

12-12-2019

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Recommended Citation

Baber, Ceola Ross; Faulkner, Paula E.; and Lyles, Dana (2019) "Relationships Between Cognitive Engagement and Self-Efficacy for High School Students Who Participate in Service-Learning," *Journal of Research Initiatives*: Vol. 5 : No. 1 , Article 1.

Available at: <https://digitalcommons.uncfsu.edu/jri/vol5/iss1/1>

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Relationships Between Cognitive Engagement and Self-Efficacy for High School Students Who Participate in Service-Learning

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Keywords

Cognitive Engagement, Self-Efficacy, Service-Learning, High School Students

Cover Page Footnote

non applicable



RELATIONSHIPS BETWEEN COGNITIVE ENGAGEMENT AND SELF-EFFICACY FOR HIGH SCHOOL STUDENTS WHO PARTICIPATE IN SERVICE-LEARNING

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Abstract

The purpose of this explanatory quantitative case study was to examine the relationship between service-learning, cognitive engagement, and self-efficacy for high school students. The study was conducted at a high school located in North Carolina. Fifty-one students in grades 10 to 12 participated in the study. All students in the study had participated in at least one service-learning activity before the study. Data was collected using the Service-Learning, Cognitive Engagement, and Self-Efficacy Questionnaire (SLCESEQ) which included items from (a) the Control and Relevance of Schoolwork subscale of the Student Engagement Instrument to measure the cognitive engagement and (b) the General Self-Efficacy Scale to measure self-efficacy. Also, respondents self-reported the demographics (race/ethnicity, gender, and grade level) as well as the number and type of service-learning activities in which they had participated. Data analysis did not yield statistically significant relationships between the service-learning, cognitive engagement, and self-efficacy). However, there were several statistically significant relationships between cognitive engagement and self-efficacy. In addition, the demographic variables had significant relationships with cognitive engagement and self-efficacy.

Introduction

Positive youth development advocates for the holistic development of assets and competencies in youth. Students spend a great deal of time in school during their adolescent years. As a result, not only does school offer academic exposure for students, but it also develops a student's emotional profile (Wang & Holcombe, 2010). Service-learning is a teaching and learning strategy that integrates reflective, meaningful community service with the curriculum and instruction to enrich academic experiences (National Youth Leadership Council, 2013). Past research indicates that the use of service-learning programs in the classroom can have a positive impact on a student academically through increased cognitive engagement as well as increased self-efficacy (Celio, Durlak, & Dymnicki, 2011; Conway, Amel, & Gerwien, 2009; Yates & Youniss, 1996). Understanding how participation in service-learning affects students' cognitive engagement and self-efficacy can support the development of appropriate activities for positive youth development.

Service-Learning

Over the past 20 years, research has assessed the positive effects of service-learning and related community-engagement programs on cognitive, affective, and civic engagement factors. For example, in their study of 44 community service programs, Yates and Youniss (1996) found that the programs shared three concepts related to adolescent identity development: agency (including self-efficacy and self-esteem), social relatedness, and moral-political awareness. Celio, Durlak, and Dymnicki's (2011) meta-analysis of 62 studies involving 11,837 participants indicated that students participating in service-learning programs demonstrated significant gains in five outcome areas: attitudes toward self, attitudes toward school and learning, civic engagement, social skills, and academic performance. Conway, Amel, and Gerwien (2009) building on the earlier work of Yates and Youniss uncovered that service-learning had effects on participants related to five outcomes: academic (including cognitive engagement), personal (including self-esteem and self-efficacy), social relatedness, and citizenship. Evidence shows that across the high school years, service-learning experiences tend to help young people become more informed and engaged citizens which support the aspirations of families, educators, and policymakers (Lee, Olszewski-Kubilius, Donahue & Weimholt, 2008; Zaff, & Lerner, 2010). In more recent studies, there is evidence that the nature of service-learning activities can empower marginalized students' sense of self and society. For example, Martin and Beese (2016) found that girls who engaged in service-learning through a high school women's studies course had increased internal motivation. Likewise, Winans-Solis (2014), in a study of marginalized males, found that service-learning that was grounded in the students' lived experiences in a particular sociocultural space empowered their sense of self and society.

Cognitive Engagement

Rotgans and Schmidt (2011) defined cognitive engagement as "the extent to which students are willing and able to take on learning the task at hand" (p. 467); they asserted that cognitive engagement can be affected by a student's learning environment. Walker and Greene (2009) found a statistically significant relationship between cognitive engagement and (a) classroom mastery goals, (b) classroom performance-approach goals, and (c) self-efficacy. Similarly, in their 2011 study, Harlow, DeBacker, and Crowson found a positive correlation between cognitive engagement and mastery goals. In a 2013 study that focused on the relationship between cognitive engagement and academic changes over time, Wang and Eccles concluded that cognitive engagement can impact a student's academic self-concept. Li and Lerner (2013) found a positive relationship between cognitive engagement and behavioral engagement across grades 9-11.

Self-Efficacy

Pajares (1997) defined self-efficacy as the assessment of one's competence to perform a specific task. Self-efficacy has an impact on students' school experiences including performance, participation, and achievement. The perceived self-efficacy of a student can affect interest in academics, how academic stressors are managed, growth of cognitive competencies, accomplished achievement, and the impact of skills on performance (Bandura, 1997; Carroll et

al., 2009; Galyon, Blondin, Yaw, Nalls, & Williams, 2012; Kennedy, 2010; Lerdpornkulrat, Koul, & Sujivorakul, 2012; Williams & Williams, 2010). Self-efficacy promotes the ability to set and pursue academic goals as well as satisfaction with academic accomplishments (Pajares, 1997; Schunk, 2003). Past research has also found a relationship between self-efficacy and service-learning (e.g., Reeb et al., 2010).

Theoretical Framework

The theoretical framework that guided this study was Bandura's (1986) triadic reciprocal determinism (TRD). TRD was an appropriate theoretical lens for this study because it allowed for analysis of how the learning environment can affect student behavior. TRD includes three factors that influence behavior: the environment, the individual, and the behavior itself. Human functioning occurs when cognitive and other personal factors, behavior, and environmental events operate as interacting causes of each other (Bandura, 1986). Self-efficacy is a self-regulatory mechanism that drives a person's beliefs in their capabilities to utilize motivation and cognitive resources, resulting in courses of action (behavior) needed to maintain control over various events and experiences (Wood & Bandura, 1989). Environmental factors are autonomous forces that shape and control behavior; Pajares and Usher (2008) indicated that curricular practices and policies are an example of environmental factors. For this study, participation in service-learning activities was considered the environmental factor since it is a teaching and learning strategy that integrates meaningful community service and includes student reflection to enrich the learning experience (National Service-learning Clearinghouse, 2013).

The Case

The case was one magnet school in an urban school district located in central North Carolina. At the time of this study, the school district served 72,000 students in 126 elementary, middle and high schools; its student population was 63.04% non-White, and 56.58% of the students received free or reduced lunch. Service-learning is a major initiative in this school district. Students who completed 100 service-learning hours during high school received the Service-Learning Exemplary Award, and students who obtained at least 250 service-learning hours were awarded the Service-Learning Diploma. The school that served as the case was selected for the study due to the high number of students participating in service-learning activities. At the time of the study, 170 students were enrolled in the school. The school's racial/ethnic population was 50% European American/White, 32% African American/Black, 11% Hispanic/Latino or Latina, 6% Asian/Pacific Islander, and 3% American Indian. Nineteen out of 54 students in the graduating class had earned service-learning diplomas.

Using a purposive sampling strategy, participants were drawn from the student population of the research site. Purposive sampling ensured the selection of appropriate participants that helped to effectively examine the research problem (Creswell, 2014). Participants had to have completed at least one service-learning activity. One hundred and fifteen consent forms were distributed to students in grades 10 to 12; 51 returned completed forms. Thirty-seven percent of the participants self-reported being enrolled in the 12th grade, 35% self-reported being enrolled in the 10th grade, and 28% self-reported being enrolled in the 11th grade. The gender breakdown was: 69% female and 31% male. The majority (57%) of the participants identified as African

American/Black; 29% identified as European American/White; 6% identified as Multiracial; and 4% each identified as Asian/Pacific Islander/Pacific Islander, and Hispanic/Latino or Latina.

Data Collection and Analysis

This study employed an explanatory case study design, utilizing quantitative data (Korzilious, 2012; Yin, 2014) collected via the Service Learning, Cognitive Engagement, and Self-Efficacy Questionnaire (SLCESEQ) that was developed by the researchers. Development of the questionnaire involved using pre-established and validated questions to measure service-learning, cognitive engagement, and self-efficacy. The questionnaire contained 29 items; three demographic items (grade level, gender, race/ethnicity) and 26 items related to service-learning, cognitive engagement, and self-efficacy.

The Student Engagement Instrument is a 35-item instrument used to assess student psychological and cognitive engagement through six subscales (Appleton, Christenson, Kim, & Reschly, 2006). The 10-item control and relevance of the schoolwork subscale were used to measure cognitive engagement in this study. Self-efficacy was measured through the 10-item General Self-Efficacy Scale which was developed to assess a person's general sense of self-efficacy (Schwarzer & Jerusalem, 1995). Before the administration in this study, the SLCESEQ was pilot tested, using 24 high school students similar to the students in the sample, who were not included in this study or enrolled in the school research site. The pilot test yielded a Cronbach's alpha of .702.

Measures of service-learning included (a) one item related to the number of service-learning activities in which the students had previously participated; and (b) four items about the type of service-learning activities the students had completed (direct, indirect, research-based, and advocacy). Table 1 includes descriptors the participants were given for types of service-learning activities. The questionnaire also included one open-ended question where students could share any comments about their high school service-learning experience.

Data were analyzed using the IBM Statistical Package for the Social Sciences (SPSS), version 22. Descriptive statistics including frequencies, percentages, and standard deviations reported findings for each item on the SLCESEQ. A bivariate correlation was run to analyze the relationship between service-learning, cognitive engagement, and self-efficacy.

Bivariate correlations between service-learning, self-efficacy, and cognitive engagement, were also calculated for each demographic variable (race/ethnicity, grade level, and gender). Crosstabs analyses were conducted to determine relationships between (a) type of service-learning activity, cognitive engagement, and self-efficacy; and (b) the number of service-learning hours, cognitive engagement, and self-efficacy.

Table 1

Descriptors for Types of Service-Learning Activities

Type of Service-Learning Activity	Descriptor
Direct	Direct service-learning activities are those you develop and implement. For example, tutoring, providing art/music/dance lessons for younger students, mentoring, etc.
Indirect	Indirect service-learning activities are ones that you participate in but are developed by another individual or an organization. For example, Habitat for Humanity, cleaning up waterways, school beautification, etc.
Research-Based	Research-based service-learning activities are those where you are collecting data, analyzing data and sharing the results. For example, collecting a water sample, writing a report, and sharing the results with others, etc.
Advocacy	Advocacy service-learning activities are those where you are promoting a cause or educating others about an important issue, such as voter registration, etc.

Results

When asked to report the number of hours participated during service-learning activities, most (45%) of the participants reported 1 to 6 hours, 20% reported 10 to 12, 15% reported 7 to 9, 12% reported 19 or more, and very few (8%) reported 13 to 15 hours. A majority (56%) who reported participating in 1 to 12 hours of service-learning activities were female, while only 24% of males participated in that same number of hours. Forty-eight percent of African American/Black participants reported completing 10 or more service-learning hours compared to 33% of European American/White students reporting the same number of hours. The number of service-learning hours declined as students progressed through the grade levels: 56% of 10th graders had participated in 1 to 12 hours of service-learning activities, compared to 28% of 11th graders and 19% of 12th graders. In reference to the type of service-learning activity, 90% of the participants indicated that they had participated in indirect activities; 69% had participated in direct activities; 51% had participated in advocacy activities, and 29% had participated in research-based activities.

Regarding service-learning, cognitive engagement, and self-efficacy, a significant relationship was only found between self-efficacy and cognitive engagement ($\rho=.548$) as shown in Table 2. There were several interesting relationships between service-learning, cognitive engagement, and self-efficacy based on gender, race/ethnicity, and grade level. For gender, although not statistically significant, for females there were negative relationships between service-learning and the other variables; while the relationships for males were positive. There was a statistically significant relationship between cognitive engagement and self-efficacy for females ($\rho=.558$).

Table 2

Relationship between Service-Learning, Cognitive Engagement, and Self-Efficacy

	SL	CE	SE
SL	----	.049	.046
CE	.049	----	.548**
SE	.046	.548**	----

Note. ** Correlation is significant at the <0.01 level (2-tailed). Service-Learning (SL), Cognitive Engagement (CE), Self-Efficacy (SE).

There was a statistically significant relationship between cognitive engagement and self-efficacy for African American/Black ($\rho=.508$; $p < 0.01$), as well as European American/White participants (0.555 ; $p < 0.05$). The sample size for Asian/Pacific Islander and Hispanic/Latino/participants was too small for analysis ($n=2$ for each group). Based on grade level, there was a positive but not statistically significant relationship between service-learning and the other variables for both grades 10 and 11; the same relationship for grade 12 was negative. There was a statistically significant relationship, at the .05 level, between self-efficacy and cognitive engagement for grades 10 (.478) and 11 (.588). When analyzed at the .01 level, there was a significant relationship between self-efficacy and cognitive engagement for grade 12 (.579).

As Table 3 shows, there were positive relationships between cognitive engagement and direct service-learning ($\rho=.104$), research-based service-learning ($\rho=.096$), and advocacy service-learning ($\rho=.080$). A negative relationship was found between cognitive engagement and indirect service-learning ($\rho=-.131$). As represented in Table 4, there were positive relationships between self-efficacy and researched-based service-learning activities ($\rho=.334$), direct service-learning activities ($\rho=.104$), and indirect service-learning activities ($\rho=.072$) for all respondents. An overall negative relationship was found between self-efficacy and advocacy type of activities ($\rho= -.058$).

Table 3

Overall Relationship between Cognitive Engagement and the Type of Service-Learning Activity

	Direct	Indirect	Research-Based	Advocacy
P	.104	-.131	.096	.080

Table 4

Overall Relationship between Self-Efficacy and the Type of Service-Learning Activity

	Direct	Indirect	Research-Based	Advocacy
P	.104	.072	.334	-.058

As shown in Table 5, positive relationships were exhibited between cognitive engagement and respondents participating in 1-3 service-learning activities ($\rho=.071$), between cognitive engagement and respondents participating in 13-15 service-learning activities ($\rho=.037$), between cognitive engagement and 16-18 service-learning activities ($\rho=.202$), and cognitive engagement and 19 or more service-learning activities ($\rho=.098$). Negative relationships were indicated between cognitive engagement and 4-6 service-learning activities ($\rho=-.084$),

cognitive engagement and 7-9 service-learning activities ($\rho=-.061$), and cognitive engagement and 10-12 service-learning activities ($\rho=-.113$). As Table 6 shows, there were positive relationships between self-efficacy and participating in 4-6 service-learning activities ($\rho=.106$), self-efficacy and 7-9 service-learning activities ($\rho=.048$), self-efficacy and 16-18 service-learning activities ($\rho=.217$), and self-efficacy and 19 or more service-learning activities ($\rho=.118$).

Table 5

Relationship between Cognitive Engagement and Number of Service-Learning Activities

	1-3	4-6	7-9	10-12	13-15	16-18	19 or more
Total	.071	-.084	-.061	-.113	.037	.202	.098

Table 6

Overall Relationship between Self-Efficacy and the Number of Service-Learning Activities Respondents Participated

	1-3	4-6	7-9	10-12	13-15	16-18	19 or more
Total	-.076	.106	.048	-.242	.000	.217	.118

Relationship between Service-Learning, Cognitive Engagement, and Self-Efficacy

Based on previous research, it was expected there would be significant relationships between service-learning, cognitive engagement, and self-efficacy. While results from the current study showed positive relationships between service-learning, cognitive engagement, and self-efficacy, they were not statistically significant. However, when service-learning was removed, a statistically significant correlation was found between cognitive engagement and self-efficacy (.548, $p < .01$), consistent with findings from Walker and Greene’s (2009) quantitative study that examined relationships between student perceptions of cognitive engagement activities and self-efficacy.

One respondent reported, “Service-learning is a great idea for high school students. I’ve learned through it and it makes me feel like I’m making a difference in the world.” Another respondent provided, “Service-learning helped me get involved in my community and give back while gaining some type of knowledge and experience from it.” The participants’ statements support the importance of incorporating service-learning into the curriculum which can have positive impacts on students’ cognitive and affective development.

Impact of Demographic Variables on Service-Learning, Cognitive Engagement, and Self-Efficacy

There were some interesting relationships between service-learning, cognitive engagement, and self-efficacy when disaggregated by gender, race/ethnicity, and grade level. As for gender, there was a statistically significant relationship between cognitive engagement and self-efficacy for female participants. These findings are consistent with both Amir, Saleha, Jelas, Ahmad, and Hutkemri’s (2014) study which found that females are slightly more cognitively

engaged in school than males and Kumar and Lal's (2006) study which found that females had a higher self-efficacy. Concerning race/ethnicity, a statistically significant relationship was found between cognitive engagement and self-efficacy for African American and European American/White students. This finding supports Walker and Greene's (2009) study that found a positive correlation between cognitive engagement and self-efficacy; by disaggregating race/ethnicity, which the current study also expands earlier research.

While the current study focused on high school students (grades 10 to 12 since 9th graders did not participate in service-learning activities), findings related to demographic variables support and expand conclusions from a similar study by Covitt (2002), who focused on middle schoolers (grades 6 to 8). Both studies found that girls had more positive attitudes and participated in more service-learning activities than boys. This finding supports the need to increase male participation since Dávila and Mora (2007) found that young men were 29% more likely to graduate from college on time if they engaged in service to fulfill a class requirement during high school. In the current study, African American students were more positive about service-learning compared to Covitt's (2002) study, where White students had more positive attitudes than Black students.

As for grade level, there was a positive, but not statistically significant relationship between service-learning, cognitive engagement, and self-efficacy for grades 10 and 11, while the relationship was negative for grade 12. There was a statistically significant relationship between cognitive engagement and self-efficacy across grade levels which is further confirmation of findings from previous research that examined cognitive engagement and self-efficacy (e.g., Carroll et al., 2009; Galyon et al., 2012; Kennedy, 2010; Lerdpornkulrat et al., 2012; Pajares, 1997; Schunk, 2003; Walker & Greene, 2009; Williams & Williams, 2010).

Descriptive analyses of the data showed that participation in service-learning decreased as grade level increased, which speaks to Skinner and Chapman's (1999) report that schools might require that students in lower grade levels participate in service-learning while allowing students in higher grade levels the option of participating.

Limitations

There were limitations to the study such as the findings cannot be further generalized due to participants being students who attended one high school in an urban school district in North Carolina who had completed at least one service-learning activity. Data collection was delimited to one administration of the questionnaire. The instrument did not measure a student's change in cognitive engagement and self-efficacy during the duration of a service-learning activity; it only captured a snapshot of the relationship between students' service-learning activities, their overall cognitive engagement, and their self-efficacy. Another limitation of the study was reliance on self-reporting by participants.

Conclusion

In the triadic reciprocal determinism (TRD) model, cognitive, behavioral, and environmental influences operate interactively as determinants of each other (Bandura, 1986). In this study, service-learning (environmental influence), cognitive engagement and self-efficacy (behavior) operated interactively to influence high school students' academic experiences in terms

of experiential learning. Current trends in education are moving from the traditional curriculum to experiential learning opportunities (Pace, 2015) and service-learning is a form of experiential learning; experiential learning can accelerate learning (Furco, 1996).

As schools, school districts, and instructional leaders implement service-learning activities and programs, teachers and leaders should be cognizant of the type of service-learning activity (direct, indirect, research-based, advocacy) that best meets the needs of the students. As shown in this study, the type of service-learning activity may have a positive or negative impact on cognitive engagement and/or self-efficacy. In the study, research-based service-learning was the only activity type that had a positive relationship with both cognitive engagement and self-efficacy, in terms of gender.

Previous research has assessed the positive effects of service-learning and related community-engagement programs on cognitive, affective, and civic engagement factors for youth. Also, there is evidence that service-learning experiences help young people become more informed and engaged citizens and can empower marginalized students' sense of self and society. This study has reiterated some of these previous findings. In closing, nurturing young people's academic engagement, motivation, and civic engagement through service-learning activities can have lasting benefits for both youth and society. K-12 schools must continue to promote service-learning. Researchers must continue to study the effects of service-learning on the academic, social, and personal development of K-12 students.

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