

7-1-2013

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Recommended Citation

Davis, Darrel R. (2013) "Cognitive and Affective Outcomes of Short-Term Service-Learning Experiences: An Exploratory Study," *International Journal for the Scholarship of Teaching and Learning*: Vol. 7: No. 2, Article 15.

Available at: <http://digitalcommons.georgiasouthern.edu/ij-sotl/vol7/iss2/15>

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Cognitive and Affective Outcomes of Short-Term Service-Learning Experiences: An Exploratory Study

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Abstract

This study examined the performance differences in cognitive and affective outcomes between students who completed a short-term service-learning experience and students who watched a video exemplar of the task. Performance measures were obtained via a written reflection paper that contained both cognitive and affective components. Results revealed no significant differences on cognitive outcomes and significant differences on affective outcomes. The results were consistent when academic level and overall course performance were controlled. Implications and future research directions are discussed.

Keywords: service-learning, cognitive outcomes, affective outcomes, written reflection

Introduction

Service-learning opportunities in higher education have grown over the past few years, and this trend is expected to continue (Bringle & Hatcher, 2010; Butin, 2006; Toncar, Reid, Burns, Anderson, & Nguyen, 2006). Many institutions are committed to the idea of community engagement and have pledged to expand opportunities for students. One reason for the increased focus on service-learning is the support both in principle and practice found within the research literature. There is evidence that service-learning provides significant benefits to the stakeholders involved (Lester, Tomkovick, Wells, Flunker, & Kickul, 2005), and this theme is consistent across disciplines and pedagogy. Within the education discipline, for example, Root (2002) focused on teacher preparation, and showed that service-learning led to significant gains on measures such as acceptance of diversity and belief in the importance of teachers' ability to bring about social change. Humanities scholars Bernacki and Jaeger (2008) examined service-learning effects on moral development and orientation, and although there were no group differences on measured scores, students reported increases in compassion and sensitivity. In the business area, Govekar and Rishi (2007) noted the transformational potential of service-learning for students in management and economics courses, while McCarthy and Tucker (2002) discussed the benefits of service-learning in business courses commenting that it "provides business faculty members with the modus operandi to enrich theory with application while increasing community service participation" (p. 645). Reynolds and Ahern-Dodson (2010), who looked at service-learning in the sciences, found benefits in this pedagogy for students, faculty, the community, and the university. From their perspective, the research-focused service-learning provided a "useful strategy for promoting science literacy" (p. 24). The literature overwhelmingly favors service-learning, and although the mounting support will lead to increased and enhanced service-learning opportunities, it will also encourage closer scrutiny of the principle and the practice.

Service-learning has been defined in several places and at different times, for example, Bringle and Hatcher (1995), Hunter and Brisbin (2000), and Bringle and Hatcher (2009). Although the definitions differ slightly, the key tenets of service, reflection, and learning are preserved in each case. Service-learning can be described as an academic activity where: the service rendered is a benefit to both the community and the student; the reflection process provides an opportunity for synthesizing the experience and applying it to course content; and the learning is educationally meaningful, thus, the service-learning task is anchored to educational objectives. All three tenets are important, but this research study is focused primarily on reflection and learning.

The reflection process is a critical part of the service-learning experience because student reflections "bridge the community service activities and the educational content of the course in a way that produces new learning not delivered solely by the course content or the community service alone" (Bringle & Hatcher, 2010, p. 5). The importance of reflection is clearly articulated in the literature. Bringle (1999) explicitly addressed the issue of reflection and used Deweyan thought as a philosophical basis for advancing reflection as an integral component of the service-learning experience. The importance of reflection is also highlighted by Dubinsky's (2006) discussion of the role of reflection when creating assignments, Hatcher, Bringle, and Muthiah's (2004) examination of the nature and quality of reflection, and Welch and James's (2007) investigation of a guided reflection technique. Ash and Clayton (2009) viewed reflection as a central figure in the learning process and proposed that reflection becomes "critical reflection" (p. 27) when it functions as a metacognitive process designed to improve thought and action, and the relationship between the two. Within their model, intentional, well-designed, and purposeful reflection generates, deepens, and documents learning.

The reflection process is primarily a benefit for students, but it may also be a useful tool for faculty. Although surveys have traditionally been the means of studying the effects of service-learning, where Lester et al. (2005) and Pierrakos, Borrego, and Lo (2007) are two examples, the reflection process may also provide faculty with an excellent assessment opportunity. Reflection as an assessment tool is becoming increasingly prevalent in the literature as exemplified by Litke's (2002) analysis of student reflection papers and Molee, Henry, Sessa, and McKinney-Prupis's (2010) model that assessed student learning using reflection. Similarly, Ash, Clayton, and Atkinson (2005) demonstrated that written reflection could be used as an assessment tool, and they also demonstrated that it could be used to assess cognitive outcomes.

The learning aspect of service-learning has been the focus of some criticism. The literature is clear and consistent regarding attitudinal shifts and other personal gains (Eyler & Giles, 1999; Toncar et al., 2006) but one outstanding question is whether or not students can identify, extract, and interpret relevant academic content from service-learning experiences (Eyler, 2000; Steinke, Fitch, Johnson, & Waldstein, 2002). In essence, the question is whether or not students perform better academically as a result of the service-learning process. Casile, Hoover, and O'Neil (2011) focused on cognitive outcomes and demonstrated that service-learning could enhance content mastery in a management course. Additionally, Yorio and Le's (2012) meta-analysis revealed that service-learning had a positive effect on both cognitive and affective outcomes. Although there is accumulating evidence that service-learning can be linked to gains in cognitive outcomes, assessing cognitive outcomes using student written reflection continues to be a developing area of interest in the field. Consistent with the evolving literature, for example Ash et al.'s (2005)

call to “document the academic and cognitive outcomes produced by the pedagogy” (p. 49) and Bringle and Hatcher's (2009) recommendation to incorporate written narratives “as authentic evidence that is collected through a structured reflection process” (p. 44), the current research study investigated the contributions of service-learning experiences to cognitive and affective outcomes using students' written reflection papers.

Time is an important consideration in service-learning, but little research has been done in the area. In one study, community partners identified time as one of the major challenges in terms of training and orientation, coordinating placements, and working with student volunteers (Birdsall, 2005). According to Daynes and Longo (2004), many of the issues surrounding time are rooted in the way institutions perceive, construct, and use time as a resource. They noted the difficulty in maintaining long-term community partnerships when students complete mainly short-term service-learning experiences. The sentiment was echoed by Tryon et al. (2008) who also focused on the issue of time and the effects of short-term service-learning. They presented strategies that could help community partners maximize short-term experiences, and they challenged institutions to increase focus on the long-term needs of their community partners. Although long-term experiences are preferred, there is value to short-term experiences. For example, Reed, Christian Jernstedt, Hawley, Reber, and DuBois's study involving students who visited dying patients showed that “even a minimal service-learning experience can have measurable impacts on the outlook and attitudes of student participants” (2005, p. 367).

The current research study was conducted within the context of a pilot project to determine the feasibility of integrating a service-learning component into a large-enrollment course. The purpose of the pilot project was not only to test the logistics of the integration, but to also begin the investigation into the cognitive and affective benefits associated with this service-learning offering. There were only a limited number of placements due to capacity restrictions outside the researcher's control, hence the decision to create an exemplar video for the remaining students. The video format was chosen because of its demonstrated pedagogical value (see Cox et al., 2006 for an example). In the interest of fairness, there was no opportunity to implement a control group where some students would not be exposed to any type of experience.

The purpose of the current research study was to investigate the differences in cognitive and affective outcomes between students who completed a short-term service-learning experience and students who watched a video exemplar of the task. The comparison was based on students' performance scores on a written reflection paper that contained both cognitive and affective components. Additionally, the study examined the potential performance differences while controlling for academic level (freshman, sophomore, junior, senior) and the final letter grade that was earned in the course. In this study, cognitive outcome was operationalized as the performance scores received on the cognitive components of the reflection paper. The cognitive components were discrete opportunities where students could demonstrate understanding and synthesis of specific course content. Similarly, affective outcome was operationalized as the performance scores received on the affective components of the reflection paper. The affective components were discrete opportunities where students could report their feeling and perceptions.

The questions explored were as follows:

1. Are there differences in cognitive outcomes between students who completed a service-learning experience and students who watched a video exemplar of the task?

2. Are there differences in affective outcomes between students who completed a service-learning experience and students who watched a video exemplar of the task?

Method

Participants

The participants were 263 undergraduate students from a large mid-western university. All students were enrolled in an introductory-level educational psychology course. The students' academic levels ranged from freshmen to seniors, and they were from diverse academic backgrounds. Sixty-eight percent of the students majored in one of the education areas. The study had Institutional Review Board (IRB) approval.

Measures and Materials

Video exemplar of the task. The researcher produced a video exemplar of the service-learning task depicting an actual reading and interaction session based on the "First Book" program, which provides books to children. The session involved a female volunteer undergraduate student and a six-year-old female child. The student was a senior education major who had training in, and exposure to tasks and conditions similarly to those in this study. The child was the daughter of a graduate student who was not connected to the researcher. The child was within the same age range as the children who interacted with the participants who completed the actual service-learning experience. The student and the child were from different ethnic backgrounds, and they had never met prior to the session.

A senior faculty member who specialized in organizing service opportunities and training volunteers trained the student prior to the recorded session. The general training topics included: the anticipated sequence of events, expectations, interacting with young children, asking and answering questions, being supportive, and being engaging, to name a few topics. The faculty member presented potential scenarios, modeled appropriate responses, practiced with the student, and then discussed the results with the student. Some training time was devoted to techniques for embedding course content within the interaction. Specifically, the student was trained to guide the interaction such that cognitive, language, socioemotional, and diversity issues would emerge. For example, socioemotional artifacts may emerge if a child is prompted to share her or his feelings on a certain topic or if they describe specific experiences. The faculty member worked with the student to ensure that this and other content-specific lines of interaction would occur and thus be directly observable by those who watched the video. After completing the general training session, the volunteer student rehearsed potential scenarios with a graduate student who had volunteered to assist in the training. This practice session provided a final opportunity for the student to focus on creating a meaningful experience for the child, and also interacting in a purposeful manner such that specific course content would emerge during the session.

On the day of taping, the faculty member introduced the student and the child and remained in the room to observe the interaction. The student and the child read two age-appropriate books, after which the student gave the books to the child as a gift. The child then wrote a "thank you" note, a requirement of the "First Book" program, after which she returned to her parent. The faculty member and the student then debriefed the interaction session reflecting on both specific events that occurred and the general overall experience. The entire session, from introduction of the participant to the debriefing of the experience, was video recorded.

The session provided a wealth of observable artifacts covering the intended content areas and much more. The richness of the interaction was probably the result of the student's competence, the training, and the child's personality and verbal nature. Specific content concepts, for example egocentric behavior, were directly observable in the interaction while other concepts such as those related to gender and diversity could be inferred based on the child's reactions and stated preferences. The interaction and subsequent video provided ample opportunities for both direct and indirect observation of key course concepts occurring under somewhat controlled circumstances.

The video recording was edited to highlight important events that occurred during the session. The final edited version of the video was thirty minutes and twenty-one seconds in length. It contained an introduction to the task, selected portions of the practice session with the graduate student, the entire reading session, the post-discussion between the student and the faculty member, and a summary review of the task. As a part of the editing process, the video was paused before important events occurred, and subtitles were added to introduce those events. The subtitles also contained recommendations and tips that would make the experience meaningful for both adult and child.

Document exemplar of the task. The researcher created an exemplar document outlining the task, expectations, and tips for meaningful interaction to name a few topics. This document contained a textual version of all the training materials that were used, and all the subtitles, hints, and review notes from the video exemplar of the task. The document, in essence, contained all the information presented during training and those included on the video. It was not feasible for the faculty member to train all the participants who would complete the actual service-learning experience. This document, however, provided a structure and method for those participants to embed course content into their interactions and to recognize course constructs as they emerged from the interactions.

Instruments

Pre-reflection paper. Each participant in the study completed two written papers. The first paper, a pre-reflection, was brief and required students to envision what it would be like to conduct a reading session with a child between the ages of five and seven. The pre-reflection had two parts titled *The experience* and *Connecting the content and your experience*. The first part, *The experience*, comprised two sections and focused on the reading experience from the perspectives of (a) the adult and (b) the child. Students were asked to estimate the current and future effects that a reading session with a child would have on first, himself or herself and second, the child. The second part, *Connecting the content and your experience*, comprised four sections and focused on extracting academic content from the experience. The four sections represented four distinct content areas: (a) cognitive development, (b) language development, (c) socioemotional development, and (d) diversity. For each section, students were asked to describe what they expected to observe from a child between the ages of five and seven, and to specify exactly what they would look for in the interaction to support their conclusions. The pre-reflection was a course requirement, but it was not graded.

Reflection paper. The final written reflection paper was a course requirement and it was graded. The reflection paper had three parts titled *The experience*, *Connecting the content and your experience*, and *Comparing pre-reflection and reflection*. The first two parts were very similar to those described in the pre-reflection, with the only difference being that the

sections were worded in the past tense, and students were required to describe their actual observations and the specific mechanisms they used to support their conclusions. The third part, *Comparing pre-reflection and reflection*, required students to compare their original perceptions described in the pre-reflection paper to their perceptions after the service or video experience. Students were asked to highlight similarities and differences and provide supported rationales for the differences. The first and third parts, *The experience* and *Comparing pre-reflection and reflection*, were used to determine attitude outcomes because they presented students with opportunities to reflect on their feeling and perceptions. The second part, *Connecting the content and your experience*, was used to determine cognitive outcomes because it presented students with the opportunity to demonstrate understanding and synthesis of the four content areas.

Procedures

During the first week of the semester, students in the course were divided into groups of five or six for pedagogical reasons not related to service-learning. Each student then completed the pre-reflection paper that was due at the end of the fourth week of the semester. One student from each group was then randomly selected to participate in the actual service-learning experience while the others in the group watched the video exemplar of the activity. This resulted in 51 students completing the actual service-learning experience while 212 students watched the video exemplar of the task. The number of students selected to complete the actual service-learning experience was a function of the capacity of the service-learning program at the time.

The service and video activities were conducted during the ninth week of the semester. Students who completed the experience were required to read the exemplar document before they were assigned to a service location. Each of the 51 service-learning students then collected two books, which were the same books used in the video exemplar, and then traveled to a local school. At the school, each student was assigned a young reader, between the ages of five and seven, based on the school's need for that day. After introductions were completed, the student and the child were assigned a quiet reading area. Although each experience had unique elements, each student spent time reading and interacting with a child, and then each presented the books to the child as gifts. The remaining 212 students watched the video exemplar of the task during the same time frame. All 263 students then wrote reflection papers based on the previously described criteria.

Data Preparation and Analysis

All papers were initially graded by the two teaching assistants (TA) that were assigned to the course. Both TAs were graduate students with extensive knowledge in the course content areas, and they were both trained by the course instructor. A different graduate assistant (GA) who was not affiliated with the course also graded the papers, but these grades were for research purposes only. In essence, each paper was graded by one of the TAs and also by the GA. The GA had completed graduate work in the content areas and was also trained by the course instructor prior to grading. The course instructor conducted one training session with the GA and it was identical to the training that the two TAs received. The training session involved reviewing general and specific grading policies and procedures, discussing the grading categories, and clarifying the criteria for correct and incorrect responses for the cognitive components. The final training task was grading and then reviewing five sample papers.

All grading was done using a spreadsheet format where graders would assign numeric scores to each section of a paper. For example, a paper would receive one score for the Cognitive Development section and a separate score for the Diversity section. The data revealed high agreement between the total scores given by each TA and those given by the GA. Intraclass correlation coefficients (ICC) were computed at the 95% confidence interval for the total scores given to the papers. The first TA graded 153 papers and the ICC was .80 ($p < .001$). The second TA graded 110 papers and the ICC was .76 ($p < .001$). These data confirmed the reliability of the grades given by the GA.

The research questions were answered using the Multivariate Analysis of Variance (MANOVA) procedure. The conservative Pillai's Trace was preferred to the Wilks' Lambda because of its robustness to unbalanced designs. Additional analyses using the Multivariate Analysis of Covariance (MANCOVA) procedure were conducted to control for the possible effects of academic level (freshman, sophomore, junior, senior) and final course letter grade.

Results

Focusing on the first research question that explored cognitive effects, the data revealed no significant differences in students' performance scores on the cognitive outcomes of the reflection paper. Table 1 shows the full results for the multivariate analysis.

Table 1
Multivariate Effects of Experience on Outcomes

Test	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Observed Power
Cognitive Outcomes							
Pillai's Trace	.022	1.435	4.000	258.000	.223	.022	.444
Wilks' Lambda	.978	1.435	4.000	258.000	.223	.022	.444
Hotelling's Trace	.022	1.435	4.000	258.000	.223	.022	.444
Roy's Largest Root	.022	1.435	4.000	258.000	.223	.022	.444
Affective Outcomes							
Pillai's Trace	.092	8.695	3.000	259.000	<.001	.092	.994
Wilks' Lambda	.908	8.695	3.000	259.000	<.001	.092	.994
Hotelling's Trace	.101	8.695	3.000	259.000	<.001	.092	.994
Roy's Largest Root	.101	8.695	3.000	259.000	<.001	.092	.994

A one-way MANOVA at the .05 level revealed no significant multivariate effect between the two groups in terms of performance scores on the content knowledge sections of the reflection paper, Pillai's Trace = .022, $F(4, 258) = 1.435$, $p = .223$, observed power = .444. Box's M = 23.737 was not significant ($F = 2.302$, $p = .011$) at the .005 level as recommended by Huberty and Petoskey (2000), thus upholding the assumption of homoscedasticity. Bartlett's Test of Sphericity was significant ($p < .001$) thus the

appropriateness of the MANOVA. The Levene's Test resulted in the following significance levels for the cognitive components: Cognitive = .701, Language = .266, Socioemotional = .327, and Diversity = .687, upholding the assumption of equal group error variances. Table 2 shows the performance on the cognitive outcomes for students who completed the service-learning experience and those who watched the video exemplar of the task.

Table 2
Students' Performance on the Cognitive Components (Cognitive Outcomes)

Cognitive Components	Experience			Video		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Cognitive Development	51	8.18	0.817	212	8.27	1.031
Language Development	51	8.02	1.029	212	7.98	1.297
Socioemotional Development	51	7.98	1.140	212	7.71	1.287
Diversity	51	7.63	1.166	212	7.75	1.160

Note. The maximum score for each outcome was nine points.

The possible confounding effects of students' academic level and final course letter grade were considered, but neither influenced the non-significant results on the cognitive outcomes. Table 3 shows the full results for the multivariate analysis with covariates.

Table 3
Multivariate Effects of Experience on Outcomes with Covariates

Test	Value	<i>F</i>	Hypothesis df	Error df	Sig.	Partial Eta Squared	Observed Power
Cognitive Outcomes							
Academic Level Covariate							
Pillai's Trace	.022	1.430	4.000	257.000	.224	.022	.442
Wilks' Lambda	.978	1.430	4.000	257.000	.224	.022	.442
Hotelling's Trace	.022	1.430	4.000	257.000	.224	.022	.442
Roy's Largest Root	.022	1.430	4.000	257.000	.224	.022	.442
Final Course Letter Grade Covariate							
Pillai's Trace	.023	1.538	4.000	257.000	.192	.023	.473
Wilks' Lambda	.977	1.538	4.000	257.000	.192	.023	.473
Hotelling's Trace	.024	1.538	4.000	257.000	.192	.023	.473
Roy's Largest Root	.024	1.538	4.000	257.000	.192	.023	.473

Affective Outcomes							
Academic Level Covariate							
Pillai's Trace	.092	8.681	3.000	258.000	<.001	.092	.994
Wilks' Lambda	.908	8.681	3.000	258.000	<.001	.092	.994
Hotelling's Trace	.101	8.681	3.000	258.000	<.001	.092	.994
Roy's Largest Root	.101	8.681	3.000	258.000	<.001	.092	.994
Final Course Letter Grade Covariate							
Pillai's Trace	.095	9.002	3.000	258.000	<.001	.095	.996
Wilks' Lambda	.905	9.002	3.000	258.000	<.001	.095	.996
Hotelling's Trace	.105	9.002	3.000	258.000	<.001	.095	.996
Roy's Largest Root	.105	9.002	3.000	258.000	<.001	.095	.996

The MANCOVAs conducted at the .05 level revealed no significant multivariate effects when controlling for academic level (Pillai's Trace = .022, $F(4, 257) = 1.430$, $p = .224$, observed power = .442) or final course letter grade (Pillai's Trace = .023, $F(4, 257) = 1.538$, $p = .192$, observed power = .473).

For the second research question, which focused on affective outcomes, the data revealed significant differences in students' performance scores on the affective outcomes of the reflection paper. A one-way MANOVA at the .05 level (see Table 1 for full results) revealed significant multivariate effects between the two groups in terms of performance scores on the affective sections of the reflection paper, Pillai's Trace = .092, $F(3, 259) = 8.70$, $p < .05$, $\eta_p^2 = .092$, observed power = .994. The observed power was excellent, and it was well above the .80 desired level. This indicated an increased probability of correctly detecting an existing effect, and a decreased risk of a type II error. Box's M = 18.971 was significant ($F = 3.090$, $p = .005$) at the recommended .005 level, indicating an increased risk of a type I error, but it was considered acceptable because of the high power result. Bartlett's Test of Sphericity was significant ($p < .001$) thus the appropriateness of the MANOVA. The Levene's Test resulted in the following significance levels for the affective components: Personal Perspective = .350, Child's Perspective = .338, Comparison = .846, upholding the assumption of equal group error variances. Table 4 shows the performance on the affective outcomes for students who completed the service-learning experience and those who watched the video exemplar of the task.

Table 4
Students' Performance on the Affective Components (Affective Outcomes)

Affective Components	Service			Video		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Personal Perspective	51	8.53	0.703	212	7.95	0.867
Child's Perspective	51	8.29	0.879	212	7.82	0.820
Comparison	51	14.31	0.836	212	14.18	1.344

Note. The maximum score for the Comparison outcome was sixteen points. The maximum for all other outcomes was nine points.

Subsequent univariate tests revealed significant differences on Personal Perspective $F(1, 261) = 19.798, p < .05, \eta_p^2 = .071$, observed power = .993 and Child's Perspective $F(1, 261) = 13.593, p < .05, \eta_p^2 = .050$, observed power = .957, where, in each case, the group that completed the actual service-learning experience outperformed the group that watched the video. There were no significant differences between the groups in terms of Comparison $F(1, 261) = .466, p = .495, \eta_p^2 = .002$, observed power = .102. The observed power for Personal Perspective and Child's Perspective were excellent and well above the desired level of .80, but the observed power for Comparison was not.

Neither students' academic level nor final course letter grade influenced the performance results on the affective outcomes. The MANCOVAs conducted at the .05 level (see Table 3 for full results) revealed that the significant multivariate effects between the two groups were still present when the data were controlled for academic level (Pillai's Trace = .092, $F(3, 258) = 8.681, p < .05, \eta_p^2 = .092$, observed power = .994) and final course letter grade (Pillai's Trace = .095, $F(3, 258) = 9.002, p < .05, \eta_p^2 = .095$, observed power = .996). The observed power in both cases were excellent and well above the .80 desired level. Similar to the results obtained without the covariates, subsequent univariate tests revealed significant differences on Personal Perspective and Child's Perspective, but not Comparison. Table 5 shows the results of the univariate analysis for the affective outcomes.

Table 5
Univariate Analysis of Variance for Affective Outcomes

Covariates	F	Sig.	Partial Eta Squared	Observed Power
Academic Level				
Personal Perspective	19.768	<.001	.071	.993
Child's Perspective	13.628	<.001	.050	.957
Comparison	0.471	.493	.002	.105
Final Course Letter Grade				
Personal Perspective	20.279	<.001	.072	.994
Child's Perspective	14.222	<.001	.052	.964
Comparison	0.322	.571	.001	.087

Note. Univariate $df = (1,260)$

Again, the observed power for Personal Perspective and Child's Perspective were excellent and well above the desired level of .80, but the observed power for Comparison was not. Where differences existed, the group that completed the actual service-learning experience outperformed the group that watched the video (see Table 4).

Discussion

The results of this study on the cognitive and affective outcomes of short-term service-learning experiences provided some evidence and support for emerging perspectives, and they also confirmed some established views within the field. Specifically, this study provided some evidence of the link between service-learning experiences and positive cognitive outcomes. Also, this study provided some evidence of the viability of using written reflection to assess service-learning outcomes. In terms of established views, this study confirmed the positive affective outcomes that are possible via service-learning experiences.

The data analysis for the question focused on students' performance on cognitive outcomes showed no significant differences between students who completed the service-learning experience and those who watched the video exemplar of the task. That is, those who completed the experience performed on par with those who watched the video. This finding is important because it suggests that students can synthesize their service-learning experiences and consequently connect those experiences to the requisite academic content. These students were able to make the connections as well as those who watched the video exemplar of task, which was purposefully infused with academic content. It is conceivable that these results were in part due to the exemplar document providing sufficient structure to guide the interaction. The results remained consistent when academic level and final course letter grade were considered. In this case, academic level could be considered a measure of student academic maturity, and final course letter grade could be considered a measure of student motivation and ability within the course. Although service-learning targets much more than academic outcomes, connecting experience to content is still a very important goal.

The results for the second research question confirmed the effect that service-learning has on affective outcomes. Students who completed the service-learning experience were better able to describe the current and future effects of reading with a child, from both their personal and the child's perspective. Although watching the video could be viewed as an experience, Kolb (1984) outlined the importance of actual experience in the learning process, and this research provided support for this position. Students who had the actual experience were able to use it as an anchor to describe the current and future effects of the experience. Although the exemplar document may partially explain these results, perhaps there are affective constructs embedded within actual experience that are only revealed during the course of human interaction. Similar to the results for the first research question, the results remained consistent when academic level and final course letter grade were considered. This is particularly important because it suggested that academic maturity, which might be expressed in writing, did not affect the results. Similarly, there is no evidence that student motivation and ability contributed to the results.

Another important implication that can be drawn from the results on the first research question is the successful demonstration of using written reflection as a tool to assess cognitive outcomes in service-learning. Students were able to identify the academic constructs embedded within their experiences and describe the evidence supporting their conclusions. This is consistent with the call in the field to increase focus on cognitive outcomes and to consider written reflection as a viable assessment tool (Ash et al., 2005).

One aspect of the study that must be noted is the relative cost of this type of assessment. Ash et al. (2005) mentioned the work involved in using written narratives as an assessment tool and this research echoes the concerns. It is a tremendous investment in time and resources, especially in the large-enrollment environment. Written reflections, however, present great potential, and they may be better measures of student learning. Another important aspect of the study is the issue of short-term experiences. Although long-term experiences are acknowledged as ideal, this study joins Reed et al. (2005) in suggesting that there is value in short-term service-learning experiences.

Limitations

This research was limited by several factors. First, this research was a part of a pilot project to determine the feasibility of integrating a service-learning component into a large-enrollment course. Therefore, those students who were selected to complete the experience only had one opportunity to do so. Under normal circumstances, the preferred format for service-learning is to have an extended experience where students experience more and ultimately learn more. The preferred service-learning format was not possible during the pilot. Next, the number of students selected to complete the service-learning task was a function of the number of service-learning slots available at the time. This resulted in unbalanced groups, and it made the statistical analyses less robust. Another limitation of the study involved grading. There is an acknowledged element of subjectivity inherent in the task of grading reflection papers. Although it is possible that grading errors may have occurred, the use of multiple graders, the level of training provided, and the high inter-rater reliability, likely mitigated the issue of grading subjectivity. Next, the current study controlled for the potential effects of academic level and course performance, but other variables may have impacted the results. Also, the exemplar document was a very important artifact in this study but the detail to which students attended to the document remains unknown. The level of student engagement with the exemplar document would have an effect on subsequent results. Next, although students reflected on the experience, their actual experiences may differ from the report due to lack of precision in recall. Finally, service-learning experiences can be very dynamic, and as such, these varied experiences may affect individual students differently. The exemplar document, however, gave students a guiding structure, which may have somewhat reduced the variability of student experiences.

Conclusion and Future Considerations

The current research study suggests that service-learning can be used to target cognitive outcomes. The emphasis on cognitive outcomes is an emerging area of interest in the field, and these results show that students are able to identify and synthesize the academic content embedded within their service-learning experiences. The results also confirm that service-learning can have a positive effect on affective outcomes; a finding well supported in the research literature. Future research could determine if these results generalize across academic disciplines and service-learning venues. Also, the temporal and management costs of service-learning are seldom examined from the perspective of the student. Future research should examine the cognitive and affective outcomes in reference to the time required for students to manage their service learning experiences. Finally, the current research answers a call in the research literature by demonstrating the use of

written reflection as a means of assessing both cognitive and affective outcomes. Additional research could provide insight into the best strategies for using written reflection where the benefits and resource cost are factored into the equation.

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