2006; Michaelsen et al. 2000; Rehling 2000; Tucker et al. 1998)
- Conflict resolution and leadership skills (Kenworthy 2010; Madsen & Turnbull 2006; Thomas & Landau 2002)
- Learning how to learn (Westover 2012; Munter 2002)

In addition to academic concepts and professional skills, the positive outcomes of service-learning include:

- Increased self-efficacy (Fairfield 2010; Weber, Weber and Young 2010; Tucker & McCarthy 2001; Madsen & Turnbull 2006)
- Increased social capital (D'Agostino 2010; Fairfield 2010)
- Social responsibility (Bowman et al., 2010; Kolenko et al. 1996; Westover 2012)
- Career exploration (Fairfield 2010; Robinson 1999; Vroman, Simmons & Knight 2010)
- Motivation to learn and do well (Fairfield 2010; Madsen 2004; Munter 2002)
- Confidence (Fairfield 2010; Konwerski & Nashman 2002; Rhee & Sigler 2010)
- Desire to continue volunteerism (Butin 2010; Bush-Bacelis 1998; Weber, Weber & Young 2010)
- Exploration of personal attitudes and values (Fairfield 2010; Madsen 2004; Madsen & Turnbull 2006; McGoldrick, Battle & Gallagher 2000; Rhee and Sigler 2010)
- Increased personal and social development (Fairfield 2010; Simons & Cleary 2006)
- Personal satisfaction and fulfillment (Fairfield 2010; Rehling 2000)
- Professional and real-world work experiences (Gujarathi & McQuade 2002; Larson & Drexler 2010; Madsen 2004; McCrea 2010; Rhee & Sigler 2010; Robinson, Sherwood & DePaolo 2010)
- Opportunity for students to become engaged in their communities (Butin 2010; Godfrey 1999; Rama et al. 2000; Weber, Weber & Young 2010).

This review demonstrates that research on service and engaged learning is replete with evidence of its benefits. However, a qualitative understanding of the impact of service-learning on the lived experiences of students is lacking. The current study seeks to fill this gap in understanding by collecting and examining student insights.

Methodology

The population for this project included 565 students enrolled in 16 different course sections (8 distinct classes) taught by 12 faculty members across 6 academic departments in 3 colleges/schools at a regional teaching university in the Intermountain West. All faculty were recruited for involvement in the study and went through a six-week intensive service-learning fellowship training prior to service-learning course implementation and administration of the survey. About half of the enrolled students were freshmen or sophomores and half were juniors or seniors. Courses included student leadership and success, introduction to business, business presentations, statistics, organizational behavior, marketing, writing, and psychology. All courses were traditional face-to-face classes and each had a 20+ hour service-learning project requirement. Project types and community partners varied by course.

Upon completion of the 16-week courses, students voluntarily completed an online Qualtrics survey composed of open-ended reflection questions constructed around the "Five R Service and Engaged Learning Theoretical Framework" (Workman & Berry 2010) (see Appendix for survey items and instructions). Students were asked to discuss in depth their learning experiences, and all student responses were voluntary, anonymous, and kept strictly confidential. Additionally, students self-identified their course and section, their instructor, their year in school, and basic demographic information (age, gender, etc.). On average, the survey took students just over 25 minutes to complete. Of the 565 students, 300 completed the open-ended responses on the survey, for a 53% response rate among enrolled students in the 16 course sections.

Data for the study were analyzed using the qualitative research tradition of phenomenology. According to John W. Creswell (1998), phenomenology describes the meaning for several individuals of their lived experiences of a concept or a phenomenon, and the purpose is to reduce individual experiences with a phenomenon to a description of the universal essence. Researchers collect data from subjects who have experienced the phenomenon and develop a composite description of the essence of the experience, which consists of "what" they experienced and "how." Following this approach, the goal of our qualitative study was to examine the lived experiences of students pertaining to service-learning. High frequency data themes under each of the "Five Rs" were recorded and analyzed employing NVIVO software.

Table 1. Student Response Coding by "Five R" Category

Category	Number of Responses	Subthemes and Frequency Percentages	
Reciprocity	243	Relationships (68%) I learned (18%) Professional skills (12%) I did not learn (1%) Human skills (1%)	*Further subcategories from "Relationships" Category:* Client taught me (57%) I taught my client (30%) My client did not teach me (10%) I did not teach my client (3%)
Reflection	279	Self-awareness (65%) Business Application (35%)	
Reality	275	Applied class principles (86%) I did not learn (14%)	
Responsibility	264	Personal development (54%) Future career (36%) No take-aways (10%)	
Rewards of Synergy	264	Responsibility enhanced project (43%) Positive personal development (39%) I did not feel responsible (12%) Career development (5%) Negative personal development (1%)	

Descriptive Results

Table 1 shows the number of coded open-ended responses for each of the Five Rs. It also delineates the subthemes for each category and the percentage of comments related to each subtheme. The subthemes are explained further with illustrative quotations in Tables 2-7.

Qualitative Responses

While it is interesting to see the overall distribution of coded student responses, the real value of the qualitative tradition of phenomenology is the richness that emerges through student comments as students describe their lived experience related to service and engaged learning projects. Tables 2-6 provide a selection of memorable and representative student quotations related to the "Five Rs." (Note: student quotations have not been edited.

Table 2. Reciprocity Memorable Responses

Category Coding	Memorable Responses	Respondent Number
Human skills	This program has taught me how important family and attitude in the family is.	9
	My clients taught me about different psychological principles that we were learning in class and how to use them. In return, it allowed me to be more aware of the circumstances, meaning that I understood better why we behave in certain ways and how we can be conscious to know how to help people with special needs. Some of the things I learn have to do with speaking clearly, simply, being patient and loving.	294
I learned	I learned a lot in return from this agency. I really got to know how a marketing plan can come to life and how to have a successful business. They were able to help me in many aspects of my life and they taught me how to have a better attitude and outlook towards taking risks and implementing new business strategies.	30
	I felt like I learned better how to portray information in statistical form. I learned better how to work in a group and with others and I learned about the students in the business lab and business strategies to improve it and its functions.	201
Professional skills	My community partner taught me how to explain my ideas more clearly, how to put together a good presentation, and how to serve to my fullest capacity or best ability.	32
	I received some much needed skills which will help me better complete school, and also be an effective contributor to the work force.	222
	By doing this I was able to learn that these students enjoy being treated like the adults that they are. They understand that they have disabilities, and appreciate being treated with respect. This will help me a lot as I go into the behavioral science field, [introspection] is everything, and it's important to try to have empathy for everyone around us. I wish I would have been able to attend the therapy sessions, but I understand why they are confidential.	260
Relationships— I taught my client	My group and I were able to give our "client" a new perspective on their social media marketing. We were able to show them who was reached and what tactics worked campaign wise. We were able to show that to make a social media campaign more successful, you need to commit much more time than was given in the past. More consistency and regularity is also needed regarding posts. Also putting more work in the quality of photos posted will give you more edge.	203
Relationships— My client taught me	My client taught me the importance of knowing that even when you have good research and reasons for something not every person will listen or care what you say and that is okay because you did your best to educate them.	8

Table 3. Reflection Memorable Responses

Category Coding	Memorable Responses	Respondent Number
Business application	I would strive more to keep in more contact with the client as well as doing it through the semester like we were advised to do.	12
	I had to interact with other people and actually put my ideas out there into the world in front of a very intimidating audience for them to judge.	30
Self-awareness	I would like to be more involved with my client. I wish my group would have spent more time with the client and even helped with the event.	47
	If I had to do this again I would put the same amount of effort and creativity into the project. It's very rewarding to see you hard work pay off.	61

Table 4. Reality Memorable Responses

Category Coding	Memorable Responses	Respondent Number
I applied class principles	This worked with reality by giving me real information about a real business and actual plans for how to better the marketing strategies for it.	4
	Through my service-learning I was able to immerse myself in an environment other than that of my classes at UVU. I was able to learn different things by being in this other environment that I would not have the opportunity to learn in class.	7
	I felt I was able to apply the course material every day because I was so engaged in school work and had countless opportunities to practice the principles being taught.	13
	This course taught me more about myself and how I learn. It taught me how to execute studying, note taking, and test taking strategies efficiently. I was able to apply it to all classes.	160
I did not learn	The overall experience was frustrating. At first, it seemed like a great time saver to have an organization already picked for us. I believe the intent was good, but with this particular organization, it did not turn out as well as planned. The lack of success may have been, in part, due to their recent move.	141

Table 5. Rewards of Synergy Memorable Responses

Future career	The most significant learning experience that I am going to take away from this project is that there is lots of ways that you can become involved in a topic. If you have questions, ask them and don't be afraid because in the end you are here to learn so you might as well find as much information as you can.	19
	I learned that in the real world you are going to be working in teams and you are going to be given different tasks and you have to count on teammates to get things done. Which means you also need to do your part.	96
	This experience was very useful in my academic program because it gave real world, hands on situations to learn how to master and create something successful.	156
Future personal development	I learned how to take the opportunities and act on them. I learned how to help others better. I learned how to learn from others.	7
	I liked that I have changed my mindset now and no longer try to just simply try to stay in the "fixed" mindset. I CAN change my future and I WILL. I gave me more confidence and the skills I needed to become an overall better student.	21
	I enjoyed being able to be a part of something else.	56
	I loved being on this project. It gave me a lot more confidence in my creativity and ability to create a successful campaign. This confidence will help me in future job interviews and eventually with a future marketing job.	61
	The most significant learning experience that I took away from this S&EL project is the fact that what I am learning is more than just knowledge. I am developing skills and learning how they apply to the real world.	256

Table 6. Responsibility Memorable Responses

Category Coding	Memorable Responses	Respondent Number
Career development	This helped me feel like I can contribute to various small businesses in a number of meaningful ways.	38
	This project changed my perception of responsibility as a citizen because anyone has their own ideas and can contribute to businesses and help out in any way.	42
Negative personal development	I felt as though I failed in my responsibility due to procrastination and I could have done a better job on my part.	12
Positive personal development	This has changed my perception by opening my eyes to the need to be a socially responsible citizen. I always knew it was important but it seems more important now	17
Responsibility enhanced my project	I felt a great deal of responsibility because I wasn't just trying to impress my professor, I legitimately felt the need to put together a good project for the business I was creating it for.	4
	It is all on you to get the work done, no one is going to the work for you. It was nice to see my business partner appreciate my ideas and made me feel a part of the business.	37
	It was different because I actually felt responsible for doing a good job because it was going to be reviewed by a real company.	39
	I felt a lot more responsibility because there was a real client that has people that are expecting professional work from them.	86

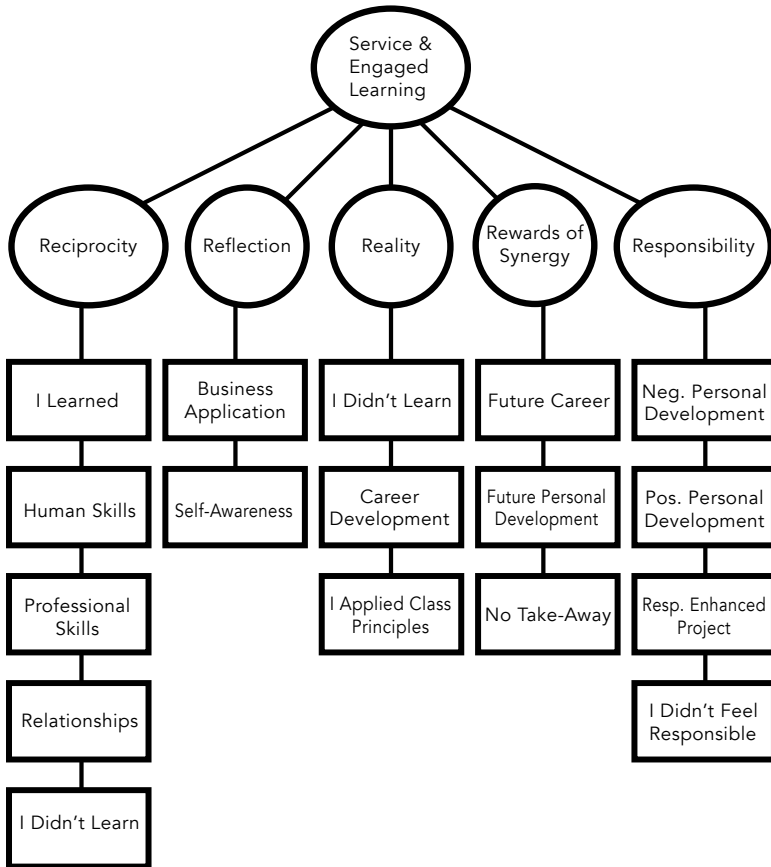Figure 2. Enhanced "Five R" model of service and engaged learning

Figure 2 indicates how the subthemes for each of the "Five R" categories, outlined in Tables 2-6, are connected to the "Five Rs."

Table 7 provides a review of the overall student experience with service-learning and includes illustrative quotations to represent each of the "Five Rs."

Table 7. Following the Student Experience across the "Five Rs" of Service and Engaged Learning

Respondents	Reciprocity	Reflection	Reality	Responsibility	Rewards of Synergy
4	My client taught me what was useful for a small business marketing plan and what was less likely to be used. I taught my client a few tricks to develop a better marketing plan.	I actually was able to see what working in marketing would be like, even on a very basic level, and got to work with a real business.	This worked with reality by giving me real information about a real business and actual plans for how to better the marketing strategies for it	I felt a great deal of responsibility because I wasn't just trying to impress my professor, I legitimately felt the need to put together a good project for the business I was creating it for	I was able to have a hands on experience and work with other professionals. I was able to take away a lot of important experiences from that
7	I learned better ways to interact with young kids. I taught strategies for these students to grow as individuals. The students taught me how to be more patient.	This experience was specific to this class. I would have not had this great opportunity if not for my service-learning class. I was able to serve and thoroughly reflect on my service through assignments created by the teacher.	Through my service-learning I was able to immerse myself in an environment other than that of my classes at UVU. I was able to learn different things by being in this other environment that I would not have the opportunity to learn in class.	There was a lot of freedom given to the students to complete their service. The professor would give us ideas and check in with us periodically. However, it was really up to each student to figure things out and get their 20 hours of service in. I appreciated this freedom, and it worked fine for me because I took the initiative and was proactive in my service.	The most significant learning experience I had was that there are opportunities for service all around me. I learned how to take the opportunities and act on them. I learned how to help others better. I learned how to learn from others.
37	I learned what it is like to be in the real business world. What ideas work or did not work.	I would start earlier in the semester and so I could see more results of my ideas.	This course required me to go out in the real business world and work with a business partner. First class I have had that asked me to do this. It helped me apply what I have learned in class to the real world.	It was nice to see my business partner appreciate my ideas and made me feel a part of the business.	The experience was all around a good one. Stressful at times, but it encouraged me to go out and really work for the better towards the business.
86	We gave the client some engaging posts and helped increase their followers on different social media platforms.	My experience was very different. I hadn't worked with a client ever in my other courses.	It was really great to have a real experience with a client. I hadn't done that before.	I felt a lot more responsibility because there was a real client that has people that are expecting professional work from them. This experience helped me realize that I need to do a professional job, even if I'm not getting paid.	This S&EL [service and engaged learning] helped me understand the power of social media, and the need to make it professional. It's not just about posting on social media, but there is a lot of work that goes into it.
19	I learned a lot from my research and gave my service partner all of my findings.	It encouraged us as students to take more steps to figure out information about our topic. By performing our own experiments and asking others about their standpoints. I believe that we did this because it gave us a chance to become more passionate about our topic. To dig a little deeper by asking professors or going to the library rather than sitting down and opening the first thing that pops up on our search bar.	I believe that my experience enabled me to apply what I learned about the course material to a very high degree.	I have seen how I can make a difference myself in the community no matter what degree, it is possible.	The most significant learning experience that I am going to take away from this project is that there is lots of ways that you can become involved in a topic. If you have questions, ask them and don't be afraid because in the end you are here to learn so you might as well find as much information as you can.

Discussion

We reflect and discuss below the outcomes in relation to the "Five Rs."

Reciprocity

Students spoke of the learning process that occurred as a result of working directly with their clients. Some of the richest human skills learning outcomes included developing a deeper understanding and reinforcement of academic concepts, including psychological principles, as well as emphasizing awareness and growth of professional behavioral skills, including improved communication and increased demonstration of patience and kindness. In addition, student comments regarding human skills benefits gained from their client projects pointed toward their enhanced realization of the importance of gaining the bigger picture of business, as demonstrated through working with and applying business tools, such as marketing plans, statistics, business strategies, working more closely with business clients, and risk taking.

While most of the student comments were positive, 14% were negative and coded under a general theme of "not learning"(see Table 1). These comments included, "I did not learn"; "My client did not teach me"; and "I did not teach my client." While several possible explanations for these comments exist, including that some students were uninterested in learning, one factor that may strongly be at work here is the nature of the student sample. A very high percentage (90+%) of the students at this regional teaching university are already working fulltime in their professional and aspirational career fields while concurrently carrying a full load of university credits. Thus, it is reasonable to believe that at least some of the students sampled were involved in service projects in their classes that they were already familiar with from their jobs. Such students may have already developed and brought the necessary skill sets required for project completion into the projects rather than developing the skills as a result of the projects.

Reflection

Student discussions of enhanced *business application and self-awareness professional skills* in the data emphasized improvement of professional communication skills and increased dedication to personal excellence and making meaningful contributions. Becoming more closely involved with their clients was a desire students expressed that they wished to follow in the future in an effort to improve client relationships and project outcomes.

Reality

Students spoke of the importance of working on projects for real businesses that would result in real consequences for their clients. Actually immersing themselves into a client's company to apply the business principles they were learning in the classroom served to provide an additional dimension to their learning that expanded well beyond a textbook. In addition, students commented that this emphasis on a project that was real forced them to become more aware of self-discipline and developing more efficient and improved study habits and work inputs.

Table 7 also highlights one student's negative response in the reality area. The student stated that he/she found the overall service and engaged learning experience to be frustrating, pointing to project outcomes that deviated from the outcomes that had been planned. This type of learning outcome, however, is certainly a very real possibility occurring in business each day. Managers do not always make the best choices in their companies, and when this happens, they learn quickly what does not work and should be addressed differently in the future. Thus, though the student comment was framed to describe a negative experience, the student could actually have learned very deeply on a global level about what kind of strategies will not address or solve a particular real business problem. This type of learning tends to stay with us into the future for a long time and thus has the possibility of being quite helpful in a future professional scenario for this student.

Responsibility

Table 7 highlights sentiments of enhanced responsibility developed by students working with client projects in the areas of improved sense of citizenship as well as personal work habits. Students spoke of the enormity of feeling personally responsible to their clients for delivering a meaningful and effective tool to help their client's real business. As compared to merely submitting to a professor a proposed solution to a business problem via a classroom case study assignment, this type of deliverable would not only impact a student's grade, but it would also impact many others within a real organization, as well as the future performance of the organization. Students spoke of the experience as being a "real eye opener" in terms of better understanding that their work reflected themselves personally and their own improved senses of professional value and integrity.

Rewards of Synergy

Memorable student responses regarding overall synergy included an emphasis on the importance of critical thinking in business problem solving that considers the big picture with multiple methods for developing solutions, as well as multiple possible outcomes that could be positive for the organization. The importance of effective teamwork and team building with others in the workplace was discussed, as well as a heightened sense of personal creativity and professional contribution. Students also expressed an understanding that success in the business world requires hard work and practice, and when those are conducted with dedication and consistent professional accountability, a heightened sense of personal confidence and pride are often additional personal rewards that endure far into one's personal and professional future life.

Conclusion

This study employed phenomenological methodology to examine students' lived experiences with service and engaged learning. Student comments helped to extend our understanding of the "Five Rs" of service and engaged learning by identifying specific aspects of these components and thereby increasing insights into the student perspective.

Findings provide evidence for the powerful impact of engaged learning in each of the "Five Rs". Rich exchanges between students and clients, or reciprocity, led not only to improved understanding and reinforcement of academic concepts but also enhanced realization of the need to gain a deeper understanding of business practices. Reflection findings emphasized the importance of professional communication skills, dedication to personal excellence, and making meaningful contributions. Improved self-discipline and more efficient study and work habits, as well as the realization that managers do not always make good choices, were outcomes related to reality. When students are working with actual companies and are expected to make meaningful contributions, their sense of responsibility is significantly enhanced as compared to submitting homework to an instructor. Finally, improved teamwork, critical thinking, personal creativity, and pride in professional contributions were mentioned as rewards that students experienced.

While this study captured the lived experiences of students related to the "Five Rs" at the end of one academic semester, future research should

utilize a pre- and post-test approach, or research could try and track students over their entire academic experience. Ideally, this survey could be completed pre/post-test as part of a capstone service-learning course, thus enabling the researchers to capture the collective reflective richness of service-learning experiences of students.

Finally, future research might also involve collecting data from service-learning faculty and community partners to determine their perspectives on learning outcomes. Future research could also include similar comparative studies across geographical regions of the US, as well as from national and international samples.

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Appendix
End-of Semester Student Self-Assessment

Informed Consent: The following questions are part of a study about Service & Engaged Learning Classes and student perceptions of learning outcomes. Your willingness to have your answers included as part of the study is voluntary and all responses will be anonymous and kept strictly confidential. Completion of the open-ended survey should require about 20-30 minutes to answer these questions. The study has no foreseeable risks or benefits, and you will receive no payment for participating in this study. All of your responses to these questions are valuable for the research and will remain anonymous. The actual answers will be kept private, hence in any report that may be published; we will not include any information that will make it possible to identify any individual. Only the primary researcher, Dr. Jonathan Westover, will see the completed answers. If you have questions regarding your rights as a research participant, or if problems arise which you do not feel you can discuss with the Investigator, please contact the Institutional Review Board Office at (801) 863-8156.

By starting the online survey you are providing consent and giving permission for your answers to these questions to be included anonymously as part of the research study.

1. Please describe your experience of RECIPROCITY during your S&EL project.
   a) What did you "give" to the client agency or client of the agency relative to what you received through doing this S&EL, if anything?
   b) What did your client teach you and what did you teach your client in return?
   c) How could this aspect of S&EL be enhanced?

2. Please describe your experience of REFLECTION during your S&EL project.
   a) Was this experience different in some substantive way from your experience in other courses, and if so, how and why?
   b) What would you do differently if you were to do another group S&EL project in the future to make the experience more positive for yourself, as well as for everyone else involved?
   c) How could this aspect of S&EL be enhanced?

3. Please describe your experience of REALITY during your S&EL project.
   a) Was this experience different in some substantive way from your experience in other courses, and if so, how and why?
   b) To what degree did your S&EL experience enable you to apply and learn about the course material or major course concepts this semester?
   c) How could this aspect of S&EL be enhanced?

4. Please describe your experience of RESPONSIBILITY to your client, teammates, or others during your S&EL project.
   a) Was this experience different in some substantive way from your experience in other courses, and if so, how and why?
   b) Has your experience in this S&EL project changed your perception of your role as a socially responsible citizen?
   c) How could this aspect of S&EL be enhanced?

5. Please comment about REWARDS OF SYNERGY as this concept relates to your own experience this semester. Is S&EL a useful part of a business school program, and if so, why and how?
   a) What is the most significant learning experience that you take away from this S&EL project?
   b) How could your experience with S&EL be enhanced to make it more useful to you?

More Than Just Pulling Weeds: A Case Study of Engaging Upper-Division Conservation Biology Students in Service-Learning

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ABSTRACT. The field of conservation biology focuses on maintaining biodiversity by mitigating both global and local threats. One of the top threats to biodiversity is the worldwide problem of invasive species. Each community has its own pests to control, and students can engage with this global issue on a local scale through well-designed service-learning courses. This article discusses how students engaged with conservation biology through an integrated service-learning project tackling invasive species at a local nature center. Products of the class, data from class artifacts, as well as student feedback on evaluations are also presented.

Introduction

Conservation Biology and Service-Learning

The mission-driven discipline of conservation biology draws from both the pure and applied sciences to address the goal of maintaining the planet's biodiversity (Soule & Wilcox 1980). The field is interdisciplinary and biological conservation must be practiced in the context of social, political, and economic landscapes (Hunter & Gibbs 2007), yet it has been

argued for decades that training programs do not put enough focus on the human dimensions of environmental conservation (Cutler 1982; Jacobson & McDuff 1998; Stevenson & Peterson 2015). Incorporating service-learning in conservation biology classes increases student learning in the "soft skills" that will benefit them in their careers (Kilgo, Sheets, & Pascarella 2015; Stevenson & Peterson 2015). Conservation biology may be one of the most appropriate science courses in which to incorporate service-learning, as students can gain insight into how communities view conservation activities firsthand while they apply their scientific knowledge to solving real-world problems.

Despite this natural fit, Kirsten Work (2017) found that many courses in conservation biology are offered in the traditional lecture format, and those with laboratories often use computer simulations. This is likely because a one-semester course cannot adequately address real conservation issues on its own (Work 2017). Active participation in conservation projects with structured reflection and evaluation enhances student learning (Evely, et al. 2017), and working with a local community partner allows students to effectively address environmental problems as part of larger conservation efforts even within the short time frame of a single semester.

Course Design and Service-Learning Integration

Service-learning is "a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities designed to promote student learning and development. Reflection and reciprocity are key concepts of service-learning" (Jacoby 1996, 6). The pedagogy has the potential to prepare students to be active participants in their communities for years to come (Jacoby 2015). Studies examining the long-term impact of service-learning in environmental courses reveal that the pedagogy has lasting positive impacts on participants (MacFall 2012; Knackmuhs, Farmer, & Reynolds 2016).

The most effective service-learning courses do not just "add on" a project to a course. To provide students with a meaningful experience, our service-learning project was completely integrated within the fabric of a course. The first step we took was to examine course objectives and brainstorm potential themes that can be addressed through incorporating service-learning that align with course content. One of the objectives of this course was to "appraise the various threats to biodiversity." There are a variety of threats to biodiversity ranging from global climate change to overharvesting. We decided to focus

on the impact of invasive species, as their impact is only second to habitat loss (Walker & Steffen 1997). Invasive species are non-native species that have been able to establish and wildly proliferate in the absence of natural controls.

A second course objective was to "explain the role of humans in species and ecosystem loss and conservation." Invasive species have essentially all been caused by humans introducing species to new areas (Sakai, et al. 2001). Public education and engagement are key in preventing and removing invasive species. It is not something that scientists and conservation agencies can do on their own, thus any opportunity to engage more individuals on this issue is important. Not only it is much easier, through public outreach and civic participation, to prevent non-native species from taking over than it is to remove them once they have established, but also invasive species can only be controlled through continued local action (i.e., removal). Identifying and removing invasive species is an effective way for students to learn about a major concept threatening biodiversity while also making an impact on a local scale.

We reached out to possible community partners to identify needs that could be addressed and fit within the context of the course. Through this outreach, a local nature center was identified as a community partner. In order to promote the service-learning partnership, efforts were made to ensure it was "collaborative, mutually beneficial, and address(ed) community needs" (Billig 2011, 11). One of the needs that the nature center identified that fit within the course content was trail maintenance through the removal of invasive species. In addition to just removing the invasive plant species, the nature center requested a basic field guide that visitors could use while walking the trails to identify the non-native plants. While the students were completing the trail maintenance, they would investigate and evaluate the "Top Ten" invasive plant species at the nature center and then compile those into a field guide. Students were also given the opportunity to share this field guide and their findings via a lunch-and-learn presentation for community members and the staff at the center.

The IPARD/C (Investigation, Planning/Preparation, Action, Reflection, Demonstration/Celebration) process was followed to ensure a high-quality service-learning experience (Billig 2011). Through the first step in the process, Investigation, students collect data about a genuine community need (Billig 2011, 8). In this course, students examined the issue of invasive species through reading assignments and lectures. They also investigated the specific

invasive plants at the nature center while they were in the field and, later, at home. During the Planning/Preparation phase, students decide exactly how they will address the community need (Billig 2011, 8). Students in this course planned their own schedules, prepared themselves by learning how to identify and remove the invasive plants, and decided how to document their findings. They also researched and wrote the content for a field guide and presentation. The Action component involves the actual service provided (Billig 2011), which for this course was the invasive plant removal from the trails. Students also created the printed field guide. Reflection should be ongoing and incorporated throughout the entire experience (Billig 2011). Each week, the class discussed various issues they experienced, the trail maintenance activity, and any problem solving they engaged in. They also discussed non-native plants regularly, and through reflection on their efforts they identified the "Top 10" invasive plant species at the nature center. At the conclusion of the course, the students' final reflection focused on their articulating the knowledge and skills gained and documenting their experiences and products on their resumes. Finally, Demonstration/Celebration involves the display of the knowledge and recognition of a job well-done (Billig 2011). Students demonstrated their content knowledge on exams and by hosting a lunch-and-learn celebration with the community to present their field guide (see Figure 1).

Figure 1.   The IPARD/C process

Results

Seven of the eight students completed fifteen hours of invasive species removal on the trails, totaling 105 volunteer hours of trail maintenance at the local nature center. It was estimated that an additional five to ten hours each was spent gathering information for the field guide, taking photographs, practicing the presentation, and presenting at the lunch-and-learn. One of the students was unable to participate in trail maintenance due to medical issues, and an accommodation was made she could still partake in the service aspect, meet the learning objective, and benefit from the overall service-learning experience. After discussing some options with the student, it was decided that she would serve the community partner (still completing the required fifteen hours) via meeting with the university's professional designer to determine the layout of the field guide, coordinating the seven other students' textual submissions for the invasive species content, and then researching three of the other identified invasive species. In the end, every student had the opportunity to participate in and reap the benefits of this service-learning class, regardless of their physical abilities.

Through this service-learning course, the idea of invasive species became more than just something students read about in a textbook; they learned first-hand the difficulties and frustration experienced by conservation practitioners. They learned details about a number of invasive species of local concern through the creation of the field guide. Each student conducted research on the "Top 10" invasive plants for the guide, including the common and scientific names, basic facts about the plants, how to identify the species, and how to remove them. Many students also took photographs for the guide while they were in the field.

Students were engaged with the material, and they demonstrated proficiency on their exams when tested on the subject. On the second exam, students were asked four questions (two multiple choice, one short answer, and one optional bonus short answer) about content knowledge around invasive species. The multiple choice questions assessed if students understood the reasons how non-native species are introduced and general characteristics of invasive species. All eight students answered the two multiple choice questions correctly. The short answer question asked students to explain why ordinary citizens can make a huge impact regarding limiting the effects and distribution of invasive species. In answering this question, six of the eight

students focused on invasive plants only. Three of the eight students suggested connecting with garden centers to stop the sale of non-native and known invasive plants. Two students mentioned other advocacy through legislation. Seven of the eight brought up the need for public education on the topic. All students also answered the optional bonus reflection question concerning their experience to that point at the nature center. Many removed invasive Japanese stiltgrass (Microstegium vimineum), which was abundant. All of the students doing the trail maintenance reflected on how once they knew what they were looking for, they found it everywhere. One student wrote, "I removed mostly stiltgrass and although we removed an entire field, it still didn't make me feel like I did anything. Walk a few steps in any direction and there was still stiltgrass for as far as I could see. It helped me to digest the importance of early detection and it brings home the point that what we do has huge consequences and can't all be fixed like we hope it can. Depressing."

Benefits

The problems that conservation biologists face are global in nature, but working locally on small-scale projects can have big impacts. Students were able to apply their knowledge in the field to real-world problems. One student commented in her course evaluation, "This class definitely opened my eyes to different ways conservation should be practiced… It was a great learning experience and a great way to get involved in the community." Additionally, it was clear to the students that invasive species are everywhere. One student commented in her reflection essay,

Often, we do not get to hear about or participate in the conservation efforts that occur close to home. For example, I have heard much more about the need to conserve the rainforest than I have the need to get rid of invasive plant species from Maryland. Typically, people tend to overlook the difference between invasive and native species when they are planting things in their gardens. If people were more conscious of the impact of their actions, they may be more inclined to choose the native plants over the invasive plants, which is something that I hope we accomplished in this project.

Another benefit students reported was the opportunity for career

exploration. As a "career-focused liberal arts" institution, our academic programs are intended to prepare students for future employment. After participating in this service-learning course and completing the course evaluation, another student commented,

> This course was incredibly helpful in my decision to pursue a career in conservation. The service-learning project at Irvine was also incredibly rewarding because we not only helped Irvine get rid of some of its invasive species, but we were able to educate the community on some of these species and how they can help get rid of these non-native species both at Irvine and in their home environments.

Since our students are especially driven by the practical nature of their degree, seeing the application of what they learn in the classroom is important to them. Research shows that college students who participate in service-learning have "demonstrated improved academic content knowledge, critical thinking skills, written and verbal communication, and leadership skills" (Cress, et al. 2010). These hands-on, authentic learning experiences provide the mechanism for students to also practice problem-solving and decision-making, which are desirable and transferrable skills that can be applied in future careers. Many of the same skills will prepare students for the job market as a conservation professional. Potential employers not only require disciplinary knowledge but also look for interpersonal and project management skills (Blickley, et al 2013; Stevenson & Peterson 2015). Integrating service-learning into a conservation biology class equips students with the tools and experiences needed to tackle and solve complex problems within conservation in the future.

This experience provided a mechanism for student learning, and it also provided information to community members about the issue. Subsequently, by creating the reusable field guide, students produced an artifact that will long outlive the course. The field guide was so well-received, the nature center asked us to print additional copies so they could sell them in their gift shop, which will result in additional monies for this non-profit organization. Since our work together, the nature center has also developed a service-learning curriculum for K-12 groups around invasive species at the nature center. The field guide we created for them is now provided to local teachers as a resource for them and their students. In addition, the university gained a solid partner for numerous future courses.

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A STEM Experiential Learning Experience: A Five-Year Synthesis of Lessons Learned

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Abstract. From Fall 2012 to Fall 2016, 127 teacher candidates at a public university in southern Louisiana and elementary school students in grades four, five, six, and eight formed a Science, Technology, Engineering, and Mathematics (STEM) partnership to develop and implement science projects. The research questions of the accompanying study over the five years were: 1. Will mentoring a science project increase student understanding of best practices afforded by the scientific method? 2. What strategies improve the quality of a STEM experiential learning experience? A paired-samples t-test on teacher candidates' pre- and post-test scores showed a significant difference in mean scores, indicating an increase in understanding in students for each of the five years. Themes emerging from the qualitative data suggest that successful strategies include preparation, staying small, organization, communication, motivation, and acknowledgement. Coincidentally, these themes closely mirror the National Society for Experiential Education's (NSEE) "Eight Principles of Good Practice for All Experiential Learning Activities."

Introduction

In May 2012, the Louisiana Region VIII Science Fair director, who is also a colleague of mine in the Department of Biological Sciences, informed me that the Shell Company Foundation had awarded grant money to our university to support our STEM Educational Outreach Program. The idea was that teacher candidates enrolled in our university's capstone methods

courses would use a hands-on approach with junior high students to boost participation in science fairs. We therefore decided to establish a partnership with local schools so that our teacher candidates could mentor the junior high students through the development and implementation of their science projects.

In summer 2012, two schools accepted our invitation to participate. We met with principals and participating lead teachers to discuss logistics and put together a plan. Using this experience, and the quantitative and qualitative data collected from my teacher candidates over the last five years, I have learned valuable lessons regarding what criteria constitutes successful experiential learning. The objective of presenting a synthesis of this research is to offer educators strategies, identified by the participants themselves, that nurture STEM experiential learning. The findings appear to validate NSEE's "Eight Principles of Good Practice for All Experiential Learning Activities."

Theoretical Basis: The Impact of Real-World Experience

Real-world field experiences in science methods courses are recognized for promoting self-efficacy, positive self-perception in pre-service teachers as future science teachers, and the formation of informed images of scientists (Miele 2014; Smolleck & Mongan 2011; Thomas & Pedersen 2003). Moreover, the Next Generation Science Standards' (NGSS) Framework for K-12 Science Education has recommended that pre-service teachers learn to ". . . organize student groups; and guide students as they collect, represent, analyze, discuss data, argue from evidence, and draw conclusions" (National Research Council 2012, 258).

In 1916, John Dewey proposed that the processes of instruction result in proper thinking when they provide "an educative experience." The experience should be continuous, authentic, and interesting to the student, and it should generate an authentic problem that stimulates thought while the student becomes informed. The student should be able to observe in order to confront the problem, form solutions, and apply them to verify their validity (Dewey 2004, 157). Situated learning theorists Jean Lave and Etienne Wenger (1991) suggest that the "place of knowledge is within a community of practice," not in copying others' performances or learning through traditional instruction (100). Accordingly, experiential learning authority David Kolb (2015) writes, "Knowledge results from the combination of grasping and transforming

experience" (51). Kolb also acknowledges the importance of reflection in experiential learning in his revised Kolb Learning Style Inventory. Identified by Kolb as The Reflecting Style, he writes that students need "the ability to connect experience and ideas through sustained reflection" (145).

In support of experiential learning, social learning theory has asserted, "In the social learning system, new patterns of behavior can be acquired through direct experience or by observing the behavior of others" (Bandura 1971, 3).

Since 1971, the National Society for Experiential Education (NSEE) has strongly advocated quality experiences outside of the classroom that promote the "demonstration of high-level cognitive skills." According to the society's publication, Strengthening Experiential Education: A New Era, "Experiential education provides a meaningful way for students to learn while pursuing educational goals important to their learning and to the greater society" (King 2013, 113). NSEE also advocates eight principles for a successful experiential learning activity: the intention of providing the learning experience, preparation for a truly authentic experience co-designed by those who will be affected, appropriate training, planning and preparation, an element of reflection, a continuous monitoring strategy precipitating improvement, a method of evaluation, and continuous acknowledgement of learning ending with a form of recognition for all participants (NSEE 2011).

How the Partnership Worked

Each fall semester, teacher candidates in their capstone methods course participated in a science fair partnership with a local school. After preparing in the methods classroom to develop science projects incorporating the scientific method, the teacher candidates formed mentor teams. They grouped the students and stocked folders with vocabulary sheets, graphic organizers, checklists, and suggestions for project ideas. For example, in 2016, twenty-one teacher candidates were assigned to a PreK-8 school. Three teams of seven teacher candidates each were formed, with each member of the three teams mentoring three students. Visits to the schools took place weekly for 90 minutes to guide 4th-, 5th-, 6th- or 8th-graders through selecting a problem, developing a question, forming a hypothesis and a procedure, collecting data, constructing a conclusion, designing a project board, and writing a report. A school fair was held, and winners at that school level then advanced to the regional fair. The teacher candidates completed a pre- and

post-test, wrote weekly reflections, and enumerated benefits and challenges at the partnership's conclusion.

Methods: Fall 2012 to Fall 2016

During each semester, I used a mixed methods approach to investigate the following research questions: 1.Will mentoring a science project increase understanding of best practices afforded by the scientific method? 2. What strategies improve the quality of a STEM experiential learning experience?

Participants

Over five fall semesters, 127 teacher candidates participated in the partnership, 63 from the Curriculum and Instruction in the Elementary School methods course (grades 1-5) and 64 from the Upper Elementary Curriculum and Instruction course (grades 4-8). The participants included five white males, five African-American females, and one Asian female. The remaining participants (116) were white females.

Data Collection and Analysis Strategies

In summer 2012, the director of the Louisiana Region VIII Science Fair and I selected a pre- and post-test for teacher candidates and for students. We deliberately included BrainPOP's figures Tim and Moby the Robot because they were so recognizable to junior high students. Appropriately, the BrainPOP video (which can be viewed at http://www.brainpop.com) was also used to prepare the teacher candidates and students. What follows refers to the "Scientific Method Pre- and Post-Test: 24 Items" document in the Appendix. (To the original test, we added items 18-21 to cover terms important in experimentation. In fall 2012 and 2013, the teacher candidates completed the 24-item pre- and post-test. Item 20 was omitted from scores in fall 2012 and 2013 because no alternatives for this item were correct. The item was revised in 2014 to include a keyed alternative. By fall 2014, items 10 and 11 were removed to make the test more instructionally aligned with classroom preparation since "theory" and item 11 were not emphasized during preparation and process. Also, item 23 was omitted from those scores because it appeared to be repetitious regarding "replication," but it was reinstated

in 2015-16. The final item was always considered ancillary because it is an opinion question.) I analyzed scores using a paired-samples t-test.

Following every weekly visit, one teacher candidate from each team submitted a reflection. The responsibility rotated within each team. The reflection included, "What we did," "What went well," "What could be changed," and "How the students reacted." At the conclusion of the partnership, teacher candidates completed a questionnaire on the benefits and challenges of the partnership. This questionnaire allowed the teacher candidates to summarize their opinions of the experience. When the partnership began in 2012, I did not ask for reflections; by fall 2013, I added the requirement, which became the groundwork for nurturing the partnership. I utilized a case study design to track the process of "a phenomenon of sort occurring in a bounded context" (Miles & Huberman 1999, 25), followed by a cross-case thematic analysis of the data. Coding was based on repetition of comments and terms, which were categorized, labeled, and tallied to determine a percentage for reporting. The lessons learned reflect the prominent themes that emerged.

Results: Fall 2012 to Fall 2016 Lessons Learned

By drawing on the experience and analyzing 99 weekly reflections submitted from Fall 2013 to 2016, along with 73 questionnaires completed from Fall 2012 to 2015, I was able to distinguish fundamental strategies that appear to nurture a STEM experiential learning experience. The lessons learned can be attributed to the comments of my teacher candidates. Coincidentally, after analyzing the data, I realized how closely the themes that emerged mirrored NSEE's "Eight Principles."

Qualitative Data: Fall 2013-2016 Weekly Reflections

Lesson 1: Prepare

To begin the partnership, I reviewed the consent form and explained its purpose: to mentor students through the development of a science project. The possible benefits I enumerated were a deeper understanding of the scientific method (in the students) and the experience of mentoring a group of students

through a process requiring long-range planning (in the teacher candidates). A result of the experience could be the improved ability to instruct, which might transfer to student teaching.

An essential component of nurturing this partnership was teacher candidate preparation. Providing visuals such as the PowerPoint and BrainPop video, along with providing actual examples and sequencing activities, prompted the teacher candidates' prior knowledge of the scientific method. In addition, using real project boards displaying an example of an actual investigation involving conditions to prevent bread mold growth, and reviewing vocabulary with concrete items, proved effective. A teacher candidate commented in class that she wished her own teachers had explained terms such as independent variable and replication with such tangible examples. Twenty-nine weekly reflections documenting first or second visits supported the preparation's effectiveness. One hundred percent of these reflections described lessons that included the strategies used in preparation. One entry from 2015 read,

> On the first day, we began by introducing ourselves. . . . We then each held up a poster with the steps of the scientific method. We had the students attempt to put us in order. . . . Next, we went through a PowerPoint. . . and described an actual experiment with moldy bread. . . We had the students watch a BrainPop video . . . and reviewed the contents of their folders.

I provided to the teacher candidates engaging activities for the students, such games, videos, word searches, and crossword puzzles. However, I allowed the teacher candidates to use the resources whenever and however they thought would be most effective. This approach fostered creativity and adaptability in the teacher candidates. An excerpt from a 2013 reflection illustrates their resourcefulness: "The vocabulary sort [activity] was also a fun interactive way for the students to better understand the different terms used in the scientific method." Another wrote, "The students seemed to really enjoy the Jeopardy game. There were several students who got very excited and competitive."

Thirty-four percent of the teacher candidates mentioned the effectiveness of examples. One wrote, "I think going over the sample report showed the students the amount of time that goes into this project." In 2015 another stated, "I have also found that providing students with some guidance by providing examples greatly increases their motivation and understanding."

Similarly, in 2016, a teacher candidate wrote, "During the lesson, we were able to share an example of a science project, the Molded Bread experiment. This served as both a model and a visual for what they will need for their own projects."

Lesson 2: Start Small and Stay Small

As indicated in 69% of the 99 weekly reflections collected, it is beneficial to start small and stay small, both in student and partner teacher numbers. During the initial experience in 2012, my teacher candidates mentored over 320 fourth, fifth, and sixth graders. This involved 16 teachers. There were 33 teacher candidates, so the student-to-teacher candidate ratio was about 10 to 1. On a 2012 questionnaire (reflections were not required), a teacher candidate suggested, "Anything more than 5 students per mentor is too many. It does not allow students personal time to spend with a mentor to determine what to research or how to test." By the following semester, I reduced the number of elementary students to 84 to accommodate the 20 teacher candidates enrolled. That semester, a teacher candidate's reflection noted, "Working in groups . . . seemed to be the best way to get the students to understand the material best. Individual attention is very important in this classroom." Since the first partnership, the ratio has been no larger than 1 to 5. According to 28% of the reflections, having a more manageable ratio is crucial.

Another thing I learned is that it is desirable to involve partner teachers who wish to take part actively in the project. Agreement appears to affect the level of teacher involvement. Participation was mentioned in 40% of the reflections. In 2014, one teacher candidate wrote, "The teachers were not involved at all." Another reported in November 2014, two months after the partnership began, "There was no work done on the projects in science class. The classroom teacher walked around the room for the first time while we were there. . . ." Partner teacher involvement can affect classroom atmosphere. The following remarks show the extreme differences in the experience as related to partner teacher involvement. In 2016, a teacher candidate wrote, "[The teacher] was very helpful. She was eager to help her students, but also eager to answer any questions that we had and help as much as possible. The students were all very engaged and had [a] good work ethic." Conversely, a comment was, "I feel that the teachers need to be in their [sic] more to help control the students. . . . I feel that the students will take us more seriously and start to behave more."

Lesson 3: Motivate

Since 2013, the importance of motivation and its effects appeared in 68% of weekly reflections. Lack of student self-motivation was a significant complaint in Fall 2012 as it became evident that intrinsic motivation was not sufficient. Accordingly, in October 2013, some fourth-grade teams decided to implement their own incentive program. Mentor team members wrote, "Also, more of our students had their folders with work done because they were rewarded with candy" and "What went well was the fact that more students are working on their projects at home because they want to get more stickers on the checklist chart." Word spread quickly about such incentives. An eighth grade teacher candidate reflected, "The students' motivation needs to change. The group and I could try new motivation techniques in the classroom such as the ones that are being used by the groups at [another school]."

By 2014, the partner teachers and I agreed that an official incentive plan was needed, so we set up a system whereby students earned tickets for daily rewards, such as candy, chips, or school supplies with a reward of an iPod (2014-15) or Kindle Fire (2016) at the partnership's end. The incentive plan significantly raised the level of student self-motivation. Reflections from Fall 2014 documented, "The students (eighth-graders) are now finishing a lot of the required task. They enjoy receiving tickets and getting prizes" and "We let the students (fifth-graders) know that these tickets are hooked to their behavior that day. . . . The students were well-behaved during this experience. . . ."

During Fall 2015, a mentor of fourth-grade students reflected, "The incentive program is a great way to keep the students on task. It is also fun to see the students retrieve their prizes." A mentor of eighth-graders stated, "It was difficult to get an overall reaction but they were all excited about the prizes." In 2016, a mentor of fourth-graders wrote, "The use of positive reinforcement and incentives helped keep . . . students on track."

Only 25% of the reflections reported that behavior or work ethic did not appear to be affected by the rewards. For example, in 2016, a mentor of fourth-graders reflected, "When we distributed incentives, students were excited, but not quite excited enough to behave properly."

We also deduced that setting a class goal was unrealistic. The teacher candidates   established individual goals for each student in their mentor group, and the benefits were direct. A 2014 team reflected, "Having [a] specific

goal set for the students worked great. We are not completely sure if it was because we offered an incentive, gave them specific goals, or a combination of both."

Lesson 4: Organize

Organization was considered important in 46% of teacher candidates' weekly reflections. Thirty-five percent noted organizational issues mostly related to confusion in reserving the computer labs, lack of computers, not following the schedule, or lack of materials to complete student experiments. In 2014, a teacher candidate expressed frustration: "I also think that the teachers need to have the computer situation dealt with before arrival, because we waste precious time with the students when dealing with the computer issues." A 2016 comment reads, "The teacher has also not bought any supplies for students so I think this makes students feel as though this project is not important."

Graphic organizers and checklists were explicitly mentioned as organizational tools in 24% of the reflections. In 2013, one team questioned their fourth-grade group about "the progress of each kid to add to the checklist chart." In Fall 2014, a mentor of eighth-grade students reflected, "Using the checklist that the students get to keep allowed the students to visually see where they were in the process and helped them stay focused."

Supplying all student materials to partner teachers reduced some organizational issues. By Fall 2015, rather than emailing documents as attachments, I loaded them on a flash drive for the teachers. This saved time and redundant emails messages.

Lesson 5: Communicate

A reference to communication appeared in 19% of weekly reflections. To maintain contact with the school site, I frequently emailed participating school staff before visits concerning resources my teacher candidates would require and sent "gentle" reminders. In spite of increased communication, disorder sometimes occurred. In 2014, a teacher candidate wrote, "The administration scheduled two classes to be in the computer lab at the same time, and we ended up having to be the class to leave. This is poor organization

and communication skills from the administration which could have been prevented."

I used weekly reflections, emails and class discussions to maximize communication with my teacher candidates. Reflections also provided opportunities to offer suggestions. I acted upon the "What could be changed" remarks as soon as possible. For example, in Fall 2013, three reflections noted the age appropriateness of the PowerPoint. A comment read, "The power point that we used was not appropriate for fourth graders, and many of them were confused after watching it." Consequently, I completely redesigned the PowerPoint to include visuals for vocabulary and each step in developing a science project. I used the familiar experience of finding mold on bread you were planning to toast for breakfast and wondering how it grew there. Apparently, my revisions were useful. In 2015, a teacher candidate typed, "Also, the PowerPoint was extremely helpful because it allowed the students to relate each step of the scientific method to an actual experiment."

Other teacher candidate recommendations were also implemented to improve the program. This suggestion came from a 2014 reflection: "I think next year instead of two classes, maybe just working with Ms. [X's] class would be better. . . ." Accordingly, in Fall 2015, we mentored only one class to reduce the student-to-teacher candidate mentor ratio. Another recommendation noted, "I think an awards ceremony would be nice to have after the judging is complete." So in Fall 2015, we held a small awards ceremony in the fourth-grade classroom after the school fair rather than having school personnel distribute ribbons after the partnership ended. In 2014, a teacher candidate commented, "Also, rewarding the students is just a great joy. I really like watching students who achieve get rewarded and get excited for their hard work."

Lesson 6: Acknowledge

Although the incentive program recognized student accomplishment on a weekly basis, after months of effort, we felt the students deserved formal acknowledgment and therefore arranged a school fair where that could happen. One hundred percent of the 17 weekly reflections documenting the school fair described a positive experience. On Fair Day, I provided snacks and drinks. These amenities were somewhat of a compensation for the teacher candidates, but the following remarks express what they really considered

to be the prize. In 2015, a mentor of fourth-graders wrote, "I loved getting to see the students receive their ribbons. You could see on their faces how proud and excited they were to get the awards. . . . Students were cheering, clapping, and encouraging their fellow classmates." A mentor of eighth-grade students reflected, "But honestly, I would say just the fact that the students showed up and were excited about the work they put into their projects really stood out the most. For a majority of them you could tell they wanted to present their work. . . ." A 2016 comment also reflected the importance of acknowledgement: "The students were really excited to finally be able to present their projects, and we were just as excited to see their final product."

End of Partnership Questionnaire: Benefits and Challenges

A final questionnaire allowed the teacher candidates to summarize their opinions of the experience. Fifty-three percent of the 73 questionnaires mentioned the actual experience as a benefit. Forty-four percent referred to increased understanding of the scientific method. A 2012 comment touched upon both benefits: "The greatest benefit was the learning experience that was gained over the past nine weeks. Science is a subject that I have always struggled with. I am now more comfortable with teaching and working with the scientific method."

Some of the "What could be changed" comments in the weekly reflections were reiterated as challenges in the questionnaires. Student motivation and lack of partner teacher involvement contributing to organizational and communication issues were mentioned again. However, 26% voiced additional concerns regarding background knowledge. For instance, "Students had no prior knowledge of scientific method" and ". . . the students were on different learning levels."

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Quantitative Data: Pre- and Post-test Results

Before any teacher candidate preparation began, I administered a pre-test, with a post-test following the partnership's conclusion. Every fall, analysis using paired-samples t-tests of teacher candidates' raw scores indicated a significant difference in mean pre-test scores compared to mean post-tests scores at the .05 level for all five years, as reported in Table 1 below. This result suggests that experiential learning had a powerful impact on the teacher candidates' understanding and ability to implement the scientific method.

Table 1: Statistical Analysis: Teacher Candidate Pre- and Post-test Results, Fall 2012 - Fall 2016

Fall 2012 Mean comparison of teacher candidates' pre-test and post-test results

Variable	N	M	SD	CI 95%	t	df	p
Pre-test	33	13.03	2.70	-5.31, -2.74	*-6.38	32	* .000
Post-test	33	17.06	2.78				

Fall 2013 Mean comparison of teacher candidates' pre-test and post-test results

Variable	N	M	SD	CI 95%	t	df	p
Pre-test	19	14.73	2.57	-6.13, -3.76	*-8.76	18	* .000
Post-test	19	19.68	1.29				

Fall 2014 Mean comparison of teacher candidates' pre-test and post-test results

Variable	N	M	SD	CI 95%	t	df	p
Pre-test	22	12.40	2.40	-4.03, -0.96	*-3.38	21	* .003

Post-test	22	14.90	2.26				

Fall 2015 Mean comparison of teacher candidates' pre-test and post-test results

Variable	N	M	SD	CI 95%	t	df	p
Pre-test	18	11.11	2.32	-8.22, -5.11	*-9.05	17	* .000
Post-test	18	17.77	2.43				

Fall 2016 Mean comparison of teacher candidates' pre-test and post-test results

Variable	N	M	SD	CI 95%	t	df	p
Pre-test	26	11.65	2.77	-6.44, -3.47	*-6.89	25	* .000
Post-test	26	16.61	2.77				

Table 2, below, provides a breakdown of raw scores and a comparison of the improvement in mean scores. It is difficult to infer if omissions and revisions had any effect on raw scores or mean scores. Perhaps if the same group of participants completed both the 24-item and 22-item pre- and post-tests at the partnership's end, inferences on effects could be made.

To discover any patterns among items, I compared responses from 85 pre- and post-tests collected from Fall 2013 to 2016. (Note that scores from 2012 could not be included in the analysis due to fire damage at the facility where we stored the documents.) The largest improvement from pre-test to post-test responses was in sequencing items 1-7 (see the Appendix).

Table 2: Analysis of Post-test Raw Scores and Percentage of Improvement in Mean Scores

FALL	HIGHEST SCORE	LOWEST SCORE	MEDIAN SCORE	IMPROVEMENT IN MEAN SCORES
2012	22/22	12/22	17/22	31%
2013	22/22	17/22	20/22	34%
2014	19/20	11/20	15/20	20%
2015	21/21	11/21	19/21	60%
2016	20/21	7/21	17/21	43%

Note: See omissions and revisions described in "Data Collection and Analysis Strategies" in the Appendix

Seventy-nine percent of teacher candidates' sequencing skills improved. The item "Is this a hypothesis that I can test? If digital cameras, Duracell batteries last longer than Energizer batteries" showed the most consistent results. Ninety-three percent of teacher candidates selected "yes" for both pre- and post-tests. Only 7% corrected their answers from "no" to "yes." The largest decline in accurate responses was for the item "If you were doing an experiment to find the temperature when green beans sprout the fastest, what would be the trials?" Thirty-eight percent of the teacher candidates changed correct answers to incorrect answers.

Discussion

The qualitative data collected over five fall semesters appear to suggest that preparation, staying small, organization, communication, motivation, and acknowledgement are fundamental strategies for providing a valued STEM experiential learning experience. The pre- and post-test results suggest that experiential learning afforded by the partnership did contribute to an increase in teacher candidates' understanding of the components of a robust investigation using the scientific method. What is also significant about the data collected is its relationship to NSEE's "Eight Principles of Good Practice for All Experiential Learning Activities." The parallel that the research showed was unintentional, which further strengthens the connection between what participants in experiential learning deem important and the eight principles themselves. Confirming NSEE's "Principle 1: Intention" was not an issue for the teacher candidates. As seniors in their capstone methods course, they were well aware of the benefits of experience over classroom instruction. In 2012, the initial year of the partnership, a teacher candidate bulleted this cautious comment in her questionnaire: "[This] has the potential to be a really awesome program for students, teachers and teacher candidates." By 2015, the following weekly reflection states with more confidence, "This partnership has been such a positive learning experience for everyone involved."

Additionally, I instructed the teacher candidates extensively before we went into the field, matching nicely with NSEE "Principle 2: Preparedness and Planning." Pre-program instruction also supports the theme "Lesson 4: Organize." From the teacher candidate's reflections and remarks, they appeared to feel prepared. In Fall 2015, one teacher candidate remarked in the questionnaire, "If I ever have a child or students who need to do a sci [science]

fair – I know exactly what to do!" The teacher candidates also recognized the importance of schedules and checklists to track student progress in 24% of the reflections.

From the initial visit, meeting NSEE "Principle 3: Authenticity" was not in question. The teacher candidates discovered that progress is a process; motivation levels and cooperation vary in a real-world experience. In 2013, a teacher candidate identified authenticity as both a challenge and benefit. "We could not have asked/had a better real-world experience working with those students. However a challenge we faced during the experience were in fact real-world situations."

During the partnership, the theme "Lesson 3: Communicate" was also addressed. Communication among teacher candidates, partner teachers, and me was important in maintaining progress, organization, and planning for future changes. Often, after reading weekly reflections, listed as NSEE's "Principle 4," procedures and materials were adjusted as quickly as possible, which also allowed "Principle 6: Monitoring and Continuous Improvement" to take place. In addition, the use of a pre-test and post-test, along with the weekly reflections, provided the data advocated by "Principle 7: Assessment and Evaluation."

NSEE "Principle 8: Acknowledgment" occurred during the partnership and at its conclusion. This item also emerged from the study under the themes "Lesson 5: Motivate" and "Lesson 6: Acknowledge." Almost immediately after the teacher candidates initiated their own incentive plan in Fall 2013, student self-motivation improved greatly; therefore, by Fall 2014 weekly rewards became an integral part of the partnership. As mentioned above, beginning in 2012, a school fair was held; the fair's organization and awards were improved based on teacher candidates' reflections.

Implications

As supported by 40% of the comments related to the theme "Lesson 2: Start Small and Stay Small," it appears crucial that all facilitators have the opportunity to willingly participate in the experience. NSEE "Principle 1: Intention" advocates that all parties understand the significance of selecting experience over classroom instruction and the learning goals that will result. Perhaps if a brief session during a faculty meeting had been scheduled to introduce the learning outcomes of the partnership, the teachers would have

felt more informed, engaged, and empowered.

With regard to "Principle 5: Orientation and Training," it appears that our program was lacking. The teacher candidates met their students and cooperating teachers on the first day of the partnership. There was no opportunity for introductions prior to that. Twenty-six percent of teacher candidates recognized as challenges the students' varied academic abilities, levels of understanding, and prior knowledge of the scientific method. Perhaps providing time for conversation, observation, and interaction would have improved the experience. An orientation period may have reduced some of the challenges noted by my teacher candidates.

In conclusion, this synthesis of findings could be useful to educators planning to implement a STEM program or any type of experiential learning experience. This study emphasizes the important role of self-reflection as a central component of the process and strongly supports the validity of NSEE's "Eight Principles of Good Practice for All Experiential Learning Activities." A Fall 2014 reflection is indicative of how my teacher candidates perceived the merits of a STEM experience and experiential learning as a teaching strategy:

This experience as a whole was beneficial to all of us . . . students because we were able to see a different side of the education spectrum. So much of the time we are just in the classroom with students and creating and following lesson plans. This was an opportunity to help prepare students to present their work on a much larger scale than just in front of their class, for a possible multitude of people, as well as present themselves in the process. It also gave us an opportunity to participate in something that is often expected of middle school students.

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