A Meta-Analysis on the Effects of Service-Learning on the Social, Personal, and Cognitive Outcomes of Learning

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Service-learning is an experience-based approach to education and learning that has a set of diverse learning outcomes. Because of the uniqueness of its pedagogical approach and breadth of potential learning outcomes, management and business scholars have recognized its value. Much theory and supporting research has been generated on the effect of service-learning on college and university students. Through meta-analytic techniques, we found support for the hypotheses that service-learning has a positive effect on understanding of social issues (Est. δ = .34); personal insight (Est. δ = .28); and cognitive development (Est. δ = .52). We also found significant moderating evidence for research design, type of reflection, type of measurement, and the service experience as optional or required. We conclude with a discussion of the theoretical and practical implications of these findings along with suggestions for future research.

Service-learning has received considerable attention from both researchers and educators in all academic disciplines (e.g., Astin & Sax, 1998; Astin, Vogelgesang, Ikeda, & Yee, 2000; Rama, Ravenscroft, Wolcott, & Zlotkowski, 2000). Overall, the efficacy of service-learning has been accepted by researchers and educators as demonstrated by its increasing adoption into higher education programs (Kenworthy-U'Ren, 2008). In a recent review, Kenworthy-U'Ren (2008) concluded that "the past decade has seen the wide-spread emergence of service-learning as a teaching tool used across a variety of disciplines, educational levels, and universities around the world" (813).

Business education is no exception to this trend. *The Academy of Management Learning and Education* (2005), the *Journal of Management Education* (2010), *International Journal of Organizational Analysis*, (2009, 2010), and the *Journal of Business Ethics* (1996) have all published special issues on service-learning. In a recent qualitative review of the business education literature, 48 studies that address the application of service-learning to undergraduate and graduate business education spanning disciplines such as accounting, finance, marketing, management, society and ethics, strategy, business communications, and leadership were reported (Andrews, 2007).

Given the growth in interest and use of service-learning in colleges and universities, it is imperative for business educators and researchers, as well as faculty across academic disciplines, to the better understand the impact of service-learning on student learning outcomes. A more clear understanding of the overall effects of service-learning on university-level students along with explanations for variance in effects is important for educational policy development for a number of reasons. First, there are associated institutional, administrative, and developmental (faculty and course) factors that accompany the integration of service-learning into program curricula, all of which represent a significant financial cost (Furko, 2004).

Second, a more complete understanding of the differential effect of service-learning on its set of distinct learning outcomes can offer guidance as to "where" to integrate the experience into a program or course by linking it with the appropriate learning objectives. Third, understanding the implementation factors that moderate the effect of service-learning on its learning outcomes can provide guidance as to "how" to implement an effective learning experience.

There has been at least one previous effort toward quantitative synthesis on the subject (e.g., Conway, Amel, & Gerwien, 2009). Conway, Amel, and Gerwien (2009) published a meta-analysis on the subject using loose criteria of inclusion,[1] which allowed for students of all ages and grade levels to be included in the sample as well as studies that may be considered to be outside of the scope of an operationally precise definition of a service-learning experience. In the present research synthesis, we employ strict inclusion rules based on four criteria, one of which is grounded in the National and Community Service Act's precise operational definition of service-learning.[2]

Cooper (2009) suggests that it may be acceptable for two research syntheses addressing an identical label to use distinct definitions of the focal construct, and further, that the differences can range from complete independence to considerable overlap. Logically these differences should be highlighted for the purpose of research interpretation. The difference in the operational definition of service-learning between the present research synthesis and those used by Conway and colleagues (2009) resulted in a considerably different sample of studies.[3]

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[1] Conway et al.'s 2009 criteria for inclusion were noted as follows: (a) pretest–posttest design using identical quantitative measures for identical pre- and postsamples; (b) participation in community service between pre- and posttests; (c) sufficient information provided to classify the measures; (d) reporting of the pretest and posttest means, the pretest standard deviation, and sample size.

[2] The National and Community Service Act of 1990 defines *service-learning* as a learning experience where students actively participate in service experiences that meet a real community need; the service enhances what is taught in the classroom and is integrated into the students' academic curricula; and the program provides structured time for a student to think, talk, or write about what the student did and saw during the actual service activity.

[3] In the our analysis there are 40 total publications included in the sample. Seventeen of these 40 are also included in the Conway et al. 2009 meta-analysis, and 23 are included in this analysis only. For a complete review of the differences between samples, the reader is referred to the reference list of both meta-analyses where an asterisk (*) is used to denote the sample of publications used.

Using the precise operational definition of service-learning referenced above, we attempt to explore the following questions: (1) What are the theoretically established learning outcomes of service-learning?; (2) What is the overall strength of service-learning in terms of these learning outcomes?; and (3) What factors moderate the relationship between service-learning and these expected learning outcomes? We explore these questions through a qualitative review of the service-learning literature and through a quantitative summary using meta-analysis techniques.

THE ELEMENTS AND LEARNING OUTCOMES OF SERVICE-LEARNING

We rely primarily on three publications to establish the learning outcomes of service-learning: Godfrey, Illes, and Berry (2005); Kolenko, Porter, Wheatley, and Colby (1996); and Kenworthy-U'Ren (2008). Godfrey, Illes, and Berry (2005) identified three fundamental elements which should be included in any successful service-learning experience, namely the "3 Rs" of service-learning, which include *reality*, *reflection*, and *reciprocity*. These elements may be best conceptualized as the instructional design and processes of service-learning experiences and are distinct from, but are linked to, the learning outcomes of service-learning. Kolenko and colleagues (1996) reviewed the service-learning program initiatives of nine major university business schools and concluded that all built their service-learning experiences around the outcomes of personal insight, understanding social issues, and the application of skills.

Godfrey et al.'s proposed instructional design and process elements can be logically mapped onto the learning outcomes of service-learning defined and established by Kolenko and colleagues (1996). In her *Journal of Business Ethics* decade review of service-learning, Kenworthy-U'Ren (2008) highlighted some of the linkages between the work done by Godfrey and colleagues (2005) and Kolenko and colleagues (1996) and concluded that the outcomes generated by Kolenko et al. in 1996 are as relevant today as they were when published.

In the following two paragraphs we review some of the linkages between Godfrey et al.'s elements and Kolenko et al.'s outcomes. *Reality* enhances academic content in a real-world setting. This real-world experience develops students' teamwork and communication skills, ability to readily adapt and respond to changing conditions, and innovation competencies (Govekar & Rishi, 2007). *Reality* also refers to providing students with a deeper understanding of the social issues that exist within

organizations and in the business environment, such as diversity, poverty, homelessness, and hunger (Godfrey et al., 2005; Govekar & Rishi, 2007). *Reflection* focuses on helping students understand "How am I different after this experience" and "forces students to think deeply and write cogently about how the service experience has affected *them*" (Godfrey et al., 2005: 316). *Reciprocity* addresses deficiencies in traditional transactional-based business education by encouraging students to engage in an open and mutually beneficial exchange between themselves and community partners. Reciprocity "provides an opportunity to deepen the service experience as students become equal and trusted partners, able to see the roots and consequences of social issues with greater clarity" (Godfrey et al., 2005: 317).

Thus, service-learning provides students with a type of *reality* and *reciprocity* experience, allowing them to develop a deeper understanding of social issues. The elements of *reflection* and *reality* align with and enhance the outcome of personal insight. And all three elements (*reality*, *reflection*, and *reciprocity*) enhance cognitive development (Godfrey et al., 2005; Kenworthy-U'Ren, 2008).

For the purpose of this quantitative summary, and consistent with the conceptual literature addressing service-learning's elements and learning outcomes, we chose to impose three learning outcomes that capture the breadth of theoretical rationale behind service-learning: understanding of social issues, personal insight, and cognitive development. The outcome of cognitive development is used to represent the learning that takes place as a result of the application of skills component proposed by Kolenko and colleagues (1996). The learning outcome organization and sample

measures for each outcome are depicted in Table 1. Each of the defined learning outcomes and its expected relationship with service-learning are reviewed in the following section.

Understanding of Social Issues

Understanding of social issues can be generally conceptualized as an individual's frame of reference, which guides decision making in terms of complex social issues and includes attitudes associated with cultural awareness and tolerance of diversity; behavioral competencies, which enable students to work with individuals different from themselves; and the motivation to work toward making a difference in the life of the community. This learning outcome also includes moral awareness and ethical reasoning skills, which have been conceptually and empirically related to the complexity of thinking about social issues (Boss, 1994).

Morgan and Streb (2001) outline the theoretical underpinnings of this learning outcome. The service-learning experience allows students to work with individuals from other cultures, races, backgrounds, age groups and with those with different competencies and abilities. This work experience cannot only help students develop greater knowledge of one's self (the personal insight learning outcome) but also an understanding, appreciation of, and tolerance for others. Further, the service-learning experience allows students to develop relationships with their peers and community partners within the scope of the service-learning program. These relationships can lead to an understanding of social justice, a tolerance for other classes of citizens, an improvement in their ability to work with others different from themselves, and

TABLE 1
Learning Outcomes of Service-Learning

Learning Outcome	Definition	Sample Measures
Understanding Social Issues	An individuals' frame of reference that guides decision making in terms of complex social issues.	Diversity and cultural awareness and sensitivity; perceptions of homeless, elderly, disabled, different races or cultures; ethical and moral values and decision making; interpersonal skills; **understanding of the needs of the community; understanding how to help the community; a desire to engage in future service activities in terms of both a feeling of responsibility and a commitment to do so.**
Personal Insight	An individual's perception of self.	Identity; awareness of oneself in terms of strengths and weaknesses; career aspirations; self-efficacy; self-esteem; determination; persistence.
Cognitive Development	Task and skill development and academic achievement.	Management skill development; writing skills; problem-solving skills; critical-thinking skills; GPA; course performance.

Note. Bold text in Understanding Social Issues learning indicates those sample measures that were included in the Civic Responsibility outcome in the additional analysis section below.

a desire to engage in future service activities in terms of both a feeling of responsibility and a commitment to do so (Morgan & Streb, 2001).

Management education and learning academics have consistently highlighted service-learning as a teaching mechanism with the potential to balance traditional business education outcomes (e.g., motivation and strategy) with outcomes such as civic responsibility, respect for others, and commitment to the common good (Dipadova-Stocks, 2005; Papamarcos, 2005).

Weber and Glyptis (2000) conducted an empirical investigation of the impact of service-learning on understanding social issues in a business ethics course. The authors measured the mean change in service-learning and nonservice-learning students' concern for social issues over the course of a semester and found that students who participated in the service-learning exercise were more likely to increase their understanding and awareness of social issues. Nnakwe (1999) also conducted an empirical investigation of the influence of service-learning participation on this learning outcome. The author found that service-learning participants experienced significant mean gains in understanding of social issues when comparing scores prior to and following the experience using self-report questions such as "As social issues go, how important is world hunger?" and "Do you think that the American public is worried, not worried enough, or not worried about homelessness?" As a final example, Giles and Eyler (1994) evaluated impact of service-learning on civic engagement by asking students about their subjective perceptions prior to and following the experience. The authors' results indicated that the service-learning experience influenced mean gains in, for example, students perceptions of "community involvement importance."

Based on theory and corresponding research support, we expect to find that student participation in service-learning experiences will lead to a positive influence on their understanding of social issues.

Hypothesis 1: The service-learning experience will have a positive effect on understanding of social issues.

Personal Insight

Personal insight can be generally thought of as how one perceives him- or herself in relation to a variety of contexts. This dimension includes categories such as identity (how one perceives him- or herself), an awareness of oneself, self-efficacy, self-esteem, perception of leadership ability, determination and persistence.

Rhodes (1997) outlined the theoretical explanations as to why and how service-learning programs can provide students with the opportunity to challenge and potentially alter their self-concepts through personal insight. Rhodes (1997) drew from Mead's "social self" theory, which argued that one's sense of self develops from the reflections imposed by others. Students participating in service-learning experiences receive valuable information from fellow volunteers and community members. This self-revealing information, activated through the process of reflection, can become a source of self-development (Rhodes, 1997). Rhodes (1997) argued that when students engage in service for and with others, particular kinds of social interactions occur that contribute to one's self-definition (Rhodes, 1997). Further, increased self-awareness and confidence in their ability can potentially impact students' perception of themselves as leaders (Astin & Sax, 1998; Eyler & Giles, 1999).

Potthoff et al.'s (2000) study explored the personal insight dimension of service-learning. Through a pre-experimental research design, the authors measured growth in service-learning students' self-reported perceptions of "understanding of self," "confidence level," and "self-esteem." The authors found that perceptions measured after the semester differed significantly from the same perceptions prior to the service-experience.

For this learning outcome, it is difficult to know whether a positive or negative change is more desirable. For example, Osborne, Hammerich, and Hensley (1998) evaluated the influence of a service-learning experience on an individual's personal insight by using objective measures designed to tap into one's self-perception and self-esteem. The authors found that the change in self-esteem for service-learning participants, as measured through the Rosenberg Self-Esteem scale, was significantly different and lower than those of nonservice-learning participants. The authors indicated that the overall lower self-esteem mean score for the service-learning class "may represent a more realistic assessment of their worth than at the onset of the semester" (9). In this example, the authors noted that the negative change may have been based on a more realistic or objective view of oneself. To further illustrate, if a study reported that a student's perception of leadership abilities was significantly decreased through a service-learning experience, the decrease may represent a more realistic view of the student's self-perceived leadership ability or motivation to become a

leader. This shift is not necessarily a negative effect, as the student has a more realistic view of his or her strengths and weaknesses and is able to apply this self-knowledge to career decisions.

The previous two illustrations exemplify instances where the change in personal insight is quantitatively negative but desirable. Thus, to avoid having positive and negative changes cancel each other out in estimating the overall effect, we created an aggregate effect for this learning outcome where the absolute value of each effect size was used. Accordingly, the hypothesis generated for this learning outcome explores the question of whether the impact of service-learning on a student's personal insight is significant or null. Based on theory and corresponding empirical support, we expect to find an overall significant influence of service-learning on the personal insight learning outcome.

Hypothesis 2: The service-learning experience will have a significant effect on personal insight.

Cognitive Development

Cognitive development includes measures that capture management skill development, writing skills, problem-solving skills, critical-thinking skills, grade-point average, and course performance. The term *cognitive development* is used to reflect the learning that takes place as a result of the component of skills application highlighted by Kolenko and colleagues (1996).

Eyler and Giles (1999) outlined the theoretical explanation as to why service-learning has a positive effect on cognitive-learning outcomes. First, students may be more motivated to solve community problems, and this added motivation can lead to increased cognitive development. Second, experience provides students with a mechanism to apply skills and knowledge in a real-world setting. As students test theory in an experience-based project, they are afforded the opportunity to establish a deeper level of understanding of course content. Finally, service-learning allows students to interact with and learn from others different from themselves (Eyler & Giles, 1999).

Feldman et al. (2006) objectively investigated the impact of service-learning on academic research paper quality. Using a quasi-experimental research design, the authors facilitated the rating of research papers written by service-learning participants and nonservice-learning students. The papers were evaluated based on five objective criteria, including the students' demonstration of the ability to take a position, develop the argument in

context, use sources effectively, engage intellectual strategies, and use language appropriately. The authors found that those students who participated in the service-learning experience were rated superior to those of the nonservice-learning group for each of the objective criteria.

Kendrick (1996) used a subjective evaluation tool to evaluate the difference between service-learning and nonservice-learning cohorts in perceived learning. Self-reports consisted of asking students to confirm statements such as, "I learned to apply principles from this course to new situations," and "I learned a great deal from this course." The author found that the service-learning participants reported greater gains in subjective learning reports when compared to their nonservice-learning counterparts.

Based on the outlined theoretical rationales and findings from applicable empirical studies, we expect to find an overall positive relationship between service-learning and student cognitive development.

Hypothesis 3: The service-learning experience will have a positive effect on cognitive development.

Moderator Variables

Through a review of the literature, several potential moderating variables were identified which may alter the impact of the service-learning experience on the associated student learning outcomes. These variables were chosen based on noted pedagogical variations and program characteristics (Batchelder & Root, 1994; Eyler, 2002; Eyler & Giles, 1999) and variables commonly identified as potential moderators in similarly situated meta-analyses (Dochy, Segers, Van den Bossche, & Gijbels, 2003; Johnson, Maruyama, Johnson, Nelson, & Skon, 1981). We chose five moderator variables that apply to all of the noted learning outcomes: (1) research design (nonexperimental, quasi-experimental, and true experimental); (2) the type of assessment used to measure the outcomes (objective vs. subjective); (3) service-learning as an option or requirement (self-selected vs. assigned); (4) course content (business vs. nonbusiness); and (5) the type of the reflection incorporated in the experience (discussion and written vs. individual written). Each exploratory moderator is discussed in more detail in the following paragraphs.

Researchers use a variety of research designs in service-learning research, and the fundamental differences between them require "research design" as an inclusion in the list of potential moderator variables. For the purpose of this meta-

analysis, we chose to code each study according to the following research designs: pre-experimental, quasi-experimental, and true experimental (Campbell & Stanley, 1963). We use the term *pre-experimental* to designate those studies in our sample that employ the one-group, pretest–posttest research design (Campbell & Stanley, 1963). This design captures the relative effect of service-learning on one group of students. In contrast, the control comparison designs (both quasi-experimental and true experimental) compare learning differences between a group of students who participated in a service-learning experience and a group participating in a traditional, nonexperience-based pedagogy. Quasi-experimental designs are a subset of the control comparison research design sample in which nonrandom or nonequivalent groups are utilized for comparison (e.g., convenience samples, self-selected groups, or assigned groups of nonequivalence). True experimental studies, also a subset of control comparison research design, are studies in which the treatment and control groups are randomly assigned and equivalent in context.

Eyler and Giles (1999) reported that individual differences exist in students who choose a service-learning option compared to those who do not. Further, that these pre-existing differences cause students to approach the experience in different ways, which may significantly influence the outcomes of the experience. All studies in the sample provided an explanation of whether students were given a choice to register for (or participate in) the service-learning course (or component within a course). For example, Bernacki and Jaeger (2008) reported that "students self-selected into courses labeled as either having a service-learning component or into traditional courses without such a requirement or label" (8) and Moely, McFarland, Miron, Mercer, and Illustre (2002) reported that the service-learning component within a required class was offered as an option to students enrolled in the class. For both of the previous examples, students were provided with a choice to participate in the service-learning experience, and both were considered to fall under the self-selected subsample of the learning outcome. In contrast, Markus, Howard, and King (1993) reported that sections of a required course were randomly selected to contain a service-learning component and that "students had no knowledge during course registration about the intended experiment or about which sections were to be treatment or control groups" (412). Markus et al. (1993) represents a study in which students were not given a choice to participate in the service-learning experience, and

thus, it was designated to fall within the assigned subsample.

In service-learning research, investigators have used a variety of measures, which may be broadly categorized as either possessing the characteristics of objectivity or subjectivity, to assess the learning outcomes associated with service-learning. For example, both objective and subjective measures of cognitive development have been explored in service-learning research. Objective measures include grade-point average and formal assessments of student performance on course assignments and exams. Subjective measures include, for example, self-reported perceptions of gains in learning and skill development. In a qualitative review of the service-learning literature, Rama and colleagues (2000) reported that researchers must consider the potential serious effect that self-report measures can have on the outcomes reported from a service-learning experience. They state that "it is unclear whether students can adequately evaluate their own critical-thinking skills. In addition, the issue of demand characteristics may emerge; students may complete a survey or respond during an interview based on how they believe their professor wants them to" (664). For these reasons, we include the nature of the measurement device as a potential moderator of the effect of service-learning on its learning outcomes.

As articulated by Godfrey and colleagues (2005), the integration of reflection into a service-learning experience is critical to a successful learning experience. Further, the definition of service-learning provided by the National and Community Service Act of 1990 requires some form of reflection be integrated into the service experience. Thus all of the studies included in our sample included some reference to the formal integration of reflection into the service-learning program. What did vary, however, was the type of reflection integrated. Two primary types of reflection exercises were reported within the sample and are consistent with the theoretical literature on reflection: group discussion reflection or individually written reflection (Kolenko et al., 1996; McCarthy & Tucker, 2002). *Discussion reflection* is a mechanism in which students participate in group discussion with others involved in the same experience (peers, instructors, or community partners). Discussion reflection has been generally described as an oral explanation of an individual's perception and also includes the act of listening carefully to others' points of view (Johnson et al., 1981). In contrast, the written reflection exercise is primarily grounded in the individual and requires no verbal discussion interaction with peers. Studies reporting individual written

reflection only as the primary reflection mechanism were included in the written reflection subsample. Studies that reported the integration of discussion reflection exercises or a mixture of discussion and written reflection exercises were included in the discussion reflection subsample.

Finally we chose to explore whether the course content had any moderating effect on the learning outcomes of the service-learning experience. The studies included in the sample were conducted in a variety of educational programs. For the purpose of this study, we chose to explore whether there were significant differences between service-learning experiences in business and nonbusiness course content.

It is important to note that although these potential moderators have been suggested and theorized, there is insufficient empirical support to draw conclusive hypotheses regarding the effects of the potential moderator variables isolated in this study, thus their inclusion is for the purpose of exploration.

METHODS

Criteria for Inclusion

As discussed previously, four criteria were used to identify studies to include in the analysis. First, the work had to be a quantitative empirical study. Second, the characteristics of the learning context had to fit the service-learning criteria proposed by the National and Community Service Act (1990). These criteria are summarized here and consist of the following: (1) students actively participate in service experiences that meet a real community need; (2) the service enhances what is taught in the classroom and is integrated into the students' academic curricula; and (3) the program provides structured time for a student to think, talk, or write about what the student did and saw during the actual service activity (reflection). Third, the dependent variables used in the quantitative study had to be conceivably operationalized into one of the three learning outcomes. Finally, the participants of this study have to be students in a college or university education setting.

Literature Search

Multiple sources were used to identify possible studies that met the inclusion criteria. Learn and Serve America has funded the compilation of numerous qualitative summaries and bibliographies of the service-learning literature. The third edition of one notable bibliography (Eyler, Giles, Stenson,

& Gray, 2001) organizes the university service-learning literature into relevant groupings. Numerous other publications were located through a review of relevant journals, including the *Michigan Journal of Community Service-Learning*, the *Journal of Business Ethics*, the *Academy of Management Learning and Education*, the *Journal of Management Learning*, the *Journal of Management Education*, and so on. Qualitative, conceptual work, and literature reviews were also reviewed as sources of relevant research. Effort was made to gain access to "file drawer studies" to reduce the effect of publication bias. Unpublished dissertations and conference proceedings were located and included through the bibliographies listed above and through reference sections in published research.

Through an open literature search, over 200 conceptual, theoretical, and empirical service-learning articles were identified. Fifty-seven of these articles met the criteria for inclusion. Forty of these 57 articles contained enough statistical information to compute the effect of service-learning on at least one of the three outcome variables. The final sample consisted of studies published between the years of 1993 and 2010 and included 5,495 unique subjects.

Consistent with the definitions and sample measures provided in Table 1 and the discussion provided above, effect sizes calculated from each study were classified into one of the learning outcome outcomes (i.e., understanding of social issues, personal insight, and cognitive development). To explore whether subpopulations existed within the learning outcome samples, each effect size was coded according to the identified moderators (either as 1 or 0). For example, the research design moderation analysis included coding pre-experimental studies as 1, quasi-experimental as 0, and true experimental investigations as 0. Both authors worked together to classify each effect size into the associated learning outcome and coded each study according to the moderator variables. Table 2 reports how each study included in the meta-analysis was coded according to its learning outcome(s) and moderator variables.

Metric for Expressing Effect Sizes

The metric that was used to estimate and describe the effects of service-learning relative to its outcomes was Cohen's *d*. This effect size measure expresses the standardized mean difference (Cohen, 1988). When provided, we used the standard deviations to calculate the effect sizes for both control comparison and pre–post research designs.

TABLE 2
Studies Included in the Meta-Analysis (Number of Studies = 40)

Study	N	Course Content	Reflection Type	Assessment Method	Service-Learning (Option or Required)	Research Design	Learning Outcome(s)
Amerson (2010)	60	Human Services	Written/Individual	Subjective	Self-Selected	Pre-Experimental	Cognitive Development, Understanding Social Issues
Batchelder & Root (1994)	96, 48	Liberal Arts	Discussion	Objective	Self-Selected	Quasi-Experimental and Pre-Experimental	Cognitive Development, Understanding Social Issues, Personal Insight
Beling (2004)	21, 19	Education	Discussion	Objective	Assigned	True Experimental and Pre-Experimental	Cognitive Development
Bernacki & Jaeger (2008)	45, 25	Mixed	Discussion	Objective and Subjective	Self-Selected	Quasi-Experimental and Pre-Experimental	Cognitive Development, Understanding Social Issues, Personal Insight
Blieszner & Artale (2008)	96	Human Development	Discussion	Subjective	Self-Selected	Pre-Experimental	Cognitive Development, Understanding Social Issues
Boss (1994)	65	Ethics	Discussion	Objective	Assigned	True Experimental	Understanding of Social Issues
Bringle & Kremer (1993)	44	Human Services	Written/Individual	Subjective	Self-Selected	Quasi-Experimental	Understanding Social Issues and Personal Insight
Cohen & Kinsey (1994)	167	Mass Communication and Society	Written/Individual	Subjective	Self-Selected	Quasi-Experimental	Cognitive Development
Curran (1998)	48	Psychology	Written/Individual	Subjective	Assigned	Pre-Experimental	Understanding Social Issues
Dorfman et al. (2004)	59	Human Services	Reflection Type Unclear	Objective	Self-Selected	Pre-Experimental	Understanding Social Issues and Personal Insight
Feldman et al. (2006)	32	Leadership	Written/Individual	Objective	Self-Selected	Quasi-Experimental	Cognitive Development
Fenzel & Leary (1997)	57	Philosophy	Written/Individual	Objective	Assigned	True Experimental	Understanding Social Issues
Gallini & Moely (2003)	313	Mixed	Discussion	Subjective	Self-Selected	Quasi-Experimental	Cognitive Development, Understanding Social Issues
Giles & Eyler (1994)	56	Business	Written/Individual	Subjective	Assigned	Pre-Experimental	Understanding Social Issues, Personal Insight
Gorman, Duffy, & Heffernan (1994)	41	Philosophy	Discussion	Objective	Self-Selected	Pre-Experimental	Understanding Social Issues
Govekar & Rishi (2007)	43	Business	Written/Individual	Subjective	Self-Selected	Pre-Experimental	Cognitive Development and Personal Insight
Greene (1996)	98	Human Services	Written/Individual	Objective	Assigned	Pre-Experimental	Understanding Social Issues and Personal Insight
Kendrick (1996)	88	Introduction to Sociology	Discussion	Subjective	Assigned	True Experimental	Cognitive Development, Understanding Social Issues, Personal Insight
Knapp & Stubblefield (2000)	44, 22	Human Services	Discussion	Objective	Assigned	True Experimental and Pre-Experimental	Understanding Social Issues
Lowe & Clark (2009)	12	Human Services	Written/Individual	Subjective	Self-Selected	Pre-Experimental	Cognitive Development
Lundy (2007)	75	Psychology	Written/Individual	Subjective	Self-Selected	Pre-Experimental	Cognitive Development and Understanding Social Issues
Mabry (1998)	144	Mixed	Discussion	Subjective	Assigned	Pre-Experimental	Understanding Social Issues
Markus et al. (1993)	89, 37	Political Science	Discussion	Subjective	Assigned	Quasi-Experimental and Pre-Experimental	Cognitive Development, Understanding Social Issues, Personal Insight
McCarthy & Tucker (2002)	437	Business	Discussion	Subjective	Assigned	Pre-Experimental	Understanding Social Issues
McWilliams et al. (2008)	28	Human Services	Reflection Type Unclear	Subjective	Self-Selected	Pre-Experimental	Understanding Social Issues
Miller (1997)	379	Psychology	Discussion	Subjective	Self-Selected	Pre-Experimental	Personal Insight
Moely et al. (2002)	541, 217	Mixed	Discussion	Subjective	Self-Selected	Quasi-Experimental and Pre-Experimental	Cognitive Development, Understanding Social Issues, Personal Insight
Mpofu (2007)	130, 65	Human Services	Written/Individual	Objective	Self-Selected	Quasi-Experimental and Pre-Experimental	Cognitive Development
Nnakwe (1999)	34	Human Services	Discussion	Subjective	Assigned	Pre-Experimental	Understanding Social Issues
Osborne et al. (1998)	93	Pharmacy	Written/Individual	Objective	Assigned	True Experimental	Cognitive Development, Understanding Social Issues, Personal Insight
Palmer, Goetz, & Chatterjee (2009)	66	Business	Written/Individual	Subjective	Self-Selected	Pre-Experimental	Understanding Social Issues
Parker-Gwin & Mabry (1998)	121	Sociology	Discussion	Subjective	Assigned and Self-Selected	Pre-Experimental	Cognitive Development, Understanding Social Issues, Personal Insight
Payne & Bennett (1999)	55	Unreported	Written/Individual	Objective	Self-Selected	Pre-Experimental	Understanding Social Issues
Payne (2000)	53	Unreported	Written/Individual	Objective	Self-Selected	Pre-Experimental	Understanding Social Issues
Potthoff et al. (2000)	136	Education	Written/Individual	Subjective	Self-Selected	Pre-Experimental	Cognitive Development, Understanding Social Issues, Personal Insight
Root, Callahan, & Spanski (2002)	442	Education	Written/Individual	Subjective	Self-Selected	Pre-Experimental	Understanding Social Issues, Personal Insight
Strage (2000)	475	Education	Written/Individual	Objective	Assigned	Quasi-Experimental	Cognitive Development
Wang & Jackson (2005)	250	Mixed	Reflection Type Unclear	Subjective	Self-Selected	Pre-Experimental	Understanding Social Issues
Wang & Rodgers (2006)	100	Mixed	Reflection Type Unclear	Subjective	Self-Selected	Pre-Experimental	Cognitive Development
Weber & Gilyptis (2000)	129, 96	Business	Written/Individual	Subjective	Self-Selected	Quasi-Experimental and Pre-Experimental	Understanding Social Issues

For control comparison designs, the effect size was calculated by subtracting the control group's mean score from the service-learning group's mean score and dividing the difference by the pooled standard deviation. In order to create comparable effect sizes, pre–post research designs were calculated using the transformation guidelines established by Morris and DeShon (2002:11). Using their Equation 13, we calculated pre–post test research designs by subtracting the mean score on the pretest from the mean posttest score, the difference of which was divided by the pretest standard deviation.

In studies where the standard deviations were not reported, the t statistic was used to calculate the effect size for both control group comparison and pre–post research designs. In these cases, the t statistic was either reported in the study or calculated using the p value, multiple correlations, or the F test, comparing the difference between two means (where the degrees of freedom was equal to one). In order to compare effect sizes across pre–post and control comparison research designs using these computations we employed Morris and DeShon's (2002: 111) Formula 11. To accomplish this transformation, we used the mean correlation between the pre–post test score across the sample.

Because this standardized effect size has been shown to be upwardly biased, especially in small samples, each Cohen's d was converted to the unbiased estimate g according to the guidelines provided by Hedges and Olkin (1985).[4]

Identifying Independent Hypothesis Tests

One of the assumptions underlying meta-analysis is independency between effects. Springer, Stanne, and Donovan (1999) found, in an experience-based learning meta-analysis on small-group learning, that the number of independent effect sizes is generally greater than the number of studies because single studies frequently report the results of multiple research projects. Further, many studies in our sample investigated the effect of service-learning on a single learning outcome under multiple moderating conditions. Many papers also provided results from both pre–post and control comparison designs (for specific papers, see "Research Design" column in Table 2). Where single publications reported both pre–post and control comparison results, two effect sizes were included in order to capture the potential differences reflected in the moderating condition. Other papers reported effects from distinct conditions using both subjective and objective assessment methods and assigned and self-selected service-learning groups (Bernacki & Jaeger, 2008 and Parker-Gwin & Mabry, 1998, respectively), which warranted the inclusion of two effect sizes in order to explore the potential differences between these moderating conditions.

Where studies reported enough information to compute multiple effect sizes on the same learning outcome, under the same conditions, and from the same sample of students, we used a single, meaned measure of the effect. For example, Strage (2000) objectively examined service-learning's effect on cognitive development and reported enough information to calculate five distinct effect sizes (e.g., midterm scores, essay scores, final exam scores). In this case, to preserve the independence between studies, we chose to calculate a single effect based on the meaned scores for the entire semester. Also for example, Nnakwe (1999) reported enough statistical information was provided to compute fourteen effect sizes under the understanding of social issues learning outcome. In this study, because all effect sizes were derived from the same sample and under the same conditions, a single, meaned effect size was used.

In all, 76 effect sizes were derived (34 for understanding social issues; 17 for personal insight; and 25 for cognitive development).

Meta-Analytic Techniques

To explore the effect of service-learning on its learning outcomes, we utilized both fixed and random effects techniques to generate and report appropriate data. We rely primarily on the random effects model to test our hypotheses and explore the moderators in terms of their significance. Several researchers note the benefits to using random effects techniques to test the relationships specified in a meta-analysis study (although the benefits are briefly summarized here, the reader is referred to Erez, Bloom, & Wells, 1996, for a more thorough treatment of the issue).

First, the overall estimate of effect size may be biased when between-group variance exists because the fixed effects method does not statistically account for potential between study differences. In contrast, the random-effects model statistically accounts for between studies variation, which results in an overall effect that can be generalized across potential subgroups within the sample (Erez et al., 1996).

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[4] $g = d\left(1 - \frac{3}{4(N_T)-9}\right)$, where N_T is equal to the total number of subjects in the study corresponding to the calculated effect size.

Second, in addition to improving parameter estimates, the random effects model provides a powerful exploratory technique for testing moderator effects (Erez et al., 1996). By including theoretically generated potential moderators as covariates in the random effects model, we can test for subpopulations within the sample with significantly different effect sizes.

Data for the random effects estimates (both overall and moderator exploration) were obtained by fitting hierarchical linear statistical equations using the program HLM 6 (Raudenbush, Bryk, Cheong, & Congdon, 2004). In the case of the current study, the overall estimated weighted effect size (Est. δ) generated from the random effects unconditional model is a meaningful representation of the effect of service-learning on the learning outcome examined (Raudenbush et al., 2004).

To determine the meaningfulness of the identified moderators, we again utilized both fixed and random approaches. Using HLM we were able to test and report on the random effects estimated weighted effect size and its statistical significance for each of the subpopulation categories by entering the identified moderator as a level-2 covariate individually. Using the same framework, we were further able to test for significant differences between the subpopulations within each learning outcome.

RESULTS

Main Effects of Service-Learning

Table 3 reports our meta-analytic findings for the overall effects of service-learning on each of its learning outcomes. Both fixed effects and random effects results support Hypotheses 1–3.

Hypothesis 1 predicted a positive effect of service-learning on a student's understanding of social issues. The fixed effect 95% confidence interval does not include zero, providing statistically significant support for the fixed effect mean weighted effect size. The random effect estimate also supports service-learning's positive effect on understanding social issues, Est. δ = .34 ($p < .01$, k effect sizes = 34, n unique subjects = 4,165). The variance component for understanding social issues learning outcome is significant suggesting subgroups within the outcome (χ^2 = 225.01, $p < .01$).

The data also support the hypothesis that service-learning has a significant effect on personal insight (Hypothesis 2). The fixed effect 95% confidence interval does not include zero, and the random effect estimate is significant, Est. δ = .28 ($p < .01$, k = 17, n = 2,521). The variance component for the personal insight service-learning outcome is not significant, χ^2 = 22.81 (p = .23).

The fixed effects and random effects data also support the prediction that service learning will positively predict a student's cognitive development (Hypothesis 3). The fixed effects 95% confidence interval does not include zero, and the random effects estimate is significant, Est. δ = .52 ($p < .01$, k number of effect sizes = 25, n = 2,891). The significant variance component suggests heterogeneity within the cognitive development outcome (χ^2 = 316.23, $p < .01$).

Moderators of Service-Learning

After examining the overall effect of service-learning on each learning outcome, we explored the potential moderating effect of each proposed exploratory moderator. As discussed, we coded for five moderators applicable to each of the three learning outcomes: research design (pre-experimental, quasi-experimental, and true experimental); assessment method utilized (objective vs. subjective); service-learning as an option or requirement (assigned vs. self-selected), course content (business vs. nonbusiness), and type of

TABLE 3
Meta-Analytic Estimates of the Effect of Service-Learning on Its Learning Outcomes: Hypotheses 1–3

	Number of publications	N	k	Mg	$SEMg$	95% Conf. Int. (fixed effects)		Est. δ (random effects)	T^2	df	χ^2
Understanding of Social issues	30	4,165	34	.37	.04	.28	.45	.34*	.05	33	225.01*
Personal Insight	13	2,521	17	.37	.06	.25	.48	.28*	.005	16	22.81
Cognitive Development	19	2,891	25	.53	.10	.36	.80	.52*	.20	24	316.23*

Note. N = number of subjects; k = number of effect sizes; Mg = mean corrected effect size (Hedges G); $SEMg$ = standard error of Mg; 95% Conf. Int. = 95% confidence interval for Mg; Est. δ = random effects estimate of Hedges g; T^2 = variance component; df = degrees of freedom; χ^2 = chi-square.
* $p < .05$. ** $p < .01$.

reflection utilized in the experience (the inclusion of discussion reflection vs. written reflection only).

Table 4 presents the fixed and random weighted effect size results for the subgroups separated by the identified moderators within each learning outcome. Table 4 displays the number of effect sizes (K), the mean weighted effect size and its standard error (Mg and SEMg, respectively), the 95% confidence interval for Mg, and the random effects estimate of the weighted effect size (Est. δ) for each subgroup. Table 4 also reports the signif-

icance test for the difference between the random effects estimate for each moderator under consideration indicated by the *p-value difference*, the variance component (T^2), degrees of freedom (*df*), and remaining chi-square (χ^2). The results of the moderator analysis are presented below by moderator.

We first explored a meaningful difference between pre-experimental and control group comparison (a subsample created that combined quasi-experimental and true experimental designs)

TABLE 4
Exploratory Moderator Analysis

				95% Conf. Int. (fixed effects)		Est. δ (random effects)	Significance Tests for Moderators			
	k	*Mg*	*SEMg*				*p-value difference*	T^2	*df*	χ^2
Understanding Social Issues										
Control comparison	12	.58	.06	.45	.72	.58*	<.01	.04	32	174.26*
Pre-experimental	22	.26	.04	.16	.35	.24*				
Quasi-experimental	7	.53	.08	.33	.73	.52*	.93	.02	10	12.99
True experimental	5	.50	.06	.35	.64	.51*				
Objective	9	.34	.09	.13	.56	.32*	.87	.05	32	225.51*
Subjective	25	.37	.05	.27	.46	.34*				
Assigned	15	.36	.06	.24	.50	.33*	.89	.05	32	223.21*
Self-selected	19	.37	.06	.23	.48	.34*				
Business	4	.41	.08	.18	.64	.41*	.33	.05	32	216.84*
Nonbusiness	30	.36	.04	.26	.45	.33*				
Written reflection	15	.26	.06	.13	.40	.22*	.01	.04	32	186.04*
Discussion reflection	16	.45	.05	.34	.56	.42*				
Personal Insight										
Control comparison	10	.56	.07	.38	.74	.42*	.02	.002	15	14.60
Pre-experimental	7	.22	.04	.13	.31	.21*				
Quasi-experimental	5	.58	.14	.14	1.01	.55*	.16	.007	5	5.82
True experimental	2	.55	.03	.44	.67	.40*				
Objective	3	.33	.09	-.07	.73	.28*	.86	.006	15	23.11
Subjective	14	.37	.06	.23	.52	.29*				
Assigned	7	.38	.07	.20	.56	.31*	.50	.005	15	22.03
Self-selected	10	.35	.08	.17	.54	.26*				
Business	2	.30	.05	-.27	.87	.28*	.99	.006	15	22.96
Nonbusiness	15	.37	.06	.24	.51	.28*				
Discussion reflection	9	.39	.08	.21	.56	.26*	.22	.004	15	21.41
Written reflection	7	.34	.08	.12	.54	.29*				
Cognitive Development										
Control comparison	13	.66	.13	.37	.94	.57*	.48	.20	23	306.16*
Pre-experimental	12	.51	.17	.14	.87	.50*				
Quasi-experimental	9	.70	.15	.39	1.07	.59*	.18	.02	10	23.96*
True experimental	3	.33	.10	.15	.60	.42*				
Objective	10	.88	.17	.50	1.25	.78*	.02	.16	23	230.47*
Subjective	15	.38	.11	.14	.62	.36*				
Assigned	10	.33	.14	.09	.56	.28**	.02	.17	23	252.40*
Self-selected	15	.70	.10	.43	1.07	.67*				
Discussion reflection	13	.46	.15	.15	.80	.45**	.12	.18	23	249.95*
Written reflection	11	.72	.14	.40	1.04	.67*				

Note. Control-comparison research designs = quasi-experimental + true experimental; *k* = number of effect sizes; *Mg* = mean corrected effect size (Hedges G); *SEMg* = standard error of *Mg*; 95% conf. int. = 95% confidence interval for *Mg*; Est. δ = random effects estimate of Hedges *g* for the moderator; *p* = the *p* value for the difference between the random effects estimates; T^2 = variance component; *df* = degrees of freedom; χ^2 = Chi-square.
* *p* < .05. ** *p* < .01.

research designs. The fixed effects analysis results contained in Table 4 suggests large differences between these subgroups for all learning outcomes. The random effects estimates and significance test for the difference between these two subgroups reveals that there is indeed a significant difference between the pre-experimental and control comparison subgroups within both the understanding social issues (control comparison Est. $\delta = .58$, pre-experimental Est. $\delta = .24$, $p < .01$) and personal insight (control comparison Est. $\delta = .42$, pre-experimental Est. $\delta = .21$, $p = .02$) learning outcomes, but not for cognitive development (control comparison Est. $\delta = .57$, pre–post Est. $\delta = .50$, $p = .48$). We then divided up the control comparison research design subsample into further subgroups based on the use of quasi-experimental and true experimental designs and found no significant difference for the subgroup mean effect size on any of the three learning outcomes.

For the understanding social issues and personal insight learning outcomes, Table 4 shows minor differences between fixed effects and random effects estimates for the subgroups separated by assessment method (objective vs. subjective). The assessment method moderator analysis for the cognitive development learning outcome, however, did reveal a significant difference ($p = .02$) between studies that used an objective method (Est. $\delta = .78$) versus a subjective measurement (Est. $\delta = .36$). Similarly, the moderator analysis for service-learning as option (self-selected) versus requirement (assigned) revealed significant results only for the cognitive development learning outcome (self-selected Est. $\delta = .67$, assigned Est. $\delta = .28$, $p = .02$).

The course content moderator (business vs. nonbusiness) revealed nonsignificant results for the learning outcomes of understanding of social issues and personal insight learning dimensions. For the cognitive development learning dimension, we were only able to locate one business study that met the criteria of inclusion and contained the statistics necessary for calculating the effect size. Thus, it was not possible to report fixed effects estimates for the business subgroup and impractical to report a test for significance by course content for the cognitive development learning outcome.

The moderator analysis for the type of reflection included in the service-learning experience revealed nonsignificant results for both personal insight and cognitive development. But for understanding social issues, this moderator analysis resulted in a significant difference ($p = .01$) between those service-learning experiences that in-

corporated an element of discussion reflection (Est. $\delta = .42$) and those that incorporated a written reflection component only (Est. $\delta = .22$).

To supplement the moderator analysis discussed above, we ran additional models for each learning outcome to explore the unique effect of each moderator while controlling for the other identified moderators and to determine the percentage of variance explained by the three moderators collectively. To accomplish this, we simultaneously entered all moderators into the Level-2 equation in HLM. For each learning outcome, the results revealed the same pattern of estimate strength, direction, and significance.

Additional Analysis:

Social Attitudes Versus Civic Responsibility

Godfrey and colleagues (2005) theorized that in addition to the "3 Rs" previously identified as critical to a service-learning experience (Reality, Reciprocity, and Reflection) a fourth element, *Responsibility*, should be considered as an essential component. *Responsibility* "holds that in addition to their wealth-creation goals students should assume the obligations of citizenship" (Godfrey et al., 2005: 318). Based on this newly proposed element that reflects the motivation and intention toward civic engagement, we chose to explore whether there is a significant difference between social attitudes and civic responsibility included within the understanding of social issues outcome.

Consistent with the premise that *responsibility* captures the student's felt obligation, motivation, and ability to engage in citizenship behaviors, we conceptualized the civic responsibility subsample to include gains in understanding of the needs of the community, understanding how to help the community, and a desire to engage in future service activities in terms of both a feeling of responsibility and a commitment to do so.

In order to statistically explore whether social attitudes and civic responsibility were distinct, both authors worked to code each publication for variables that captured potential civic responsibility. For civic responsibility, we included effect sizes for variables that captured a student's feeling of responsibility, motivation, and commitment to engage in future service activities (see Table 1 for sample measures in bold typeface). For the social attitudes dimension, we included, for example, effect sizes that reflected the students' social attitudes in light of diversity, the elderly, disadvantaged persons, and interpersonal skills. Following the same pattern of establishing independence be-

tween effect sizes, we were able to calculate 15 total, meaned effect sizes for civic responsibility. Three effect sizes were generated from studies that reported results within the civic responsibility category alone, and 12 effect sizes were calculated from studies that reported results for both social attitudes and civic responsibility. Using the publications that reported on both social attitudes and civic responsibility, we used a paired-sample *t* test to explore for differences between the two categories.

The results revealed a significant difference between the two categories within the understanding of social issues outcome [$t(11) = 3.62$, $p = .004$] where social attitudes ($Mg = .37$, $SEMg = .10$) was significantly higher than civic responsibility ($Mg = .24$, $SEMg = .08$).

DISCUSSION

Through this meta-analysis we set out to explore the overall effect that service-learning has on its expected learning outcomes and to explore some potential differences in the application of service-learning programs and research, which may help to explain some of the variance in research findings. Our findings provide information to support the goal of the study.

Through a review of the business and nonbusiness literature, we first provided evidence and substance for the expected learning outcomes of service-learning. The main overall effects of service-learning on all of its expected learning outcomes can be considered to range approximately from small to medium. Service-learning positively impacts students' understanding of social issues (Est. $\delta = .34$), the personal insight of students participating in the experience (Est. $\delta = .28$), and the cognitive development of those students involved in the experience (Est. $\delta = .52$).

Following the analysis, which focused on the overall effects of service-learning on its defined learning outcomes, we conducted a moderator analysis based on using the five exploratory moderators indicated above and an additional analysis to explore whether social attitudes and civic responsibility were statistically distinct. A discussion of these findings is presented below.

Research Design

As noted above, we used the appropriate Morris and DeShon (2002) formulas to correct for differences in how the mean gain and mean difference effect size metrics were calculated. Logically, these formulas cannot adjust for the differences

that were inherent in the research design utilized to study the service-learning experience. Thus, by using the formulas provided by Morris and DeShon (2002), we are able to isolate and investigate the influence that different research designs have on the reported degree of student learning. For both the understanding social issues and personal insight learning outcomes, the control group comparison research design (a composite of quasi-experimental and true experimental) was significantly higher than the pre-experimental design. In contrast, although the fixed and random effects estimates do show a difference, our study reports no significant statistical evidence for the difference between the different approaches to research design in the cognitive development learning outcome.

Pre-experimental and control comparison research designs are fundamentally different, based on the frame of reference used for comparison. Pre-experimental designs measure the relative learning gain for one group of students. Control comparison research designs employ a more rigorous technique comparing student learning that results from a service-learning experience to learning resulting from a traditional learning environment. This finding suggests that a study's research design and methods (possibly chosen for the sake of convenience and ease) greatly impact the research results and should be considered when interpreting the study's conclusions.

After investigating the difference between pre-experimental and control comparison designs, we investigated for differences within the control comparison composite. Our investigation suggests that no significant difference exists between the quasi-experimental and true experimental subgroups on any of the learning outcomes. This finding, although not significant, communicates important information to service-learning researchers.

True experimental designs are employed in an attempt to reduce bias and strictly control context for the purpose of isolating the effect of the experiment of interest. True experiments also require random assignment of subjects in order to factor out the alternative explanation that differences in the effect may reside in personal differences between those who choose the experience and those who did not. Thus, the true experimental research designs in our sample assigned students to the service experience and, further, purposely withheld others from it. While seemingly beneficial for research, requiring (and simultaneously withholding) the experience for a group of students forces the researcher (often also the course instructor) to make a difficult decision. In their quasi-experi-

mental research design, Weber and Glyptis (2000) articulated the paradox well: "Experimental researchers may have objections to the parameters of our study. However, we believe that it would be unethical to design a research project that intentionally withheld from students an experience we believed to be a learning experience" (347).

There is logically an inherent struggle in deciding between a more rigorous research design and not allowing students the choice to participate in the service-learning experience. However, the fact that the difference between true experimental and quasi-experimental was insignificant, coupled with the significant required versus optional moderator analysis suggests that the researchers act of requiring service-learning (as opposed to allowing student choice) may be the more important factor in the corresponding study's research findings.

Type of Measure Used

There were no significant subgroups for understanding social issues and personal insight in terms of the type of measure used in the study (objective vs. subjective). For the cognitive development outcome, however, this moderator was significant. This suggests that, according to our sample, a researcher/educator might expect to find a higher cognitive development gain when using an objective measure (Est. δ = .78) to evaluate the outcome (e.g., grade-point average, test scores, or objective evaluation of written work) when compared to subjective measures (Est. δ = .36; e.g., self-reported gains in learning). This is consistent with Rama and colleagues' (2000) argument that a student's self-evaluation of cognitive development may be somewhat inaccurate, based either on sociocognitive biases or inherent inadequacies in self-evaluation. These findings suggest that researchers and educators should carefully consider how they evaluate the effectiveness of their service-learning course corresponding to the desired outcome.

Service-Learning as Required or Optional

There were no significant subgroups for understanding social issues and personal insight in terms of service-learning as optional or required (self-selected vs. assigned). In contrast, students who voluntarily chose to participate in the experience displayed significantly higher gains in cognitive development when compared to those who were assigned to the service-learning group. Within the cognitive development learning outcome, the service-learning benefit can be small

(Est. δ = .28), if students are not given a choice as to participation, to medium (Est. δ = .67), if students are able to choose the learning experience. This significant difference may be explained through the variance in learning motivation corresponding to choice or lack thereof in learning preferences. Ryan and Deci (2000) argued that a student's intrinsic learning motivation may lack where educators impose learning and educational demands upon them. Boekaerts and Cascallar (2006) similarly argue that imposed demands can undermine a student's interests and expectations, which may ultimately cause disengagement from the learning activity when obstacles and distractions arise. They further argue that misalignment between a student's learning desires and imposed learning activities can cause negative affect, which ultimately acts to distract the individual from the learning objectives. This may be particularly applicable to a service-learning experience where students engage with the community outside of the classroom.

Interestingly, cognitive development is the only learning outcome to display significant differences between these two subgroups. These findings suggest that instructors who utilize service-learning experiences to enhance student learning outcomes should consider the objectives of its integration into the course in lieu of the voluntary or nonvoluntary nature of the service experience. These findings also suggest that there may be motivational differences between the learning outcomes of cognitive development and the social and personal outcomes of learning. In other words, where learning motivation (as influenced by choice) may be a key component to cognitive development (e.g., skill development and academic achievement), it may be less of a factor in terms of understanding social issues and personal insight.

Course Content

In this study we chose to conduct an exploratory moderator analysis between those studies in a business education environment versus those not in business education. Based on the sample included in this analysis, we found no statistical evidence for a difference for service-learning's impact on student learning between business and nonbusiness settings. Although no significant difference was found, the large majority of studies we included were from a nonbusiness academic discipline. As reflected by Table 4, we were able to compute only five effect sizes for understanding of social issues: two for personal insight, and one for cognitive development. Thus, based on the sample

of studies that satisfied the criteria for inclusion in this analysis, one potential limitation of our work here is the low number of business studies included.

Type of Reflection

Although the fixed and random effects analysis showed considerable differences for cognitive development, only the understanding of social issues learning dimension showed a significant difference for the type of reflection included in the service-learning experience. This analysis found that the inclusion of a discussion reflection component in the service-learning experience impacted a student's understanding of social issues significantly more than those service-learning experiences that included a written reflection component only. This finding supports the theoretical rationale for gains in understanding social issues as outlined by Morgan and Streb (2001). Although most studies did not report the exact structure of the discussion reflection session, any form of discussion reflection has the capability to foster relationships with peers, instructors, and community partners of distinct cultures, races, backgrounds, and age groups. Through discussion reflection exercises, different knowledge, attitudes, and values can be exchanged, which support an understanding, appreciation of, and tolerance for others.

Social Attitudes and Civic Responsibility

Consistent with Godfrey and colleagues' (2005) proposition that *Responsibility* should be considered as an essential component to the service-learning experience, we found significant differences between a student's gain in social attitudes and a student's felt obligation/intentions to engage in citizenship behaviors (civic responsibility). We offer two ways to interpret this finding. The first is that this significant difference provides statistical support for an additional learning outcome category of service-learning. The second is that there are at least two dimensions within the established understanding social issues learning outcome (social attitudes and civic responsibility). We discuss more on these interpretations below.

LIMITATIONS AND FUTURE DIRECTIONS

There are two primary limitations as a result of our effort here. The first is that the results do not necessarily shed light on the potential differences between business academia and other academic disciplines. Although there is an abundance of

qualitative research and conceptual theory that addresses the relationship between service-learning and business academia, we found few empirical studies that met the criteria for inclusion for this analysis. In this regard, future effort might be allocated toward the quantitative study of service-learning in university and college business schools. A stronger empirical research literature that investigates the impact of service-learning on its learning outcomes in business academia would be critical to understanding the potential idiosyncrasies, which may exist within the academic discipline.

The second limitation is evidenced by the remaining significant variance in the understanding social issues and cognitive development learning outcomes. We argue that this variance may be due to two primary causes: (1) the generalized categorization of learning outcomes; and (2) the presence of additional meaningful moderating variables residing in service-learning instructional design and processes. We discuss each of these potential causes in more detail below and offer suggestions for future theoretical and empirical service-learning research.

Learning Outcomes

For the purpose of this meta-analysis and consistent with the established service-learning theory, we imposed the learning outcomes of cognitive development, personal insight, and understanding social issues. These theoretically derived and generalized learning outcomes are logically complex, consisting of multiple dimensions contained within the overarching outcomes. This is particularly true of the cognitive development and the understanding social issues learning outcomes as evidenced by the continued significant heterogeneity in each of the learning outcomes effect sizes after potential moderators were imposed.

Using hypothesized management education theory, we found statistical evidence for the difference between social attitudes and civic engagement. Whether social attitudes and civic engagement represent distinct learning outcomes of service-learning or dimensions within the understanding social issues learning outcome is open to debate, and our collective interpretation will have an impact on the direction of future research. We do not attempt to argue for either interpretation here; instead we provide thoughts on how the literature might proceed depending on either interpretation.

If civic engagement and social attitudes are conceptualized as distinct learning outcomes, then, as a research community, we might be tempted to

continue to divide the theoretically established learning outcomes into further stand-alone outcomes. For example, within the cognitive development learning outcome, there may be a significant difference between critical-thinking/problem-solving ability and the knowledge of intellectual material associated with the course content (Eyler, 2000).

A benefit to this approach is that we would, over time, develop a concise list of theoretically and empirically distinct learning outcomes of the service-learning experience. In this case we might better understand the methodological and design variations in service-learning programs that lead to distinct and context-specific learning outcomes, which would help answer the questions of when, where, and how to use service-learning corresponding to the desired outcome. One major drawback is that we are forced to ask ourselves, "will the continued efforts to define stand-alone learning outcomes associated with service-learning result in a return on our investment?"

In contrast, it may also be helpful to consider social attitudes and civic engagement as dimensions of the overarching understanding social issues learning outcome and leave the established structure of service-learning learning outcomes intact for the sake of conceptual understanding and organization moving forward. This may allow for a greater focus on the methodological variations between service-learning experiences that make a difference in student learning outcomes.

The inherent struggle in defining an agreed upon set of service-learning learning outcomes is reminiscent of the criterion problem in the work behavior and performance literature. Austin and Villanova's (1992) review of the issue suggests that performance criteria were defined and redefined since the early part of the 20th century. They further highlight "categorizing framework" and "dimensionality" as two issues that have troubled theorists and researchers. In their concluding remarks, Austin and Villanova state that "the problems of criteria have been and remain multiple. Criteria are dynamic, multidimensional, situation-specific, and serve multiple functions" (862). The same might be said for the learning outcomes of service-learning experiences.

Either interpretation certainly highlights the need for additional theoretical work to clarify and organize the learning outcomes, dimensions within those outcomes, as well as the associated typology and structure of attitude, behavioral and/or knowledge-based changes (see Thompson & Hunt, 1996).

Service-Learning Instructional Design and Processes

Service-learning experiences can differ dramatically in the way that they are designed and administered. These variations can have a differential impact on student learning from the experience. This premise has been demonstrated here in the moderator analysis, which showed program characteristics can influence student learning outcomes significantly and differentially. There is still more that we need to know about methodological variations in service-learning programs that contribute to variations in student learning.

In 2000, Janet Eyler attempted to answer the question, "What do we most need to know about the impact of service-learning on student learning?" She answered this question in part through the following statement: "most studies of student outcomes have simply used 'service-learning' as the predictor variable and 'service-learning' covers dramatically different experiences" (12). As an academic community, we have certainly come a long way in our understanding of the service-learning variations that matter,[5] but it seems that moving forward, we still need to address a few key additional variables. This may be due to the seeming void of a concise organizing framework for practitioners and researchers to meaningfully and succinctly report on technical variations in service-learning experiences, which would facilitate our understanding of how to design service-learning experiences for maximum student benefit.

To concisely define and organize these systematic pedagogical variations is outside the scope of our work here, and there are previous works that have begun to articulate the importance of these differences along with the need for a systematic organizing framework (e.g., Eyler, 2000; Bringle & Hatcher, 2000). For example, Eyler (2000, 2002) notes that the types of preparatory instruction and activities (e.g., case studies, simulations, lectures); reflection types (timing and structure); and foci (self-monitoring or course content); and the degree of facilitated reciprocity between the student and the community partner (through student involvement in site selection and joint goal setting) can all vary significantly between service-learning experiences, and these variations can influence the degree and direction of student learning that takes place. Conceivably service-learning programs can

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[5] This is evidenced in part by our ability in the current study to code most studies for programmatic variations, such as type of reflection (written or discussion) and whether the experience was required or optional.

vary in each of the above-noted categories, and the different techniques may be used to surgically steer student learning in the desired direction.

CONCLUSIONS

In conclusion, and consistent with the work done by Bringle and Hatcher (2000), we suggest that future service-learning research systematically collect and report information guided by the principles of scientific research. This implies that service-learning design and process variations should be expressly noted and theoretically linked to a sound organization of learning outcomes. Additional theoretical work may be needed to help systematically guide future service-learning research. Only through a sound and established service-learning theoretical framework can we begin to conduct systematic research that can be used for continuous improvement and further refinement.

Despite the limitations in its current state, we have taken steps toward defining and structuring the theoretical outcomes of service-learning and through meta-analytic techniques have determined that service-learning can be an effective pedagogy in university and college academic programs. Students who participate in a service-learning experience generally demonstrate a more positive understanding of social issues, alter their personal insight, and experience gains in cognitive development. Through this effort, we were also able to highlight some of the variations in service-learning process and design that impact student learning. Collectively these results help to explain both "where" and "how" service-learning experiences should be used to achieve the desired learning objectives. They further suggest that service-learning is an effective tool in business education programs that can be used to supplement traditional education pedagogies resulting in enhanced student learning. And finally, these conclusions help to articulate a program for future research in the field.

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