

CREATING A GREENER FUTURE

GREEN WORKS IN KANSAS CITY PROGRAM EVALUATION

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ABSTRACT

Green Works educates urban high school students about Kansas City's environmental challenges, involves them in service-learning projects that improve our community, prepares them for post-secondary education and the STEM workforce, and connects them to opportunities in the growing green economy. Green Works has anecdotal evidence of its success, not only for the youth but also for their families and neighborhoods. Evaluation questions: How does Green Works help urban, teen participants reach their goals? Can the insights gained from the use of Fuzzy Cognitive Mapping (FCM) be used to provide input to program replication and sustainability?

EXECUTIVE SUMMARY

Green Works began in the fall of 2007 with a mission of preparing urban teens for the workforce using an environmental service-learning curriculum. Green Works excels at environmental education, workforce development, and helping students gain social capital connections that positively impact their futures. Green Works unites several types of learning opportunities in their learning environment held in out-of-school time: science learning, environmental stewardship, job skill training, internships, financial literacy, and life skills. The ultimate goal of Green Works is to help students grow into independent, resilient, and accountable adults who are actively engaged in their communities.

Early in its programming Green Works undertook a thorough program evaluation (Campbell, 2009) which generated the following findings: demonstration of mastery of academic environmental science concepts; increased self-perceptions, confidence, and concern about the environment; and an increased impact on the environment through example and influence. Since 2009, Green Works has continued to grow its programming and make alterations based on student outcomes. While much of the program emphasis is on environmental stewardship, Green Works provides a broad foundation that supports students' transition to adult life. The current evaluation for Green Works used Fuzzy Cognitive Mapping (FCM) methodology to uncover students' own perceptions of how Green Works helps them meet their goals. The most important reason for selecting FCM is participant empowerment. FCM establishes the students as experts in their own lives who are sharing their insights and perspectives with the evaluator and the program team. The second reason is that FCM is increasingly used for environmental planning studies.

The FCM project consisted of meeting in small groups and individually to learn the fundamentals of creating a cognitive map. Following the explanation, students completed a questionnaire and then created their cognitive maps. A handout of "start concepts" was used for knowledge activation. The start concepts consisted of common

beginning concepts, such as the Green Works programs and strategies. Students understood that they did not need to use all or any of the start concepts.

GREEN WORKS IS NOT ONLY ABOUT ENVIRONMENTAL STEWARDSHIP. FOR STUDENTS, IT IS AN INVESTMENT IN THEIR FUTURE THAT IS PAYING OFF.

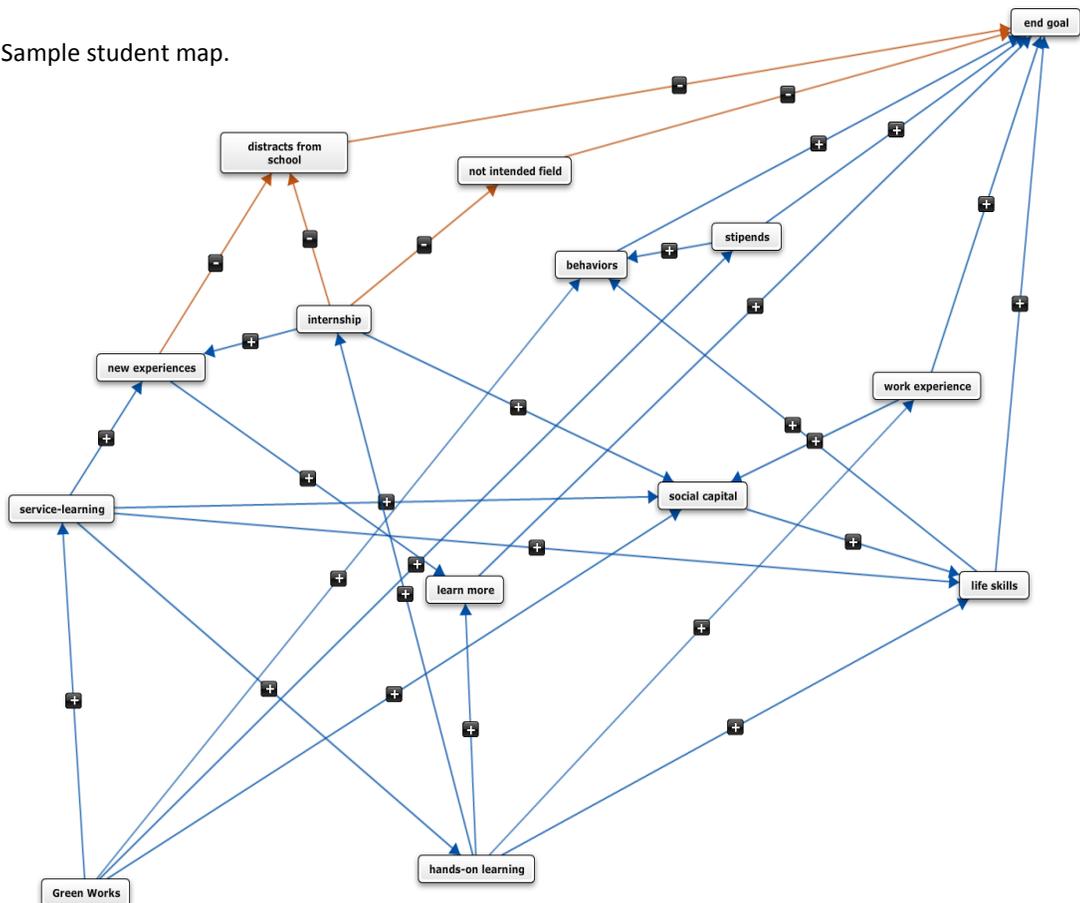
The results of the questionnaires demonstrated how passionate the students are about Green Works. They feel better prepared for employment. In school they are doing better in their academic classes. They are also setting goals for themselves and working to achieve them, and getting more involved in community activities.

Table 1. Results of questionnaire.

Measure	N Valid	Mean	Mode	Std. Deviation
I am doing better in my academic classes.	12	4.250	5.00	.86603
I feel better prepared for employment.	14	4.50	4.00	.51887
I am handling my money differently.	14	4.21	5.00	.80178
I am setting goals for myself and working towards them.	14	4.36	4.00	.63332
I have gotten involved in more community activities.	14	3.8571	4.00	1.6732

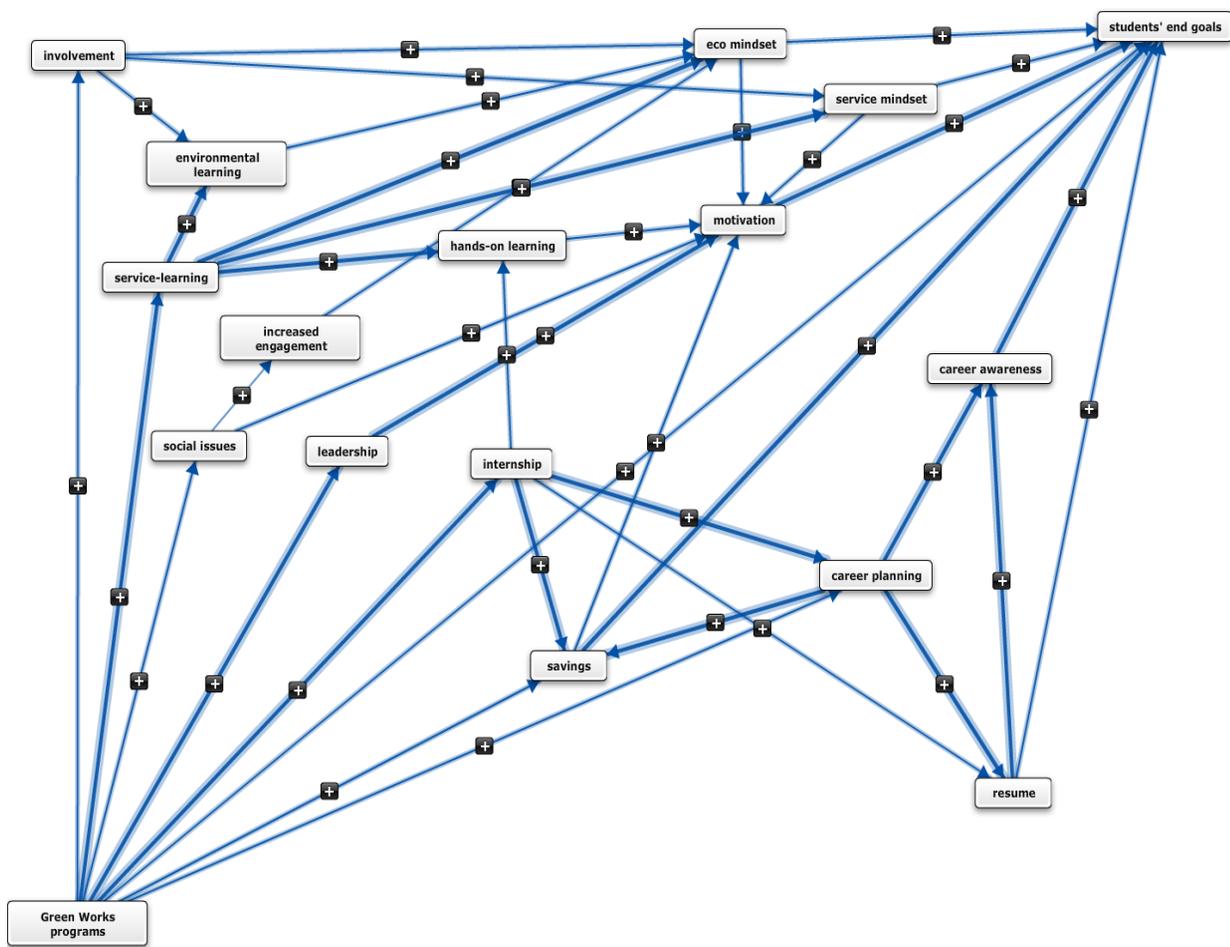
5 point scale: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree

Figure 1. Sample student map.



One primary advantage of FCM is the structure it provides to make capturing students participants' knowledge an intuitive process. The FCM methodology builds on qualitative cognitive maps, which originated in the social sciences, and makes the maps computable through the application of fuzzy set theory. Each student drew a map that shows how Green Works helps him or her reach a goal. The students began with Green Works in the lower left-hand corner and their end goal at the upper right. (Most students identified an end goal of graduating from high school and going to college or into the workplace). Students then self-identified aspects of their personal Green Works experience that either positively or negatively impacted movement towards their goal. The evaluator then applied fuzzy set theory to aggregate and condense the information from the maps into concepts. The map below shows a simplified combined map of the most frequently used concepts.

Figure 2. Simplified, combined map.



THE CONCEPTS WITH GREEN ARROWS ARE WHAT THE STUDENTS SAY THEY ARE GAINING FROM GREEN WORKS. THESE ARE UNIQUE OPPORTUNITIES VITAL TO FUTURE SUCCESS.

Table 2: Results of FCM scenario. Please note, the concepts names stem from the students' words. They are described in the full report.

Negative change/barrier			Positive change/facilitator		
Maximum	Medium	Minimum	Minimum	Medium	Maximum
			Comfortable in a business setting		
			Career awareness		
			Hands-on learning		
			Leadership		
			Life skills		
			Networking		
			Science academics		
			Self-confidence		
			Self-determination		
			Social issues		
			Eco mindset		
			Engaging others		
			Green collar careers		
			Increased motivation		
			Learn more		
			Service mindset		
			Setting priorities		
			Social capital		
			Stipends		
			Detracts from school		
			Social outcomes (with peers)		

CONCLUSION

Eight years ago the Green Works programming was designed to raise science literacy, change students behavior, and introduce students to growing careers in the field of environmental sustainability. In 2009, Dr. Connie Campbell conducted an evaluation of the ECOS environmental education program and verified that students' science literacy was increasing and they were in fact changing their behaviors towards the environment. (Campbell, 2009). This FCM evaluation supports and builds on the findings of Campbell. Along with reporting an improvement in science academics and changed behaviors, the students also mapped outcomes that will most certainly increase their chances of success in the workplace, including comfort in a professional setting, leadership and life skills, career awareness and improvement in their self-confidence, self-determination and motivation.