

**Assessing the impact of Green Literacy's  
sustainability education programs by examining  
attitudes and behaviors of individuals in the  
program**

**Karen McCarthy**



**Capstone Report – April 2021**

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## Executive Summary

Green Literacy is a non-profit organization based in Nashville, Tennessee, whose mission it is to teach communities how to live sustainably. Although the organization has been in operation for 12 years, its stakeholders are unsure as to the impact of their efforts. Green Literacy needs to assess whether it has advanced the knowledge, values, and attitudes of its program participants. While often in education intervention programs we measure short-term outcomes (e.g., by counting number of participants or doing simple pre-post surveys), the long-term outcomes are more subtle and can be difficult to measure (Thomson et al., 2003). This capstone project was designed to identify how best to measure a change in sustainable behavior among Green Literacy's program participants.

Behavior-change interventions have been used in many contexts, including environmental psychological research related to behavior change towards household energy use, recycling, and waste minimization. The Theory of Planned Behavior (TPB) is one of the more widely used theoretical frameworks in research and has been used to explain and predict people's behavior. The framework provides a good approach to conceptualize and measure sustainable behavior.

Based on the TPB framework, this capstone project used the following two questions to guide the work and assist Green Literacy in understanding the impact of its education programs on the community:

1. How have attitudes towards the behavior, the subjective norms connected to the behavior, and perceived behavioral control changed because of Green Literacy's sustainability program?
2. How do community members report that their behavior has changed owing to Green Literacy's sustainability program?

To gather and analyze data on participants' attitudes and behavior towards sustainable living, I used a mixed methods approach. I administered the 15 question New Ecological Paradigm survey instrument, followed by interviews with 11 of the survey responders. From the analyses I determined the following seven findings:

1. Participants maintain a positive attitude towards environmentally positive behavior.
2. Green Literacy's program provides the support needed for individuals to perform in positive environmental ways.
3. Participants feel supported by their employers.
4. Participants feel empowered to promote sustainability.
5. Satisfaction with programming decreases over time.
6. Participants feel they model good behavior.
7. Participants benefit from the community of practice developed within Green Literacy's program.

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Based on these findings, I developed the following recommendations:

**1. Collect data to support key indicators**

To identify *how* best to measure change in sustainable behavior, it is key to identify *what* to measure. Green Literacy should develop a survey around the three tenets of TPB that include: personal sustainable behavior, sustainable attitudes, the subjective norm, perceived control, situational factors, and consequences of sustainable living.

**2. Create a feedback loop for participants**

The community of practice created by Green Literacy extends beyond its programs and into the participants' external communities and lives. In order to determine the reach of its programming, Green Literacy should attempt to access these data through social media posts as well as articles involving participants, their organization, and their network.

**3. Update program content**

From my interviews, there was a feeling that the roundtable offerings were too basic for professionals working in the sustainability field. Green Literacy needs to update its program content to include more advanced information and make use of teaching tools like case studies to continue to engage these individuals.

**4. Engage program alumni**

Individuals who are no longer active in the program can be considered program alumni and are a valuable resource to Green Literacy. They can provide expertise and financial support and expand Green Literacy's reach to a national level. Green Literacy should engage current participants to assist in reconnecting with past participants and use LinkedIn to locate and re-engage past participants. Green Literacy should immediately begin to collect alternate contact information from its current participants.

These recommendations will open pathways to connect to past and current program participants and, more importantly, give Green Literacy the opportunity to measure the change in sustainable behavior among participants.

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## Introduction

Human activities are changing the planet both negatively and positively, and the planet is facing a number of global environmental challenges, such as increased greenhouse gas emissions, oceans acidifying, arctic ice at its lowest observed extent, resource depletion, and loss of biodiversity (Leemans & Solecki, 2013). At its Conference on Sustainable Development in 2012, the United Nations acknowledged these negative trends and, with agreement from world leaders and commitments for action, initiated sustainable development goals. These world leaders recognized that these environmental challenges cannot be solved if only some countries participate or by advanced technology alone. And any research towards sustainability requires the collaboration of business, governments, and civil society (Leemans & Solecki, 2013).

At the UN Conference on Environment and Development at Rio de Janeiro in 1992, leaders from around the world identified education and learning as the way forward to combat the social and environmental issues facing the world. For any education intervention to be successful, it is crucial to not only have individuals understand the topic of sustainable living but to motivate and empower individuals to change their behavior and act for sustainable development. The United States is one of the top consumers of natural resources but lags in the use of renewable energy. The ‘throw away’ culture has the United States as one of the top producers of waste material that in some cases is shipped to other parts of the world for disposal. Some organizations here in the United States have taken up the mandate to educate the populace around the area of sustainable living and development.

Green Literacy is one such organization that for the past 12 years has been teaching Nashville’s communities how to live sustainably. As an organization, Green Literacy wants to provide high-quality sustainability education programs that will succeed in changing the behaviors of the Nashville community towards sustainability. However, it is challenging to find good techniques to evaluate the success of its programs. Green Literacy is interested in understanding how to measure its impact on the community at large; to know how to evaluate the effectiveness of its social enterprise and whether it is influencing the culture of teaching the community how to live sustainably. The purpose of this capstone project is to provide Green Literacy with better techniques to assess long-term outcomes such as shifts in values and behaviors that benefit the environment.

**“Sustainability is the need to ensure a better quality of life for all, now and into the future, in a just and equitable manner, whilst living within the limits of supporting ecosystems.”**

**Agyeman (2008)**

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## Organization Context

Green Literacy is a non-profit organization in Nashville, Tennessee, focused on sustainability education. Green Literacy teaches communities how to live sustainably by organizing, training, and connecting leaders in classrooms, households, and workplaces so they are empowered to teach others how and why to make more sustainable choices. With its Sustainable Classrooms Curriculum, Green Literacy works with teachers to turn their classrooms into spaces for exploring and demonstrating sustainable living early in life. The household division partners with community organizations to train professionals to create sustainable living education systems that will inspire residents and families to be part of the solution. And with their Corporate Sustainability Roundtable, Green Literacy partners with businesses to build a community and culture of sustainable workplace behaviors. There are approximately 50 corporate organizations of varying sizes participating in the sustainability roundtable. Organizations in middle Tennessee meet monthly to share their organization's systemic approach to sustainability. The roundtable cultivates relationships to help organizations map their own systems to find opportunities to realize their sustainability goals. New organizations are continuously being invited to join the roundtable, and Green Literacy provides workshops to assist these organizations with their sustainability goals. The challenges of the pandemic have allowed Green Literacy to expand its reach. Green Literacy hosted several virtual events and used platforms like LinkedIn to reach a wider audience. Now people from cities around the United States participate in Green Literacy's education programs.

The staff of Green Literacy consists of an executive director, a director of operations, a director of programs, and a sustainability education manager. The staff is passionate about protecting the natural resources and works tirelessly to promote sustainable living. The staff is supported by the board of directors, interns, and volunteers. The main stakeholders are the executive director and the director of programs. It is their responsibility to report on the success of their sustainability education programs. It is important to the staff, the board, and the funders of this non-profit to understand how well its education programs are changing the Nashville community. The staff wants to confidently report the success of the programs when Green Literacy courts future funding to expand its programs and reach. An accurate assessment of Green Literacy's program will also allow them to practice continuous improvement, a process to improve their program quality over the long-term. Green Literacy's long-term goals include evidence of increased sustainable behavior. This capstone project provides techniques to assess this long-term outcome.

Green Literacy uses Agyeman's (2008) definition of sustainability, describing it as "the need to ensure a better quality of life for all, now and into the future, in a just and equitable manner, whilst living within the limits of supporting ecosystems." Green Literacy needs to understand how to measure its impact on the community at large; to know how to evaluate the effectiveness of its social enterprise and whether it is influencing the culture of teaching the community how to live sustainably. I will focus on understanding how best to evaluate individual behavior towards sustainability.

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## **Problem of Practice**

Green Literacy wants to know how to measure the impact of its programs on the community. The organization is challenged by its funders and supporters to demonstrate its success and so has a need for good performance measurement techniques. If the organization can develop a good program evaluation, it can continuously improve the management and performance of its programs.

Sustainability education is considered good when it successfully creates an awareness of the relationship of humans to the natural environment. Education that advances individuals' knowledge, values, and attitudes and invokes responsible environmental or sustainable behavior is successful. How can Green Literacy assess whether it has advanced the knowledge, values, and attitudes of its program participants? It is important that it selects the right indicators to measure its long-term outcome of increased sustainable behavior. Too often in education intervention programs we measure the short-term outcomes by counting things like number of participants and doing simple pre-post surveys. The long-term outcomes we want to measure are more subtle and can be difficult to measure (Thomson et al., 2003).

Green Literacy has developed an evaluation plan, and this capstone project aims to give the organization good, reliable indicators to use in its on-going evaluation and assessment of its program's impact on the community. The literature supports the use of education as the change agent for sustainable development and has many examples of assessing attitude and behavior change. Green Literacy has reported on its short-term outcomes by measuring, for example, total number of corporate green teams, number of programs, and the number of staff trained. However, Green Literacy lacks the data necessary to track and measure behavior change.

## **Framework and Literature Review**

The literature review explores the importance of sustainability education in changing attitudes and behavior that will lead to individuals in our society acting in a sustainable way towards the environment and natural resource challenges that face our world today. The work that Green Literacy does is important and timely, and the literature gives justification to the work the organization does. The review also outlines the challenges faced by organizations in their work on sustainability education and presents several research studies that utilized education in changing attitudes and behavior of their participants. These examples become relevant in understanding how the change was identified and measured.

Sustainability education seeks to prepare individuals for active participation in dealing with social and environmental issues within their own communities and across national and international boundaries (Meyer, 2015). At the UN Conference on Environment and Development at Rio de Janeiro in 1992, leaders from around the world tackled the challenge of sustainability and identified education and learning as the way forward to combat the social and



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environmental issues facing the world. The program of action developed at the conference, titled Agenda 21, promoted the idea that school-age to adult education was critical for promoting sustainable development around the world and giving future generations a fighting chance of addressing environmental and development issues (Martin & Jucker, 2005). The UN framework argued that there was no room for education as usual with simply adding new subject content (e.g., climate change) to students' curricula but, in order to make real impact, called for an educational approach with a transformational aim that would target and influence students' concerns, dispositions, and values towards a global context (Brook, 2013). The UN community wanted to promote respect for the human rights of all people, respect of future generations, respect and care for the Earth's ecosystems, and respect of global cultural diversity. Thus, the demands of sustainability education are extensive. With the goal being to motivate and empower individuals to change their behavior and act for sustainable development, different methods of education are required. It is vital to align students' values with those outlined by UNESCO (Brook, 2013).

Many studies have presented the positive returns from education on many social aspects of society. Research has found that increases in education have reduced teenage births (Black et al., 2008), reduced crime (Lochner & Moretti, 2004), positively influenced civic participation like voting (Milligan et al., 2004), and increased political involvement (Dee, 2020). Education also influences environmental behaviors. Many would agree that climate science involves complicated topics and achieving any climate literacy requires those skills procured at school, such as acquiring and interpreting complex issues (Chankrajang & Muttarak, 2017). Education reinforces the knowledge, values, and priorities that are acquired through school and increases the learners' ability to prepare for a future that is expected to experience limited resources (Cutler & Lleras-Muney, 2010). Haron et al. (2005) agreed that education can advance the understanding of complex environmental topics such as climate change. Green Literacy's programs aim to teach many of these complex topics.

Studies in several different contexts have found that education is positively correlated with pro-environmental behavior. One study found that individuals with higher education were more likely to recycle (Callan & Thomas, 2006). Another study by Bellows et al. (2008) found that individuals with higher education also had a higher probability of buying organic foods. Other studies have found that higher education levels were also related to water saving behaviors (Berk et al., 1993) and energy saving behavior (Han & Cudjoe, 2020).

Sustainability education faces some challenges. A main criticism made of sustainability was that it was anti-development and seemed to turn a blind eye to economic development. The two issues would often end up on opposite sides of political debates in countries around the world. Politicians and civic leaders would side with sustainability or economic development, rarely both. According to Robottom (1987), education is also ideological and thus becomes vulnerable to the self-interests of the people in power in society. In this way education and sustainability are exposed to the same criticisms and challenges. Environmental issues and therefore environmental or sustainability education are subject to political and deep philosophical

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struggles, which have created barriers to the sustainability goals proposed by the UN community (Hart, 2010).

Another challenge to tackling the current environmental challenges involves changes in the general population's actions, activities, and behavior. The aim of sustainability education is to transform or modify human behavior. Behavior change interventions are layered in complexity, and it is important to accurately determine the behavior change techniques (BCT) or the means through which the behavior change occurs, as well as the mechanisms of action and any identifiable links between them (Connell et al., 2019). Studies show that behavior change is difficult to sustain and that the approaches used to encourage behavior change tend to suppress, rather than eradicate, the original behavior. The original behavior remains in the memory system and available to lapse or relapse under certain conditions (Bouton, 2014). Even though there are these challenges, behavior change interventions have been shown effective and this theory will help guide the framework needed to study Green Literacy's impact.

Behavior change interventions are used in many contexts and are used often to effect positive health outcomes. There are behavioral interventions aimed at addressing individual health concerns by targeting behaviors that have been shown effective in changing eating behaviors. These interventions also have the potential to improve health (Connell et al., 2019) and to reduce premature mortality (Kontis et al., 2014), disability (Nyunt et al., 2012), and health care expenditures (de Bruin et al., 2017). These interventions follow a variety of theoretical frameworks. The social cognitive theory model for healthy behavior change has been shown to increase fruit, vegetable, and fiber consumption; increase physical activity; and prevent long term weight gain in college students (Greenwood et al., 2008). Another study using a unified theory of behavior change was shown to help parents become agents of change in the lives of their children, supporting their mental health needs (Olin et al., 2010). Using the theory of planned behavior, Milton and Mullan (2012) showed its effectiveness in increasing behaviors such as adequately keeping hands, surfaces, and equipment clean in an effort to reduce the incidence of illness. There are several frameworks available and appropriate to use to measure behavior change of Green Literacy's program participants, but further examination of the literature highlights the most suitable.

Sopha et al. (2011) examined the literature for theoretical frameworks of research related to household energy behavior and identified the three most common theories in environmental psychological research: the Theory of Planned Behavior (TPB, Ajzen, 1991), the Norm-Activation Theory (NAT, Schwartz & Howard, 1981), and the Value-Belief-Norm Theory (VBN). Sopha et al. (2011) found that 30% of all studies used the TPB, 15% the NAT, 15% the VBN, and 13% a hybrid of at least two of the theories (Klößner, 2013). TPB is a general model of deliberate behavior; NAT was initially developed for one type of behavior - altruism; and VBN is an integrative theory linking the theory of NAT to findings about individual values and behavior (Klößner, 2013). Because the theory of planned behavior is a widely used framework and appropriate for a sustainable behavior context, I have identified it as a reliable framework around which to study Green Literacy's impact.

## Conceptual Framework

The theory of planned behavior (TPB) model, pictured in Figure 1 below, assumes that behavior is determined by the intention to perform the behavior. This is controlled by three factors: the attitude towards the behavior, the subjective norms connected to the behavior, and perceived behavioral control (Ajzen, 1991). Attitude describes an individual's opinion of performing the behavior, whether favorable or unfavorable. The subjective norm represents how the individual distinguishes any social pressure towards performing the behavior. Perceived behavioral control describes how the individual views his or her own ability to perform the behavior (Tonglet et al., 2004). In our context, people act in ways that promote positive environmental outcomes if they 1) hold a positive attitude to the activities, 2) experience social pressure from people in their network to perform the activities, and 3) believe they are able to perform the activities (Klöckner, 2013).

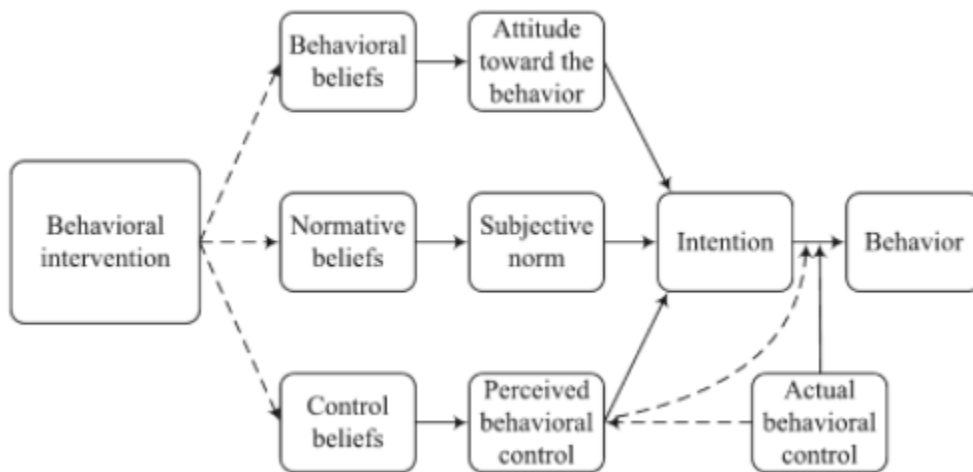


Figure 1: Expected effects of a behavioral intervention in the theory of planned behavior (TPB)

TPB has been used in numerous studies to predict and explain why people behave the way they do in various contexts. TPB was used to explain behavior change associated with health screenings, predicting attendance, and frequency of attendance (Sheeran et al., 2001). Another study used TPB to explain and predict preventive intention on sexual behaviors among junior high school students (Baudouin et al., 2020), and a study by Ndofirepi (2020) examined the correlation between entrepreneurship education and entrepreneurial goal intentions.

Kaiser et al. (1999) propose that the TPB is ideal at predicting pro-environmental behavior because it includes the measure of constraints beyond one's control. Pro-environmental behavior by nature is vulnerable to many situational constraints that are outside an individual's control. TPB allows for a measure of difficulty in performing behavior which considers the complexity in pro-environmental behavior.

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TPB has also been used to explain sustainability behavior in eco-friendly decision making to stay at green hotels (Kim & Han, 2010); identify the driving forces behind recycling and waste minimization behavior (Tonglet et al., 2004); and explain public transportation use to support an effort to reduce car use and encourage the use of public transportation (Heath & Gifford, 2002). TBP will therefore allow us to examine how Green Literacy impacts individuals' intentions to change behavior and how those intentions are impacted by their social and physical environments.

## **Capstone Questions**

Education remains an important component towards sustainability development, and to evaluate Green Literacy's influence on the community it serves, I will examine the community's behavior towards sustainability. The purpose of this capstone project is to provide Green Literacy with better techniques to measure its long-term goals of realizing change in attitudes and behavior of the Nashville community.

This capstone project uses the following two questions to guide the work and assist Green Literacy in understanding the impact of their education programs on the community:

1. How have attitudes towards the behavior, the subjective norms connected to the behavior, and perceived behavioral control changed because of Green Literacy's sustainability program?
2. How do community members report that their behavior has changed owing to Green Literacy's sustainability program?

Question 1 utilizes the three tenets of the theory of planned behavior to further the understanding of how attitudes and behavior changes have occurred among participants in Green Literacy's sustainability education programs. Question 2 focuses on how the participants describe the changes to their attitudes and behaviors. To answer these two questions, I utilized both quantitative and qualitative research design methodologies.

## **Project Design**

### **Methods**

To explore the attitudes and behaviors of the participants in Green Literacy's programs, I utilized a mixed methods approach. First, I utilized a quantitative methodology in the form of a survey of all active roundtable members. This list of members also included participants in Green Literacy's more recent virtual offerings. With approval from the Director of Green Literacy and

assistance from the Director of Programming, an email invitation to participate in the survey was sent to all active program participants. The email invitation was sent through Green Literacy’s email system. The email contained a link to the online survey created using Qualtrics (Appendix A).

I utilized The New Ecological Paradigm (NEP) as my survey instrument. The NEP was first published by Dunlap and Van Liere (1978). It is a widely used measure of environmental concern in the world and has been employed in many studies. The NEP scale measures general beliefs about the relationship of human beings to the environment (Hawcroft & Milfont, 2010). The creators, Dunlap and Van Liere, demonstrated reliability and validity in the original 1978 scale and the revised scale (2000), which my study used. They demonstrated known group predictive validity and high Cronbach alphas supporting internal consistency, and the scale was positively correlated with measures of support for environmental regulations and personal behavior (Hawcroft & Milfont, 2010). Figure 2 lists the 15 items that make up the NEP survey.

#	Item
1	We are approaching the limit of the number of people the earth can support.
2	Humans have the right to modify the natural environment to suit their needs.
3	When humans interfere with nature it often produces disastrous consequences.
4	Human ingenuity will ensure that we do not make the earth unlivable.
5	Humans are severely abusing the environment.
6	The Earth has plenty of natural resources if we just learn how to develop them.
7	Plants and animals have as much right as humans to exist.
8	The balance of nature is strong enough to cope with the impacts of modern industrial nations.
9	Despite our special abilities, humans are still subject to the laws of nature.
10	The so-called “ecological crisis” facing humankind has been greatly exaggerated.
11	The Earth is like a spaceship with very limited room and resources.
12	Humans were meant to rule over the rest of nature.
13	The balance of nature is very delicate and easily upset.
14	Humans will eventually learn enough about how nature works to be able to control it.
15	If things continue on their present course, we will soon experience a major ecological catastrophe.

Figure 2: New Ecological Paradigm (NEP) survey questions

Responses to the survey were anonymous, and no tracking metadata was employed to identify participants. The email invitation to participate in the survey was sent out twice, after which the data were downloaded from Qualtrics to a secure laptop for analysis. These data are relevant to answering the first tenet in the first capstone question that explores attitudes.

The qualitative portion of my project utilized interviews. I recruited participants through the NEP survey. The survey included a demographics section that requested age range, gender, education, and years in program. An additional interview recruitment item was also placed in this section that invited participants to volunteer to be interviewed. The participants who agreed provided a contact email address. I used the email provided by the participants to request interview times

and collect phone numbers to conduct phone interviews. Semi-structured interviews were conducted and recorded by me. Questions asked during the interview were designed with TPB factors in mind and are summarized in Table 1.

Table 1: Outline of Interview Questions

<b>TPB Factors</b>	<b>Questions focused on:</b>
Attitude	Benefits and challenges attributed to program participation
Social pressure	Expectations from employer and peers; how participants impose their expectations towards sustainable behavior on others
Behavioral control	How sustainable behavior was performed and how challenges to sustainable actions were addressed

The questions aimed at identifying the presence of the TPB factors in the program’s setting and in the lives of the participants and any changes participants themselves describe as being linked to Green Literacy. (See Appendix B for full interview questions and their mapping to capstone questions and TPB framework.) I then transcribed and analyzed the recorded interviews.

## **Data Analysis**

### **Surveys**

Quantitative data from the NEP survey were compiled in an Excel spreadsheet and analyzed using descriptive statistics. The data were also aggregated to produce an overall score for each participant. The 15 items were measured using a 7-point Likert scale, with 1 indicating strongly disagree, 7 indicating strongly agree, and 4 indicating neutral. The higher the overall score, the stronger the measure of environmental concern displayed by the participants.

A request to participate in the survey was emailed to 319 recipients through Green Literacy’s email system. A total of 79 recipients completed the NEP survey. The survey responses were collected between January 5 and January 19, 2021. The data were analyzed using Excel.

Table 2 displays the demographic makeup of the survey participants. Of interest, 48% of the respondents are in the 18 to 34 age range. This is not surprising, as this is congruent with studies that show younger people to be more sensitive to environmental concerns (Klineberg et al.,1998). Also evident is that 95% of the respondents are college educated, with 42% having a post graduate degree. This is also in line with the literature, which supports the positive correlation between education and pro-environmental behavior. Studies like Callan and Thomas (2006) found individuals with higher education were more likely to recycle.

Table 2: Survey Participant Demographics

Participant Demographics			
Demographics		Frequency	% Percent
Gender	Female	58	73.4%
	Male	20	25.3%
	Prefer not to say	1	1.3%
Age	18 - 24	8	10.1%
	25 - 34	30	38.0%
	35 - 44	17	21.5%
	45 - 54	11	13.9%
	55 and over	13	16.5%
Education	Some college no degree	3	3.8%
	Associate degree	1	1.3%
	Bachelor's degree	42	53.2%
	Post graduate degree	33	41.8%
Years in Program	less than 1 year	15	19.0%
	1 to 3 years	49	62.0%
	3 to 6 years	10	12.7%
	more than 6 years	5	6.3%

N = 79

Figure 3 depicts the respondents' mean scores. According to the literature (Ntanos et al., 2019), a mean score greater than 4 indicates participants with high concern for the environment and sensitivity to environmental concerns. I tested possible differences between NEP scale mean scores and respondents' years in the Green Literacy program.

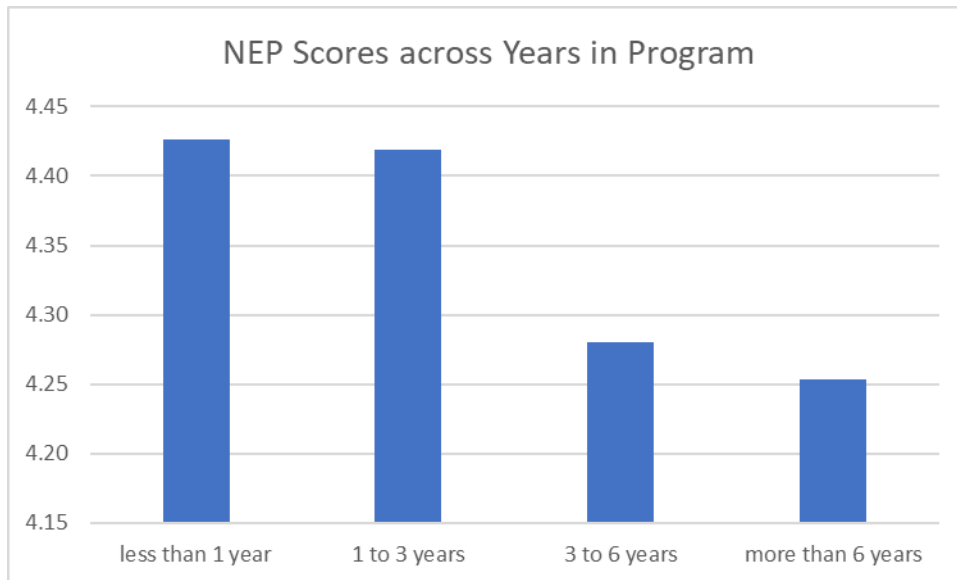


Figure 3: Average mean New Ecological Paradigm (NEP) scores

After collapsing the data into two categories, 0 to 3 years and greater than 3 years, I performed an independent samples t-test using Excel. First, I calculated the mean and variance for each group. 0 to 3 years has mean = 4.42 SD = 0.35 and variance = 0.09. Greater than 3 years has mean = 4.27 SD = 0.30 and variance = 0.12. Then I performed an F test to test the equality of the variance,  $F = 1.3256$ . I then performed the t-test with equal variance,  $t(77) = 1.6767$ ,  $p = 0.0976$ . There is not enough evidence to reject  $H_0$  at the significance level 0.05. Therefore, there is no significant difference between the means of the two groups.

## Interviews

Data were collected through one-to-one recorded interviews with Green Literacy program participants. I designed the interview questions around the three tenets of TPB such that they would elicit responses related to participant attitudes about sustainable topics, any social pressure participants felt to change, and whether they felt they had the resources to change (see Appendix B for full list of questions). Through the interviews, my aim was to understand individual motivation in being a part of the program and any challenges experienced being in the program. I also expected to understand how these participants perceived that their behavior had changed because of their involvement with Green Literacy. The interviewees were stratified across the number of years in the program. See Table 3.



Table 3: Participants' Years in Program

Years in Program	Survey respondents	Interviews
less than 1 year	15	2
1 to 3 years	49	5
3 to 6 years	10	2
more than 6 years	5	2
<b>Total</b>	<b>79</b>	<b>11</b>

N = 11

I transcribed individual participant interviews and identified qualitative data for manual thematic analysis. After re-reading the transcripts, I assigned codes to excerpts from the transcript that expressed relevant meaning in relation to the capstone questions. I also imported the transcribed interviews into NVivo, a computer-assisted qualitative data analysis software program for thematic analysis. I used the frequency query feature to find frequently occurring words. After a manual review of the material, I selected several words and phrases as codes. The software's coding process classified different interview excerpts under the codes I identified.

In the next step of the analysis, I grouped the codes that shared similar meaning into themes and then reviewed and refined the themes to ensure that they reflected participants' responses. Table 4 displays the themes that emerged from the interviews.

Table 4: Data Analysis Themes

<b>Themes from Participant Interviews</b>				
		n participants (N=11)	0-3 years in program (n=7)	3-6 years in program (n=4)
<b>Theme 1</b>	<b>Program participation created a sense of community</b>	100%	100%	100%
	Build relationship with peers Develop network with peers			
<b>Theme 2</b>	<b>A community of practice developed organically</b>	100%	100%	100%
	Shared sustainable practices Support for beginners Diversity of expertise			
<b>Theme 3</b>	<b>Participants receive support from employers, family, and friends</b>	82%	86%	75%

<b>Theme 4</b>	<b>Participants are proud of their knowledge and feel empowered to share with their other networks</b>	64%	43%	100%
<b>Theme 5</b>	<b>There is an opportunity to tailor the program to better meet the needs of participants</b>	27%	14%	50%
<b>Theme 6</b>	<b>The program participants have a sense of hope for the future</b>	27%	43%	0%
	Hopeful			

100% of the participants said something about Themes 1 and 2, which related to the people, community, and shared network they gained from being in the program. Theme 3 about support ranked very high across both groups of participants. 100% of the 3-6 years in-program participants said something about Theme 4, while only 43% of the 0-3 years in-program participants felt empowered. Critique of the program content, Theme 5, was also higher among the 3-6 years in-program participants at 50%. Interestingly, Theme 6 was talked about only by the 0-3 years in-program participants.

## Findings

The discussion of findings is grouped by capstone question. For each finding, evidence from the interviews, survey responses, and supporting literature are presented. Seven findings came out of this capstone project. Findings 1 through 5 addressed the first capstone question, and Findings 6 and 7 addressed the second capstone question.

*Capstone Question 1. How have attitudes towards the behavior, the subjective norms connected to the behavior, and perceived behavioral control changed as a result of Green Literacy’s sustainability program?*

**Finding 1:** Participants maintain a positive attitude towards environmentally positive behavior.

Based on the survey results, respondents can be categorized as pro-NEP attitude and are environmentally sensitive. The average mean NEP score was 5.39, indicating high sensitivity to environmental challenges (Ntanos et al., 2019).

Interestingly, the average mean for questions related to the possibility of an eco-crisis was high when compared to other dimensions of the survey. The mean for question 15 was 6.15.

Participants are sensitive to the challenge but also believe that changes made now can have an impact on the future.

Q 15	If things continue on their present course, we will soon experience a major ecological catastrophe	<b>6.15</b>
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There is a difference in this concern when considering the age of the participants (see Figure 4). A number of studies, including a study by Klineberg et al. (1998), showed that younger individuals are more environmentally sensitive than older individuals. Younger participants, age ranged 18 to 34, had a stronger sense of ecological catastrophe than those in the 35 and over age group.

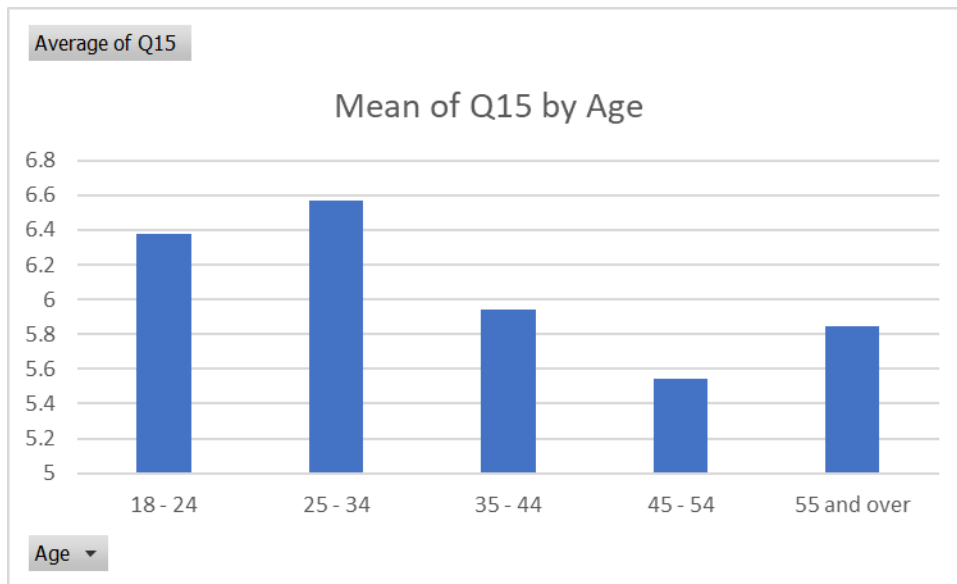


Figure 4: Mean New Ecological Paradigm (NEP) scores for question 15 by age

Surprisingly, the mean for question 15 for participants in the program less than a year and those in the program more than six years was the same and the highest at 6.4 compared to the other participants (see Figure 5).

The number of years in the program does not factor into the attitudes of the participants. Participants come into the program with a positive attitude towards sustainable behavior and maintain this positive attitude throughout their experience with Green Literacy.

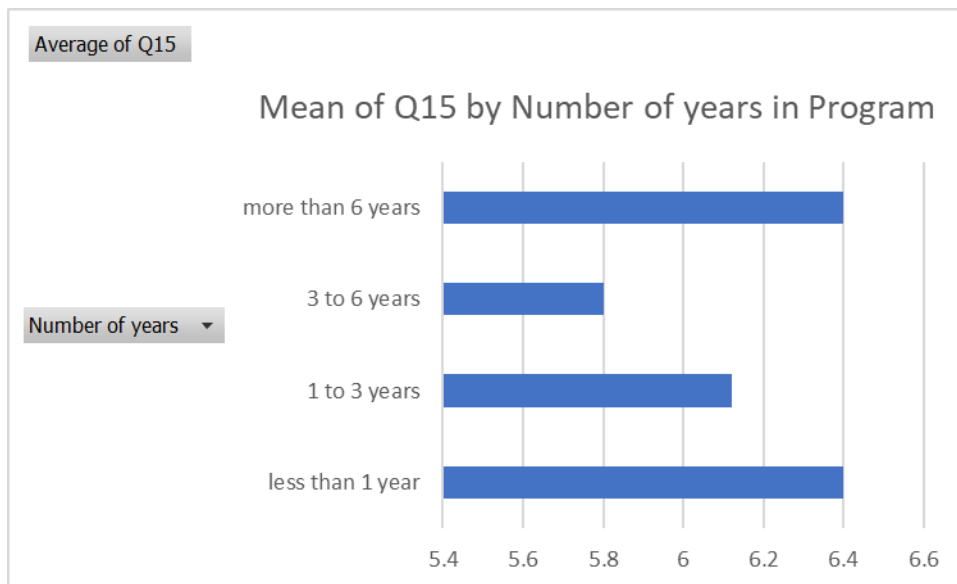


Figure 5: Mean New Ecological Paradigm (NEP) scores for question 15 by number of years in program

The qualitative data corroborate this finding. Several participants lamented Tennessee being behind other states and the United States lagging behind other countries in regards to sustainable development and sustainable living; however, they remained passionate about the work they did individually and within their organizations. They continued to believe they were making a positive impact. One participant described it this way.

“I think if you can make one change then you can change this and you can change that. There is that quote by Edward Everett Hale says I am only one but I am still one and so it’s basically just saying I can only do so much but I’m still going to do that much. Is me using my reusable water bottle going to change the world overnight? No, of course not, but at least I know that I am not contributing to the problem.”

The TPB explains that a positive attitude towards positive environmental outcomes is a key factor to individuals performing behaviors that lead to these positive outcomes (Klößner, 2013).

**Finding 2:** Green Literacy’s program provides the support needed for individuals to perform in positive environmental ways.

Participants described feeling supported by the Green Literacy organization. When asked about the benefits of participating in the program, some expressed the tangible ways in which Green Literacy supports them. One participant described the help with strategic planning and goal setting received through partnership with Green Literacy.

“So, one, I think Green Literacy consulting and services have been really helpful and I’m part of our green team at work. We have been trying to reach certain sustainability goals

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in 2020 and now we're planning for 2021, and they have just been incredibly helpful with that strategic planning. They've helped us set goals and actually achieve them, ...”

Participants described other benefits like learning how other companies and individuals implement sustainability initiatives within their organizations. There were also intangible benefits like having a community of like-minded people who meet regularly to share knowledge, experience, and ideas. One participant expressed a benefit of the roundtable in the following way.

“... they find it a good networking opportunity so those individuals participate because they want to”

Participants gained customers, associates, and even friends through the Green Literacy program. This supportive program, as described by the participants, is an example of the subjective norm to perform pro-sustainability behaviors, a tenet of the theory of planned behavior. This is not surprising, as having the support of others is borne out in the literature as a key factor that influences sustainable behavior and decisions (Tonglet et al., 2004).

**Finding 3:** Participants feel supported by their employers.

Participants in the program feel supported by their employers. The corporate roundtable program brings individuals from several local organizations together. Some participants are decision makers/key stakeholders in their organizations' sustainability initiatives, but most are middle management who volunteer to sit on committees working to make their organizations more sustainable. The participants are given the time to attend programs and the resources to enact programs of their own. Some employees lead the green initiative within the organization and engage their associates with suggestions and encouragement on how they too can live sustainably. Participants described this support in the following way.

“We have a couple of employees who are especially passionate about sustainability or they find it a good networking opportunity so those individuals participate because they want to and then LW just allows them to do that during company time and supports them in that way.”

“... a lot of different sustainability health and wellness groups that I'm active in as a result of the support of the company. I get ample support for travel and memberships.”

“Our organization has actually been really supportive partially just the fact that they allow us to take work time on the clock to attend Green Literacy workshops and webinars.”

This finding is consistent with the literature that explores the factors that influence the decisions of individuals to perform sustainable behavior (Tonglet et al., 2004). Two tenets of the TPB are that there is an expectation that the individual's behavior meet the norm and individuals must also perceive that they are able to implement the sustainable behavior. This organizational support establishes the norm within the organization towards sustainable behavior. With the

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knowledge gained from the program and resources provided by the program, individuals perform behavior that promotes sustainable living.

**Finding 4:** Participants feel empowered to promote sustainability.

When participants were asked how they encourage others in their personal and professional network to live sustainably, participants described ways in which they share their knowledge and resources with family and friends. Even though the question did not reference recycling, all participants described their drive to recycle and also have their family members do the same. Participants were knowledgeable about behavior like recycling that they believe everyone can do. One participant described her interactions with family like this:

“So specifically, I’ll talk about my parents, they recycle at home. It’s just having those conversations with people you know. And my boyfriend we started recycling at home. When we first got together, he was buying these 32 packs of plastic water bottles and I’m like oh gosh no we can’t do this.”

Participants in the program become agents of change whenever they share their knowledge on recycling. They are also applying social pressure on their network and perceive they have the necessary resources to display their sustainable behavior. One participant gave this example that describes her influence:

“I saw this really cool company. It’s called Forest. They sell bracelets made from recycled plastic and glass. Look how cool this is. And then I ended up buying one for my mom. And then she’s gotten several compliments on her bracelet, and she gets to tell them it’s made from recycled material.”

Participants understand that when they share with those around them, it has a much further reach and influences the norm. One participant described it as spreading ripples.

“... we call it spreading ripples when you tell one person and they tell 2 people and they tell another 2 people. Again, it’s just all about having those conversations.”

These participants are all pro-NEP with high sensitivity to environmental concerns. They feel that if they can influence the behavior of those around them, their influence will reach more people. A study by Khanalizadeh et al. (2010) indicated a relationship between learning and empowerment as described by competence, self-determination, and impact. The literature supports this finding, as through the knowledge-sharing that occurs in the program, individuals are empowered.

The participants believe in the capabilities of humans to positively impact the environment but understand the limitations when dealing with nature. Question 9 depicts this with an overall mean score of 5.95.

Q 9	Despite our special abilities, humans are still subject to the laws of nature	<b>5.95</b>
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High mean scores were seen across all participants regardless of how long they were in the program. Those who were in the program the longest, however, scored the highest on this question (see Figure 6). The interview data tell us this is the group with 100% who feel empowered.

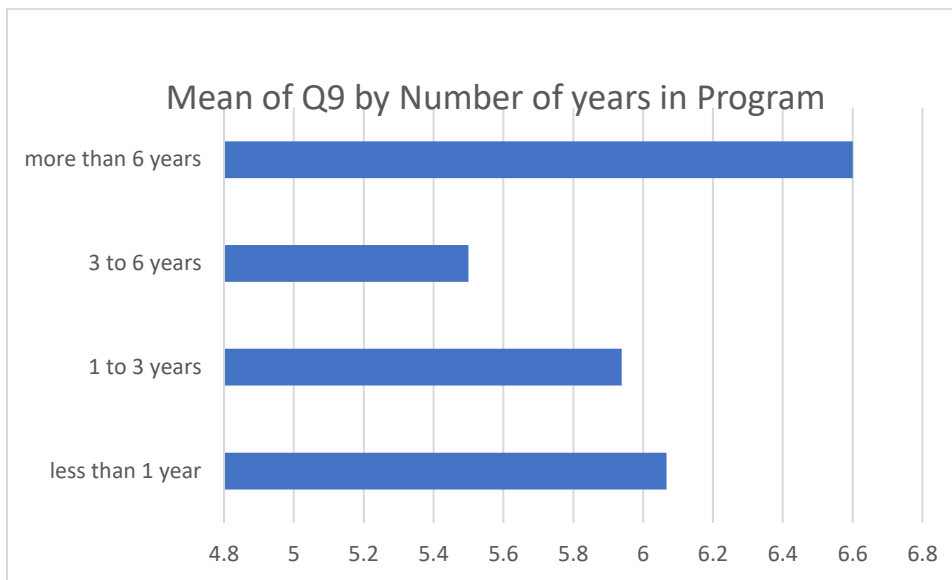


Figure 6: Mean New Ecological Paradigm (NEP) scores for question 9 by number of years in program

When asked what challenges they faced in their quest to encourage others, all participants could tell at least one story of being ignored or debated on the issue presented. They all had family and friends who were not interested in changing their behavior even when presented with the information from the participant. One participant told this story:

“I took two friends with me and we literally had just gone to this exhibit and we were staying at one of the friend’s apartment. And so the girl had separate compartments for trash and for recycling. And after going to this exhibit that talked about everything from fashion to recycling to cooking through all these different things the girls that I was with they just threw all the trash when we were leaving the apartment to come home.”

However, none of the participants was discouraged from continuing to share their knowledge and experience with their network. The participants remained empowered even in the face of opposition. The same participant whose friends disappointed her was still able to say this:

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“I’m very optimistic about Nashville, and from having this conversation I want to get more involved with Green Literacy if I can.”

**Finding 5:** Satisfaction with programming decreases over time.

Based on survey results, mean NEP scores decrease the longer the participants stay in the program, going from 4.43 to 4.25. 75% of the group with 3 years and more participation are also in the 35 and older group. This correlates with finding 1’s analysis that younger people are more sensitive to environmental concerns.

From the interview data, the longer participating individuals are those who are most critical of the program. There were three interviewees who had a critique regarding program content, but this individual articulated it the best:

“...done a really good job of creating some programs online over the last couple of months that I think are a lot more relevant to working professionals and adults in the community. They just did a workshop last week on recyclables and that was great. My sense for a long time is a lot of what they were doing was fairly obvious. Things that were more education for those who were not familiar with environmental issues and sustainability, but for people who already have a good understanding and are involved in that I think it was pretty basic. So, I think offering **more advanced information, case studies, that sort of thing is more beneficial to professionals** working in the sustainability field.”

The participants want more advanced topics or more depth to the topics currently covered. There is a suggestion to change the format of the program to include case studies.

*Capstone Question 2. How do community members report that their behavior has changed owing to Green Literacy’s sustainability program?*

**Finding 6:** Participants feel they model good behavior.

Participants feel that they model good behavior towards positive environmental outcomes. Participants are able to connect their everyday behavior and activities to living sustainably. When asked what they do or how they make a difference, participants listed the behaviors they practiced that they felt showed how they lived sustainably in their everyday life. One participant described it this way:

“Well, I have two kids and I feel like the biggest contribution I’m making is teaching them how to live lightly, how to grow food in the garden, be mindful of electricity use, buying stuff and wondering where our food comes from, eating foods that are made locally and you know we all try to do that in our house. My husband is equally passionate about living lightly and being more self-sufficient in terms of growing some of our food, making solar energy on our roof, and stuff like that.”



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And another this way:

“Our home is a place we can control really easily and place where we can make a difference, so we’re really strict about recycling and reusing in our home. You know, buying second hand, composting, again I consider those low hanging fruit for us, as those are things, we can do easily so we are very lucky to be able to do those things easily and so I hope that by doing that we’re modeling good behavior for friends and family members. And you know when people come to visit your house, we don’t make it like a huge thing but we’re like oh yea this is where the recycling bins are. And we encourage people to ask questions if they don’t know what to do with something. We’re happy to tell them like yea that goes in the compost bin and this is why.”

Participants are influencing the norms in their networks and applying social pressure when they provide an example to their network on how to live sustainably. We know from example-based learning that modeling examples is effective in learning (Van Gog & Rummel, 2010). The participant example will impact the learning of those in their network. In this way the participants in the program are creating the conditions for others to successfully alter their behavior. And we know from the TPB that social pressure is a main factor in determining whether or not individuals perform behavior with positive environmental outcomes.

**Finding 7:** Participants benefit from the community of practice developed within Green Literacy’s program.

Surprisingly, all participants described the community that they are a part of by being in Green Literacy’s program. Even when the question did not specifically address this topic of community, participants talked about the people, the presenters, the partnerships, and the opportunity to network with other organizations and people.

There was one participant who had been a part of the program for three months who described the network as the only benefit they have gained so far.

“I met a ton of people there with all the different organizations in Nashville, and I mainly know climate Nashville because it encompasses all the programs so you are kind of aware what everybody else is doing...”

A community of practice has grown around the roundtable programs. Lave and Wenger (1991) first developed the concept of a community of practice, and it is described as a group of people who share a common concern, a set of problems, or an interest in a topic and who come together to fulfill individual and group goals (Li et al., 2009). The roundtable shares knowledge and best practices to advance the sustainability domain in Nashville. Some quotes from participants include the following:

“We have a couple of employees who are especially passionate about sustainability or they find it a good networking opportunity so those individuals participate.”

“Mostly it’s just getting to know the network of other non-profit professionals in the area. I am not native to middle TN. I moved here for this job about 3 years ago, so their

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sustainability roundtables have been really helpful, meeting other professionals who are interested in sustainability.”

“Our newest partnership is with the TN environmental council. We also partnered up with the Wilson county 4H; they have an annual plant sale every year.”

“... it’s getting to be more of a thing. Eat and grow locally, so that’s encouraging, and I know GL partners with groups that do help that movement.”

“It’s so exciting. To see GL partnering with TN department of environment and conservation or metro Nashville government agencies or whatever...”

In communities of practice, long timers share their knowledge and experiences with new comers. Individuals who have been a part of the roundtable for more than a year are able to help new comers integrate into the community and make the connections that will benefit them and their organizations. There are common goals and interests in living sustainably that unite the people in the program. The participants welcome new comers to the roundtable all through the year and this ensures the continuity of the program. These practices are consistent with the literature on communities of practice.

## **Summary of Findings**

Program participants maintain a positive attitude while in the program. The individuals who volunteer to represent their organizations at the roundtable events are generally already passionate about sustainability. The community that has developed around the program and the network that extends to other pro-sustainability groups and government entities is composed mainly of individuals with an existing interest in sustainability and learning how to live sustainably. There is a social pressure that exists in the community and it is this social pressure that fosters the subjective norms present in the community. The support provided by Green Literacy, the individual organizations, and the personal and professional networks foster the behavioral control factor. Positive attitude, subjective norms, and perceived behavioral control are important factors necessary for driving sustainable behavior. These factors are clearly present in this context of Green Literacy programs and, as the community grows and continues to foster this factor rich learning environment, the participants will experience change in behavior.

## **Limitations**

This mixed methods study has limitations in the sample population size used. The survey invitation had a 24% response rate, but only 11 interviews were done. This study gives a mere snapshot of the experiences, attitudes, and perceptions of the participants in Green Literacy’s

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programs. The group of 11 participants was a convenience sample requested from participants of the survey who volunteered.

Another limitation occurs because the individuals participating in the study already care about sustainable living. Individuals who participate in these types of educational programs already have a positive attitude towards pro-sustainability behavior. However, my interview sample had 45% participants who worked directly in a sustainable development role in their organization. These individuals volunteered to be interviewed and created a self-selection bias to the study.

Another limitation stems from the fact that the topics of sustainable living and development are highly politicized topics. Policy concerning sustainable development is controlled by federal policy, and change in policy follows the change in political power. This makes sustainability a topic that people argue down political lines. This introduces the problem of demand characteristics, which describes how people's behavior and experiences can change as a result of being studied. In this context, people might respond to questions in a pro-sustainable way rather than express honestly what they really believe and do.

## **Recommendations**

From the survey data and interviews regarding individual attitudes and behavior in response to questions related to environmental concerns and sustainable living, I abstracted the following recommendations: (1) implement a consistent process to collect data to support key indicators needed to measure changes in attitudes and behavior, (2) create a feedback loop for participants, (3) update program content, and (4) engage program alumni.

### **1. Collect data to support key indicators**

In performing outcomes-based evaluation, Green Literacy seeks to look at the impact, benefits, and changes to participants and the community at large. Green Literacy's long-term outcome is increased sustainable behaviors, and to measure this I am recommending tracking attitudes towards sustainable behavior, subject norms, and perceived control. These are the three tenets of the TPB.

The findings indicate that the TPB provides a practical framework for assessing sustainable behavior in program participants. Table 5 outlines six dimensions to build a survey around, namely personal sustainable behavior, sustainable attitudes, the subjective norm, perceived control, situational factors, and consequences of sustainable living. As noted in Table 5, the survey should also include a section for gathering demographic information.

Table 5: Dimensions of Recommended Survey

Dimensions	Description	Example Question
Personal sustainable behavior	Future intentions, frequency of activity, past behavior	Target specific behaviors. For example, around waste reduction - I intend to reuse glass containers in my home
Sustainable attitudes <b>T</b>	The attitude towards sustainable behavior	Reusing glass containers helps to reduce waste
The subjective norm <b>P</b>	The social pressure to perform sustainable behavior	Most people would approve of me reusing glass containers
Perceived control <b>B</b>	The perception of the ability to perform the behavior	I know how to reduce my household waste
Situational factors	Physical factors that facilitate or hinder sustainable behavior	Reusing glass containers takes up too much room
Consequences of sustainable living	The outcomes of sustainable behavior	Reusing glass containers saves money
Demographic information	Include age, gender, marital status, education, occupation, household role, and number of people in the household	

These dimensions were developed in a study by Tonglet et al. (2004) to identify the driving forces behind recycling and waste minimization. They used a 7-point Likert scale, and an analysis of the mean score of the participants, as done in this capstone, will provide good quantitative data to track. Their analysis using these dimensions found a significant relationship between recycling and waste activities and the outcomes and consequences, as well as concern for the community. The TPB has been used to successfully predict whether individuals will perform specific behaviors and is a trusted and effective framework. If Green Literacy builds the survey around the TPB, it will have created a reliable survey.

To measure change in attitudes and behavior, Green Literacy will require pre-program and post-program measurements. However, the post program should not be administered after one participation, as this is not enough time to assess change in attitude and behavior. There should be a minimum of three encounters with the program before the post program measurement is administered. If this survey is developed and administered continuously throughout the year, Green Literacy will effectively track attitudes and behavior of its program participants. The survey can be administered prior to an individual's first participation and then four times per year to all participants (every quarter). Green Literacy will need to assign a person to develop the

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questionnaire. It can be developed around activities already described in Green Literacy's certification assessment:

- Food Waste Reduction
- Indoor Air Quality
- Green Space
- Solid Waste
- Energy
- Water

The creation of the survey instrument will take time so it would be best to create one template that can be used across the different subject matters. The questions should be worded to allow for easy update of water to waste for example.

A person will also need to be responsible for scheduling and administering the survey and compiling and reporting the results. Overall means and data stratified by the demographic data will provide informative reports. If the data are compiled correctly, an increase in scores of the TPB dimensions will indicate an increase in sustainable behavior. This survey will allow Green Literacy to access household level data. If permission is granted, the survey should also be administered by the green team in the individual organizations to their staff. The organization data can form a baseline measurement for the city and surrounding areas.

Surveys like the NEP scale are reliable instruments for measuring attitudes and can be administered multiple times over time to note changes. The NEP survey can be administered to Nashville residents by using public survey platforms and can provide a good baseline measurement to describe the city's sensitivity towards environmental challenges.

Data gathered under the situational factors dimension can aid in identifying factors that individuals consider a hindrance to performing sustainable behavior. Green Literacy can address these issues in future program events.

## **2. Create a feedback loop for participants**

Green Literacy has created an active community of practice among the participants in its programs, most notably with the corporate and community roundtable groups. Participants share their knowledge and expertise with each other and empower each other to encourage sustainability within their separate organizations and communities. However, this community of practice crosses over other networks the program participants are involved in, and in order to assess its impact and measure increases in sustainable behavior, Green Literacy needs to know what activities are occurring in the community through their participants. Green Literacy needs access to more individual level data.

My community benefit and norms findings revealed useful qualitative data available among program participants yet those data are not being used by Green Literacy. For example, an interviewee volunteers at the local community center teaching local residents about sustainability

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and sustainable living. This volunteer work was not done under the banner of Green Literacy, but Green Literacy influenced this participant's desire to teach others. Another interviewee makes compost boxes with his daughter and gives them to his neighbors. Another described how she teaches her children about growing food through their backyard garden and how they get to share the harvest with their family. And another participant who is currently a student writes a blog about sustainability.

The data and information gathered through this participant feedback will serve as measurement for indicators of increased sustainable behavior. The data collected can be in the form of video and photo logs and articles involving participants, their organization, and their network. By geo-tagging the pictures and other qualitative data, Green Literacy can report on the increase in the geographic reach of its programs and, by continuously collecting these data, can report on its increase. This type of information expresses Green Literacy's growing impact in the community.

This type of qualitative data is evidence of activities and behavior performed by participants in the community and can be categorized, counted, and stratified by geographic location as well as other demographic data. Qualitative data is one established methodology to research and evaluation and if Green Literacy collects these data, it will be able to measure sustainable behavior using this methodology.

Green Literacy can initiate this process with the use of social media platforms. Studies, like Dolan et al. (2017), have shown that social media can provide an effective communication and engagement strategy, and its content and engagement can be conceptualized and measured. By using the social media platforms that allow posting of pictures, Green Literacy can take advantage of the connections and exposure the platforms provide. Start by curating the Green Literacy social media account. For example, use photos of the staff and volunteers at local events to provide content for the site. These postings can be tagged with the organization's handle, the "live sustainably" hashtag, and others that will link the post back to the organization. At the mobile lab events when Green Literacy is interacting with a wider public audience, introduce the idea of following and tagging Green Literacy to their photos of them doing a live sustainable activity in their homes or workplace. Program participants and program partners should also be encouraged to do the same. This request to connect postings can be incentivized to attract the engagement of more willing participants. A well-managed and curated site can give Green Literacy increased exposure and access to new qualitative data. The site can also be used to generate an audience for the other online offerings, such as the YouTube channel and blog, and connect other partners who are already using social media in this way.

Not all participants use social media, and some only use it to have a professional presence online, so Green Literacy will not reach everyone in this manner. A resource will need to be assigned to manage the social media accounts, keeping them current and engaging. If Green Literacy invests the resources to manage this process, it can garner exposure to a wider Metro Nashville audience and a better picture of how far-reaching their influence extends. Using the platform's reporting, Green Literacy can track progress over time. To develop this social media platform organically will take time, but Green Literacy can start the process with their existing online presence.

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### **3. Update program content**

The roundtable groups are diverse in knowledge and experience, and there is the potential to lose participants who are experienced and well versed in the topic of sustainability. These highly knowledgeable participants are crucial to the continued growth of Green Literacy's community of practice. My findings were clear on the support participants felt they received from Green Literacy, but some data questioned the appropriate levels of support.

Green Literacy successfully attracts highly skilled individuals to their program, and some participants have been involved with the program for three years or more. From the findings, it is evident these skilled and long running participants are the most critical of the program content. However, it is important to keep these individuals actively engaged and retained in the community. It is also important to continue providing the support for newcomers to the community and those new to the topic of sustainable living. Green Literacy must consider the age of their participants, as well as how long they have been in the program, when deciding on program content.

I recommend that Green Literacy update the curriculum to include advanced topics with expert guest speakers and include case studies in the program content. A study by Kunselman and Johnson (2004) found the case method, that is, applying case studies to courses, was effective at enhancing student learning. The study draws upon active learning theory as a framework for its findings that suggest the use of case studies allows students to effectively move from conceptualizing the ideas to applying the ideas to their situations.

Green Literacy will need to assign a person to make these program changes and find engaging content and case studies relevant to its participants. Schedules that include guest speakers will need to be prepared and scheduled in advance. Most professionals are now comfortable with online presentations, so the roundtable can become a blended program allowing for a wider range of guest speakers. If Green Literacy makes these additions to its program, it will increase the engagement of its more highly skilled participants and will continue to provide the effective support it already demonstrates.

### **4. Engage program alumni**

Green Literacy's program has been active in the Nashville area for around 12 years. From a small community group in 2009 to now having a seat on the Mayor's sustainability advisory committee, Green Literacy's influence and impact have increased. Many participants and organizations have come and gone over the years, and many are not active in the community. Individuals leave the companies, and new employees take over participating in the program.

But what influence do the previous leaders have? Did they join another organization and volunteer to incorporate sustainability with their new employer or move away and no longer stay involved in sustainability work? These individuals who are no longer active in the program can

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be considered alumni. This group of individuals is a valuable resource for Green Literacy. A study done by Cannon (2015) identified seven benefits of fostering good alumni relationships:

1. Supporters – because of the existing relationship, alumni can be activated to provide skills and experience as support for current participants
2. Expertise – ability to tap the wealth of experience and skills
3. National – potential for alumni to be ambassadors for Green Literacy in cities around the country
4. Employability – alumni provide career support
5. Financial – because of the relationship, they usually support fund raising efforts
6. Personal development – this is a benefit the alumni gain from giving back to Green Literacy
7. A changing market – alumni cross generations, and knowing how to tailor a message to millennials, for example, is beneficial

Not only will Green Literacy benefit in these seven ways but the alumni will become an additional source of data that can be conceptualized and measured.

Green Literacy can start developing its alumni network through contact via email and LinkedIn. It can use the current active participant network to find previous participants and create a group just for this segment of past participants. Green Literacy should then create events online and in person to connect and re-establish relationships with this group of past participants. It can host online events in the form of sustainable presentations, with alumni as guest speakers, or in-person events in the form of local volunteer opportunities that will bring people together in a more casual setting, for example, a tree planting or a cleanup activity.

Green Literacy will need to assign a person to create this group and invite the participant alumni to join. Then Green Literacy will need to engage them with activities they are interested in. It might be beneficial to have volunteer leaders for this alumni group. This provides the Green Literacy staff with support and assistance in developing and engaging this group.

If Green Literacy can successfully develop and foster an engaging alumni network, it will see many benefits from renewed human capital, financial gains, and a rich source of data to continue the accurate measurement of its long-term outcomes.

## **Conclusion**

This capstone project has explored the attitudes and behaviors of the participants in Green Literacy's programs by utilizing a mixed methods approach. The quantitative method employed the NEP survey of 79 active roundtable members. The qualitative method employed interview questions aimed at understanding attitudes, subjective norms, and perceived control of program participants towards behavior that promoted good sustainable outcomes. As an organization, Green Literacy wants to provide high-quality sustainability education programs that will succeed



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in changing the behaviors of the Nashville community towards sustainability. However, it is challenging to find good techniques to evaluate the success of its programs. This capstone project has provided Green Literacy with recommendations that will assist the organization in better assessing long-term outcomes such as shift in values and behaviors that benefit the environment.

From my findings and work done in the literature, I have made four recommendations. Green Literacy should 1) collect data to support the key indicators, 2) create a feedback loop for participants, 3) update program content, and 4) engage program alumni. These recommendations will allow Green Literacy to engage its participants towards the goal of measuring the organization's impact on the community and tracking the change in sustainable behavior. The recommendations have financial implications, as Green Literacy will need people to develop and manage these initiatives. Continuing to support and engage this diverse community of participants, however, is worth the investment and will assure the continued success and viability of the Green Literacy program.

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# Appendices

## Appendix A – Survey Recruitment Letter

**From:** [REDACTED] <>  
**Sent:** Wednesday, December 16, 2020 1:49 PM  
**To:** [REDACTED] <>  
**Cc:** McCarthy, Karen <>; [REDACTED] <>  
**Subject:** Survey for Vanderbilt Student

Good afternoon Green Literacy supporters!

We are contacting you on behalf of Vanderbilt University to ask if you would agree to participate in the attached survey. This survey is based on the New Ecological Paradigm scale which was devised by US environmental sociologist Riley Dunlap and his colleagues. It is designed to measure the environmental concern of groups of individuals.

As part of her Capstone Project, Vanderbilt student Karen McCarthy is using a model of evidence-based practice that requires her to gather various types of data. Karen is working with our organization to aid us in better understanding Urban Green Lab's impact on the community.

Should you agree to participate, there are 19 questions which should take between 5 to 10 minutes to complete. We hope you choose to participate in this important study that will benefit Urban Green Lab and add to the knowledge in this field.

Responses will only be shared in aggregate without identification. You're welcome to contact Karen, copied here, with any questions.

**Survey:** [https://peabody.az1.qualtrics.com/jfe/form/SV\\_1T01LBN57LXMIID](https://peabody.az1.qualtrics.com/jfe/form/SV_1T01LBN57LXMIID)

Thank you!

[REDACTED] MSL  
Sustainability Education Manager  
Green Literacy  
c (615) 390-8341  
Pronouns: she/her/hers

**Donate today to support sustainability education.**  
Green Literacy is a registered 501(c)(3) organization. Contributions are tax-deductible to the full extent of the law. FEIN: 27-1011744

[ **WARNING** : This email came from an external source. Please treat this message with additional caution.]

Appendix B - Interview Questions/Capstone Questions Relationship Matrix

Theory of Planned Behavior Tenets in Context	Capstone Question	Interview Question
<p>people perform a behavior with positive environmental outcomes if they hold <b>a positive attitude towards it</b></p>	<p><b>Q1.</b> 1. How have attitudes towards the behavior, the subjective norms connected to the behavior, and perceived behavioral control changed because of Green Literacy's sustainability program?  <b>Q2.</b> 2. How do community members report that their behavior has changed owing to Green Literacy's sustainability program?</p>	<p>1. What are some of the things that you know now that you didn't know before joining GL? 2. How has this new knowledge affected or will affect your actions? 1. What benefit if any have you experienced in your personal or professional life with what you have learned or actions you have taken based on your GL participation? 2. What challenges have you faced acting on what you have learned through GL participation?</p>
<p>people perform a behavior with positive environmental outcomes if <b>other people expect them to act in that way and support them in doing so (social pressure)</b></p>	<p><b>Q1.</b> 1. How have attitudes towards the behavior, the subjective norms connected to the behavior, and perceived behavioral control changed because of Green Literacy's sustainability program?  <b>Q2.</b> 2. How do community members report that their behavior has changed owing to Green Literacy's sustainability program?</p>	<p>1. How does your organization encourage your participation in GL? 2. What are the expectations on you now that you participate in GL? 1. How do you encourage others around you to think about the things you have learned through GL? 2. What are your positive and negative experiences in sharing with others? 1. How do you feel you make a difference in protecting natural resources? 2. What do you do if you go to a location that does not practice basic sustainability, example there are no recycle bins?</p>
<p>people perform a behavior with positive environmental outcomes if <b>they perceive themselves as being able to implement their intentions</b></p>	<p><b>Q1.</b> 1. How have attitudes towards the behavior, the subjective norms connected to the behavior, and perceived behavioral control changed because of Green Literacy's sustainability program?  <b>Q2.</b> 2. How do community members report that their behavior has changed owing to Green Literacy's sustainability program?</p>	<p>1. How do you conserve natural resources in your daily life? 2. How have you influenced others to act sustainable since participating in GL's program?</p>