Using Service-learning to Promote Transdisciplinary Collaborations among Undergraduate and Graduate Students

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Abstract

Services to children are often provided through a transdisciplinary model, particularly when students are receiving special education services and supports. Given the individual and diverse needs of these children, professionals often work collaboratively in evaluating students, interpreting results, and making recommendations for appropriate services. Professionals are expected to have prior knowledge regarding the expertise of their trans-disciplinary peers. However, they may have never been presented with this opportunity during their preparation in higher education. Therefore, a project was designed to address this deficiency at two very different locations: a university campus-based child care center, and a residential facility supporting homeless women and young children experiencing poverty. Participants were 109 undergraduate psychology students in an advanced developmental psychology class, 93 exceptional education graduate students, and 24 undergraduate speech/language pathology students. In groups consisting of students from each discipline, students completed developmental screenings on 2-3 children ranging from 1 month to 5 years of age. Results of a pre-posttest evaluation indicated that students were significantly more comfortable working in transdisciplinary collaborative groups and more interested in working in transdisciplinary groups in a future professional capacity after completing this service-learning project.

Introduction

Service-learning courses have been steadily increasing in number on college campuses over the past several decades. This concept has been described as an educational approach in which students complete and reflect on a structured service activity to enhance their understanding of course content (Jacoby, 1996). Proponents of academic service-learning believe that the real-world application of classroom knowledge in a community setting allows students to synthesize course material in more meaningful ways and can be transformational for students (Eyler & Giles, 1999). In fact, research has found that students who participate in service-learning show numerous positive outcomes including more positive attitudes toward self, school, learning and civic engagement, and increased social skills and academic achievement (e.g., Billig, 2009; Celio, Durlak, & Dymnicki, 2011; Conway, Amel & Gerwien, 2009). Finally, service-learning projects offer valuable opportunities for *career exploration* and enable students to acquire career-specific

experiences. Thus, service-learning is an ideal platform for exposing students to the specific expectations, roles, and responsibilities that they are likely to encounter in their chosen profession.

In order to effectively prepare students in higher education for careers, it is critical to identify the knowledge and skills necessary to be successful professionals. Service-learning projects can then be designed with these goals and objectives in mind. In fact, establishing clear objectives for students and helping them make explicit connections between the service-learning project and content acquisition is associated with stronger student academic engagement and performance (Billig, Root & Jesse, 2005), increased problem-solving skills (Conrad & Hedin, 1982) and improved satisfaction with both academic and service-learning (Hamilton & Zeldin, 1987). With this in mind, one of our goals was to explore the efficacy of using service-learning for promoting discipline-specific professional responsibilities and methods.

Students with majors in disciplines such as education, social work, speech and language pathology, and psychology often express an interest in working with children and families. Although the primary focus of this work may differ across disciplines, a shared objective is to identify and provide effective interventions to optimize development for the child. Successful interventions require the collaboration of professionals from a variety of disciplinary perspectives. In fact, the importance of gaining insights from many disciplines with respect to a child's development is well recognized. Guralnik (2000) suggests, "the interdisciplinary team assessment of young children with possible developmental delays or of those with established developmental disabilities constitutes a critical component of the larger system of services and supports for children and their families during the early childhood years (p.3)."

Thus, a primary challenge for educators preparing students to work with children and families in early intervention settings is to ensure they have an appropriate depth of knowledge not only in their own expertise area but also across professional domains. For example, a student preparing to work as a speech-language pathologist (SLP) must gain expertise in the components of language, language development, and assessment of language performance. In addition, this student will need to recognize the impact of a child's physical, emotional, cognitive,

and social development to fully understand the child's developmental trajectory. Similarly, students in other disciplines such as psychology and special education will benefit from fully understanding all aspects of language development from their peers in speech-language pathology. With this in mind, it may be beneficial for this student to work with peers in special education, psychology, physical therapy, and occupational therapy to gain a holistic view of children and their development. A transdisciplinary teaching model is a potential solution to provide this type of learning for students during their college career. However, little transdisciplinary exposure is provided to students. We tested the efficacy of using a transdisciplinary teaching model to address this challenge as well as to increase the comfort level of students in working with young children and conducting developmental assessments. In transdisciplinary models, teams of individuals from different disciplines collaborate with one another to complete professional work such as assessment and intervention planning (Kaczmarek, Pennington, & Goldstein, 2000; McClam & Flores-Scott, 2012; Nash, 2008). The hallmark of an interdisciplinary team is its ability to integrate and synthesize information from numerous disciplines through an interactive group decision-making process (Garner, 1994; Rokusek, 1995). The aim of having students from diverse educational backgrounds work together is to help them learn a variety of theoretical approaches and apply them in naturalistic settings (Nash, 2008). According to McClam and Flores-Scott (2012) "describing, understanding, and finding solutions for the critical sustainability problems we face today require the development of cross-disciplinary approaches to teaching, learning, and research" (p. 231). It is important to recognize that one professional from one discipline will not be able to solve and meet all of the unique needs of a child and their family (Lamorey & Ryan, 1998). Also, family structures are complex and have numerous strengths, needs, resources, desires, hopes, and dreams (Lamorey & Ryan, 1998). Senge (1973) stated that teams that work together to support families do not struggle because of an individual's skill but "because they are unable to pull their diverse functions and talents into a productive whole" (p. 69). There is a clear need to have students think broader than their own discipline of study. This breadth of knowledge will potentially help improve the services they provide children and families upon entering the field. Transdisciplinary team approaches allow educators to pair students from different educational backgrounds and have them work with one another to conceptualize and critically think through problems facing them.

Transdisciplinary models are one of the most prevalent models used in early intervention (King, Strachan, Tucker, Duwyn, Desserud, & Shillington, 2009; Vanderhoff & Act, 2004). This type of approach has been reinforced by early intervention legislation dating back to 1986, which called for cross-disciplinary teams and the inclusion of parents as part of the decision-making process (Senge, 1973). This approach can reduce discontinuity of services, decrease conflicting and confusing reports to families, and increase service coordination (King et al., 2009). Also, using a transdisciplinary team model for early intervention services has been linked to more efficient service delivery, reduction in cost, more coherent intervention plans, and facilitation of professional development (King et. al, 2009). King et. al (2009) provided three essential components for successful implementation of transdisciplinary teams. First, professionals from multiple disciplines assess the child simultaneously. This assessment should include both standardized and informal tools. During this assessment, one person on the team should serve as the primary facilitator, one or two other professionals interact with the child, and the rest of the team observes the child interactions. Second, successful transdisciplinary teams work best when team members work together and schedule working meetings on a regular basis. This will allow team members to regularly exchange knowledge and collaborate on intervention planning. Finally, a primary feature of transdisciplinary work is the idea of role release. Role release enables the team to become truly transdisciplinary, as specific members will "release" and teach intervention strategies from their own discipline and allow other team members to carry out this intervention with the child and their family.

Given the widespread usage of transdisciplinary models in early intervention programs, it is critical that institutions of higher education prepare students to be effective practitioners on teams consisting of individuals from disciplines that differ from their own. Historically, there have been few programs of study in higher education that have provided opportunities for students to develop these skills in applied settings (Kilgo & Bruder,1997; Silverman, Hong, Trepanier-Street, 2010). Barriers to providing interdisciplinary experiences for students are numerous particularly in settings that provide services (see Kilgo & Bruder, 1997 for review) Thus, faculty members in higher education need to be creative in creating such opportunities for students. The

primary purpose of this study was to explore the effectiveness of using a service-learning project to enhance student interest in participating in transdisciplinary collaborations that mirror those found in professional settings.

Method

Description of the Service-learning Project

This study was conducted across four semesters at a mid-sized, public university located in an urban area in the northeastern United States. During the first three semesters, 93 graduate students in a special education course (EXE 650) and 109 undergraduate students in and advanced developmental psychology course (PSY 417) were placed into teams of 2-3 students consisting of at least one student from EXE 650 and one student from PSY 417. During the fourth semester, 27 undergraduate students enrolled in a speech and language pathology course (SLP 424) joined the project. Each course consisted entirely of students majoring in that specific discipline so each student group consisted of at least one student majoring in psychology, one student majoring in speech-language pathology, and one certified teacher (graduate student in exceptional education).

At the beginning of each semester, students were asked to complete a survey designed to assess their attitudes regarding transdisciplinary collaboration, conducting developmental assessments and working with very young children (birth to age 5) in their careers (see Table 1). Students were then extensively trained by their instructors (the authors) to administer and score the Ages and Stages Questionnaire, 3rd Edition (ASQ-3; Bricker, Squires, Mounts, Potter, Nickel, Twombly & Farrell, 1999). Each team was then assigned children that were located either at a child care center located on the college campus that primarily serves the children of faculty, staff, and students at the college, or at a transitional residential facility that provides housing and support programs for homeless, single-parent families experiencing poverty. These screenings were sponsored through a partnership with Help Me Grow Western New York, which is part of the national Help Me Grow organization that aims to "build effective early childhood systems that mitigate the impact of adversity and support protective factors among families, so that all children can grow, develop, and thrive to their full potential (HMG, 2018)." As referenced, to expose students to transdis-

ciplinary collaboration, each student was responsible for taking the lead on one developmental assessment while other students in the group provided support.

Students were then responsible for scoring the assessments and completing course assignments related to the developmental screening project (a combination of writing assignments and oral case presentations). At the completion of the project, students were again asked to complete the survey assessing their attitudes regarding interdisciplinary collaboration and working with very young children

Description of the Courses

Each course in this project included service-learning and students were asked to complete a minimum of 10 hours of service for an identified community need. In partial fulfillment of this requirement, students in these three courses completed developmental screenings of young children, between birth and age 5, as part of Help Me Grow.

EXE 650: Assessment of Young Children with Disabilities

This course is an upper-level graduate course focusing on the assessment of infants and preschoolers with disabilities. The content of this course includes assessment of young children in each of the early childhood developmental domains: physical (including fine and gross motor), social-emotional, cognitive, communicative (expressive and receptive), and adaptive. The course also focuses heavily on the implementation of universal screening tools, administration of varying types of assessments such as arena, environmental, criterion-referenced, and norm-based. About half of the students are early childhood special education majors, seeking a graduate degree in such. The second half of students are childhood (grades 1-6) majors, seeking to extend their certification down to the early childhood (birth-2nd grade) developmental level. All students in this course have some prior experience in working with children with disabilities in preschool or school-aged settings. Prior to taking this course, students must complete pre-requisite courses in behavior management, specialized and differentiated instruction, and a course in overall assessment strategies, including how to collect, graph, and analyze assessment data for school-aged children.

PSY 417: The Atypical Infant
This course is an introduction to issues related to infant mental health and takes a developmental psychopathology approach to examining risk factors, developmental delays and developmental disabilities during the first three years of life. Screening, assessment and early intervention is also surveyed. Students who take this course are either majoring (n=49) or minoring (n=4) in psychology and must have completed an introductory psychology course and either a child development or lifespan developmental course in psychology. Thus, these students are all either juniors or seniors with prior academic experience in child development.

SLP 424 Speech-Language Pathology Programs in Schools
This course is an upper-division course focusing on the ways in which SLPs provide assessment and treatment services in school-based settings for children birth – 21 years of age. The course focuses on assessment models that promote collaboration among school-based professionals, as well as collaborative intervention techniques such as response to intervention, collaborative teaching, and consultative services. All students enrolled are seniors majoring in speech-language pathology and had to have completed course work in language acquisition, language remediation, audiology, and communication disorders. Therefore, all students had prior experience in language development, assessment, and disorders for children birth to five years of age.

Perceptions of the Benefits of Transdisciplinary Collaborations
Quantitative measures of student perceptions to interdisciplinary collaborations and attitudes about working with very young children were obtained using a survey designed by the authors (see Table 1). This survey consisted of 6 items which were each measured using a 5-point Likert-type rating scale ranging from strongly disapprove to strongly approve, and was administered at both the beginning and end of the semester.

In addition, at the beginning of the project students were asked to complete open-ended questions regarding their perceptions in regard to collaborating with others to complete academic work, and their previous experience completing service-learning projects. At the end of the project, students were asked open-ended questions about their experiences administering and interpreting the ASQ with students in other disciplines. Specifically, they were asked if their perceptions about

working collaboratively changed after completing the service-learning project, the aspects of the project they enjoyed, and the aspects they found challenging. The third author of the study completed qualitative content analysis to understand the students' perceptions regarding collaborative work and service-learning projects before and after participating in the project. In qualitative content analysis participant talk is analyzed to develop specific themes that relate to a participant's behavior or experiences (Creswell, 2012; Downe-Wamboldt, 1992). The study's analysis method was established using guidelines from Creswell (2012). First, the third author established the unit of analysis, which was the students' individual responses to each open-ended question. Next, the third author read each individual response three times and highlighted keywords or phrases that encompassed the main idea/theme of the response. These keywords were used to establish a coding schema. This coding schema consisted of a keyword and a corresponding definition that was constructed based on the responses provided by students. This coding schema was then used to code all pre and post open-ended responses. This coding system allowed the authors to generate the underlying meaning and intent of the participant responses (Cavanagh, 1997; Downe-Wamboldt, 1992; Graneheim & Lundman, 2004). Also, coding allows investigators to take a singular account from one participant and compare and combine that account with others of a similar nature. By comparing and contrasting responses with the same code, the third author generated the primary themes found from this qualitative analysis.

Results

Changes in Interest in Participating in Transdisciplinary Collaborations

Separate 3 (course) X 2 (pre/post) analyses of variance were conducted for the two items (items # 4 and #5 – see Table 1) designed to measure perceptions regarding interdisciplinary collaborations. Results of these analyses indicated students in all three courses were much more comfortable working with individuals from other disciplines after completing the developmental screening project, $F (2,223) = 6.49$, $p = .01$, $\eta p2 = .07$, and indicated a greater interest in working with professionals from other disciplines once they completed their degree after completing the screening project relative to their interest level before the screening project, $F (2,223) = 4.49$, $p = .04$, $\eta p2 = .03$.

Based on qualitative analyses, students stated the following were aspects they enjoyed about collaborative work prior to participating in this service-learning project: (1) having the ability to learn from others, (2) hearing a variety of perspectives that may be different from their own, and (3) distributing the workload among all group members. The following were the primary dislikes noted by students regarding collaborative academic work before participating in ASQ data collection: (1) difficulties coordinating schedules among group members, (2) not being able to equally distribute the workload among all students, (3) disagreements about the ways in which to complete an assignment, and (4) reluctance in trusting and relying on group members to complete specific tasks. During pre-testing the majority of students across all class disciplines stated that they had experience working collaboratively to complete class assignments, however few students had participated in service-learning.

Qualitative analyses of the post-survey open-ended questions found that in general the students' perceptions about working collaboratively with other students changed in a positive manner. In general, there was a decrease in comments regarding dislikes and/or difficulties when collaborating with others. Specifically, comments regarding disagreements among team members and difficult trusting in and relying on group members were not present in the post-project survey. Based on the coding of participant responses, positive aspects of collaboration in this survey learning project fell into one of the three themes: (1) personal growth, (2) professional development, and (3) community connectivity. In terms of personal growth, responses found in this common code typically were about the overall student learning experience, learning from other diverse backgrounds, and building confidence. For example, one student in exceptional education stated this when asked about aspects enjoyed: "being able to help my partner find confidence and ease when doing the ASQ and helping her with strategies to help the child's attention". Similarly, a psychology student stated "It was great to have group members from other majors to complete the ASQ with. We helped and supported each other which allowed us to effectively complete the assignment". Finally, a different psychology student expressed the most positive aspect of participating in this service-learning project was "hearing other people's ideas and values. Working with someone older than me and more experienced made me more confident when completing the ASQ".

For the theme of professional development, student responses discussed that the service-learning project helped them understand and link to tasks they would potentially complete in their profession and that they were able to receive hands on experience they did not previously have. For example, a SLP student wrote, "I think it's a great class to prepare you for future situations and getting people comfortable with working with people out in the real world". Also, an exceptional education student reported this about the service-learning project "it helps to create real world situations outside of the classroom – to help your community and learn more than you could ever learn from a textbook". Finally, after participating in the service-learning project students felt it helped them understand and connect with their community. One exceptional education student stated, "I enjoyed the service-learning project because they are new and different ways to incorporate topics and procedures learned in class and put to use in an environment that matters. It gets me more familiar with my community and what is offered". In addition, a psychology student wrote, "I think that participating in service-learning is a great way to extend your comfort zone a little and do something helpful for another person".

Discussion

In conclusion, students who participated in this transdisciplinary service-learning opportunity generally had favorable feelings about these collaborations and expressed belief in the value of learning from the perspectives of others in disciplines that differed from their own. The qualitative findings indicated that students perceived that their participation in this assignment helped them to appreciate their own skill set and expertise in regard to working with young children. Because they so often take coursework with only others from their same discipline, there is a tendency to take their skill set for granted, as "everyone" can do what they can do, in their eyes. However, once they are placed on a team representing one or two other disciplines, students gain a greater understanding and appreciation for not only the skills and expertise of their transdisciplinary peers but of their own valuable contributions as well. This project allowed students to clearly see what they "brought to the table" in terms of their abilities to interact and engage with young children while assessing achievement of developmental milestones across several domains. Students not only learned from each other, but also realized they had the ability to share their own knowledge with others and share diverse skill sets that others may not possess. In this

regard, this project was incredibly innovative. Small group work is commonly seen among students in academia, but always within their own coursework and discipline. Students reported a new-found respect for their own discipline and proficiency within their field as a result of this experience. Thus, these findings highlight the value of providing both undergraduate and graduate students with the opportunities to collaborate with students from other disciplinary perspectives in authentic, collaborative projects. This is particularly important for students who are likely to be involved in providing intervention services for children. Such services are typically provided in the context of transdisciplinary teams but it is unreasonable to expect new professionals to be effective in these collaborations without explicit exposure to this method of providing intervention services.

Importantly, students also professed an increased interest in collaborating with professionals from other disciplines in the future. They indicated that participation in this project prepared them for future experiences once they left academia and began their professional careers and that this type of collaboration across disciplines allowed them to have a greater understanding of the role other professionals fulfilled within the realm of early childhood education. Students also felt that this project helped them to prepare for authentic real-world situations they might encounter when dealing with other professionals. Students overwhelmingly expressed the sentiment that engaging in service-learning provided them with opportunities to interact with children and families in an authentic way which they felt was far more valuable than content they would have received from a textbook in a more traditional learning approach.

On a broader level, these data support the effectiveness of collaborative learning as a high-impact practice (Kuh, 2008), a teaching strategy that has been demonstrated to positively impact student learning. Collaborative learning is a term for students working together to achieve learning outcomes (Bruffee, 1999). According to Kuh (2008), collaborative assignments/projects have two goals, 1) learning to work and problem-solve with others and 2) "sharpening one's own understanding by listening seriously to the insights of others, especially those with different backgrounds and life experiences". Collaborative learning is also considered to be one of the seven principles of good practice in liberal

arts education (Chickering & Gamson, 1987). A large body of literature provides evidence that cooperative learning is associated with higher levels of thought and longer retention of information (e.g., Johnson and Johnson, 1986). The shared learning gives students an opportunity to engage in discussion, take responsibility for their own learning, and thus become critical thinkers (Totten, Sills, Digby, & Russ, 1991).

Finally, although this experience is likely to have a direct and positive impact on students interested in careers that provide intervention services with children, this experience is also likely to have a positive impact for the students who may go on to careers that are not involved in providing intervention services for children. Teamwork or professional collaborations is consistently identified by employers as one of the top skills they find essential in new hires. In fact, teamwork/collaboration was rated as the second most essential career competency in the National Association of Colleges and Employers Job Outlook 2018 survey (NACE, 2018). Although 97.5% of employers rate this competency as essential, only 77% indicate that recent graduates are proficient in teamwork/collaboration. Thus, it is critical the instructors in higher education continue to provide opportunities for students to engage in collaborative experiences.

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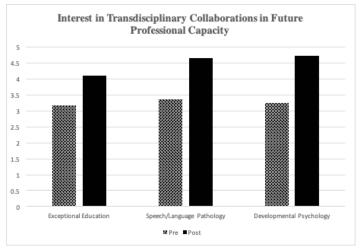
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Table 1. Class ratings before and after the service-learning project

	Exceptional Education		Speech-language Pathology		Development Psychology		
	Pre Mean(SD)	Post Mean(SD)	Pre Mean (SD)	Post Mean (SD)	Pre Mean (SD)	Post Mean (SD)	F
Comfort with Young Children							
	4.1 (.30)	4.26 (.56)	3.98 (.42)	4.29 (.46)	3.61(.50)	4.17 (.63)	2.89+
Comfort with Developmental Assessment							
	3.69(.81)	4.67(1.21)	3.94(.98)	4.53(.80)	4.56(1.15)	4.71(1.26)	4.26*
Comfort working with Transdisciplinary Collaborations							
	3.21(.61)	4.09(.83)	3.28(1.13)	4.81(1.25)	3.37(1.06)	4.59(.94)	4.89*

Note: * p <.05, + p <.10.
5 point rating scale where 1=Strongly Disagree, 2=Disagree, 3=Neither Agree nor Disagree, 4= Agree, 5=Strongly Agree

Figure 1. Group by Time Differences for Interest in Transdisciplinary Collaborations in a Future Professional Capacity