Changing littering behavior among university students in Egypt: Integration of community readiness and community-based social marketing

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Changing Littering Behavior among University Students in Egypt: Integration of Community Readiness and Community-Based Social Marketing

A Thesis

Presented to
The Center for Sustainable Development
The American University in Cairo

Presented by Nevin Nabil Torky
Supervised by Professor Carie Forden and Dr. Hani Swilam

March 2017
Abstract

Litter is simultaneously the most ignored and most visible form of environment degradation and is harmful to the health of humans and wildlife. The littering problem in Egypt is a major issue that can be seen in most of Egyptian neighborhoods. Many countries are working on litter reduction strategies, studies and programs to be litter free countries. In Egypt, there is almost no literature or national initiatives that address littering. There is an obvious need to study littering behavior and develop intervention programs to reduce litter in Egyptian communities.

This study aims to help to change adult littering behavior as well as provide potential recommendations for future anti-littering efforts in two Egyptian universities. The first goal of this research is to identify the unique characteristics of the students in both universities and their level of readiness to change littering behavior in their universities by using the Community Readiness Model (CRM). The second aim is to use this information in planning for effective littering prevention programs to be implemented in the future in both universities by using Community-Based Social Marketing (CBSM).

The CRM is an efficient and innovative tool for characterizing and assessing the level of readiness of a community to take action on an issue. In this study, CRM assessed the students’ knowledge about littering problem and the exiting littering prevention efforts and their characteristics, capacities and commitment to change littering behavior. Each university receives one of the nine stages of community readiness, and overall strategies for conducting littering prevention programs are recommended accordingly. The CBSM is also a useful tool for fostering behavior change by identifying the barriers to a behavior and developing programs to overcome these barriers. This study is analyzing the perceived barriers to design
littering prevention strategies and activities that address these barriers.

The results indicated that both universities are at the “Initiation” stage of readiness to change littering behavior. Strategies were recommended to reduce littering that match the level of readiness within both universities and possible CBSM tools were suggested to address the barriers found in both universities.
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Chapter One: Introduction

Finnie (as cited in Abdul Shukor et al., 2012) argued that litter is simultaneously the most ignored and most visible form of environment degradation. Littering is a social and environmental problem. It not only is ugly to look at, it is also harmful to the health of humans and wildlife, creates health and safety hazards, increases anti-social behavior, and has a negative economic impact (Schultz et al., 2011; Kingdom House, 2016). Many countries are suffering from littering problems and their governments and scientists are working on litter reduction strategies, studies and programs. Schultz et al. (2011) described the three dominant approaches to understanding litter and littering behavior. These approaches include research on who litters, how often people litter, what types of items are littered, and the effectiveness of strategies to reduce litter.

The littering problem in Egypt is a major issue that can be seen in most Egyptian neighborhoods, cities and governorates. Litter is a financial burden on the government that has to provide more manpower for cleaning, and litter sometimes stays for a long time in its location without being removed. Accumulated trash is the result of both littering and garbage collection problems. Most of the literature on waste in Egypt focuses on garbage problem, waste management and recycling, but not littering. Almost no existing literature was found related to littering behavior in Egypt and how to reduce its environmental impact. Littering prevention initiatives in Egypt are also few. There are some magazine articles in English that talked about it, and a Facebook page called “Keep Egypt Clean Project” but little else (KeepEgyptClean, 2015).

Although there are many sources of litter around the world such as construction and demolition sites, households, industries, uncovered trucks,
pedestrians, and moving vehicles (What is Littering, 2017), there is evidence that the large majority of litter is linked to individual behavior (Schultz et al., 2011). It is therefore likely to be helpful if we find effective ways to change littering behavior.

The effectiveness of pro-environmental behavior interventions, such as littering cessation, increases when they are aimed at removing barriers for change and are based on an understanding of the factors that promote pro-environmental behavior (Steg & Vlek, 2009). Steg and Vlek (2009) proposed a general framework to encourage pro-environmental behavior by examining not only the main factors underlying individual behavior in a community, but also the effects of contextual and motivational factors. This framework should help to identify under which conditions intervention strategies should be most effective for encouraging pro-environmental behavior effectively. As mentioned earlier, although there is no literature that talks about the factors that underlie littering behavior in Egypt, there was a study that examined pro-environmental behaviors of citizens in Cairo and the relationship between pro-environmental behavior and demographic variables, beliefs, values, and religiosity (Rice, 2006). This study found that among other factors that there was a lack of optimism, together with feelings of helplessness among participants. The study suggested that additional research was needed to reveal the motivations behind environmental activism, and the reasons why younger people are less engaged than their elders in pro-environmental behavior (Rice, 2006). Based on this research, (Rice, 2006) recommended some motivational factors to promote environmental concerns. These included the use of faith-based messages at the grassroots level through governmental and non-governmental organizations to promote pro-environmental behavior. Rice (2006) also recommended supplementing this strategy with other mass media efforts to talk more about environmental issues.
Prevention programs are more successful when they are owned by the community and when the community is deeply involved in planning and implementing solutions to their problems in collaboration with researchers and academics (Edwards et al, 2000). Gaining community participation to address local issues is important to produce meaningful change within the community and increases the likelihood of program sustainability. It helps develop effective prevention programs that fit with the local culture and nature of the community (Castañeda et al., 2012). Edwards et al. (2000) suggested that some of the challenges to implementing community-based programs are related to the unique characteristics of the communities themselves, particularly in their attitudes, values, resources, history, political climate, strengths, and weaknesses. If these contexts are not considered during planning and implementation, they can affect the success of the prevention efforts (Engstrom et al., 2002).

Plested et al. (1999) argued that a community readiness assessment provides a basis for understanding the relationship between community dynamics and prevention programs, because it suggests methods to overcome prevention hurdles. The Community Readiness Model is an efficient and innovative tool for characterizing and assessing the level of readiness of a community - or across a group of communities - (Thurman et al., 2003) to take action on an issue (Kelly et al., 2003), and to develop and implement prevention programs at the individual level (Thurman et al., 2003). This tool has effectively addressed problems ranging from health and nutritional issues to environmental and social issues (Thurman et al., 2003). The Community Readiness Model assesses several dimensions, among them are the community climate, commitment to change and the assessment of critical capacities and constraints that may affect community readiness for environmental change.
Engstrom et al. (2002) confirmed that a community readiness assessment can identify the environment’s characteristics, and analyze how these characteristics play a role in the behavior of the community. Therefore, a community readiness assessment can be used to proactively measure the strengths and weaknesses of a community in order to determine what capacity building strategies are necessary for future change efforts to take hold (Castañeda et al., 2012), and it may be useful for identifying what types of interventions would be most effective for preventing littering.

The model of the Community readiness to change includes four different components: 1) community and organizational climate 2) prevention attitudes and efforts 3) commitment to change and 4) capacity to change (Castañeda et al., 2012). Castañeda et al. (2012) identified characteristics such as relational capacity to implement change, which includes social ties, community attachment, stakeholder involvement and collaboration/teamwork and active citizenry, all of which relate to sense of community. Mcmillan & Chavis (1986) defined the sense of community that it is “a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members’ needs will be met through their commitment to be together.” Sense of community is important to assess in developing littering prevention strategies. By developing a sense of belonging and unity, people can work together in their neighborhoods, communities, work, schools, parks, etc. to collectively bring about positive change. The greater the community spirit, the more individuals will invest in that community (Moawad Abd-El-Aal & Steele, 2013). This was seen in the 25th of January revolution when a strong sense of belonging and community developed. In particular, people started to choose to clean the streets in Tahrir and other neighborhoods as a reflection of this feeling. At that time, Egyptians felt the sense of community and belonging not only to their
This research aims to assess readiness to change littering behavior among Egyptian youth in two universities in Greater Cairo, one private and another one public which will be referred to as University A and University B. Literature showed that littering is more common among younger adults (Schultz et al. 2011), therefore this study focus on younger adults in universities, where they are grouped together.

This research aims to answer three research questions. First, do Egyptian youth in universities A and B litter? Why do they litter? Second, if they litter, are they ready to change their littering behavior? What are the levels of readiness of each university to change littering behavior and implement littering prevention strategies within their universities? Finally, what are the littering prevention strategies and anti-littering interventions that could be developed to implement change in an Egyptian university context?

It was hypothesized that many people in the Egyptian community know that littering and garbage is a major problem in Egypt. However they may not be ready to take action to fix it. Littering prevention strategies are suggested based on the Community Readiness Model and the Community-Based Social Marketing tools.

The Community-Based Social Marketing (CBSM) was introduced by the Canadian environmental psychologist Doug McKenzie-Mohr who was aiming to foster more sustainable behavior (McKenzie-Mohr, 2000). It has been successfully used to change a wide range of behaviors, specifically, environmentally responsible behaviors (McKenzie-Mohr, 2013). CBSM aims to identify barriers and benefits in the community associated with the selected behavior before designing an intervention program related to it. Furthermore, CBSM suggests several tools to tackle these barriers and benefits (McKenzie-Mohr, 2013)
This research appears to be the first to use both the Community Readiness Model (CRM) and Community-Based Social Marketing (CBSM) to address an environmental issue such as littering in Egypt. It is also the first research to talk about littering behavior among youth in Egypt and to develop strategies to reduce it. This research fills a gap by assessing the barriers that contribute to littering behavior among Egyptian youth and suggesting what could be done to increase their engagement in anti-littering activities in Egypt.
Chapter Two: Literature Review

The Problem of Littering

1.1 Definition of Litter.

Litter can be defined as “any piece of glass, plastic, paper, metal, cloth, rubber, food, or food by-product which is thrown away in public places outside of waste collection containers. Intact toys, wood, rocks, broken pieces of asphalt, garbage containers, or garbage in containers are not considered litter” (Schnelle et al., 1980). Littering is a worldwide problem that has been receiving attention in research and in prevention efforts. However, littering is more common in the Middle East and receives less attention and focus (Arafat et al., 2007).

1.2 Social and Environmental Consequences of Littering.

Littering is not only a matter of beauty, it also represents one of the major contributors to the pollution and degradation of the environment (Muñoz-Cadena et al., 2012). It is harmful to the health of humans and wildlife. Misplaced litter such as plastic, styrofoam, paper, glass, and many other consumer materials that are thrown out in the environment, cause a number of harmful environmental consequences such as contamination to the soil and air. Litter also contributes to social problems such as safety hazards, fire hazards, human health hazards, and indirect health hazards from bacteria, rats, roaches, and mosquitoes that are attracted to litter (Schultz et al., 2011). It also has economic impact on the community and it increases anti-social behavior and crime (Kingdom House, 2016). Changing littering behavior is a critical need to save the environment and reduce the social and health impact of littering on the community (Lewis et al., 2009).

1.3 Health and Well-being Consequences of Littering.

There is a relationship between litter and well-being. Venhoeven et al. (2013)
explained how environmental conditions have a relationship with well-being. They believe that on the macro level, pro-environmental behavior increases hedonic well-being by enhancing the environmental conditions people live in, and that people can live a more comfortable life under better environmental conditions. They also argued that pro-environmental behavior in general can provide hedonic well-being (pleasure) because it brings people a step closer to reaching a sustainable goal. Second, pro-environmental behavior can provide eudemonic well-being (flourishing) because it is perceived as the right course of action. These ideas were demonstrated in a study report conducted by the “Keep Britain Tidy” campaigns to improve the environment (Keep Britain Tidy, 2013). The participants in the campaign discussed the social impacts of litter that it could make an area seem undesirable, run-down and unsafe. These participants are working to improve places across England and many more individuals and groups are actively involved in cleaning up the places where they live and work, improving community spirit, wellbeing and pride (Keep Britain Tidy, 2013).

**Understanding Behavior**

Most of the literature has addressed behavior related to littering and evaluation of anti-littering strategies. Schultz et al. (2011) briefly mentioned the three dominant approaches that were conducted in previous studies to understand litter and littering behavior: who litters, how often people litter, and collected litter. The “who litters” approach used surveys and some observational research to study littering behavior relating to the individual’s demographic and characteristics. These studies concluded that littering is more common among males, younger adults and individuals living in rural areas (Schultz et al. 2011). They also reviewed studies that tried to answer the question “How often do people litter?” by watching the behavior of individuals in
public spaces. They concluded that it is important to understand the role of physical context in facilitating or discouraging littering behavior, for example they found that people tends to litter less in a litter free spaces. Schultz et al. (2011) also reviewed studies that addressed collected litter that is, counting and characterizing the types of litter collected from different locations to understand determinants of littering. They found that the highest number of collected litter items was to cigarette butts. Wever et al (2010) mentioned in their literature review that cigarette butts are the only littered item that has received considerable attention compared to other types of litter. They also think that the characteristics of the littered object affect the littering behavior, for example small objects are most likely to be littered than other items.

Schultz et al. (2011) argued that although there is no accurate information on the percentage of litter that is attributable to improper actions of the individual, there is evidence that a large majority of litter is linked with the individual’s behavior. It is therefore important to understand the behavior causing litter and the types of littering behaviors to design a specific intervention for each type. Wever, van Onselen, Silvester and Boks (2010) posited a distinction between two types of littering behavior, active and passive. They identified active littering as the behavior when an individual places litter while moving or start to move, while passive littering is defined as placing litter in a place and refraining from cleaning it up when leaving later. They argued that not all different types of littering behavior can be addressed by the same intervention.

A study on littering in Nablus, Palestine, that measured the perception and opinion of residents toward littering and littering practices, found that the majority of interviewees shared the perception of street cleanliness as a shared responsibility between citizens and local municipalities, and that 48% of them were willing to
participate as a volunteer to clean the streets within a public campaign (Arafat et al., 2007). It was also found that the majority of interviewees indicated that one of the factors that would help hinder people from littering was enhanced ‘moral and religious convictions’ because of Islam (Arafat et al., 2007). In Middle Eastern countries then, religious leaders can take on a major role in encouraging people to follow the regulations of Islam that discourage or forbid littering. In a study examining the role of Islamic environmental ethics in pro-environmental behavior in Egypt, Rice (2006) found a link between religiosity and pro-environmental behaviors and argued that focusing on personal ethics is effective in countries where environmental laws are not adequately enforced. Rice (2006) also suggested using a faith-based message to promote pro-environmental behaviors, for example at Friday prayers, as a way to reach a wider audience than any mass media campaign could achieve.

Grasmick et al. (1991) argued that antilittering campaigns that appeal to citizens' conscience or sense of community pride are attempts to increase the threat of shame and embarrassment for littering. They evaluated an Oklahoma Antilittering Campaign that emphasized the moral obligation to keep the state clean. The results suggested that the threat of shame and embarrassment significantly reduced the previously reported littering, because a high proportion of the participants in the post campaign group responded that they would feel guilty and wouldn’t feel respected if they did litter. Heywood (2002) found that embarrassment, shame and guilt around littering behavior were at higher levels than for other inappropriate behaviors discussed in the study such as bikers failing to warn walkers when passing.

1.1 Litter Prevention Strategies

Wever et al. (2010) discussed the effectiveness of interventions previously
applied in practice to reduce litter. These strategies were divided into antecedent strategies and consequences strategies.

1.1.1 Antecedent Strategies.

Antecedent strategies are preventive strategies and measures to prevent the occurrence of undesired behavior (Dwyer et al., 1993). Abdul Shukor et al. (2012) reviewed 50 studies on three antecedent strategies: environmental design, prompting, and cleaning up the prior litter, and found that all had both strengths and weaknesses. The environmental design factor focused in different studies on the impact of the availability of the trash receptacles, their numbers, their attractive design and their location on reducing littering behavior, and it was found that all these factors discourage people to litter. Written, oral and visual prompts were found to be the most popular and effective method in reducing littering behavior. Making the message polite, clear, simple and understandable also had an effect. Abdul Shukor et al. (2012) also investigated the impact of the “Cleaning up prior to litter” strategy found in several studies and they concluded that cleaning up residential areas reduced littering behavior because both residents and visitors determined the accepted behavior from the surrounding environment. Finally, the paper also suggested to give more attention to follow up measurement to ensure the strategies would remain effective even after the intervention is removed.

Schultz et al. (2011) proposed several strategies for litter prevention that are a combination of both structural and motivational activities. Because the results showed that litter begets littering and the presence of litter communicates the acceptability of littering, it was suggested that the key to the success of any litter prevention activity is to clean up and remove existing litter. Roales-Nieto (1988) found out that increasing the number of trash receptacles, when implemented alone or along with publicity
campaigns, produced a minimal decrease in litter. However, a significant decrease in litter was observed when active participation of citizens in cleaning up their neighborhood was added to the availability of trash receptacles and publicity campaigns whose purpose was to make citizens aware of the importance of keeping the city clean. Therefore, involving community residents in cleanup activities can promote a long-term reduction in litter and increase an individual’s motivation to not litter. It is unclear though whether active participation is effective only if employed with other factors or could it be successful on its own (Roales-Nieto, 1988).

While there is little research on antecedent strategies for littering in Egypt, it seems likely that in countries like Egypt that have budget constraints and different priorities, it is difficult to provide numerous trash receptacles in some places or increase their numbers in places where trash receptacles already exists.

1.1.2 Consequence Strategies.

As for the consequence strategies, which take effect after the act of littering or non-littering, these are either rewards or punishment (fines) (Wever et al., 2010). While most countries have laws against littering, these laws are usually not actively enforced. However, countries that have high fines like Singapore have very clean streets because law is enforced and fines for littering are very high (Wever et al., 2010).

Egypt is among those countries that have laws against littering that are not enforced. Law 38/1967 addresses public cleanliness, and regulates the collection and disposal of solid wastes from houses, public places, commercial, and industrial establishments. Articles 1 and 2 of the law stipulate that it is prohibited for inhabitants, institutional entities and owners of businesses to dispose of garbage in locations other than those identified by the local Authority (Ministry of
In another law, article 37 from law (4/1994) on environment prepared by the Egyptian Environmental Affairs Agency (EEAA) (2009) concerns collection, waste treatment, and disposal. It is prohibited to burn, throw away or treat garbage and solid waste except in areas designated for such purposes. These waste disposal areas are situated far from housing or industrial or agriculture areas as well as waterways (Ministry of Environment/Egyptians Environmental Affairs Agency n.d.). According to the national newspaper, Al Ahram, Egypt's interim President Adly Mansour issued amendments to the 38/1967 Public Hygiene Law to 106/2012 Law, which empowers local authorities to fine pedestrians for littering. The fine for littering can now range between EGP 200 and EGP 5,000 (Ahram Online, 2014). It has not been reported yet whether this amendment has been enforced.

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Classification by time</th>
<th>Classification by nature</th>
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<tbody>
<tr>
<td>The availability of trash bins</td>
<td>Antecedent</td>
<td>Structural</td>
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<tr>
<td>Environmental design of trash bins</td>
<td>Antecedent</td>
<td>Communication</td>
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<tr>
<td>Prompts</td>
<td>Antecedent</td>
<td>Communication</td>
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<tr>
<td>cleaning up the prior litter</td>
<td>Antecedent</td>
<td>Economic</td>
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<tr>
<td>Fines</td>
<td>Consequence</td>
<td>Regulatory</td>
</tr>
<tr>
<td>Rewards</td>
<td>Consequence</td>
<td>Economic</td>
</tr>
</tbody>
</table>

Table 1 Littering Prevention Strategies classification

1.2 Community Organizing and Social Change

Reducing littering requires social change and community organizing. Social change is related to values that promote human rights, fairness and equity (Finn & Jacobson, 2003). Community organizing brings together members of marginalized groups to attain social justice and social change. It helps communities to develop and
promote interconnectedness among community members to achieve this change (Brady & O’Connor, 2014). Social work, human development and community development are fields that work for the benefit of human communities, but how about what humans are doing to the environment? According to the United States Environmental Protection Agency (EPA), the definition of environmental justice is “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.” (Environmental Justice).

Brady & O’Connor (2014) developed a framework of community organizing which suggests that organizing around a social problem requires work on motivation and community building before the stages of planning, mobilization and outcomes can occur. The motivation component behind a community organizing practice is very important as it can be a driving force to create social change in communities around a problem community members are probably aware of and have experienced. Littering is a problem that many people are living with and suffering from in their communities, and non-litterers value of not littering and thus may be motivated to create change.

Interconnectedness is an important characteristic of the organizing process that organizers need to be aware of throughout the organizing process. When participants in community organizing groups experience success, they grow a greater sense of interconnectedness with each other, which makes them more likely to continue until the end (Brady & O’Connor, 2014). Community organizing can be easier in communities like universities, as students are already organized in small groups in classes, clubs, interests etc., in addition to the existing interconnectedness among
students which can help littering prevention activities to succeed.

1.3  Empowerment and Citizen Participation

Rappaport (1987) suggested that empowerment is a process, a mechanism by which people, organizations, and communities gain mastery over their affairs, Which can moreover lead people to be involved in their communities and look for solutions to problems they experience (Rappaport, 1987). Kloos, et al. (2012) mentioned in their book the definition of citizen participation as "a process in which individuals take part in decision-making in the institutions, programs, and environments that affect them" (p. 354). These concepts were explored in an Egyptian study about practicing environmental citizenship in Egypt among students in a new environmental education course in the Faculty of Education in Beni-Suef University conducted by Abd-El-Aal & Steele (2013). The study gave the opportunity to the teachers to explore and take leadership roles in local environmental issues by allowing students to practice environmental citizenship in their communities. Although the students faced some challenges related to the nature of the environmental problem they focused on and related to their neighbors’ attitudes towards their initiatives, the positive change they achieved supported the authors’ recommendation to include community-based and projects based environmental education in Egypt that encourage the environmental citizenship. Abd-El-Aal & Steele (2013) identified the enormous impact of the political revolution on the students’ sense of empowerment and their willingness to do real change. The researchers reported that the students were affected by the 25th of January revolution where many Egyptians experienced the cooperation between a variety of socio-economic and religious backgrounds and the growing sense of participation by citizens (Abd-El-Aal & Steele, 2013).
1.4 Community Readiness for Change

In Colorado State University, the Tri-Ethnic Center developed the Community Readiness to Change Model in American to provide an efficient tool for characterizing and assessing a community’s readiness to take action on an issue (Kelly et al., 2003). The center originally created the model for use with alcohol and drug abuse prevention programs, but then used it in health and nutrition programs, environmentally centered prevention programs and social programs (Edwards et al., 2000). The assessment is comprised of 36 open-ended questions spread across 6 dimensions of readiness: (1) Community efforts (programs, activities, policies, etc.) (2) Community knowledge of the efforts (3) Leadership (including appointed leaders and influential community members and not necessarily a decision maker, depending on the problem/issue) (4) Community climate (prevailing attitudes in community about the issue) (5) Community knowledge of the issue (6) Resources related to the issue. The community readiness assessment is done in the form of face-to-face interviews that are conducted with a minimum of four to six community leaders or key informants who have knowledge of how the issue is currently being addressed by the community (Edwards et al., 2000; Kelly et al., 2003; Schroepfer et al., 2009).

Castañeda et al. (2012) discussed the four elements of readiness assessment while reviewing 13 community and organizational readiness assessments. They recommended to assess these components before planning for any intervention in any type of community. These components of readiness are; (1) community and organizational climate that facilitates change, (2) attitudes and current efforts toward prevention, (3) commitment to change, and (4) capacity to implement change.

1.4.1 Community Climate.

The community climate dimension is the degree to which current community
conditions promote positive versus negative behaviors. Assessing the community climate as one of the dimensions of the Community Readiness Model is to determine if the community will accept or reject a prevention intervention or not. If the community climate turns out to be characterized by a sense of responsibility and empowerment, this may serve as a catalyst for future action and planners will know where the future efforts need to be targeted (Castañeda et al., 2012).

1.4.2 Prevention Attitudes and Efforts.

The second component mentioned by Castañeda et al. (2012) is the current activities and efforts of the community toward the prevention of the issue which is related to the motivation for readiness to change. The authors identified it in three categories, assessing current awareness, assessing current value and assessing current efforts. Assessing the current awareness will determine if the community is aware of the target problem as a major problem that their community faces, and if the community knows about the cause of the problem, the consequences and how it impacts their community. The current value will assess how important this problem to them, while the current efforts will assess the knowledge of the current efforts and activities done to address this problem in their communities (Castañeda et al., 2012).

1.4.3 Commitment to Change.

This dimension measures whether or not the community believes they are in need to change the desired behavior or not and if they view feasible, possible and likely to be successful if the innovative programs are implemented (Castañeda et al., 2012).

1.4.4 Capacity to Implement Change.

This dimension assesses the degree to which specific community characteristics are necessary for the change effort to take hold exist. Characteristics
such as (1) Relational capacity to implement change: this include social ties, community attachment, stakeholder involvement and collaboration/teamwork, and active citizenry; (2) Collective efficacy: belief in one’s own or the community’s ability to effectively accomplish a task or to engage in future change efforts (3) Leadership: To what extent leaders and influential community members are supportive of the issue or to what extent leadership is effective (4) Resources: To what extent local resources (people, time, money and space) are available to support efforts (5) Skills and knowledge necessary to implement an innovative program, including: adaptability, evaluation, technical, research and data dissemination, cultural competency, and training. When these capacities exist, communities are better able to mobilize and support change efforts (Castañeda et al., 2012).

Once assessments of readiness to change are completed, they need to be analyzed so that communities can be assigned to a stage. First, after conducting the assessment, the interviews should be transcribed and scored by a research team who uses anchored rating scales of readiness to assign scores ranging from 1 to 9 for each of the six dimensions. Each dimension gets an independent scoring, which is a statement representing the lowest stage/level of readiness (1 = no awareness) and at the other end the highest stage/level of readiness (9 = high level of community ownership). Then the research team calculates together the overall mean score of the community’s stage of readiness (Schroepfer et al., 2009). The final score classifies community into one of nine stages of readiness: 1) no awareness 2) denial/resistance 3) vague awareness 4) pre-planning 5) preparation 6) initiation 7) stabilization 8) confirmation/expansion 9) high level of community ownership (Kelly et al., 2003).

To ensure effectiveness, the CRM framed the strategies of each stage to be built on the previous stage. Accordingly, the CRM gathered the implementation
strategies for the nine stages into three groups, which have three main goals and strategy recommendations to achieve. The three groups are classified as follows: 1) Lower Stages (1-3): No Awareness, Denial and Resistance and Vague Awareness, 2) Intermediate Stages (4-6): Pre-planning, Preparation and Initiation and 3) Advanced Stages (7-9): Stabilization, Confirmation and Expansion and Professionalization (Kelly et al., 2003). (See Appendix 4)

Based on the stage of readiness, goals and general strategies that are appropriate for each stage of readiness should serve to guide the intervention process and be effective in moving the community to the next stage of readiness (Schroepfer et al., 2009).

The task of the researcher is to define, describe, or devise appropriate strategies for each stage of readiness, which are general statements or examples of approaches that may be effective. However, the specific strategies should come from the community itself. Thurman et al. (2003) argue that in order to move the community toward implementing and maintaining local prevention and intervention efforts that are successful, effective and sustainable, community mobilization must be based on the involvement of multiple systems and the utilization of within-community resources and strengths and using models that are community-specific and culturally relevant. This is done in the community change model through a workshop facilitated by the research team for stakeholders and local leaders where they discuss the issue in the context of their culture/community, and identify strengths and challenges to implementing programming. These specific strategies, based on the community readiness framework should help to move their community forward in its level of readiness to act on the issue (Kelly et al., 2003).
1.5 Community-Based Social Marketing

One strategy to initiate social change is community-based social marketing. Social Marketing involves “the use of marketing principles and techniques to influence a target audience to voluntarily accept, reject, modify or abandon behavior for the benefit of individuals, groups or society as a whole” (Kotler & Roberto, 1989). Social Marketing aims to improve health, safety and communities and protect the environment by applying marketing principles and techniques to achieve specific behavioral goals (Lee & Kotler, 2011).

Social marketing techniques have been adopted by national programs in the US, Canada, Australia, New Zealand and UK. Additionally, it has been used by international organizations working in community development and health such as the WHO, World Bank, Center for Disease Control and Prevention and Health Canada (Kotler et al., 2002).

Social marketing was criticized for not addressing enough consumer and market research before implementation and also for its reliance on advertising only. For these reasons, the Social marketing theory and practice have evolved into other frameworks such as Community-Based Social Marketing (CBSM) which introduced by the Canadian environmental psychologist Doug McKenzie-Mohr aiming to foster more sustainable behavior (McKenzie-Mohr, 2000).

CBSM blends social marketing theory and social psychology research together to introduce socio-psychological tools to motivate behavior change by empowering individuals to make conscious choices and informed decisions about their behaviors. The Community-Based Social Marketing has been successfully used to change a wide range of behaviors related to the environment including promoting pro-environmental behavior (McKenzie-Mohr, 2000), enhancing environmental regulations (Kennedy,
2010), reducing energy consumption, increasing recycling (Haldeman & Turner, 2009), changing youth littering behavior (Hughes & McConnell, 2016), and improving edible food waste (Whitehair et al., 2013).

**The CBSM Framework**

The CBSM framework involves five stages: selecting desired behaviors to be promoted, identifying barriers and benefits associated with the selected behavior, developing strategies that include tools to change the selected behavior by addressing those barriers and benefits, conducting a pilot program with a small group of a community, and finally implementing a broad-scale program and evaluating it (McKenzie-Mohr, 2013).

1.1.1 **Selecting Desired Behaviors.**

To change behavior towards sustainability and encourage pro-environmental behaviors, there is a multitude of behaviors that should be targeted. The CBSM framework plans to solve this issue by first determining which behavior to promote (McKenzie-Mohr, 2000). For example if the purpose is waste management, the target behavior could be reducing waste in households, promoting recycling, etc. Each behavior in the list should be guided by two criteria: no behavior should be divisible; and each behavior should be end-state. After that it is important to ask some questions related to determining the impact of a particular behavior and the probability of engaging individuals in this particular behavior (McKenzie-Mohr, 2013).

1.1.2 **Identify Barriers and Benefits**

It is important before designing an intervention program to understand the reasons that people behave the way they do and what would motivate them to act differently. These barriers could be internal (motivations, knowledge, skills etc.) or
external (infrastructure, regulations etc.) to the individuals that can be discovered by focus groups, observational studies and surveys (McKenzie-Mohr, 2000). Planners should be well informed about the actual barriers and benefits before considering strategies to influence what people do and to design an effective and successful program.

1.1.3 The CBSM Tools

CBSM suggests several tools to incorporate in the intervention program according to the barriers and benefits identified in the previous stage. These tools are developed from social science research but the difference here is that they are based on solid information rather than just guessing (McKenzie-Mohr, 2013). McKenzie-Mohr (2013) developed seven different strategies, 1) Commitments 2) Social Norms 3) Social Diffusion 4) Prompts 5) Communication 6) Incentives and 7) Convenience. Each of these strategies is suited to particular barriers. For example if the barrier is lack of motivation, then the proposed strategies for this specific barrier are “commitment”, “social norms” and/or “incentives”.

1.5.1.1.1 Commitment.

Previous research supported the notion that individuals need to be consistent in their thoughts and behaviors. Therefore, McKenzie-Mohr (2013) developed the “commitment” tool that has been effective in the research for promoting sustainable behavior in which he strongly emphasizes on the compelling effect of the written commitments to achieve the targeted behavior more than verbal commitments. We as individuals tend to commit to a plan if we told someone we would, thus commitments are recommended to obtain motivation (Noiseux & Hostetler, 2013). Group commitments can be particularly effective because usually individuals care about what other members in the team think of them (McKenzie-Mohr, 2013).
1.5.1.1.2 Social Norms.

Social norms in social psychology research refer to human behavior when it is guided and regulated by what other people do (Burchell et al., 2013). These norms can be used to change individual behavior when it is communicated to people that the desired behavior is being practiced by a large percentage of people (Burchell et al., 2013). Goldstein et al. (2008) argued that when people receive a new law related to pro-environmental action or a new green product, and they are unsure about it, they usually observe how others will deal with it first. The more similarity and closeness between people in groups the stronger the impact of social norms on behaviors and actions because people are most likely influenced by others similar to them when deciding how to act if put in similar situations (Goldstein et al., 2008). The social norms approach was used in changing behaviors into sustainable ones, such as the towel re-use messages experiment that was adopted by a chain of hotels in the US. Hotels usually ask their guests to re-use towels to save the environment but it was not really enough to convince guests to do so. To see if there was a more effective approach, an experiment included three different types of messages written on three different cards in different guestrooms. The card messages were: “Help Save the Environment” followed on the back by information about the importance of respecting nature; the second message was “Partner With Us To Help Save the Environment” followed on the back by information encouraging guests to cooperate with the hotel to save the environment; lastly the message that used the social norm approach was “Join Your Fellow Guest In Helping To Save The Environment” followed on the back by information that the majority of guests in the hotel reuse their towels. The last message increased towel reuse by 34%, which demonstrated that the social norms are a powerful tool for change (Goldstein et al., 2008).
Goldstein et al. (2008) advised policy makers who want to promote pro-environmental behaviors in communities to consider focusing in their information campaigns on what many people do to preserve the environment rather than focusing on how many people’s practices are harming the environment. It is also important for communicators in such programs to be careful when designing messages to avoid unintentionally encouraging a behavior that they wanted to discourage. For this tool to be effective it should be introduced in the form of the desired behavior that people should adopt because it is the norm. In addition to that, the norm should be presented at the time and place that the desired behavior is encouraged or discouraged (McKenzie-Mohr, 2013).

1.5.1.1.3 Social Diffusion.

The third tool is the "social diffusion" which is based on the evidence that the adoption of new behavior happens as a result of friends, family members or colleagues introducing it to them. For this approach to be effective, McKenzie-Mohr (2013) suggests that it is important to ensure that the desired behavior is visible enough. He recommends using this tool with the “Commitment” tool and get commitments from people who adopt the desired behavior and look for opportunities to advertise this commitment. For example, taking photos of children picking up the litter and placing it in a visible display to serve as a reminder of their commitments and enhance social diffusion (McKenzie-Mohr, 2013).

1.5.1.1.4 Prompts.

The fourth tool is “Prompts” which serves as a reminder to people who tend to forget to behave in an environmental friendly way. For example, making trash receptacles visually interesting so that they are noticed and hopefully used (McKenzie-Mohr, 2013) Prompts are only suitable for target audiences who know
and are willing to act but forget; prompts don’t change attitudes (McKenzie-Mohr, 2013). Research has found prompts effective in promoting pro-environmental behavior for example in littering, household energy savings, recycling and reducing outdoor water use. Prompts should also be noticeable, self-explanatory and close to the place where the desired behavior is carried out (McKenzie-Mohr, 2013). A study of the use of prompts at a university intervention targeting food waste found that a poster with a simple graphic that read “All Taste No Waste” followed by the statement “Eat What You Take, Don’t Waste Food”, reduced waste reduction by 15% (Whitehair et al., 2013).

1.5.1.1.5 Communication.

“Communication” is the seventh tool provided and involves creating effective messages. The CBSM framework has provided a number of methods that can enhance the effectiveness of the written message. One of the methods that could be effective in the university setting is delivering the desired message by an individual or an organization (university club) that is credible with the students McKenzie-Mohr (2013). Also, social media such as Facebook and other similar social media outlets; public relations and events; promotional items; and entertainment media such as video games and public art can be especially effective with university students (Lee & Kotler, 2011).

1.5.1.1.6 Incentives.

Financial or other incentives has been found to be effective in motivating individuals to have more sustainable behavior. Incentives were mostly applied in previous research with waste reduction but had less impact in other sustainable behaviors such as reducing the use of cars and the conservation of forests and the habitat (McKenzie-Mohr, 2013). Incentives are an effective tool particularly when
individuals lack motivation to behave as desired (McKenzie-Mohr, 2013). To be effective, incentives should be large and visible, and they shall be used to reward positive behaviors. For example, rewarding recyclers by charging them lower fees for garbage collection, or like what some countries do when people are encouraged to sell their recycled items in automated machines and receive a monetary reward in return (McKenzie-Mohr, 2013).

1.5.1.1.7 Convenience.

The last tool, “Convenience” addresses the external barriers that any community could have. Regardless of how effective strategies for internal barriers could be, they wouldn’t be successful unless external barriers are dealt with (McKenzie-Mohr, 2013). For example if a national campaign is to be conducted in Cairo to encourage the use of bikes to reduce the traffic and pollution, it will definitely be unsuccessful unless the roads are redesigned to accommodate bikes. External barriers should be identified at the beginning as advised before by focus groups with the target audience and literature research, then assess how other similar programs overcame this barrier and if it’s realistic according to the resources of the program or not. Overcoming external barriers very much depends on the nature of the barrier thus the strategies shall be tailored to each situation (McKenzie-Mohr, 2013).

1.6 The Integration of Social Marketing and Community Readiness to Change

Although the Social Marketing efforts usually focus on individuals and those of the CRM usually target communities, it is possible to achieve more successful behavior change by combining both strategies (Kelly et al., 2003). Kelly et al. (2003) think that identifying the dimension of the readiness model through formative research (focus groups) while paying attention to the community’s barriers,
knowledge about the problem and the efforts to address this problem, can advise social marketing efforts targeting to specific audiences. Carrigan et al. (2011) also recommended this integration, as they believe that effective segmentation and targeting based on the stage of readiness can make the environmental and marketing campaigns more successful. For example, when a community is found in the intermediate stage of readiness and has a good awareness of the efforts, the social marketing tool should focus on building stronger social networks using the resources found through the community readiness assessment (Kelly et al., 2003) rather than on large advertising campaigns.

Based on the literature review presented and the lack of information and published studies in Egypt’s case in terms of littering behavior and littering prevention programs, there is a need for further studies to understand and assess the attitudes and behaviors among individuals in the Egyptian community regarding littering behavior to develop effective community-based prevention programs. The Community Readiness Model helps to understand the community context in which programs must be implemented (Kakefuda et al., 2008). The information that will be obtained from the Community Readiness Model will be the factors affecting readiness in the community and the overall level of readiness. This information can then be used to guide a multitude of decisions in program development, implementation and evaluation (Kelly et al., 2003) to community leaders using the Community-Based Social Marketing tools that will be discussed.
Chapter Three: Methodology

Sample Characteristics

Two universities in urban Cairo, one public and one private were chosen. The total number of participants in the survey was 212 who were all from schools of Science and Engineering due to the nature of the study and its relevance to their studies. The number of participants from University A was 114 which represented 5.06% from the school; however only 98 from University B represented 114 of their school as well.

Seventy-nine percent of participants fell in the 18 to 20 years old category, and 21% were in the category of 22 to 29 years old. Out of the 208 participants overall who indicated their gender, 73 (35%) were males and 135 (65%) were females. In University A, 40.7% were male and 59.3% were females. While in University B, 28.4% were only males and 71.5% were female.

Survey Development

1.1 The Community Readiness Assessment (CRA)

The Tri-Center developed a CRM handbook to help organizations use the Community Readiness Assessment tool in their interventions within their community. A readiness assessment should be modified to meet the different needs of each community, and the generic questions of the CRM need to be adapted according to the issue being addressed, while irrelevant questions should be eliminated.

The questions provided in the CRM handbook are 36 qualitative questions related to six different dimensions to be asked in the form of an interview with leaders in the community on behalf of their community members. This methodology was adapted for the purpose of this study. Using the questions from the CRM handbook as a guide, twenty quantitative questions were developed in the form of a self-reported
survey to be conducted with the community members of two universities. These focused on only 4 dimensions from the CRM in this survey, as the original model is based on measuring previous efforts done by the community key leaders, which was not the case in this study. Other parts of the survey included questions for; (a) age and gender (b) littering behavior (c) littering prevention strategies and (d) sense of community.

Due to the different settings of this study than previous assessments and while developing the survey, many measures were considered such as the history of littering prevention efforts in each university as both universities didn’t have documented littering preventions in the past which required to shift the direction of the questions to be quantitative questions instead of qualitative ones and to be addressed to the community members which are in this case the students rather than the leaders of this community. Therefore, “the community efforts” dimension were eliminated from the surveys and scoring development, and were asked to some of the professors in each university. The responses of those questions were first used in developing the score of the dimension of “Knowledge of efforts” based on each university, and whether it has littering prevention efforts or not. Secondly, it was used in the analysis of the overall stage of each university and the strategies that will be recommended for each university.

This survey was tested with ten graduate students in one of the targeted universities who provided a valuable input in adjusting the survey to be used with the target universities.

The four dimensions that were adapted from the handbook of the CRM are: (a) Community knowledge of the efforts (b) Knowledge about littering problem (c) Community climate (d) Resources and willingness to participate. Each dimension was
divided in two to three sub-dimensions, which included from one to three questions, as demonstrated in table 2.

| a) Community knowledge of the efforts | a) Awareness/knowledge of efforts b) Depth of Knowledge |
| b) Knowledge about littering problem | a) Awareness/knowledge of efforts b) Depth of Knowledge |
| c) Community Climate | a) Concern b) Something should be done c) Role they should play |
| d) Resources and willingness to participate | a) Potential resources b) Willingness to participate in efforts |

Table 2 The survey’s dimensions and sub-dimensions

1.1.1 Community knowledge of the efforts

The first of these dimensions, which is called “community knowledge of the efforts”, involved asking questions related to the extent to which community members know about local efforts and their effectiveness, and whether the efforts are accessible to all segments of the community. In the CRM, the questions included; “Please describe the efforts in your community to address the issue”, and “What are the misconceptions or incorrect information among community members about the current efforts?” In the present study, the first sub-dimension focused on assessing the level of awareness and knowledge of littering prevention efforts by asking participants if they were aware of (yes, no, don’t know): 1) littering prevention programs on campus 2) littering prevention advertisements on campus and 3) garbage separation and a recycling system on campus. The second sub-dimension focused on the depth of knowledge that students had about the prevention efforts in their universities by asking them about the effectiveness of interventions (very effective, effective, somewhat effective, not at all effective and don’t know), through three questions: 1) the effectiveness of littering advertisements 2) the visibility and
accessibility of littering advertisements, and 3) the availability of trash receptacles around the university.

1.1.2 Knowledge about the issue

“Knowledge about the issue” is the second dimension in the CRM, which assessed the knowledge of community members about the causes of the problem, consequences, and how it impacts the community. These questions were adapted to ask about the littering problem, and to assess the students’ knowledge about how much the littering problem occurs in their universities and its effect on the community. The sub-dimensions created under this dimension are similar to the previous one; a) awareness/knowledge of the problem and b) the depth of knowledge. The participants identified the littering problem in their universities with either very big, big, moderate, small problem, not a problem at all or don’t know. The depth of knowledge sub-dimension included questions to measure their knowledge of the impact of the problem and its consequences on their university. A number of choices were offered to choose from according to their level of knowledge, or the participant may choose that the problem doesn’t have any impact on their university.

1.1.3 Community Climate

“Community Climate” dimension is the assessment of the prevailing attitude of the community towards the issue, and whether it is one of helplessness, or of responsibility and empowerment. The CRM interview questions requested information about the issue, whether it is a priority to community members, and if the community is supporting the efforts, and how many of them are playing a key role in implementing these efforts. This dimension was adapted to the littering problem and the situation in both universities. For that reason, it was divided into three sub-dimensions to provide information regarding a) the student’s concerns towards the
problem; in which case the student will give information about the need to solve the problem and if other community members are supporting the efforts b) something should be done about the problem; where the student will provide information about if the community needs to stop littering behavior and c) the role they should play to solve the problem; which will ask the students about whose responsibility it is to solve the littering problem, and if it’s part of theirs as well, and what role would they play if needed to participate in littering prevention efforts. In some of the questions, the students were asked to rate their level of agreement (strongly disagree, disagree, agree, strongly agree) with statements in this part of the survey, which included questions measuring attitudes towards solving the littering problem.

1.1.4 Resources related to the issue

The last dimension of the CRM questions in the survey is “Resources related to the issue”, asking the leaders about the local resources – people, time, money, space, etc. – and if they are available to support efforts. The dimension name was modified to “Resources and willingness to participate” and included information about the participation of the students themselves. The dimension was divided into two sub-dimensions to ask about a) the potential resources in their universities to solve the problem and b) their willingness to participate in these efforts. (See Appendix 1 for the survey)

1.2 Understanding Littering Behavior

This study aims to understand the littering behavior in University A and University B. Understanding the size of littering in both universities identifies if littering is a problem or not. By asking the students themselves if they litter or not and what are the reasons they do so, this will confirm the overall picture of littering as a problem in each university.
Improving our understanding of the behavior of individuals who are responsible for littering can supplement the results from the Community Readiness Assessment in the formulation of effective strategies to address the problem of littering in universities. “Do you litter and why” are two questions that were designed in a specific and detailed form to identify what type of litter the students do and for which reasons they litter. For example, dropping gum is different than throwing things out of a car and they are both different from leaving food remnants at the place where students eat. The reason behind littering would also identify the root of the problem, for example, the reasons could be due to the way litter is conceptualized, or due to policy related to trash collection. Some people may litter because they don’t think one piece of trash matters, and others could be littering only because there aren’t any trash bins near them. (See Appendix 1 for the survey)

1.2.1 Littering Prevention Strategies

Though the CRM will recommend broad strategies to prevent littering based on the stage of readiness, asking the students about the specific strategies that are appropriate for their campuses was also seen as important. Doing a cleanup campaign, developing a garbage separation and a recycling system as part of the solutions to littering are among the strategies that were offered to students to choose from. Every student was asked to choose three strategies out of eleven suggested. (See Appendix 1 for the survey)

1.2.2 Sense of Community

As discussed in the literature, antilittering campaigns that appeal to citizens' conscience or sense of community pride are attempts to increase the threat of shame and embarrassment for littering (Grasmick et al., 1991). For this reason, some questions have been added to the survey to assess if some of the littering prevention
strategies can be based on developing a sense of pride and community cohesion. Part of these questions were grouped together to ask about the students’ feelings about their universities in order to assess the sense of ownership to their community. For example, a question directed towards the students was whether they felt at home in their universities, or if they put a lot of time and effort into being a part of their university. Another question included among the suggested littering prevention strategies was if conducting an awareness campaign that links community pride to keeping the community clean was an appropriate strategy. (See Appendix 1 for the survey)

1.2.3 Validation

In order to assess the survey’s reliability the researcher used Cronbach’s Alpha to test the internal consistency of the four sets of items in the survey that had scales which included Q8, Q9, Q18 and Q19. All sets of items showed acceptable or good internal consistency (see Table 3). Two sets of questions measured respondents’ littering attitudes and behavior. The items in question eight asked respondents about their littering behavior. The alpha coefficient for the four items was .818, suggesting that the items have good internal consistency. For the items in question nine which assessed attitudes toward littering, the alpha coefficient was .795, again suggesting good internal consistency. One set of questions measured littering attitudes and behavior at the universities. The alpha coefficient for the five items of question twenty is .686, suggesting that the items have acceptable internal consistency. Finally, one set of questions measured sense of community at the universities. The alpha coefficient for the six items of question nineteen is .771, suggesting that the items have good internal consistency.
<table>
<thead>
<tr>
<th>Question</th>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>.818</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>.795</td>
<td>10</td>
</tr>
<tr>
<td>18</td>
<td>.771</td>
<td>6</td>
</tr>
<tr>
<td>19</td>
<td>.686</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 3 Cronbach's Alpha Analysis
Chapter Four: Results

1.1 Readiness for Change

This study aimed to assess University A and University B community readiness to solve littering behavior. The stage of readiness of each university along with the other questions in the survey will help both communities to find the appropriate strategies to solve the littering problem in both universities. To assess the stage of readiness for change, four dimensions were analyzed: knowledge of littering efforts; knowledge of littering problem; community climate; and resources and willingness to participate. For each dimension, overall scores were calculated.

**Dimensional Results**

As already discussed, CRM has been modified in this study to assess four dimensions in each university. Each dimension received a score based on the anchor rating scale (See Appendix 2). The calculated score for the four dimensions of the Community Readiness Model for University A and University B are displayed in Table 4.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>University A</th>
<th>Stage</th>
<th>University B</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Knowledge of Littering Prevention Efforts</td>
<td>7</td>
<td>Stabilization</td>
<td>5.75</td>
<td>Preparation</td>
</tr>
<tr>
<td>Knowledge of Littering Problem</td>
<td>7</td>
<td>Stabilization</td>
<td>6.5</td>
<td>Initiation</td>
</tr>
<tr>
<td>Community Climate</td>
<td>6.5</td>
<td>Initiation</td>
<td>7.5</td>
<td>Stabilization</td>
</tr>
<tr>
<td>Resources and willingness to participate</td>
<td>7</td>
<td>Stabilization</td>
<td>7.2</td>
<td>Stabilization</td>
</tr>
<tr>
<td><strong>Average score/Overall Stage</strong></td>
<td><strong>6.9 (6)</strong></td>
<td><strong>Initiation</strong></td>
<td><strong>6.7 (6)</strong></td>
<td><strong>Initiation</strong></td>
</tr>
</tbody>
</table>

*Table 4 Calculated score for Readiness in University A and University B*

The scores show that both universities received slightly different scores in each dimension. However, when the overall score was calculated, they both ended up in
the same overall stage of readiness. See figure 1 for a graphical illustration of the differences in readiness by dimension between University A and University B.

![Comparison of stages of readiness between University A and University B](image)

*Figure 1 Comparison of stages of readiness between University A and University B*

*University A*

The dimensional results for University A are displayed below in figure 2. The results indicate that University A is high in the stages of Community Knowledge of Littering Prevention Efforts, Knowledge of Littering Problem, and Resources and Willingness to Participate in Efforts, but is lower in the Community Climate dimension.
The dimensional results of University B show that the highest dimension of readiness is Community Climate, then the Resources and Willingness to participate in efforts. Both Community Knowledge of Littering Prevention Efforts and Knowledge of Littering Problem are scoring the same and they are lower than the other two. See figure 3 for a graphical illustration for the dimensional results for University B.

Figure 2 Stages of readiness for University B

University B

Figure 3 Figure 3: Stages of Readiness for University B
**Dimension 1 - Community Knowledge of Littering Prevention efforts**

According to the CRM guidelines in some of the literature, the first dimension was “Community Efforts”. To assess the students’ knowledge about the Littering Prevention Efforts in their universities, it was important to know the existing efforts and link it to their level of knowledge and if they are aware of the current efforts, or they have misconceptions about these efforts. Existing efforts were identified through interviews with faculty and observation. The below table 4 displays the difference between the existing littering prevention efforts in both universities.

<table>
<thead>
<tr>
<th>In the last two years</th>
<th>University A</th>
<th>University B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Littering Prevention Programs</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Written or Visual Littering prevention Advertisement</td>
<td>Yes in 2015 but not yet available</td>
<td>No</td>
</tr>
<tr>
<td>Garbage Separation and Recycling System</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Trash bins throughout the university</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Table 5 Existing Littering Prevention Efforts in University A and University B*

The Community Knowledge of the Efforts dimension was measuring two sub-dimensions; (a) Awareness/Knowledge of Efforts and (b) Depth in Knowledge. The Awareness/Knowledge of Efforts were questioning to what extent the students know about the existing efforts described in Table 5, while Depth in Knowledge was assessed through questioning if students knew that those efforts were accessible, effective and if trash bins were found throughout the university.

According to the anchor rating scale (See Appendix 2) and following the CRM guidelines, in order to determine the stage of each dimension, the score for the sub-dimension were examined. If the sub-dimension scores indicated a mixture of levels, the final level designation was determined by examining the description of all the involved levels choosing the one that best described the combination of sub-
dimension scores.

*University A*

The score of Awareness/Knowledge of Efforts sub-dimension was 67.55%, while the score of the depth in knowledge was 74.74%. The highest score for University A was for the awareness of availability of garbage separation and recycling system, and the availability of trash bins throughout the university. The lowest scores were for the availability of the written or visual littering prevention advertisement, to which they gave it a considerably high score for its effectiveness, and a lesser score for its accessibility. See figure 4 for the graphical illustration of the score of each question in the Community Knowledge of the Efforts dimension.

According to the anchor rating scale (See Appendix 2), the stage of readiness for this dimension was at a 7, Stabilization, for University A. At this stage, many community members have heard of efforts in their universities addressing the littering problem, and are familiar with the purpose of the effort in their universities. Many community members also know the effectiveness of these efforts.
University B

The score of Awareness/Knowledge of Efforts sub-dimension was 61.34%, while the score of the depth in knowledge was 54.95%. The highest score for University B was for the awareness of the lack of littering prevention programs in their university. The lowest scores were for the availability of trash bins throughout the university, as most of them said that they don’t have trash bins. Also, almost half of students were confused about having garbage separation and a recycling system in their university, which resulted in a low score in this question. See figure 5 for the graphical illustration of the score for each question in the Community Knowledge of the Efforts dimension.

According to the anchor rating scale (See Appendix 2), the dimensional stage of readiness for University B was at 5.75, between stage 5, Preparation, and stage 6, Initiation. This was rounded down to the Preparation stage where at least some community members have heard of efforts in their universities addressing the littering problem, are familiar with the purpose of the effort in their universities, and at least some community members know the effectiveness of these efforts.
Dimension 2 - Community Knowledge of Littering Problem

The community knowledge of littering problem dimension was calculated through two sub-dimensions; (a) awareness/knowledge of the issue and (b) depth of knowledge of the issue. The awareness/knowledge of efforts addressed to what extent the students know about the problem itself and how much it occurred in their university. Depth of Knowledge measured if they knew about the effects on the community and its consequences.

University A

The score of Awareness/Knowledge of issue sub-dimension was 79.57% while the score of the depth in knowledge was 64.50%. The highest score for University A was for the awareness of the proportion of people in the university who are littering. They knew that the problem occurs locally in their university among their community members. The lowest scores were how much they know about the effects of litter. See Figure 6 for the graphical illustration of the score of each question in the Community Knowledge of the Littering Problem dimension.

The stage of readiness for this dimension was at a 7, Stabilization, for University A. At this stage, At least some community members know a lot about causes, consequences, signs and symptoms. At least some community members have some knowledge about how much it occurs locally and its effect on the community.
The score of Awareness/Knowledge of Issue sub-dimension for University B was 85.94%, while the score of the Depth in Knowledge sub-dimension was 56.33%. The highest score for University B was for the awareness of the proportion of people in the university who are littering and their knowledge about the effects of litter in general. They knew that the problem occurred locally in their university among their community members. The lowest scores were how much they know about the effects of litter. See figure 7 for the graphical illustration of the score of each question in the Community Knowledge of the Littering Problem dimension.

The difference between the two scores led to a variation in the calculation method of the dimensional stage. According to the anchor rating scale (See Appendix 2) the Awareness/Knowledge of Issue sub-dimension was in stage 8, while the Depth in Knowledge sub-dimension fell within stages 4, 5 and 6. As per the guidelines of the CRM, the scorer can give a score in between two levels in case the two levels are not wholly true and according to the definition of each sub-dimension. Thus, the stage of readiness for this dimension was at a 6.5 (6), Initiation, for University B. At this stage, at least some community members know something about causes,
consequences, signs and symptoms, and at least some community members have some knowledge about how much it occurs locally and its effect on the community.

**Figure 7 University B: Dimension 2 - Community Knowledge of littering Problem**

**Dimension 3 - Community Climate**

The Community Climate dimension measured three sub-dimensions; (a) Concern, (b) Something Should Be Done and (c) Role They Should Play. The Community Climate in general refers to the community’s attitude towards the littering problem. The “Concern” was assessing to what extent the students see the littering as a problem, and if they care about this problem or not. The “Something Should Be Done” refers to how much they think that people in their universities need to stop littering, and the “Role They Should Play” is asking specifically about their responsibilities towards this problem and whom they think should be leading littering prevention efforts. It also went deeper by asking students the type of roles they would play in these prevention efforts.

**University A**

The score of Concern sub-dimension was 71.29%, while the score of Something Should Be Done was 93.86%, and the Role They Should Play was 59.18%. The highest score for University A was for the question on whether they...
thought that people in their university should stop littering. The lowest scores were how much they feel that keeping the community clean isn’t part of their responsibilities. See Figure 8 for the graphical illustration of the score of each question in the Community Climate dimension. Due to the variation between the three percentages, Concern was placed in stage 7 and Something Should Be Done was placed in stage 9, while the Role They Should Play was between stage 5 and 6, according to the anchor rating scale (See Appendix 2). Again as per the guidelines of the CRM, the scorer can give a score in between two levels in case the two levels are not wholly true and determine the stage by the description of all the involved levels. Thus, the stage of readiness for this dimension was at a 6.5 (6), Initiation, for University A. At this stage, at least some community members would play a key role in developing, improving, and/or implementing efforts. Possibly being members of groups or speaking out publicly in favor of efforts, and/or as other types of driving forces.

Figure 8 University A: Dimension 3 - Community Climate

University B
The score of Concern sub-dimension was 70.45%, while the score of Something Should Be Done was 96.94%, and the Role They Should Play was 69.30%. The highest scores for University B were for the questions (a) where they thought that people in their university should stop littering, (b) where they cared of the effects of littering and (c) where they chose leading roles in the littering prevention efforts. The lowest scores were how much they think that people in their universities use trash bins. See figure 9 for the graphical illustration of the score of each question in the Community Climate dimension. Again, due to the variation between the three percentages, the Concern was located in stage 7, and Something Should Be Done was located in stage 9, while the Role They Should Play was at stage 7, according to the anchor rating scale (see appendix 2). Repeating the same methodology to choose the stage that best describes the combination of sub-dimension score, the stage of readiness for this dimension was at a 7.5 (7), Stabilization, for University B. At this stage, At least some community members would play a key role in ensuring or improving the long-term viability of efforts. The attitude in the community is —We will be taking responsibility.
Figure 9 University B: Dimension 3 - Community Climate

Dimension 4 – Resources and Willingness to Participate

The Resources and Willingness to Participate dimension measured two sub-dimensions; (a) Potential Resources, and (b) Willingness to Participate in Littering Prevention Efforts. The Resources and Willingness to Participate refers to the community’s potential resources to support local littering prevention efforts.

The Potential Resources assessed the potential funding, capabilities and personnel in each university to solve the littering problem. The second sub-dimension went deeper by asking them the type of roles they would play using these potential resources in the littering prevention efforts.

University A

The score of Potential Resources sub-dimension for University A was 80%, while the score of Willingness to Participate was 61.40%. The highest score for University A was for asking to what extent there were capabilities available among the members of their university to solve the littering problem. The lowest scores were for the leading roles the students chose to have in the littering prevention efforts. See figure 10 for the graphical illustration of the score of each question in the Resources and Willingness to Participate dimension.
According to the anchor rating scale (See Appendix 2), the stage of readiness for this dimension was at a 7, Stabilization. At this stage, Strong Resources can be obtained and/or allocated to support further efforts to address the littering problem, it is expected that the university will provide stable or continuing support, and many Community Members showed willingness to participate in efforts to address the littering problem.

**University B**

The score of Potential Resources sub-dimension was 62.10% while the score of Willingness to Participate was 83.67%. The highest score for University B was for the leading roles the students chose to have in the littering prevention efforts. The lowest scores were for the available funds that can be allocated from university members to solve littering problem. See figure 11 for the graphical illustration of the score of each question in the Resources and Willingness to Participate dimension.

According to the anchor rating scale (See Appendix 2), the stage of readiness for this dimension was at a 7.2 (7), Stabilization, for University B. At this stage, Strong Resources can be obtained and/or allocated to support further efforts to address the
littering problem, the university is expected to provide stable or continuing support, and many Community Members showed willingness to participate in efforts to address the littering problem.

![Graph showing littering behavior rates](image)

**Figure 11 University B: Dimension 4 - Resources and Willingness to Participate**

### 1.2 Understanding Littering Behavior

**Questions 1: Do they litter?**

This part of the survey assessed students’ littering behavior by asking them four questions about their daily activities in their communities: home, university and when they socialize with their friends. The students were asked about four different behaviors, and they were asked to rate their level of littering behavior by choosing one of these responses: (always, usually, often, once in a while, never). When the respondent chose the first three choices, they were considered littering, but when the respondents chose the last two choices (once in a while, never) they weren’t considered littering.

The overall littering behavior rate among all the students in University A was 21% who littered by any of the four examples of littering offered, however in University B only 11% littered. See figure 12 for the graphical illustration of the difference
between the two universities.

**Figure 12 University A: The average littering behavior for University A and B**

**University A**

The overall littering behavior rate among all the students was 21% who littered by any of the four examples of littering offered. The highest littering behavior was 27% for dropping gum, facial tissue, candy wrappers, paper containers, food or food wrappers on the ground, sidewalk, or street. The lowest littering behavior was 12% for dropping drink cans or bottles on any outdoor areas. See figure 13 for the graphical illustration of Littering Behavior in University A.

**Figure 13 University A: Littering Behavior – Do they litter?**

**University B**
The overall littering behavior rate among all the students was 11% who littered by any of the four examples of littering offered. The highest littering behavior was 16% for leaving paper, food remnants, or other discards at the place where you were eating. The lowest littering behavior was 4% for throwing things out of a car on the street or waterways. See figure 14 for the graphical illustration of Littering Behavior in University B.

**Figure 14 University B: Littering Behavior – Do they litter?**

**Questions 2: Why They Litter**

This part of the survey assessed students’ reasons for littering. They were asked to rate their level of agreement to each one of these reasons (strongly agree, agree, neither agree or disagree, disagree, strongly disagree). Across both universities, the most common reason for littering was that there isn’t a trash bin nearby.

**University A**

The highest scores for University A were for the reasons: (a) there isn’t a trash bin nearby which was the main reason for 56% of total students (b) I didn’t even realize that I had littered (unintentional littering) which was the main reason for 41%
of total students. The next highest two reasons were (c) I don’t feel like picking it up and (d) I don’t have time to dispose of the litter properly. See Table 6 for the detailed score of each question.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I don’t think one piece of trash matters.</td>
<td>14%</td>
</tr>
<tr>
<td>b. I don’t feel like picking it up</td>
<td>21%</td>
</tr>
<tr>
<td>c. I think someone else will pick it up</td>
<td>11%</td>
</tr>
<tr>
<td>d. There isn’t a trash bin nearby.</td>
<td>56%</td>
</tr>
<tr>
<td>e. I didn’t consider the item dropped to be litter.</td>
<td>12%</td>
</tr>
<tr>
<td>f. I don’t have time to dispose of the litter properly.</td>
<td>20%</td>
</tr>
<tr>
<td>g. I don’t care about the effects of litter.</td>
<td>6%</td>
</tr>
<tr>
<td>h. I don't know about the effects of litter.</td>
<td>10%</td>
</tr>
<tr>
<td>i. I didn’t even realize that I had littered (unintentional littering)</td>
<td>41%</td>
</tr>
<tr>
<td>j. I feel like keeping the community clean isn’t my responsibility.</td>
<td>6%</td>
</tr>
</tbody>
</table>

Table 6 The reasons why students litter in University A

University B

The highest score for University B were for the reason that there isn’t a trash bin nearby which was the answer for 38% of total students. Then the second highest reason was (b) I think someone else will pick it up. See Table 7 for the detailed score of each question.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I don’t think one piece of trash matters.</td>
<td>4%</td>
</tr>
<tr>
<td>b. I don’t feel like picking it up</td>
<td>5%</td>
</tr>
<tr>
<td>c. I think someone else will pick it up</td>
<td>13%</td>
</tr>
<tr>
<td>d. There isn’t a trash bin nearby.</td>
<td>38%</td>
</tr>
<tr>
<td>e. I didn’t consider the item dropped to be litter.</td>
<td>1%</td>
</tr>
<tr>
<td>f. I don’t have time to dispose of the litter properly.</td>
<td>6%</td>
</tr>
<tr>
<td>g. I don’t care about the effects of litter.</td>
<td>4%</td>
</tr>
<tr>
<td>h. I don't know about the effects of litter.</td>
<td>10%</td>
</tr>
<tr>
<td>i. I didn’t even realize that I had littered (unintentional littering)</td>
<td>9%</td>
</tr>
<tr>
<td>j. I feel like keeping the community clean isn’t my responsibility.</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 7 The reasons why students litter in University B

Question 3: What are the effects of littering?

This question was assessed under the Community Readiness Assessment in the knowledge of littering problem dimension. Not only is this question important to identify the readiness stage of each university, but also to understand the views of the
student participants regarding the effects of littering on their communities. The question was simply offering numbers of effects of littering and the respondents could choose more than one answer. See figure 15 for the detailed rate of each effect for each university.

*University A*

The highest rates for University A were for the effects: (a) Littering has a negative effect on people’s moods (b) Littering discourages tourists to visit Egypt and (c) Littering puts a financial burden on the government. The lowest rate for University A was that littering increases anti-social behavior. As demonstrated from the CRA analysis, 53% of University A students choose from 4 to 7 littering effects which indicated moderate to high knowledge of littering effects.

*University B*

The highest rates for University B were for the effects: (a) Littering causes health problems (b) Littering has a negative effect on people’s moods and (c) Littering makes my community look ugly. The lowest rate for University B was that littering discourages investors to invest in Egypt. As demonstrated from the CRA analysis, only 33% of University B students choose from 4 to 7 littering effects which indicated moderate knowledge of littering effects.
**Figure 15 University A and B: Effects of Littering**

**Questions 4: What role would students like to play in a littering prevention initiative in their University?**

This question was assessed under the Community Readiness Assessment (CRA), in the Community Climate dimension and Resources. This question was important to identify the readiness stage of each university in both dimensions, but a closer view to the roles of the student participants in littering prevention efforts was also needed. The question was offering numbers of roles that the respondents could choose from. See figure 16 for the detailed rate of each role in each university.

**University A**

The highest roles chosen in University A were; (a) I would like to be a participant in the initiative and (b) Stop littering and recommend it to others. The lowest rate for University A was that they would not be interested in being involved in such an initiative. As demonstrated from the CRA analysis, 61% of University A students chose leading roles in littering prevention initiatives which indicated moderate to high participation.
University B

The highest rate for University B was for the effects; (a) I would like to be a participant in the initiative and (b) I would like to be a participant in the initiative. The lowest rate for University B was that littering discourages investors to invest in Egypt. As demonstrated from the CRA analysis, 83% of University B students chose leading roles in littering prevention initiatives, which indicated high participation.

Figure 16 University A and B: Students’ role in Littering Prevention Initiatives

1.3 Littering Prevention Strategies

This part of the survey asked students about the strategies they thought would be most effective in their universities. They were offered eleven strategies, from which they were asked to choose the most three appropriate strategies.

University A

The highest scores for University A were for the strategies; (a) Do a cleanup campaign (b) Conduct an awareness campaign that links community pride to keeping the community clean (c) Remind people that even a small amount of trash is still
litter. See Table 8 for the detailed score of each question.

| a. Show pictures of what your community/campus would look like if nobody throws litter | 31% |
| b. Publicize that littering is harmful to the environment | 16% |
| c. Conduct an awareness campaign that links community pride to keeping the community clean | 44% |
| d. Remind people that even a small amount of trash is still litter | 40% |
| e. Publicize that littering damages the image of our community | 24% |
| f. Tell people littering is not the right thing to do | 4% |
| g. Do a cleanup campaign | 45% |
| h. Develop a garbage separation and a recycling system as one of the solutions to littering | 32% |
| i. Distribute plastic bags to encourage people to put the litter in the bag | 18% |
| j. Provide incentives or rewards at the personal and the group/organizational level for raising and maintaining litter awareness | 31% |
| k. Have well-known spokespersons, such as politicians or celebrities, to talk about litter prevention | 14% |

Table 8 The most effective strategies chosen by University A’s students

**University B**

The highest score for University A were for the strategies; (a) Do a cleanup campaign (b) Develop a garbage separation and a recycling system as one of the solutions to littering. See Table 9 for the detailed score of each question.

| a. Show pictures of what your community/campus would look like if nobody throws litter | 22% |
| b. Publicize that littering is harmful to the environment | 17% |
| c. Conduct an awareness campaign that links community pride to keeping the community clean | 32% |
| d. Remind people that even a small amount of trash is still litter | 27% |
| e. Publicize that littering damages the image of our community | 15% |
| f. Tell people littering is not the right thing to do | 2% |
| g. Do a cleanup campaign | 45% |
| h. Develop a garbage separation and a recycling system as one of the solutions to littering | 49% |
| i. Distribute plastic bags to encourage people to put the litter in the bag | 32% |
| j. Provide incentives or rewards at the personal and the group/organizational level for raising and maintaining litter awareness | 38% |
| k. Have well-known spokespersons, such as politicians or celebrities, to talk about litter prevention | 6% |

Table 9 The most effective strategies chosen by University B students

### 1.4 Sense of Community

This part of questions was assessing the sense of ownership of the students to their universities and their sense of pride and community cohesion. They were offered seven questions to understand the relationship between the students and their
universities and they were asked to rate their level of agreement to each one of these reasons (strongly agree, agree, neither agree or disagree, disagree, strongly disagree).

Across both universities, most of the students in both universities felt good because they are part of their universities.

*University A*

Most of the students in University A agreed on all the questions as seen in figure 17, only few of them felt they have influence over what their university is like.

See figure 17 for the detailed score of each question.

*Figure 17 Sense of Community in University A*

*University B*

University B only agreed on 4 questions, they were different than university A, as more than 40% of the students felt they had influence over what is their university is like. However, very few of them felt that their university had been successful in getting their needs met. Furthermore, more than 20% of student only felt home at their universities. See figure 18 for the detailed score of each question.
Figure 18 Sense of Community in University B
Chapter Five: Discussion

This study was pursued to answer three research questions. First, do Egyptian youth in universities A and B litter? Why do they litter? Second, if they litter, are they ready to change their littering behavior? Finally, what are the littering prevention strategies and anti-littering interventions that could be developed to implement change in an Egyptian university context?

The Overall Stages of Readiness for University A and B

As discussed before, this study has used the CRM anchor rating scale with a slight modification to some of their stages. Each dimension in the CRM scale has nine stages that define each stage. Furthermore, these decisions are broad and the differences between each stage are not clear in their differentiation. Therefore, some stages overlay one another, which caused some uncertainty in the process of modifying the scale to percentages and while calculating the percentages of some of the stages. In addition to that, in the calculation phase, CRM recommended to round down the stages whether in calculating the dimensions or the overall stage, this resulted in that both universities might have different calculations in each sub-dimension but it ended up to be at the same stage.

The new modified CRM anchor rating scale is based on percentages to differentiate between statements, so some dimensions were barely meeting the percentage but they ended up in the next stage. Therefore, in some cases, the rounding down policy was used to maintain the calculations with the right statements. Despite the differences in the dimension results between University A and University B, and the differences in the availability of littering prevention efforts, the two universities are in the same overall stage of readiness. Both universities are at the “Initiation” stage of readiness to solve littering behaviors in their campuses. To be
identified as in this stage, “Enough information is available to justify efforts (activities, actions, or policies). An activity or action has been started and is underway, but it is still viewed as a new effort. Staff is in training or has just finished training. There may be great enthusiasm among the leaders because limitations and problems have not yet been experienced. Community climate can vary, but there is usually no active resistance (except, possibly, from a small group of extremists), and there is often a modest involvement of community members in the efforts” (Edwards et al., 2000).

There are a number of factors that could be the reason why both universities have the same readiness stage despite the differences between them in almost all aspects of this study. First, as described in Table 4, the calculated score for the readiness stage of each University is that University A was at a higher stage than University B in the Community Knowledge of Littering Prevention Efforts and Knowledge of Littering Problem. However, University B was at a higher stage than University A in the Community Climate and Resources and willingness to participate dimensions. These discrepancies between the two universities led to almost a balance when the overall stage of readiness was calculated. In addition, both universities were almost similar in the Resources and Willingness to Participate dimension, which also helped the scores to come together.

According to the definition of the initiation stage, the students in both universities have at least a basic knowledge about the littering prevention efforts in their campuses (Oetting et al., 2014). Students in University A have basic information about the availability of littering prevention efforts, and also the students of University B know that their university is lacking littering prevention efforts.

A second aspect of the initiation stage is that littering prevention activities or
actions are underway, but it is still viewed as a new effort (Edwards et al., 2000).

According to the information received from the professors in University A, the university has a couple of activities that are running such as having trash receptacles throughout the university and garbage separation and recycling systems. University A also had anti-littering advertisements throughout classes in Spring 2015 by one of the student clubs in the university but didn’t have any littering prevention programs or events prior to this. On the other hand, University B had only one activity, which was having a trash receptacle throughout the university, according to the professors in University B. These activities can be viewed as new efforts.

Another characteristic of this stage is that community members have basic knowledge about the littering problem and its effects on the community. They are also aware that there is a littering problem in their campuses (Oetting et al., 2014). At this stage, some students would play a key role in planning, developing and/or implementing new, modified, or increased littering prevention efforts. Resources can be obtained and/or allocated to support further efforts to address the littering problem and some students are willing to support these efforts but it is considered a modest involvement (Edwards et al., 2000; Kelly et al., 2003). Their slogan at this stage is “This is our responsibility; we are now beginning to do something to address this issue” (Oetting et al., 2014).

**Dimensional Results**

After defining the readiness stage, a set of broad goals and are developed in order to help the communities to move to the next stage of readiness through planning and developing their own prevention programs (Edwards et al., 2000). It is important to use the details of each dimension discussing the similarities and differences between the two universities to develop more effective littering prevention strategies.
that are appropriate to each community’s culture and needs. Identifying the gaps in community resources can help the community select a prevention program that is most appropriate to their needs and fills the gap in their resources (Stith, et al., 2006).

**Dimension 1 - Community Knowledge of littering Prevention efforts**

It is clear from the stage of readiness of each university that there is a two level difference between them on this dimension. University A was at the stabilization stage while University B was at the preparation stage. University A was confident about the availability of the garbage separation and recycling system and the trash receptacles throughout the university, as these two activities are continuously running in University A. The knowledge and awareness of these two activities received high scores which confirmed what was reported by University A’s professors. However, in terms of the availability of the anti-littering advertisements, they were confused, perhaps because the advertising was not available in all classes, or because students did not pay attention to the advertising.

University A students were also confused about the availability of littering prevention programs in their university, as only 63% knew that they didn’t have such programs. However, in University B, most of the students were aware that they didn’t have any littering prevention programs. Similar to University A, the students in University B were confused about the availability of the anti-littering advertisement, in spite the fact that they didn’t have any advertisement according to the professors of University B. However, there might have been small initiatives in the university that the professors didn’t know about.

Both universities were also similar in the discrepancies found between the questions of the availability of an anti-littering advertisements and how effective it was. Both universities received low scores (46% and 47%) in the availability, but they
both received high scores in the effectiveness of the advertisement (76% and 80%), which endorses the fact they were confused. In all cases, it appears that both universities are in need of a more accessible and effective anti-littering advertisement program.

The explanation behind the low score of University B in this dimension was due to the questions related to the availability of trash receptacles throughout the university and the availability of garbage separation and recycling system. Only 22.62% confirmed the availability of trash receptacles and 46.24% denied the fact that the university has a garbage separation and recycling system. They may have received a low score in the trash receptacles due to the problematic design of the question which asked about the trash receptacles and recycling receptacles at the same time or it could be a problem in the design of the bins (location, size, signage, etc.). As this dimension focused on assessing the knowledge and awareness of the existing littering prevention efforts, it is recommended when planning to implement anti littering activities in both universities to consider focusing on reaching out more to the students.

**Dimension 2 - Community Knowledge of the Littering Problem**

The difference between the two universities in this dimension is very small. However, the CRM’s policy of rounding down the scores led to locating them into two different stages of readiness. University A was at the stabilization stage of readiness, while University B was at the initiation stage. The similarities between both universities were in the parts of their knowledge about how much the problem occurs in their universities. Their responses to this question confirmed that littering is a problem at both universities. University A thinks 48% of them litter (from all to half of the population), and University B thinks that 50% of their populations litter (same
Although both universities were close in their perception to the littering problem in each of their universities, they were different in terms of their knowledge of the littering effects on their communities. University A had medium knowledge, as 53% of them chose from 4 to 7 effects of littering. However, University B had low level of knowledge as only 32.65% knew about the effects of littering. As demonstrated in the effects section of the understanding littering behavior result, the higher scores of the effects chosen by University A were for “Littering discourages tourists to visit Egypt” and “Littering has a negative effect on people’s moods”. Most probably, the reasoning behind the first effect, that University A usually recruits foreign students to study in their university, and they must have faced these arguments before while encountering their foreign colleagues. The second effect is probably what littering affecting their mood when they see litter scattered around their campuses and neighborhoods. University B’s higher responses were for “Littering causes health problems” and “Littering has a negative effect on people’s moods”. Their first choice indicated that their understanding of the problem has gone beyond the littering effect on them personally. Both universities are in need for education about littering effects and the consequences they might have on their communities and their lives, which will be a motivation for them to seek change.

**Dimension 3 - Community Climate**

Unlike the last two dimensions, where University A was at a higher stage than University B, in this dimension, University B was at a higher stage than University A. University A was at the initiation stage of readiness, while University B was at the stabilization stage. The similarities between both universities lie in the fact that they both reported that they cared about the effects of littering and that something should
be done about the littering problem in their universities. They both think that people in their universities need to stop littering to solve this problem. Their responses to this question confirmed that they have a high concern towards the littering and that something needs to be done to solve this problem. However, a discrepancy was that only 43% of University A’s students reported that keeping the community clean is part of their responsibilities and only 61% reported wanting to take a leading role in littering prevention efforts. At University B, 63% reported that keeping the community clean is part of their responsibilities, and 84% of all the students reported that they would choose leading roles in littering prevention efforts. These differences were reflected in the fact that rates of littering a University A were considerably higher (21%) than at University B (11%).

An anti-littering campaign in University A might need to focus on building the individual’s responsibility within their local communities, including their university, towards the littering problem. In both universities, there is a need to identify the different roles each community member should play in changing the littering profile in the community.

University B was in a high position in terms of the previously discussed discrepancies. Despite the fact that their scores were not that high in feeling responsible of keeping the community roles, they showed higher initiation than University A in taking leading roles in littering prevention efforts in their university. Immediate littering prevention programs should be started in University B to recruit those students ready to participate in these initiatives.

**Dimension 4 – Resources and Willingness to Participate**

Both universities in this dimension were at the Stabilization stage of readiness. University A students reported higher potential resources to solve littering problems
than in University B students. In both universities, the higher scores were for capabilities and then volunteers, and the lowest scores were for donations. According to the CRM’s description for this stage, both communities have strong resources that can be allocated (Williams et al., 1997) to support further efforts to address the littering problem and are expected to provide stable or continuing support. In addition to that, the students themselves showed willingness to participate in efforts to address the littering problem.

Understanding Littering Behavior

1.1 Litter Objects

The student participants of this study were asked to report their specific littering behavior in the past month during their daily activities at their community. Understanding the type of object littered is important to help the study in recommending the appropriate littering prevention strategy (Williams et al., 1997). Dropping gum, facial tissue, candy wrappers, paper containers, food or food wrappers on the ground, sidewalks and streets, was the most popular response among students in both universities. Zero Waste Scotland reported that what ‘counts’ as litter is one of the drivers of littering behavior, as there is always confusion about what counts as litter in terms of context (Lyndhurst, 2012). Research has found that people who litter gum do not consider dropping gums as littering (as cited in Lyndhurst, 2012). The other options mentioned in the same question, which received the highest score in litter included facial tissue and candy wrappers. These objects are small items, where another research was done for Keep Wales Tidy in UK found in a focus group that people tend to litter smaller items but in the mean time they bin larger ones (as cited in Lyndhurst, 2012). Developing a littering prevention strategy and programs focusing on the object that is being littered as gum for example, is an approach to
educate people who might not be aware about how harmful it can be to litter a gum. A study, which was done by ENCAMS (the Keep Britain Tidy campaign), has reported that the one-day cleaning up for chewing gums in the town center in United Kingdom cost about £25,000 in 2004 (The Environmental Audit Committee, 2004). Anti-littering campaigns focusing on preventing gum littering are available online and on YouTube.

1.1.1 Why They Litter

Previous research has put much effort to explain why people litter to understand the behavior factors that lead people to litter so it can be used to develop anti-littering prevention based on this understanding (National Environment Agency, 2011). This study used some of the reasons mentioned in previous research and asked the students if they littered what were the reasons for their action. The most popular responses for both universities were the lack of trash bins near them. This is somewhat surprising as in University A, 87% of the students agreed that there are trash bins throughout their university and 72% of the students also reported that people in their university use trash bins. However, 56% of the students report that the reason behind their littering attitude is the lack of nearby trash bins. Their response could be based on answering the question behind their littering behavior, which was asking about their reasons of littering in general, no specifically in their universities. Laziness was among the major reasons for littering and barriers to proper disposal in previous research (Levin, 2006; Lyndhurst, 2012). What motivates people to litter in this case is that laziness keeps them from going to the bins while having the desire to get rid of the litter as quickly as possible because they consider it unpleasant to keep (Lyndhurst, 2012). While laziness was not offered as a reason in the present study, a study conducted by Understanding Littering Behavior in Australia in different found
that 'laziness' and 'no bin nearby' reasons were grouped together when people admitted littering at some point in their lives (Williams et al., 1997). Laziness as one of the personal factors that influences littering behavior should be targeted in the planning for littering prevention strategies. Anti-littering interventions based on decreasing the distance between trash bins to encourage people to dispose their litters in the bins could be also one of the successful strategies (Sibley & Liu, 2003) but considerably more expensive and unsightly. Laziness factor might be considered in future research to know if it was among the reasons younger people are littering.

1.1.2 Strategies

The third question of this study asked “what are the littering prevention strategies and anti-littering interventions that could be developed to implement change in an Egyptian university context?” Based on the result of this assessment, we now understand the existing level of knowledge, beliefs, awareness and social norms regarding the littering problem in both universities. To design littering interventions we can integrate the knowledge gained from the Community Readiness Model (CRM), the responses of the students when they were asked about the best strategies for their universities, and the Community-Based Social Marketing (CBSM) framework. The CRM suggests strategies targeted to the stage of initiation, while the CBSM suggests specific tools to the specific barriers and benefits found in both universities.

1.1.3 CRM Strategy Structure

The CRM model suggests generic strategies that can be adopted to fit any community’s local conditions (Edwards et al., 2000). It provides each stage of community readiness with a general goal for strategies and some ideas on how to translate this goal into actions and intervention programs to be implemented in the
community (Hull et al., 2008). According to the CRM handbook developed by Oetting et al. (2014), this goal should be accomplished within 3-5 years to move the community to the next stage of readiness (See Appendix 4).

The overall stage of readiness for both universities was “initiation”, which falls under the “Intermediate Stages” group, according to Kelly et al. (2003). The strategies for this intermediate stage should support the community to do specific actions to achieve their goals, for example, through organizing events that help gain public support. In addition, the CRM handbook, defined the goal of the “Initiation” stage to “provide community specific information”. It is recommended then that both universities maintain and enhance the existing littering prevention programs and continue to plan for other programs in order to provide the students with the information that they lack regarding littering effects and efforts in each university.

1.1.4 CBSM Strategy Structure

McKenzie-Mohr (2013) has revisited the CBSM framework as illustrated in Table 10.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of Motivation</td>
<td>Commitment, Norms, Incentives</td>
</tr>
<tr>
<td>Forget</td>
<td>Prompts</td>
</tr>
<tr>
<td>Lack of Social Pressure</td>
<td>Norms</td>
</tr>
<tr>
<td>Lack of Knowledge</td>
<td>Communication, Social Diffusion</td>
</tr>
<tr>
<td>Inconvenient</td>
<td>Change program structure (convenience)</td>
</tr>
</tbody>
</table>

*Table 10 CBSM Framework to Select Behavior-Change Tools Based on Barriers*
1.1.5 **CBSM Strategy for both universities**

Based on the assessment, barriers to changing littering behavior were identified in both universities, and then CBSM strategies were selected for targeting these barriers (see Table 1). The results of each university are provided to help key leaders to choose which tool they see appropriate into their communities.

<table>
<thead>
<tr>
<th>The Reasons why students litter</th>
<th>University A</th>
<th>University B</th>
<th>CBSM Barriers</th>
<th>CBSM Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t think one piece of trash matters</td>
<td>14%</td>
<td>4%</td>
<td>Lack of Motivation</td>
<td>Commitment, Norms, Incentives</td>
</tr>
<tr>
<td>I don’t feel like picking it up</td>
<td>21%</td>
<td>5%</td>
<td>Lack of Social Pressure</td>
<td>Norms</td>
</tr>
<tr>
<td>I think someone else will pick it up.</td>
<td>11%</td>
<td>13%</td>
<td>Lack of Social Pressure</td>
<td>Norms</td>
</tr>
<tr>
<td>There isn’t a trash bin nearby</td>
<td>56%</td>
<td>38%</td>
<td>Inconvenient</td>
<td>Change program structure (convenience)</td>
</tr>
<tr>
<td>I didn’t consider the item dropped to be litter</td>
<td>12%</td>
<td>1%</td>
<td>Lack of Knowledge</td>
<td>Communication, Social Diffusion</td>
</tr>
<tr>
<td>I don’t have time to dispose of the litter properly</td>
<td>20%</td>
<td>6%</td>
<td>Lack of Motivation</td>
<td>Commitment, Norms, Incentives</td>
</tr>
<tr>
<td>I don’t care about the effects of litter</td>
<td>6%</td>
<td>4%</td>
<td>Lack of Knowledge, Lack of Social Pressure</td>
<td>Communication, Social Diffusion, Norms</td>
</tr>
<tr>
<td>I don't know about the effects of litter</td>
<td>10%</td>
<td>10%</td>
<td>Lack of Knowledge</td>
<td>Communication, Social Diffusion</td>
</tr>
<tr>
<td>I didn’t even realize that I littered (unintentional)</td>
<td>41%</td>
<td>9%</td>
<td>Forget</td>
<td>Prompts</td>
</tr>
</tbody>
</table>
I feel like keeping the community clean isn’t my responsibility | 6% | 4% | Lack of Motivation, Lack of Social Pressure | Norms

Table 11 Selecting Behavior-Change Tools using CBSM Framework Based on Barriers Found in Both Universities

In order to motivate students to not litter, the universities can use the benefits of not littering identified in the survey. The benefits of not littering listed by the students in order of the highest responses across both universities are: 1) Better health benefits, 2) Encourage tourists to visit Egypt, 3) Positive impact on people’s mood, 4) Community will look more beautiful, 5) Remove the financial burden on the government, 6) Encourage investors to invest in Egypt and 7) Decrease the anti-social behavior among people.

In addition to designing littering prevention strategies based on barriers and benefits, the strategies identified by students on the survey can be utilized. Table 12 presents these strategies and associates them with CBSM tools to change the desired behavior.

The suggested strategies by students

<table>
<thead>
<tr>
<th>University A</th>
<th>University B</th>
<th>CBSM Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Show pictures of what your community/campus would look like if nobody throws litter</td>
<td>31%</td>
<td>22%</td>
</tr>
<tr>
<td>Publicize that littering is harmful to the environment</td>
<td>16%</td>
<td>17%</td>
</tr>
<tr>
<td>Conduct an awareness campaign that links community pride to</td>
<td>44%</td>
<td>32%</td>
</tr>
<tr>
<td>Keeping the Community Clean</td>
<td>Remind People that Even a Small Amount of Trash is Still Litter</td>
<td>40%</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Publicize That Littering Damages the Image of Our Community</td>
<td></td>
<td>24%</td>
</tr>
<tr>
<td>Tell People Littering Is Not the Right Thing to Do</td>
<td></td>
<td>4%</td>
</tr>
<tr>
<td>Do a Cleanup Campaign</td>
<td></td>
<td>45%</td>
</tr>
<tr>
<td>Develop a Garbage Separation and a Recycling System as One of the Solutions to Littering</td>
<td></td>
<td>32%</td>
</tr>
<tr>
<td>Distribute Plastic Bags to Encourage People to Put the Litter in the Bag</td>
<td></td>
<td>18%</td>
</tr>
<tr>
<td>Provide Incentives or Rewards at the Personal and the Group/Organizational Level for Raising and Maintaining Litter Awareness</td>
<td></td>
<td>31%</td>
</tr>
<tr>
<td>Have Well-Known Spokespersons, Such as Politicians or Celebrities, to Talk About Litter Prevention</td>
<td></td>
<td>14%</td>
</tr>
</tbody>
</table>

Table 12 Selecting Behavior-Change Tools using CBSM Framework Based on Strategies Suggested by Students in Both Universities

**Recommended Strategies for University A and University B**

**1.1 Strategies to Address Lack of Knowledge**

The Community-Based Social Marketing framework (CBSM) suggests using
communication and social diffusion to tackle the lack of knowledge problem (McKenzie-Mohr, 2013). Focus groups, outreach, environmental education, and meetings are ways to implement these strategies.

Figure 19 Strategies to Address Lack of Knowledge

1.1.1 Focus Groups/Meetings

Focus groups are needed to inform key leaders in each university about the results of this study and the recommendations to improve littering around each campus. It is important to include some of the students who are taking leading roles in university clubs in order for them to work on specific strategies to tackle the littering prevention programs. One of the outcomes of the focus groups could be the recognition that there is a need for additional data collection in order to gather more information about the littering problem in the university.

It is also important to conduct meetings with the university administration to discuss the recommendations of the research, the specific strategies suggested by the focus groups and to seek their support. They could be one of the speakers in any of the events or presentations that will be conducted in the university to endorse the anti-
littering activities. It is recommended also to schedule meetings periodically with the university administration to provide them with updates on progress of the efforts.

1.1.2 Educational outreach programs

According to the results of this study, many of the students were not aware of the existing efforts in the university to prevent litter. Therefore, it is important to educate students about existing and future efforts to reduce litter and to seek their cooperation and support for these efforts. Educational outreach programs should target university key leaders, staff and administration, and students to educate them on the littering problem in the university, its causes, consequences, effects on health, environment and on the community. Previous research/interventions has indicated that presentation and group discussions a few minutes before or after class time were successful to persuade students and professors to turn off classroom lights when they leave empty classrooms after each class (Werner et al., 2012). Werner et al. (2008) also found that education in the form of group discussions was more effective than a lecture form especially if the topic of the discussion was to guide the recipients toward attitude and behavior change.

Presentation and group discussions can also reach out to students through their social network hubs in the university. Social networks in the universities usually gather students who are most likely to have the same interests and/or same life styles. Social networks are a good opportunity to involve students to be engaged in littering prevention initiatives. These social networks can also make use of social diffusion (McKenzie-Mohr, 2013). Thus, if one or two persons were encouraged to participate in joining the cause and make the desired behavior visible, others most likely will be influenced and will join too. In an study to understand change in littering behavior in a school social network, Long et al. (2014) confirmed that friends’ influence each
other’s behavior as many of his focus groups’ participants reported that they were less motivated to put their waste in the bin when they noticed that other friends in the group littered. Using popular persons to influence a group has been found effective in changing a desired behavior in the group (Stead et al., 2006, Long et al. 2014). Leijdekkers et al. (2015) suggested that in order for littering prevention programs to succeed, program designers let the group participants choose their own group leader so that the program designers can position him as a role model, where he can influence the rest of the group by his behavior.

Some of the students surveyed felt that allowing a well-known spokespersons such as politicians or celebrities talk about litter prevention is an effective strategy to reduce litter, and this strategy has been employed in Egypt. For example, the UNDP has used Omar Samra who is an influential person to youth in the field of mountain climbing and adventurous activities to lead a Clean-up event in 2014. The event promoted the idea that it is the responsibility of everyone to preserve and keep the natural environment clean (UNDP Egypt, Clean-up & Hike in Wadi Degla with Omar Samra, 2014).

1.1.3 Outdoors Environmental Education

Among the effects of littering are the consequences that littering has on the environment in addition to making communities looks ugly, and having a direct impact on people’s wellness and moods. These effects received the fewest scores from the students in both universities, which shows their lack of knowledge. Hence it is very important to include the impact of littering on them and on the community in the message that will be developed in the various communication channels tools discussed later. Leijdekkers et al. (2015) suggested providing outdoors environmental education to create a more positive attitude and build an appreciation of the
environment. Informal education in the form of excursions or one-day trips that may include fun activities in natural or community settings that may help build understanding of the importance of keeping the environment litter-free.

Littering as one of the environmental problems that should be educated to you at earlier stages when they are children, although this study have different target audiences, but one of the activities that could be suggested is for students to organize outdoor environmental education activities for children in the summer where they can educate them about littering problem and the effects of littering on their communities. This activity can help the students to feel responsible and be a role model to the children and also will be helpful to the children to grow up knowing that littering is undesired behavior.

1.1.4 Training for University staff

Training for University staff is one of the CRM’s suggested strategies for the “initiative” stage of readiness where both universities are. It is important to empower the staff and administration in the university with knowledge about the effects of consequences of littering and about the nature of the problem in the university. The CRM handbook developed by Oetting et al. (2014), suggests providing training to the staff on conducting the Community Readiness assessment in order to make sure that the intervention which will be conducted in the university helps to move the university from the “initiation” stage to the following stage which is the “Stabilization” stage and so on. The training should help the staff to be a role model to students in adopting the anti-littering behavior. In addition to that they may participate in the planning of the littering prevention program in the university, which can reinforce ownership of this program, and also ensure its sustainability. The faculty (professors) of both universities can be informed about the exiting efforts to
prevent littering in the university so that they can talk to the students during classes about the program and encourage them to participate.

1.1.5 Communication tools and Creating Effective and Relevant Messages

There are a numbers of tools suggested by Lee & Kotler (2011) in their original framework of social marketing to be used to develop a strong communication plan in order to promote the desired behavior according to the context of each program (university) and its target audience (students). The following are a list of some of the tools that can be relevant to the student’s lives in the university. See Appendix 5 for the full list.

1) Public Relations and special events (Stories on TV and Radio/ Articles in Newspapers and Magazines/ Public Affairs and Community Relations/ Videos/Media Advocacy/Conferences/Exhibits/Meetings)

2) Printing materials (flyers/brochures/posters/stickers)

3) Special Promotional Items (Clothing and functional items)

4) Personal Selling (face-to-face meetings/ presentations/ training sessions)

5) Social Media (Facebook/Twitter/Youtube videos/Mobile applications)

6) Website (Banner ads/Links)

7) Entertainment Media (Video games/Public art)
In order to use any of the communication tools mentioned earlier effectively, the messages have to be designed carefully and to address misconceptions and lack of knowledge. Messages should also be consistent with the stage of readiness of each dimension. Therefore, the following are key points that need to be taken into consideration while developing the anti-littering campaigns messages:

- Address male and female students together.
- Define litter objects and educate students about the items that are considered litter such as gum, facial tissues and cigarette butts.
- Make it clear that unintentional littering is still considered littering, and recognize that littering behavior often occurs while the person is not aware of the littering action.
- Publicize the littering behavior types conducted by students from this study’s result so that they can be aware of their actions.
- Increase the knowledge about the effects of litter and its consequences on the environment, health, well-being, etc. (Kingdom House, 2016).
- Link the community pride to keeping the university clean. Focus on their good
feelings to be part of their universities.

- Point out that students can have an influence over their university and how it looks like (especially with University B).
- Develop a culture of personal and collective responsibility towards a litter free university.
- Promote that the university is like the students’ home to urge them to keep their university clean as much they do their houses.
- Encourage recycling as one of the solutions to the littering problem and promote using the recycling bins in the university (especially University A). Educate them about the value of every unwanted item and it can be reused in another way.
- Promote picking up litter and how it can make the person feels good about himself and about the place they have cleaned (Barnes, 2008).
- Promote that disposing litter properly doesn’t take much time off their schedule compare to the time and effort that will be put into cleaning the litter.
- Promote that littering increases anti-social behavior among people living in the same community (as cited in Durdan et al., 1985).
- Promote that littering makes the university ugly and emphasize the importance of the beautification of their community. Encourage students to help to collect litter to make their university a more beautiful place.
- Promote that littering is one of the reasons that discourages tourists in Egypt (Kingdom House, 2016).
- Promote that littering puts more financial burden on the university and on the government to clean their neighborhood (Zero Waste Scotland, 2013).
- Show images before and after a class, the first one when it is clean and the second one after leaving litter around the class.
Many studies and national campaigns around the world emphasize on the way the anti-littering message should be written to be effective in preventing litter. Therefore, the following recommendations are to be put into consideration when developing anti-littering messages that will be used in anti-littering campaigns inside the university:

- Present the message vividly to capture the attention of the students and persuade them to stop littering (McKenzie-Mohr, 2013).

- Present the message simply to make it easy for students to remember it (McKenzie-Mohr, 2013).

- Make the message more personalized using the students’ views of the littering problem found in the results. An example of one the interventions was addressing one of the reasons behind littering which was “someone else will clean it”, they used the slogan “If not you, who? (It’s the right thing to do)” (as cited in Leijdekkers et al. 2015). A story featuring one of the cleaning workers (janitors) working hard to clean up the litter daily could be on the message communicated to the students to persuade them to reduce litter.

- Use credible sources to deliver the message or to lead the littering prevention program if possible, in order to have more influence on the students and persuade them to stop littering (McKenzie-Mohr, 2013). Every university should look carefully for credible sources who might be leaders of students clubs, professor whom students look up to, or senior administration who always keep their words with students or university alumni who became successful or celebrities in the community.

- Make the message more tailored to the students using their interests, as the promotion of behavior among youth should be built on fun and cool activities (Prestin & Pearce, 2010). In addition to that, color in printing media and sounds in media
communication should be designed based on youth’s preferences (McKenzie-Mohr, 2013).

- Publicize positive information (Prestin & Pearce, 2010). For example provide information about the high percentage of people who are not littering and show that few people are littering and that the message reader should be one of the non-littering people.

- Avoid preaching students to stop littering and write the messages in a way to involve them in the campaign (Prestin & Pearce, 2010). In the present study, very few students chose the strategy where students should be told that littering is not the right thing to do (4% in University A and 2% in University B).

- Highlight the personal connection between the students’ behaviors as individuals and the global environment (Prestin & Pearce, 2010) if they decided to cooperate and save the environment by not littering.

- Provide personal or university goals to reduce littering (McKenzie-Mohr, 2013) that can be combined with recycling goals. Announce the goals in the campaign’s promotional materials.

- Provide feedback and information regarding the results of the littering prevention program conducted in the university and focus on the impact of the anti-littering behavior on the university, the individuals and the environment (McKenzie-Mohr, 2013).

- Mix between “Gain” messages and “Loss” messages, whether to highlight the positive outcomes students will gain if they stopped littering and/or approach them by focusing on what they will lose if they don’t adopt the behavior. For example, a message may say “If you littered, we will live in an ugly place” or “If you didn’t litter, you will save the environment”.
1.2 Strategies to Address Lack of Motivation

The Community-Based Social Marketing framework (CBSM) suggests using the following tools 1) Commitment 2) Social Norms 3) Incentives to tackle the lack of Motivation problem (McKenzie-Mohr, 2013).

1.2.1 Group Written and Public Commitments

Commitments are one of the tools advised by the CBSM framework and other researchers in the behavior change field. McKenzie-Mohr (2013) highlighted the research finding that individuals who fulfill small requests are more likely to fulfill large requests. He also suggested that providing people with convenient opportunities to be engaged in sustainable behaviors would help them to alter their beliefs and shape their attitudes (McKenzie-Mohr, 2013). Since a high percentage of both universities showed interest in participating in littering prevention initiatives, an immediate plan for engaging those students to take an active role in small and large littering prevention initiatives is important and would be a key role in the success of these interventions in each university.

![Figure 21 Strategies to Address Lack of Motivation]

Research has shown that group commitments and how much the group is involved in the community influence the littering behavior among the group (McKenzie-Mohr, 2013 & Leijdekkers et al., 2015). Therefore asking for written and
public commitments from student groups during motivational presentations and group discussions is likely to be helpful. These commitments will involve students and give them a feeling of responsibility for their actions. Students’ permission can be sought to make these commitments public in order to have a stronger impact. According to McKenzie-Mohr (2013) making public announcements makes participants honor their commitments more. This should also help making the desired behavior become normal, which will hopefully encourage other students to follow suit, making it a social norm not to litter.

1.2.2 Clean-Ups

“Clean up” was among the high scored strategies suggested by the students of this study. It is also one of the common activities for littering prevention. For example, Roales-Nieto (1988) found that involving citizens in community clean-up activities increased their motivation not to litter during the duration of his study, and also it changed their behavior on the long-term. Organizing Clean Up Days to clean up the litter on campus and/or the neighborhood should be helpful in both universities. This activity can attract the local media to cover youth Clean-Up events which will help to spread the word about anti-littering prevention activities. Additionally, using social networks to promote the events will also help to encourage the desired behavior among students and their friends who would like to join the activity.

McKenzie-Mohr (2013) suggested combining commitment along with the social diffusion to induce more students to embrace the desired behavior. A verbal commitment can be sought during the Clean-up activity and advertised by the social media or can be documented to be used in developing promotional materials inside the university. Several ideas can be drawn out of the focus groups on how to
implement this. For example choosing a particular day to clean up the university, or clean up classes after the end of the day. Cleaning up the neighborhood can influence both the students as being role models to the neighborhood community or change agents. Also it can have a direct impact on the community residents themselves by following the students’ behavior in keeping their community clean after the clean-up day.

In a report written for the “Clean Up Britain”, it was suggested to organize a clean-up day dedicated only to one type of litter such as cigarette butts or chewing gum. Although it might seem as a limited idea with limited impact but the researchers suggested it would have a greater long-term impact on changing littering behavior among a target audience as it makes the message simple and specific (Kolodko et al., 2016).

1.2.3 Litter Bags

Another activity which can support to establish the anti-littering norm in both universities is distributing litterbags to students or create litterbag hangers around the university. Students in the present study suggested distributing plastic bags to encourage people to put the litter in the bag instead of throwing it away, and an earlier study showed that the use of litterbags with other tools in an intervention program to dispose litter properly has an impact on reducing litter (As cited in Leijdekkers et al. (2015).

1.2.4 Incentives

Monetary and non-monetary incentives are recommended to be used as a tool to encourage people to perform a desired behavior when the motivation is low (McKenzie-Mohr, 2013; Huffman et al., 1995). The incentives can be in different forms according to the context of the littering prevention intervention and according
to the audience. It can be through providing financial rewards, which might be effective but not sustainable (McKenzie-Mohr, 2013). Other examples could be like verbal rewards, food coupons, privileges etc. When combined with other tactics, incentives have been found to be especially effective (Leijdekkers et al. 2015). As monetary incentives can be expensive especially if implemented with large number of people, littering prevention program developers in the university should look into ways to reduce the cost of incentives in both universities. For example, Heyman & Ariely (2004) found that people find that a chocolate bar as rewarding as money. Finding local sponsors who can give out food or drink coupons as incentives to reduce litter might be a good opportunity to lower costs. Another way is to put verbal rewards on notice boards where all students can see and read for example that some group is being recognized for keeping their classroom litter free.

It is important also to know when to give out these incentives. McKenzie-Mohr (2013) recommends pairing the incentive with the desired behavior and make it visible. Providing incentives as a prize in a competition between classes for the cleanest classroom might be effective and low cost. Inspectors can visit classes in specific buildings after each class ends to count the number of litter objects left out around the class and put scores accordingly.

1.3 Prompts to Address Forget

Verbal or visual prompts are tools to remind people of activities that they usually believe in and do but sometimes they tend to forget. Prompts are like slogans that explicitly promote specific behaviors and preferably should be put next to the locations where the targeted behavior is occurring (McKenzie-Mohr, 2013; Whitehair et al., 2013).
Simple, noticeable and self-explanatory signs encouraging students not to litter, should be located beside the university’s food courts and kiosks where they buy food and drinks to remind them at the time of purchase. If they believe that littering is not a good behavior, then most probably they will follow the request without giving much thought. Prompts to remember to recycle also can be efficient in the case of University A, where they have already installed bins of recycling, so these prompts can serve as promotional signs to remind them with the exiting service so that they can use it efficiently.

1.4 Norms to Address Lack of Social Pressure

The social norm is an important tool to use to influence behavior by showing them in a creative way what other people do. The researcher recommends developing programs in both universities that make anti-littering become a social norm. The previously recommended activities in the lack of motivation tools, clean ups and litterbags activities can help indirectly shape a new norm among students in both universities and their surrounded communities by not littering or engaging in anti-littering activities.
1.4.1 Developing anti-littering social pressure

Kolodko et al. (2016) suggest starting littering prevention interventions that target the people who litter occasionally because they might litter due to circumstances and might be ashamed of their behavior. They believe that those litterers are more ready to change their behaviors and they can have an influence over heavy litterers when they see that the littering behavior becomes socially unacceptable and abnormal. Since many of the university students in the present study appeared to be occasional litterers, this would seem to be an especially effective tool.

1.5 Strategies to Address Inconvenience
1.5.1 More Trash Bins and Creative Bin Designs

Without addressing the external barriers for changing the desired behavior, the other CBSM tools would be less effective (McKenzie-Mohr, 2013). “There isn’t a trash bin nearby” was the most common answer when students were asked why they littered in both universities. This may not have been accurate, but university administrators may want to look into this issue to see if in fact there is a need for more trash receptacles on their campuses. Kolodko et al. (2016) suggest to make the litterbins more available, accessible and visible, and to be placed in key locations where people usually meet together. Another study suggests decreasing the spaces between the trash bins as a solution to the laziness factor (Leijdekkers et al., 2015)). This will make it more possible to students to dispose their litter properly. In addition, the design of the trash bin can influence the people’s behavior towards littering, Kolodko et al. (2016) suggest introducing fun bins to make disposing litter more enjoyable. For example, in The Philippines, creative basketball ring waste receptacles were introduced (Manila Bulletin, 2015).

1.5.2 Recycling System

There is evidence that recycling has an impact on reducing littering behaviors, therefore national programs around the world have integrated recycling into anti-littering campaigns (Wagner, 2007). Providing recycling education programs to both universities should help reduce littering. For University A it would be a tool to encourage students to use the existing recycling services. For University B it might be to make them interested in recycling and develop recycling systems at the university. A successful recycling activity currently at University A, called CanBank, where students can recycle their soda cans and get a 10% discount on two taxi rides, could be implemented at University B (AUC Venture Lab, 2017).
Chapter Six: Challenges, Limitations and Future Research

The littering problem as the focus of this study was initially a challenge, as it was impossible to find previous literature review on littering problem in Egypt. Hence, it was necessary to review littering literature in the United States of America and the United Kingdom, where there was numerous incidences of evidence based research and national campaigns.

The CRM is designed to assess the characteristics of individual communities and is not designed for the purpose of generalizing beyond those communities. Further, the sample in the present study represents a small number of the population of the students in each university, so even generalizations to the entire university community should be made with caution.

Through the preparatory stage of the CRM prior to the application of the model, the researcher found some challenges in identifying the universities where the study could be conducted and later the challenge was to identify suitable participants that represented each university. The researcher contacted several professors in different universities, but only two universities were reached out through several professors in each university.

Another potential limitation was found at the beginning while planning to use the CRM, because the application of the CRM does not provide guidelines on the use of the tool in case the key leaders in the community were not leading any organized efforts previously on the issue, which was littering problem in this study. To overcome this limitation, it was necessary to adjust the CRM model to conform to the exiting situation of the littering problem in the two universities as two communities where the CRM will be conducted. In this study, the CRM model was developed to assess the community readiness of the students in each university to change the
littering behavior by replacing the qualitative questions that should be addressed to
the community leaders with quantitative ones to be addressed to the students.
Therefore, it was necessary to modify the anchored rating statements to fit with the
littering problem, then a new scoring system was developed to measure the
quantitative questions and identify a readiness stage for each university. The latter
process was challenging as it was difficult to design a new scoring system that
assigned different type of questions under each dimension to one of nine statements in
each dimension. With some difficulty a scoring system was developed to assign a
stage for each university. The new scoring system could be used in the future by other
researchers if they want to assess the community readiness by a quantitative method
or to assess readiness through the community members not the community leaders.

This study focuses on the use of the CRM as an assessment tool of the littering
behavior in two communities and assessment to their willingness to change this
behavior, and designing strategies to change this behavior. However, the
implementation of these strategies is outside the scope of this study, so these
strategies will be provided to the administration of both universities in order to
implement them. The developed strategies may not be generalizable to other
universities, but they can be useful if other universities had the same barriers of the
study’s universities. The barriers can be identified by replicating the same assessment
tool that was developed in this study and using the same analysis method. Future
researchers can benefit from the results of this research to implement to these tools in
private and public universities, evaluate their effectiveness, and finally provide
recommendations about the best tools that can suit the Egyptian culture. This study
could also for the basis for future research, as there are many opportunities to
investigate the littering problem in Egypt and implement prevention intervention
programs to change littering behavior in different community settings with different target audiences.

The literature review has shown that gender and urbanization are factors that can have an impact on littering behavior, so further research is needed to examine these factors and to see if the CBSM tools might need to be adapted to fit the unique concerns of diverse groups within communities. Additionally, future research may consider replicating such research in formal and informal communities around Egypt. The fact that the CRM is designed to assess the particular needs of a community make it especially suited to such an endeavor. Studying why people litter in these diverse settings would contribute to our understanding of the how to best tackle the problem.
Chapter Seven: Conclusion

This research examined the characteristics of the Egyptian youth in two universities with regard to their littering behavior. It was found that both University A and University B are at the Initiation stage of readiness to address littering problem. At this stage, both universities have basic knowledge about littering prevention efforts in their universities as well as basic knowledge about the littering problem and its effects on the community. At this stage, both universities also acknowledge that littering is a problem and have basic knowledge about littering prevention efforts in their universities as well as basic knowledge about the littering problem and its effects on the community. The students are somehow ready to do something about it but they lack the knowledge, the motivation and the social pressure to stop littering, as well as they sometimes forget not to litter. As a result, both universities are in need of activities that help provide specific, clear and explicit information about the consequences of littering in different forms of communication channels. The study recommended fourteen different activities using the CBSM framework and tools to tackle the barriers found in both universities, which are the lack of information, lack of motivation, lack of social pressure, forgetting and inconvenience.

The next step is for this research for both university administrations to use the data and the recommended strategies drawn from the CRM framework and CBSM framework to develop policies and littering prevention programs/campaigns in both universities; both implement them and test their effectiveness.

Littering is a major issue found in most Egyptian neighborhoods and is mostly caused by human behavior whether intentional and unintentional. Littering affects everyone, litterers and non-litterers by creating an unhealthy and unpleasant environment. Therefore, something needs to be done about it through the participation
of all sectors in the community. Without the engagement of universities and implementing specific activities guiding and restricting such anti-social behavior, this problem will not be solved. Conducting the CRM framework and CBSM framework in university settings is the first step toward tackling littering problem in Egyptian universities and should be used as a guide to start similar initiatives in other universities in Egypt. It also should be used as a guide to other environmental problems that need to be change in university settings or to examine it into community settings.
Appendix 1: Survey

Q1 What is your age group?
   a. 18-21   b. 22-29   c. 30-39   d. 40+

Q2 What is your gender?
   a. Male   b. Female

Q3 In which university you are a student?

Q4 Littering in my university is a…
   a. Very big problem   b. Big problem
   c. Moderate Problem   d. Small problem
   e. Not a problem at all   f. Don’t know

Q5 What proportion of the population in your University do you think litters?
   a. All   b. Most   c. Half   d. Few   e. None

Q6 People in my University need to stop littering …
   a. Agree Strongly   b. Agree
   c. Neither agree nor Disagree   d. Disagree
   e. Strongly Disagree

Q7 What are the effects of littering? (you can choose more than one answer)
   a. Littering causes health problems   b. Littering make my community looks ugly
   c. Littering has a negative effect on people’s moods   d. Littering puts a financial burden on the government
   e. Littering discourages tourists to visit Egypt   f. Littering discourages investors to invest in Egypt
   g. Littering increases anti-social behavior   h. littering doesn’t really cause any problems

Q8 For the next set of questions please think about your daily activities at your community: home, work/school/university, while shopping, and while socializing with friends and family and how often you do that. In the past month have you …

<table>
<thead>
<tr>
<th>Activity</th>
<th>Always</th>
<th>Usually</th>
<th>Often</th>
<th>Once in while</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>dropped gum, facial tissue, candy wrappers, paper containers, food or food wrappers on the ground, sidewalk, or street?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>dropped drink cans or bottles on any outdoor areas?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>left paper, food remnants, or other discards at the place where you were eating?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>thrown things out of a car on the street or waterways?</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Q9 When I litter, I do it because … (in case you litter)

<table>
<thead>
<tr>
<th>Reason</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t think one piece of trash matters.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I don’t feel like picking it up</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>I think someone else will pick it up</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>-------</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>d.</td>
<td>There isn’t a trash bin nearby.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td>I didn’t consider the item they dropped to be litter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td>I don’t have time to dispose of the litter properly.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>g.</td>
<td>I don’t care about the effects of litter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h.</td>
<td>I don't know about the effects of litter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i.</td>
<td>I didn’t even realize that I had littered (unintentional littering).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>j.</td>
<td>I feel like keeping the community clean isn’t my responsibility.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>k.</td>
<td>I never litter</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Q10** Are you aware of any programs in your university that deal with litter prevention
a. Yes  
b. No

c. Don’t know

**Q11** Have you seen or heard a specific message or ad about litter prevention at your university in the past year?

a. Yes  
b. No  
c. Don’t know

**Q12** If yes, do you think these ads about litter prevention at your university were effective?

a. Very effective  
b. Effective  
c. Somewhat effective  
d. Not at all effective  
e. Don’t know

**Q13** If yes, were these efforts accessible and visible to the whole university?

a. Yes  
b. No  
c. Don’t know

**Q14** Does your university have a garbage separation and a recycling system?

a. Yes  
b. No  
c. Don’t know

**Q15** If your university community leaders decided to do littering prevention programs, which THREE of the following strategies do you think would be the most effective?

a. Show pictures of what your community/campus would look like if nobody throws litter  
b. Publicize that littering is harmful to the environment  
c. Conduct an awareness campaign that links community pride to keeping the community clean  
d. Remind people that even a small amount of trash is still litter  
e. Publicize that littering damages the image of our community  
f. Tell people littering is not the right thing to do  
g. Do a clean-up campaign  
h. Develop a garbage separation and a recycling system as one of the solutions to littering  
i. Distribute plastic bags to encourage people to put the litter in the bag  
j. Provide incentives or rewards at the personal and the group/organizational level for raising and maintaining litter awareness  
k. Have a well-known spokespersons, such as politicians or celebrities, to talk about litter prevention
Q16 Who do you think should lead the littering prevention efforts in your University?
   a. University members (students/professors/staff)
   b. University clubs
   c. Neighborhood communities
   d. Administrations of schools/universities
   e. Government/City Council

Q17 What role would you like to play in a littering prevention initiative in your University?
   a. I would like to lead the initiative
   b. I would like to be a participant in the initiative
   c. I would like to provide encouragement and emotional support to the organizers of the initiative
   d. Participate in an organized litter clean-up effort
   e. Support with money
   f. Stop littering and recommend it to others
   g. Stop littering
   h. I would not be interested in being involved in such an initiative
   i. Don’t care

Q18 How well does each of the following statements represent how you feel about your university?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Being a member of this University makes me feel good.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>b. Members in my University and I value the same things.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>c. I feel at home in this University</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>d. This University has been successful in getting the needs of its members met.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>e. I put a lot of time and effort into being part of this University.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>f. I have influence over what this neighborhood is like</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>g. I care about what my community members think about my actions</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Q19 How well does each of the following statements represent your University?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Members in my University have the capability to solve littering problem</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>b. Members in my University</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
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</tbody>
</table>
can donate to help litter prevention efforts to succeed

<p>| | | | | |</p>
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</tr>
</thead>
<tbody>
<tr>
<td>c. Members in my University can commit as volunteers to help litter prevention efforts to succeed</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>d. The streets/sidewalks in my University are well maintained for people who are walking</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>e. There are trash and recycling receptacles throughout and around my University</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>f. Members in my University usually use these trash bins</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

Q20 In your opinion, what needs to be developed to implement change in littering behavior in your neighborhood

---

Thank you
Appendix 2: Anchor Rating Scale

1- Community Knowledge of Efforts

1 Community members have no knowledge about local efforts addressing the issue.

2 Only a few community members have any knowledge about local efforts addressing the issue. Community members may have misconceptions or incorrect knowledge about local efforts (e.g. their purpose or who they are for).

3 At least some community members have heard of local efforts, but little else.

4 At least some community members have heard of local efforts and are familiar with the purpose of the efforts.

5 At least some community members have heard of local efforts, are familiar with the purpose of the efforts, who the efforts are for, and how the efforts work.

6 Many community members have heard of local efforts and are familiar with the purpose of the effort. At least some community members know who the efforts are for and how the efforts work.

7 Many community members have heard of local efforts, are familiar with the purpose of the effort, who the efforts are for, and how the efforts work. At least a few community members know the effectiveness of local efforts.

8 Most community members have heard of local efforts and are familiar with the purpose of the effort. Many community members know who the efforts are for and how the efforts work. Some community members know the effectiveness of local efforts.

9 Most community members have extensive knowledge about local efforts, knowing the purpose, who the efforts are for and how the efforts work. Many community members know the effectiveness of the local efforts.

2- Willingness to assume Leadership

1 Leadership believes that the issue is not a concern.

2 Leadership believes that this issue may be a concern in this community, but doesn’t think it can or should be addressed.

3 At least some of the leadership believes that this issue may be a concern in this community. It may not be seen as a priority. They show no immediate motivation to act.

4 At least some of the leadership believes that this issue is a concern in the community and that some type of effort is needed to address it. Although some may be at least passively supportive of current efforts, only a few may be participating in developing, improving or implementing efforts.
5 At least some of the leadership is participating in developing, improving, or implementing efforts, possibly being a member of a group that is working toward these efforts or being supportive of allocating resources to these efforts.

6 At least some of the leadership plays a key role in participating in current efforts and in developing, improving, and/or implementing efforts, possibly in leading groups or speaking out publicly in favor of the efforts, and/or as other types of driving forces.

7 At least some of the leadership plays a key role in ensuring or improving the long-term viability of the efforts to address this issue, for example by allocating long-term funding.

8 At least some of the leadership plays a key role in expanding and improving efforts, through evaluating and modifying efforts, seeking new resources, and/or helping develop and implement new efforts.

9 At least some of the leadership is continually reviewing evaluation results of the efforts and is modifying financial support accordingly.

3- Community Climate

1 Community members believe that the issue is not a concern.

2 Community members believe that this issue may be a concern in this community, but don’t think it can or should be addressed.

3 Some community members believe that this issue may be a concern in the community, but it is not seen as a priority. They show no motivation to act.

4 Some community members believe that this issue is a concern in the community and that some type of effort is needed to address it. Although some may be at least passively supportive of efforts, only a few may be participating in developing, improving or implementing efforts.

5 At least some community members are participating in developing, improving, or implementing efforts, possibly attending group meetings that are working toward these efforts.

6 At least some community members play a key role in developing, improving, and/or implementing efforts, possibly being members of groups or speaking out publicly in favor of efforts, and/or as other types of driving forces.

7 At least some community members play a key role in ensuring or improving the long-term viability of efforts (e.g., example: supporting a tax increase). The attitude in the community is—We have taken responsibility.

8 The majority of the community strongly supports efforts or the need for efforts. Participation level is high. —We need to continue our efforts and make sure what we are doing is effective.

9 The majority of the community are highly supportive of efforts to address the issue. Community members demand accountability.
4- Knowledge of Issue

1 Only a few community members have any knowledge about the issue. Among many community members, there are misconceptions about the issue, (e.g., how and where it occurs, why it needs addressing, whether it occurs locally).

2 At least some community members have heard of the issue, but little else. Among some community members, there may be misconceptions about the issue. Community members may be somewhat aware that the issue occurs locally.

3 At least some community members know a little about causes, consequences, signs and symptoms. At least some community members are aware that the issue occurs locally.

4 At least some community members know some about causes, consequences, signs and symptoms. At least some community members are aware that the issue occurs locally.

5 At least some community members know some about causes, consequences, signs and symptoms. At least some community members have some knowledge about how much it occurs locally and its effect on the community. At least some community members know a lot about causes, consequences, signs and symptoms.

6 At least some community members have some knowledge about how much it occurs locally and its effect on the community.

7 Most community members know a lot about causes, consequences, signs and symptoms. At least some community members have a lot of knowledge about how much it occurs locally, its effect on the community, and how to address it locally.

8 Most community members have detailed knowledge about the issue, knowing detailed information about causes, consequences, signs and symptoms.

9 Most community members have detailed knowledge about how much it occurs locally, its effect on the community, and how to address it locally.

5- Resources Related to the Issue

1 There are no resources available for (further) efforts.

2 There are very limited resources (such as one community room) available that could be used for further efforts. There is no action to allocate these resources to this issue. Funding for any current efforts is not stable or continuing.

3 There are some resources (such as a community room, volunteers, local professionals, or grant funding or other financial sources) that could be used for further efforts. There is little or no action to allocate these resources to this issue.

4 There are some resources identified that could be used for further efforts. Some community members or leaders have looked into or are looking into using these resources to address the issue.
5 There are some resources identified that could be used for further efforts to address the issue. Some community members or leaders are actively working to secure these resources; for example, they may be soliciting donations, writing grant proposals, or seeking volunteers.

6 New resources have been obtained and/or allocated to support further efforts to address this issue.

7 A considerable part of allocated resources for efforts are from sources that are expected to provide stable or continuing support.

8 A considerable part of allocated resources for efforts are from sources that are expected to provide continuous support. Community members are looking into additional support to implement new efforts.

9 Diversified resources and funds are secured, and efforts are expected to be ongoing. There is additional support for new efforts.
### Appendix 3: Scoring Sheet

<table>
<thead>
<tr>
<th>1- Community Knowledge of Efforts</th>
<th>A. Awareness/knowledge of efforts</th>
<th>B. Depth in Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Community members have no knowledge about efforts in their universities addressing the littering problem.</td>
<td>0-20% Awareness/knowledge of efforts</td>
<td>0-20% Depth in Knowledge</td>
</tr>
<tr>
<td>2 Only a few community members have any knowledge about efforts in their universities addressing the littering problem and know about. Community members have misconceptions or incorrect information about the efforts in their universities.</td>
<td>21-40% Awareness/knowledge of efforts</td>
<td>0-20% Depth in Knowledge</td>
</tr>
<tr>
<td>3- At least some community members have heard of efforts in their universities addressing the littering problem but little else.</td>
<td>41-60% Awareness/knowledge of efforts</td>
<td>21-40% Depth in Knowledge</td>
</tr>
<tr>
<td>4 At least some community members have heard of efforts in their universities addressing the littering problem and are familiar with the purpose of the efforts.</td>
<td>41-60% Awareness/knowledge of efforts</td>
<td>41-60% Depth in Knowledge</td>
</tr>
<tr>
<td>5 At least some community members have heard of efforts in their universities addressing the littering problem and are familiar with the purpose of the efforts in their universities, who the efforts are for, and how the efforts work.</td>
<td>41-60% Awareness/knowledge of efforts</td>
<td>41-60% Depth in Knowledge</td>
</tr>
<tr>
<td>6 Many community members have heard of efforts in their universities addressing the littering problem and are familiar with the purpose of the effort. At least some community members know about the efforts in their universities.</td>
<td>61-80% Awareness/knowledge of efforts</td>
<td>41-60% Depth in Knowledge</td>
</tr>
<tr>
<td>7 Many community members have heard of efforts in their universities addressing the littering problem and are familiar with the purpose of the effort. At least a few community members know the effectiveness of these efforts.</td>
<td>61-80% Awareness/knowledge of efforts</td>
<td>61-80% Depth in Knowledge</td>
</tr>
<tr>
<td>8 Most community members have heard of efforts in their universities addressing the littering problem and are familiar with the purpose of the effort. Many community members know who the efforts are for and how the efforts work. Some community members know the effectiveness of these efforts.</td>
<td>81-100% Awareness/knowledge of efforts</td>
<td>61-80% Depth in Knowledge</td>
</tr>
<tr>
<td>9 Most community members have extensive knowledge of efforts in their universities addressing the littering problem knowing the purpose, which the efforts are for and how the efforts work. Many community members know the effectiveness of these efforts.</td>
<td>81-100% Awareness/knowledge of efforts</td>
<td>81-100% Depth in Knowledge</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2- Knowledge of issue</th>
<th>A. Awareness/knowledge of littering problem</th>
<th>B. Depth in Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community members have no knowledge about the littering problem.</td>
<td>0-20% Awareness/knowledge of efforts 0-20% Depth in Knowledge</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Only a few community members have any knowledge about the issue. Among many community members, there are misconceptions about the issue, (e.g., how and where it occurs, why it needs addressing, whether it occurs locally).</td>
<td>21-40% Awareness/knowledge of efforts 0-20% Depth in Knowledge</td>
<td></td>
</tr>
<tr>
<td>At least some community members have heard of the issue, but little else. Among some community members, there may be misconceptions about the issue. Community members may be somewhat aware that the issue occurs locally.</td>
<td>41-60% Awareness/knowledge of efforts 21-40% Depth in Knowledge</td>
<td></td>
</tr>
<tr>
<td>At least some community members know a little about causes, consequences, signs and symptoms. At least some community members are aware that the issue occurs locally.</td>
<td>41-60% Awareness/knowledge of efforts 41-60% Depth in Knowledge</td>
<td></td>
</tr>
<tr>
<td>At least some community members know some about causes, consequences, signs and symptoms. At least some community members are aware that the issue occurs locally.</td>
<td>41-60% Awareness/knowledge of efforts 41-60% Depth in Knowledge</td>
<td></td>
</tr>
<tr>
<td>At least some community members know some about causes, consequences, signs and symptoms. At least some community members are aware that the issue occurs locally.</td>
<td>61-80% Awareness/knowledge of efforts 41-60% Depth in Knowledge</td>
<td></td>
</tr>
<tr>
<td>At least some community members know a lot about causes, consequences, signs and symptoms. At least some community members have some knowledge about how much it occurs locally and its effect on the community.</td>
<td>61-80% Awareness/knowledge of efforts 61-80% Depth in Knowledge</td>
<td></td>
</tr>
<tr>
<td>Most community members know a lot about causes, consequences, signs and symptoms. At least some community members have a lot of knowledge about how much it occurs locally, its effect on the community, and how to address it locally.</td>
<td>81-100% Awareness/knowledge of efforts 61-80% Depth in Knowledge</td>
<td></td>
</tr>
<tr>
<td>Most community members have detailed knowledge about the issue, knowing detailed information about causes, consequences, signs and symptoms. Most community members have detailed knowledge about how much it occurs locally, its effect on the community, and how to address it locally.</td>
<td>81-100% Awareness/knowledge of efforts 81-100% Depth in Knowledge</td>
<td></td>
</tr>
</tbody>
</table>

### 3- Community Climate

<table>
<thead>
<tr>
<th>A- Concern</th>
<th>B- Something should be done</th>
<th>C- Role they should play</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community members believe that the littering problem is not a concern</td>
<td>0-20% Concern 0-20% something should be done 0-20% role they should play</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2 Community members believe that littering problem may be a concern in this community, but don’t think it can or should be addressed.</td>
<td>21-40% Concern</td>
<td>0-20% something should be done</td>
</tr>
<tr>
<td>3 Some community members believe that littering problem may be a concern in the community, but it is not seen as a priority. They show no motivation to act.</td>
<td>21-40% Concern</td>
<td>21-40% something should be done</td>
</tr>
<tr>
<td>4 Some community members believe that littering problem is a concern in the community and that some type of effort is needed to address it. Although some may be at least passively supportive of efforts, only a few may be participating in developing, improving or implementing efforts.</td>
<td>21-40% Concern</td>
<td>21-40% something should be done</td>
</tr>
<tr>
<td>5 At least some community members are participating in developing, improving, or implementing efforts, possibly attending group meetings that are working toward these efforts.</td>
<td>41-60% Concern</td>
<td>41-60% something should be done</td>
</tr>
<tr>
<td>6 At least some community members play a key role in developing, improving, and/or implementing efforts, possibly being members of groups or speaking out publicly in favor of efforts, and/or as other types of driving forces</td>
<td>41-60% Concern</td>
<td>41-60% something should be done</td>
</tr>
<tr>
<td>7 At least some community members play a key role in ensuring or improving the long-term viability of efforts (e.g., example: supporting a tax increase). The attitude in the community is —We have taken responsibility.</td>
<td>61-80% Concern</td>
<td>41-60% something should be done</td>
</tr>
<tr>
<td>8 The majority of the community strongly supports efforts or the need for efforts. Participation level is high. —“We need to continue our efforts and make sure what we are doing is effective”.</td>
<td>61-80% Concern</td>
<td>61-80% something should be done</td>
</tr>
<tr>
<td>9 The majority of the community is highly supportive of efforts to address the littering problem. Community members demand accountability.</td>
<td>81-100% Concern</td>
<td>81-100% something should be done</td>
</tr>
<tr>
<td><strong>4- Resources</strong></td>
<td><strong>A. Potential Resources</strong></td>
<td><strong>B. Willingness to participate in efforts</strong></td>
</tr>
<tr>
<td>1 There is no resources available for (further) efforts.</td>
<td>0-20% Potential Resources</td>
<td>0-20% Willingness to participate in efforts</td>
</tr>
<tr>
<td>2 There are very limited resources (such as one community room) available that could be used for further efforts. There is no action to allocate these resources to this issue. Funding for any current efforts is not stable or continuing.</td>
<td>21-40% Potential Resources</td>
<td>0-20% Willingness to participate in efforts</td>
</tr>
<tr>
<td>3 There are few resources (such as volunteers, local professionals, or grant funding or other financial sources) that could be used for further efforts. There is little or no action to allocate these resources to solve the littering problem. There is little willingness to participate in those efforts.</td>
<td>41-60% Potential Resources</td>
<td>21-40% Willingness to participate in efforts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>There are some resources identified that could be used for further efforts. Some community members showed willingness to participate in efforts to address the littering problem. These resources are either capabilities, funds or volunteers.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41-60% Potential Resources 41-60% Willingness to participate in efforts</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>There are resources identified that could be used for further efforts to address the issue. Some community members or leaders are actively working to secure these resources; for example, they may be soliciting donations, writing grant proposals, or seeking volunteers. Some community members showed willingness to participate in efforts to address the littering problem.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>41-60% Potential Resources 41-60% Willingness to participate in efforts</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>New resources can be obtained and/or allocated to support further efforts to address the littering problem. Some community members showed willingness to participate in efforts to address the littering problem.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61-80% Potential Resources 41-60% Willingness to participate in efforts</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>A considerable part of allocated resources for efforts are from sources that are expected to provide stable or continuing support. Many Community members showed willingness to participate in efforts to address the littering problem.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61-80% Potential Resources 61-80% Willingness to participate in efforts</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>A considerable part of allocated resources for efforts are from sources that are expected to provide continuous support. Community members are looking into additional support to implement new efforts. Many Community members showed willingness to participate in efforts to address the littering problem.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>81-100% Potential Resources 61-80% Willingness to participate in efforts</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Diversified resources and funds can be secured, and littering prevention efforts are expected to be ongoing. There is additional support for new efforts. Most Community members showed willingness to participate in efforts to address the littering problem.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>81-100% Potential Resources 81-100% Willingness to participate in efforts</td>
<td></td>
</tr>
</tbody>
</table>
## Appendix 4: CRM General Recommendations

<table>
<thead>
<tr>
<th>Stages</th>
<th>Goals</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower stages (no awareness, denial/resistance and vague awareness)</td>
<td>increase awareness that the community should and can do something about the issue.</td>
<td>interpersonal contacts and media advocacy to build awareness, legitimacy and a core group of supporters within the community.</td>
</tr>
<tr>
<td>Intermediate stages (pre-planning, preparation and initiation)</td>
<td>communities are gearing up to take specific action and gathering information relevant to achieving their goal</td>
<td>gathering local data to serve as the basis for developing specific efforts and to analyze costs and benefits of different courses of action organizing events to help solidify public support (such as public forums) and cultivating sources of funding for efforts</td>
</tr>
<tr>
<td>Advanced stages (stabilization, confirmation/expansion and high level of community ownership),</td>
<td>keep momentum for efforts going strong, solicit consumer feedback, evaluate and revise efforts to meet changing needs and apply the knowledge gained to other related issues.</td>
<td>efforts to develop capacity for training, evaluation and networking among resources</td>
</tr>
</tbody>
</table>

(As cited in Kelly et al., 2003)
Appendix 5: Major Social Marketing Communication Channels

A. ADVERTISING (PAID MEDIA AND UNPAID PUBLIC SERVICE ANNOUNCEMENTS)

<table>
<thead>
<tr>
<th>Broadcast:</th>
<th>Outdoor/Out of Home:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Television</td>
<td>Billboards</td>
</tr>
<tr>
<td>Radio</td>
<td>Busboards</td>
</tr>
<tr>
<td>Internet: Banner ads</td>
<td>Bus shelter displays</td>
</tr>
<tr>
<td>Print:</td>
<td>Subways</td>
</tr>
<tr>
<td>Newspaper</td>
<td>Taxis</td>
</tr>
<tr>
<td>Magazine</td>
<td>Vinyl wrap on cars and buses</td>
</tr>
<tr>
<td>Direct Mail:</td>
<td>Sports events</td>
</tr>
<tr>
<td>Separate mailings</td>
<td>Banners</td>
</tr>
<tr>
<td>Paycheck and other stuffers</td>
<td>Postcards racks</td>
</tr>
<tr>
<td>Internet/Web sites</td>
<td>Kiosks</td>
</tr>
<tr>
<td>Backs of tickets and receipts</td>
<td>Restroom stalls</td>
</tr>
<tr>
<td>Ads on Internet/Web</td>
<td>Truckside advertising</td>
</tr>
<tr>
<td>Ads in Theaters</td>
<td>Airport billboards and signage</td>
</tr>
</tbody>
</table>

B. PUBLIC RELATIONS AND SPECIAL EVENTS

<table>
<thead>
<tr>
<th>Stories on television and radio</th>
<th>Special Events:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articles in newspapers and magazines</td>
<td>Meetings</td>
</tr>
<tr>
<td>Op-eds</td>
<td>Speakers’ bureaus</td>
</tr>
<tr>
<td>Public affairs/community relations</td>
<td>Conferences</td>
</tr>
<tr>
<td>Lobbying</td>
<td>Exhibits</td>
</tr>
<tr>
<td>Videos</td>
<td>Health screenings</td>
</tr>
<tr>
<td>Media Advocacy</td>
<td>Demonstrations</td>
</tr>
</tbody>
</table>

C. PRINTED MATERIALS

<table>
<thead>
<tr>
<th>Brochures</th>
<th>Calendars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newsletters</td>
<td>Envelope messages</td>
</tr>
<tr>
<td>Flyers</td>
<td>Booklets</td>
</tr>
<tr>
<td>Posters</td>
<td>Bumper stickers</td>
</tr>
<tr>
<td>Catalogs</td>
<td>Static stickers</td>
</tr>
</tbody>
</table>

D. SPECIAL PROMOTIONAL ITEMS

<table>
<thead>
<tr>
<th>Clothing:</th>
<th>Functional Items:</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-shirts</td>
<td>Key chains</td>
</tr>
<tr>
<td>Baseball hats</td>
<td>Flashlights</td>
</tr>
<tr>
<td>Diapers</td>
<td>Refrigerator magnets</td>
</tr>
<tr>
<td>Bibs</td>
<td>Water bottles</td>
</tr>
<tr>
<td>Temporary Items:</td>
<td>Litterbags</td>
</tr>
<tr>
<td>Coffee sleeves</td>
<td>Pens and pencils</td>
</tr>
<tr>
<td>Bar coasters</td>
<td>Bookmarks</td>
</tr>
<tr>
<td>Lapel buttons</td>
<td>Book covers</td>
</tr>
<tr>
<td>Temporary tattoos</td>
<td>Notepads</td>
</tr>
<tr>
<td>Balloons</td>
<td>Tote bags</td>
</tr>
<tr>
<td>Stickers</td>
<td>Mascots</td>
</tr>
<tr>
<td>Sports cards</td>
<td>Door hangers</td>
</tr>
<tr>
<td></td>
<td>e-Games</td>
</tr>
<tr>
<td></td>
<td>e-cards</td>
</tr>
<tr>
<td></td>
<td>Podcasts</td>
</tr>
</tbody>
</table>

(Lee & Kotler, 2011)
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of youngsters. This report (product) is produced by students of Wageningen University as part of their MSc Programme.


Prevention Research, Colorado State University:

http://english.ahram.org.eg/News/103011.aspx


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