Environmental Education Program Goals and Growth: The Role of Funding, Administrative Capacity, Target population and Program Structure

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ABSTRACT

Management of solid waste is a critical problem because current disposal techniques are harmful to the environment and contaminate community resources. Waste management education programs have factors such as funding, administrative capacity, target population and program structure that affect program goal accomplishment and growth. I analyzed program materials from StopWaste.org and Keep America Beautiful and conducted interviews with program officials. I found that program structure and target population did not have a direct affect on programs achieving their goals or growth. However, they both have unintended consequences such as excluding adults from their program and having different methods of teaching waste management education with StopWaste.org's methods being more effective than Keep America Beautiful's. Furthermore, I found that program structure can affect the three other factors, while those three can affect program structure as well. Administrative capacity was found to inhibit the goals and growth of Keep America Beautiful, but only growth of StopWaste.org. In addition, administrative capacity affected target population but was influenced by program structure and funding. Limited funding was found to be the most important issue with both waste management education programs and affected all other factors; it only limited growth for StopWaste.org but growth and goals for Keep America Beautiful. Nevertheless, no matter how effective a program can be by solving these specific factors, it will not be enough to overcome the lack of support many schools give to waste management education programs. It must become a core-requirement in schools to be effective.

KEYWORDS

Keep America Beautiful, StopWaste.org, waste management education, K-12 schools

INTRODUCTION

Solid waste management is a critical problem because current disposal techniques are harmful to the environment and contaminate community resources. In 2008, 4.62 pounds of municipal solid waste per person were produced daily in the U.S. (US EPA 2008). Much of this waste is disposed of in landfills, which contribute to global warming through greenhouse gas emissions and may pollute ground water (Uiterkamp et al. 2010, Themelis and Ulloa 2007, Khitoliya1 et al. 2009). In response, cities and communities have adopted waste management programs focusing on waste reduction, recycling and composting practices to decrease their dependency on landfills (Corral-Verdugo 2003, Linden and Carlsson-Kanyama 2003, Kipperberg 2007, Matete and Trois 2008, Read et al. 2008). However, a lack of knowledge on how to manage waste and the harmful effects of waste on the environment prevents individuals from participating in recycling and waste reduction (Kennedy et al. 2009, O'Connell 2011). Thus, waste management education (WME) programs have emerged to not only inform people about waste and other environmental issues, but also to increase involvement in waste reduction, recycling and waste composting.

WME program goal accomplishment and growth, which are crucial to the success of waste reduction initiatives, are affected by limited funding, administrative capacity, target population and program structure. These education programs use media advertisement, school curriculum, website information and outdoor activities to provide knowledge, while encouraging environmentally beneficial patterns of behavior (Parris 2002, Malgorzata et al. 2003). Since 1990, the EPA's Office of Environmental Education has provided curriculum for schoolteachers (Parris 2002). However, many states do not have a coordinating body for environmental education that funds programs (Parris 2002). Because there is an absence of funding from federal or state agencies, financial support for environmental education or waste management education programs is limited to third party funding sources, making funding a limiting factor (O'Connell 2011). Although many programs are effective, results can vary based on their approaches. K-8 schoolteachers implemented waste curriculum prepared by civic leaders in Kansas City, Missouri, successfully teaching many children on the importance of waste management

and how to participate (Hasan 2004). Programs oriented to children create life-long environmental awareness, yet the impact is not immediate because there is a delay before the schoolchildren are in decision-making positions (Evans and Gill 1996, Hasan 2004). Community-based education programs, programs that involve children and adults of a community helping to repair the environment, increase waste management participation and have an immediate impact on waste management decisions because they involve all sections of society (Evans and Gill 1996, O'Connell 2011). But community education programs may require a lot of time, which may deter many from participating, and may need prohibitively high levels of funding (Hirose and Madae 2009, O'Connell 2011). Hence, program structure and target population can limit growth and goal completion. In addition, a lack of trained teachers and administrators to run WME programs may detrimentally affect the teaching of curriculum content, making administrative capacity a limiting factor. However, even with this knowledge, it is not clear how funding, administrative capacity and target population all affect differently structured programs, and in turn, how program structure affects these factors that inhibit program goals and growth.

This study examines factors that prevent WME programs from reaching their goals. I hypothesize that: 1) a lack of funding will inhibit goal execution and growth, 2) programs could use more teachers and administrators to grow and execute goals, 3) differences in target population may affect program growth and goal execution, 4) different program structure will change how effective the program is at reaching their goals and can affect the goals and growth of WME programs and 5) These four factors will affect each other.

METHODS

I conducted interviews and analyzed program websites to specify their activities and program goals to identify barriers that prevent each program from reaching their goals. I chose the Keep America Beautiful (KAB) Recycle Bowl and StopWaste.org to see how funding and administrative capacity, program design and target population influence the realization of program goals and growth.

Study System

StopWaste.org in Alameda County and Keep America Beautiful (KAB) are both education programs but StopWaste.org is a community-based education program while KAB is an incentive based program. In the 2011-2012 school year, the Alameda County Office of Education, EarthTeam and StopWaste.Org worked with over thirty schools in the Alameda County through the Service-Learning Waste Reduction Project. The collection of high schools, middle schools and community partner organizations has a leadership team formulating methods to reduce waste on campus and in the community. This is done through hands-on student action projects that help teach science, math and many other subjects. The Keep America Beautiful program is in K-12 schools across the nation. The program runs a Recycle-Bowl where the schools compete to recycle the most garbage. This takes place for 4 weeks in October and November, and Recycle-Bowl results are posted in February. An educator's toolkit to the first 1000 schools that apply is given to the teachers. Online material about waste management education is provided as well, but no teachers are provided nor does the program to help teach WME through community activities. I theorize that funding, administrative capacity, program design, and the population serve as the main factors that can prevent goal accomplishment and can inhibit growth. In addition I hypothesize that these four factors can affect each other.

Data Collection and Analysis

Interviews

I conducted interviews to examine the administrative capacity, funding information, structure, and target population of each program. I recruited participants by contacting each institution through email. Participants targeted for this study were program leaders. These interviews focused on the history and goals of each program, program goals, the motives for their particular methods, program budget and capacity, target population, and the results from their approach. I conducted a total of two interviews, one for each organization. StopWaste.org phone interview lasted

approximately 30 minutes and was digitally recorded with the participant's approval. The KAB interview was conducted through emailing the questions, and receiving the answers back. The interview consisted of questions that helped answer the broad research questions of this study. Based on their answers I interpreted how funding, administrative capacity, program design and target population all inhibit goal achievement and growth of each program. In addition, I determined how those four factors affected each other. Although interviews were the bulk of my data, further information was needed in order to understand how program structure and target population affected the programs.

Online Material

I documented the general approach of each program by analyzing what activities each program is consisted of and who they targeted. Further analysis was necessary to determine how program structure and target population affected program's growth and goals. The information was observed on http://schools.stopwaste.org for StopWaste.org and http://recycle-bowl.org/ for KAB. I studied the program structure by examining to what lengths the program provided their target population with teaching material. StopWaste.org for example, included providing teachers, online material, community leaders versus KAB providing only online material and an educator's toolkit with cash prize incentives. This allowed me to see how effective each program was at teaching life-long awareness, importance and practices of waste management and how this could affect their goals and growth. Furthermore, I compared each program's target population; KAB being nationwide while StopWaste.org is only county wide. Determining each program's target population helped explain why they took that particular program structure. Moreover, I observed what populations they excluded to analyze how this could affect each program's effectiveness. Administrative capacity and funding had a more clear answer on how they affected goals and growth; answered by the interviews and explained in the results section.

RESULTS

Interviews and Online Resources

Interviews with representatives from Keep America Beautiful and StopWaste.org and their website information revealed that funding, administrative capacity, program structure and target population were key factors affecting program growth and achievement of program goals. In addition, the four factors were found to affect each other.

Funding

Funding is the most important factor hindering program growth for both programs. However funding only affected KAB's achievement of program goals. An absence of funding in 2013 will limit what KAB will be able to accomplish because, without funding, an advertisement campaign, educators toolkit and $1000 statewide prize will be removed. Therefore the growth and the goals of the program were hindered. However, StopWaste.org will receive adequate funding in 2013. The $180,000 budget will be able to continue to service the 35 schools they currently do. However, this is not enough funding to supply more schools with their waste management education. Therefore their growth was hindered. In addition, funding was found to affect: administrative capacity by influencing how much help you could afford and program structure by determining what activities/incentives the program could provide.

Administrative Capacity

Administrative capacity was found to inhibit program goal achievement and growth for KAB but only growth for StopWaste.org. KAB has one full-time person and a part-time student run KAB, and they are in need of another full-time staff member. Because they do not have enough help, it is difficult for them to carry out basic functions within the program restricting program growth and goals. However, StopWaste.org has

one person running the whole program with contracted teachers from Earthteam.org to help educate students. Currently, the amount of services they have is enough for the 35 schools, but it may become an issue as they decide to add more schools. In addition, administrative capacity was found to be affected by program structure and funding. Furthermore, administrative capacity also has an influence on target population.

Target Population

Target population did not affect either program in terms of achieving their goals and growth. This was because both program's major goal is to increase waste management participation in students, which is achieved. However, the programs do exclude specific groups of people, which do affect the program's effectiveness. The program does not attempt to include adults, having unintended consequences explained in the discussion section. Furthermore, it was found that target population could affect program structure and results by basing your structure on sub-populations within the target population such as different ethnicities and cultures.

Program Structure

Program structure did not affect either program in terms of achieving their goals or growth. However, both programs had different effectiveness in increasing waste management education based on their structure. It was found that StopWaste.org had a more effective program structure than KAB to increase waste management participation within students. StopWaste.org is specialized in that they have contracted teachers who provide community work that educates students the importance of, and how to participate in waste management. KAB only offers an educators toolkit to the first 1000 schools that apply, and cash incentives to increase participation. This leaves the education only up to the schoolteachers, which may not be effective because they have other subjects to teach. However, it was found that target population, funding and administrative capacity can affect program structure. In addition, program structure affected funding, administrative capacity and target population.

Results Table

Barriers	Keep America Beautiful	StopWaste.org
Funding	• Most important factor • Limits growth and goals • Not enough funding for 2013 will lose advertisement campaign, educators toolkit and state-wide cash prize	• Most important factor • Only limits growth • Current funding is adequate for 35 schools but needs more money to service more schools
Administrative Capacity	• Limits growth and goals • Does not have enough help to carry out basic functions in the program in 2013	• Limits growth only • Current help is enough to service schools • Needs more help to service more schools
Target Population	• Did not affect program goals and growth directly • Indirectly, has consequences for leaving out groups of people • Local-based	• Did not affect program goals and growth directly • Indirectly, has consequences for leaving out groups of people • Nation-wide
Program Structure	• Did not affect program goals and growth directly • Uses contracted teachers and community based projects that are effective at teaching waste management importance and changing behavior	• Did not affect program goals and growth directly • Uses incentives to increase waste management participation in students but is not long lasting and not effective and educating on the importance

DISCUSSION

The main goal of this study was to determine how funding, administrative capacity, target population and program structure affect the ability of waste management education (WME) programs to grow and carry out their goals. However, the affect of each factor on programs varied because of the different approaches each program took to achieve their

specified goals. Lack of funding was the primary issue limiting both programs, though Keep America Beautiful KAB was more impacted than Stopwaste.org. Limited administrative capacity was a more significant issue for KAB, however it may cause additional concern to both programs as they grow. Each program targeted school children and excluded adults, which may have unintended consequences that undermine the programs' ability to achieve their goals. Although informants at each organization stated that their program structure fit their needs, I found that to the respective approaches of each program affected other factors that, in turn, limit program growth and executing goals in different ways. Stopwaste.org uses a community-based approach, while KAB uses incentives. The program structure, the approach the program took in completing their specified goals, varied between both programs, resulting in dissimilar resource use. Therefore, how each factor affects the programs changes based on program structure.

Funding

Keep America Beautiful had a greater issue with funding than StopWaste.org, particularly because KAB will not be fully funded for 2013 and will have to cut the educator toolkit that is provided to the first 1000 schools that register. The educator toolkit is used to help teachers teach students about the importance of recycling. In addition, KAB will need to remove their marketing campaign and may eliminate the $1000 statewide prize to the school with the highest rate of recycling participation. Because this program has a money-incentive based structure, removing the incentives and knowledge toolkit will limit the number of schools that apply to the program. Furthermore, the lack of marketing will reduce the number of schools that know of the program, in turn, limiting the amount of children who receive WME. Although funding is still a major issue to for Stopwaste.org, with the program operating at capacity in terms of the services they can distribute to schools, current funding is adequate for the schools they are working with.

Presently, funding is limiting the growth of both programs, but it has not hindered goal achievement for Stopwaste.org as it has for KAB. KAB seeks to increase recycling through incentives, but removing the $1000 due to lack of funding will hinder this. In

addition, funding was found to increase the impact of limited administrative capacity and the effectiveness of a program structure. This reinforces the findings of a study of a single WME program that found money to be a limiting factor in hiring more environmentally educated teachers (Meichtry and Harrell 2002), confirming that funding is a primary issue in most WME programs. Cuts in funding, as experienced by the KAB, are due to programs relying solely on third-party sources that can withdraw funding at any moment (Heart and Nolan 1999). This issue could be avoided if waste management education was considered a core element in public education, which would allow for government financing and enhanced program support (Blumstein and Saylan 2007, Lichtveld 2010). Funding is an issue that affects the majority of WME programs, and it can limit the growth and executing goals while further enhancing other factors that affect WME programs.

Administrative Capacity

Administrative Capacity was an issue for KAB because they needed more help to function, but it was not a problem for StopWaste.org. Currently, one full-time person and a part-time student run the KAB program, and they are in need of another full-time staff member. At StopWaste.org one person runs the entire organization, but uses contracted teachers from Earthteam.org to deliver content. Stopwaste.org currently operates in 35 schools and does not require additional assistance to sustain their program. However, the contracted teachers that Stopwaste.org hires, who are trained in teaching about waste management issues, might be harder to find and fund as programs expand, as has been the case with other WME programs (UNESCO 1997, Dudhapachare and Sheikh 2012). Therefore, administrative capacity is limiting growth and goal completion for KAB but only growth for StopWaste.org. However, both of these programs differ from traditional WME programs that have staff personnel delivering program content in schools (Philosophy of Education 2003, Guixin 2010). Programs providing instructors to schools require more funding (Knapp 2000). However, this funding issue can be partly avoided by integrating WME into current science subjects (Knapp 2000). This is the approach of both KAB and Stopwaste.org. Thus, the issue of administrative capacity is influenced by

funding and program structure. The more funding a program receives, the less administrative capacity becomes an issue. In addition, the number of schools a program can service may depend on if the program provides instructors or online material, demonstrating how administrative capacity can affect target population. Furthermore, this is a difference in program structure, which is another example of how it can affect administrative capacity.

Target Population

Targeting specific populations leaves out other groups of people from WME and affects program structure, resulting in hidden consequences. Both programs targeted students from grades K-12, excluding adults. However, the goals of the programs were not to teach adults and younger children, but to instill habits for future generations rather than focus on adults with set behaviors. In addition, teaching children in middle and high school may instill life-long environmental awareness, while students are able to participate in waste reducing activities that help build the community (Evans and Gill 1996). Children in elementary school may not be old enough to do this. Although targeting this age group creates life-long environmental awareness in students, the impact is not immediate because there is a delay before the schoolchildren are in influential positions, like adults (Evans and Gill 1996, Hasan 2004). Neither organization identified ways in which program structure affected their effectiveness at teaching WME to their target population. But, they did not search for one. One study found that urban participants in California's NorthBay WME program felt a sense of environmental empowerment more than non-urban participants, which may be because NorthBay delivers material to a very diverse group of children (Stern et al. 2011). Because the program knew of the urban population, they tailored their activities to cater to their needs suggesting that target population does affect program structure. However, Larson et al. (2010), whites had greater environmental knowledge and awareness than minorities. The difference in findings between these two studies may be due to differences in the WME program structures. Targeting specific population has an affect on program structure and results of the program.

Program Structure

Program structure interacted with the other contributing factors and affected how the programs achieved their goals and how their resources were used. KAB uses an incentive based program, in which schools report the amount of recycling done and are rewarded based on their efforts. Many schools reported an increase during the recycling competition, however this may not be the case after the competition is completed. This suggests an interesting flaw in the program. Reward-based incentives only succeed at securing temporary compliance, and when it comes to producing lasting change in attitudes and behavior, these types of rewards are ineffective (Kohn 1993). Therefore, participation in recycling may decrease when incentives are removed. This could occur next year, when funding cuts are put into effect and the $1000 prize from KAB is withdrawn. Furthermore, this highlights the link between funding and program structure, as reduced funding can impede the effectiveness of a WME organization's program structure. In contrast, StopWaste.org uses a community-based approach to increase waste reduction and environmental awareness. The program solves community environmental issues with the knowledge the students have learned in school. He (2010) shows that using local problems could help educate and further drive the point of the importance of WME. A local issues-based focus may help students see how pollution is actually a problem more effectively than an incentive based program like the KAB program. In addition, such an approach brings critical thinking into waste management education, which is a serious problem in WME if absent in curriculum (Blumstein and Saylan 2007). However, StopWaste.org only serves 35 schools in Alameda County, a much smaller scale than KAB. This allows for the program to build relationships with its participants and among themselves, a factor that has been shown to increase participation (Huckfeldt 1973). This demonstrates the effect that target population has on program structure. StopWaste.org would not be able to take a community-based approach if their target population was the entire U.S., or even that of Alameda County. KAB chose an incentive-based problem because it is easier to execute that approach across the entire U.S. than a community-based approach. WME goal achievement is based largely on the approach of a given program (Aguilar and Krasny 2011). Once the approach is decided,

then funding, administrative capacity, and target population are designated. However, these factors also affect program structure because knowing what the program can provide, in terms of funding target population and administrative capacity, may influence what structure can be done around the desired goals.

Study Limitations

My study design did not effectively assess how program structure affects WME programs, because of limited time and money. More research is needed to find the specific factors that inhibit goal completion in WME programs because programs structures and, therefore, factors vary depending on the program. Limited numbers of interviews could create some bias, which include, making the program appear to need help and excluding information. More interviews should be conducted with teachers who work within the schools and students/participants, which can help further determine how program structure and target population affect WME programs. Furthermore, analysis should be done if more funds were provided to them. Not only would this help conclude how funding affects WME programs, but it would also aid in finding how effective the program structure is. This would truly establish a clear difference in the effectiveness of program structures. In addition, the generalizations that could be made about other programs through this study's findings are limited. However, this study does provide a research model for understanding WME education programs and does suggest patterns across different program types.

Future Research

My findings demonstrate how funding, administrative capacity, target population affect and are affected by program structure and how these factors may effect goal completion by showing the how these factors affect both programs differently. However, this conclusion has led me to understand that the research question should no longer be directed to all WME programs. Factors inhibiting the growth and goal completion of these programs vary between organizations because of their program structure. There are

some factors, such as funding, that are most likely to be a factor among all WME programs, but even the severity at which it affects the program varies. This study should serve as a baseline study for future research to look specifically how each factor affects a particular program. By looking at one factor for a particular program, one can truly understand how this factor is affecting the program, how program structure affects the program and how effective the program can be if the issue is solved.

Broader Implications and Conclusion

Specific factors preventing attainment of goals vary between programs because program structure and therefore the severity of how the factors affect each program differ. The approach that these programs take in order to achieve specified goals greatly influence how and what factors will affect them. Thus, the there are some general factors that might affect a program. Nevertheless, no matter how effective a WME program can be, the long-term viability of these programs comes into question. There is a lack of support from schools, which are ranked based on standardized test scores and which may prioritize budget considerations over curriculum expansion, specialized teacher training and teaching quality. In addition, an unexpected finding was that not all school principals are supportive of these the types of programs and not all school districts want to make WME a comprehensive curriculum. This is because schools' academic proficiency is based on standardized tests, giving a public school its prestige and assuring continued funding. However, these tests are based on core academic subjects such as Math, English and Science. They do not include any WME content. Therefore, schools do not want to devote time, effort and support to WME programs. Consequently, if schools do not participate, WME programs can be rendered useless no matter how a program can become more effective by improving their curriculum, funding, structure and methods of teaching. Government support is necessary to overcome this obstacle. By making WME a core requirement within formal education would not only help give these programs the proper funding to improve their approach, but it would also increase school support by making it a requirement in standardized testing. Only then will waste management education receive full backing and raise participation and awareness with the students and

faculty as whole. This will help spread the message that waste and other environmental issues are a huge problem in our society, and must be receive the same support as every other subject in school.

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APPENDIX A: Interview Questions

- Please describe your program (sub-questions below to include in your answer please).
    - How is the program organized?
    - When did it begin? How has it changed since?
    - How long have you (interview participant) been involved in the environmental education program? What do you do within the program?
- What are the key goals in your program and do you feel your current program structure fits the needs of accomplishing your goals?
- What are the key shortcomings of your program in terms of achieving specified goals that you stated in the previous question? And how do you think you could overcome these?
- Do you have the population demographics of your program? If so, what groups of people does the program target?
- Do you think your current program targets your intended audience? (Sub-questions below)
    - What groups respond well? Can you assess this?
    - Why did you choose the current design of your program?
- From the way your program is designed or located, do you feel you are leaving some of the population out? (Adults, young children) And how have you made that choice? Will you be able to change this in the future?
- What are some of the flaws you feel the design of your program have, and how does that limit your program from growth/working?

- What problems do you see with participants in your program?
- Is funding a factor limiting program effectiveness and/or growth? If so how does it affect your program in terms of administrative capacity, program organization and target population? Do you have enough people working for you?
- What are some other limitations that you feel restrict the program from growing? How do these affect your results?
- Are there other programs that you might advise me to contact?