

Promoting Waste Sorting Behavior: A Case Study on Awareness Campaigns in Egypt

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Abstract:

Developing countries still lack the technical and financial resources to manage household waste. Although Egypt is considered one of the countries that have taken numerous actions regarding waste separation, recycling rates remain low. The methods for disposing of solid waste are distributed as follows: 81% of Egyptians dispose of the waste they generate in local garbage bins, and only 12% attempt to recycle (Ministry of Environment, 2023). Therefore, individual responsibility for waste separation must be cultivated to facilitate cooperation and coordination. In this context, the aim of this study is to raise awareness about waste sorting at home and the role of individuals in protecting the environment.

This study aims to highlight the importance of waste separation and the negative effects of not sorting waste on society. Two data collection tools were used: first, a survey conducted on a sample of 1,000 youth and adolescents aged 13-35, and second, in-depth interviews with experts in the fields of media and recycling.

The results revealed significant participation in waste sorting practices among respondents, with 75.4% sorting waste at home or school. Motivations for sorting waste are primarily materialistic, as 66.7% of respondents cited reduced electricity bills as the main motivator. However, there are still barriers, including unclear recycling signs, time constraints, and insufficient infrastructure, which hinder broader participation in waste separation.

Key words: awareness campaign, Egypt, social media, waste sorting.

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تعزيز سلوك فرز النفايات: دراسة حالة حول حملات التوعية في مصر

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ملخص الدراسة:

لا تزال البلدان النامية تفتقر إلى الموارد التقنية والمالية لإدارة النفايات المنزلية وعلى الرغم من أن مصر تُعتبر من الدول التي اتخذت العديد من الإجراءات فيما يتعلق بفرز النفايات، إلا أن معدلات إعادة التدوير لا تزال منخفضة. حيث تُورَّع طرق التخلص من النفايات الصلبة على النحو التالي: 81% من المصريين يتخلصون من النفايات التي ينتجونها في صناديق القمامة المحلية، في حين أن 12% فقط يحاولون إعادة التدوير (وزارة البيئة، 2023). لذلك، لا بد من تعزيز المسؤولية الفردية تجاه فرز النفايات لتسهيل التعاون والتنسيق.

في هذا السياق، تهدف هذه الدراسة إلى زيادة الوعي بأهمية فرز النفايات في المنازل ودور الأفراد في حماية البيئة. كما تسلط الضوء على أهمية فرز النفايات والآثار السلبية لعدم القيام بذلك على المجتمع. تم استخدام أداتين لجمع البيانات: استبيان شمل عينة مكونة من 1000 شاب ومراهق تتراوح أعمارهم بين 13 و35 عامًا ومقابلات متعمقة مع خبراء في مجالي الإعلام والبيئة.

كشفت النتائج عن مشاركة كبيرة في ممارسات فرز النفايات بين المشاركين، حيث أفاد 75.4% منهم أنهم يقومون بفرز النفايات في المنزل أو المدرسة. وكانت الدوافع الأساسية وراء فرز النفايات مادية، إذ أشار 66.7% من المشاركين إلى أن تخفيض فواتير الكهرباء هو الحافز الرئيسي. ومع ذلك، لا تزال هناك عوائق مثل عدم وضوح علامات إعادة التدوير، وضيق الوقت، ونقص البنية التحتية، مما يعوق المشاركة الأوسع في عمليات فرز النفايات.

الكلمات المفتاحية: حملات التوعية، وسائل التواصل الاجتماعي، فرز النفايات.

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Introduction

Recycling is a growing phenomenon worldwide today, as Heather Rogers shows in his documentary film (2005) *Gone Tomorrow: The Hidden Life of Garbage* and the book of the same name. Over the last three years, recycling has become a major issue in Egypt as several initiatives have been taken by people in the community, as can be seen on certain websites such as *Verynile*, a serious cleaning campaign run by Egyptian start-ups such as (*Greenish*) and (*Bassita*), who work together to clean up the Nile in Cairo (*Verynile*, 2019). Many well-known Egyptian stars have participated in this event, and non-governmental organizations such as (*the Rotary Foundation*) have also contributed financially to the action and successfully supported the process. The latest initiative of President El Sisi's government "*EthadarLelAkhdar*, 2019" is an eco-friendly campaign launched by the Ministry of Environment through a series of billboards on Cairo's streets calling to "prepare for the green, prepare for the future". The environmental campaign was made of eco-friendly materials to support the main idea of improving the environment "*Ethadar Lel Akhdar*, 2019". The volume of household waste is increasing dramatically worldwide and has an ever greater impact on the environment (*Elmosaad et al.*, 2023). Population growth, rapid urbanisation, expanding economies and improving living standards are all contributing to an increase in household waste. It is mainly generated by rapidly growing cities in developing countries. (*Minghua et al.*, 2009)

Despite the significance of the issue, media messages in Egypt that is influencing the idea of recycling remain vague and indecisive. The endeavors of media to raise awareness about how people should appropriately sort their daily waste at home inadequately reflect the severity of the problem. There are numerous factors that contribute to the complexity of the future of recycling in Egypt. Firstly, the lack of funding and facilities to support small industries involved in the recycling of waste products is present. Egypt lacks advanced recycling technology, resulting in lower quality of recycled material compared to the high quality of recycled material in countries such as Europe, where 85-90% of the original materials are achieved ("*National Study*", 2008);

nevertheless, it is crucial to take this issue seriously in order to provide a virtuous life for the population and their families.

Problem Statement

Proper waste separation and recycling is a critical component of environmental sustainability; however, many individuals lack the awareness, motivation, and engagement to actively participate in waste sorting practices at the household level. Furthermore, this study aims to investigate the factors that contribute to the lack of waste separation behaviors among the general public and explore potential strategies to raise awareness and promote individual responsibility for waste management. Specifically, the study seeks to: Assess the current levels of awareness and understanding around the importance of household waste separation and recycling, and explore the role of media and communication campaigns in shaping public knowledge, attitudes, and behaviors towards waste separation.

Research Significance

1. **Improved Waste Management:** More effective strategies for managing waste can spring up through understanding how awareness campaigns affect waste sorting behavior. Proper sorting reduces contamination of recyclable materials and enhances the efficiency of recycling processes, ultimately decreasing the volume of waste sent to landfills and mitigating environmental pollution.
2. **Behavioral Change:** Through examining the impact of awareness campaigns, this research can shed light on how to motivate individuals to adopt environmentally friendly behaviors. Understanding the factors that stimulate or hinder behavior change can assist in designing more effective campaigns and interventions.
3. **Public Engagement:** Insights from the study can reveal how well different segments of the population engage with and respond to environmental messages. This knowledge can assist in tailoring campaigns to address specific community demands and preferences.

Research Objectives

This study aims to identify the role of media in promoting waste separation in Egyptian homes, Subsequently, this study aims to achieve the following objectives:

1. Identifying the role of the media in promoting waste segregation in homes.
2. Encourage future environmentally friendly actions.
3. Disseminate knowledge about types of waste and garbage cans and their impact on the environment.
4. Raise awareness about waste separation and accessible ways to separate waste.

Research questions:

1. What is the media role in raising awareness about waste sorting?
2. What are the current practices and challenges associated with garbage sorting in households and schools?
3. What is the percentage of participation in garbage separation initiatives among households and schools in Egypt?
4. How do respondents perceive the coverage of waste sorting issues by Egyptian media?
5. How does exposure to media coverage affect respondents' perceptions of the ease of garbage separation?
6. What is the relationship between respondents' opinions on waste sorting and their behavioral intentions toward sorting garbage?
7. How do respondents perceive the importance and effectiveness of garbage separation at personal, local, and international levels?

Research hypothesis

H1: Greater Direct Exposure to Media Positively Influences Individuals' Knowledge about Sorting Garbage

H2: The More Effectively Media Spreads Awareness about Sorting Garbage, the Stronger the Behavioral Intention to Sort Garbage

H3: Demographic Factors (Age, Gender, Social Level) Mediate the Relationship Between Media Exposure and Knowledge About Sorting Garbage

H4: Socioeconomic Factors moderate the Relationship between Media Exposure and both Knowledge about Sorting Garbage and Behavioral Intentions

Research Variables

<u>Independent Variables</u>	<u>Intermediate Variables</u>	<u>Dependent Variables</u>
1- Direct exposure with media 2- The role of media spreading awareness	Demographic: Educational level - Age – Gender – Social level	1- Knowledge about sorting garbage 2- Behavioral intention to the dependent

This study uses assortment of qualitative and quantitative methods. Therefore, it is considered both exploratory and conclusive. The aim is to measure people's awareness of waste separation by conducting in-depth interviews and an exploratory survey. The qualitative methods were measured through in-depth interviews, while the quantitative methods were measured through an exploratory survey.

On one hand, the in-depth discussion is prepared and carried out with (5) of media professional; this interview's objective is to find ways to accomplish an effective waste sorting campaign and to know the most efficient ways to communicate with the intended target audience. On the other hand, people's knowledge was measured by coordinating an exploratory survey included teenagers and youth from 13-35 to capture

the attitudes and behaviors of a key demographic group. Finding out the level of awareness of the idea of separating waste at home was the objective.

Theoretical framework

Technology Acceptance Model:

Technology Acceptance Model (TAM & Davis, 1989) has been one of the most important models of technology acceptance, with two primary factors influencing an individual's intention to use new technology: perceived ease of use and perceived usefulness (Mitzner, 2016). Based on "Technology Acceptance Model", it could be suggested that external variables affect the users' perceptions of ease of use and usefulness which lead in turn to the development of a behavioral intention and action resulting to the adoption of new innovation. However, this change in behavior could not be possible without the effect of some external variables (J.Davis, 1989)

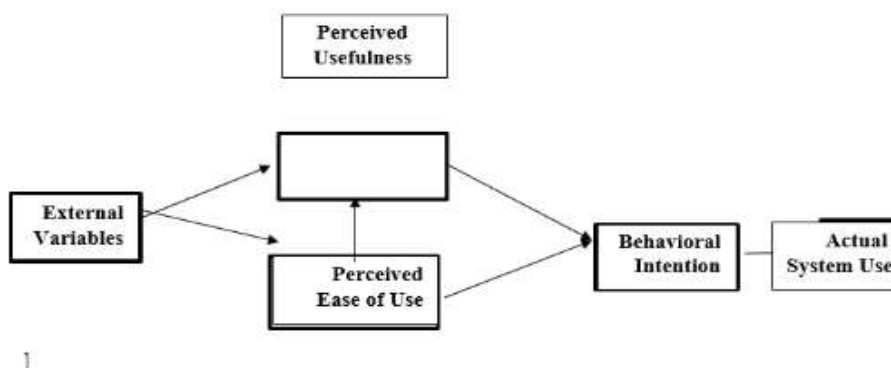


Figure 1. Technology Acceptance Model (TAM)

The current case depends on the use of the Technology Acceptance Model (TAM) (shown in Figure 2), introduced by Davis in 1985 to study the behavior of audience towards the acceptance of waste sorting in Egypt. TAM, by classification, considers user perceptions of ease of use and usefulness as the main factors affecting the acceptance level of any technology.

The research variables tested, which were directly extracted from TAM, include perceived ease of use (PEOU), perceived usefulness (PU), and technology acceptance (TA). PEOU and PU were simultaneously acting as dependent and independent variables, while (TA) was merely a dependent variable that depended on PEOU and PU.

A survey conducted on 1000 respondents in Egypt reveals findings that contrast the normally accepted assumption by demonstrating that external variables could have direct effects on usage behavior over and above their indirect effects. It indicates that TAM is significantly and consistently better at predicting frequency than volume of usage.

Literature review

Waste and waste management

Modern waste management is virtually impossible without public awareness of the proper handling of waste and the will to tackle and solve this problem. (Miltojević, Krstić, & Petkovic, 2017). It is important to start the sorting process from home. It is not mandatory to buy different garbage cans for different types of waste. To illustrate, the process can be done by collecting cardboard and paper and putting them in a separate garbage bag before disposal. Labelling bags and matching each bag to the type of item would make the process much easier. (Geoff, 2018)

Global waste witnessed an increase of 28% -from 5.6 Mt in 1997 to 7.65 million tons in 2007- and is estimated to further increase by 30% in 2020. The cooperation between the people and the community determines the success of every program. Consequently, poor waste separation behavior among the community may be due to various factors that prohibit the waste separation practice, which may include a limited market for recyclables, or lack of information about the right way to separate waste. (Low Sheau et al., 2016)

Waste is characterized as undesirable and unusable materials and is viewed as a substance that has no utilization. Hence, waste that is found in the environment is called garbage. It is mostly considered a solid waste that incorporates waste from our homes (domestic waste), waste from schools, workplaces, etc. (municipal waste), and waste from factories and plants (industrial waste).

Sources of waste can be divided into four types: industrial waste generated in factories and mines; commercial waste produced in schools, colleges, shops, and offices; household waste obtained from activities such as cooking and washing, and agricultural waste produced in farms. (BYJU 'S, 2019)

Waste management is the practice of handling solids with a range of office methods for recycling products that are not part of the landfill. The process involves the use of garbage as a valuable tool. For management, it is the healthy and effective way of disposing the used goods and chemicals. (Rinkesh, 2017). Moreover, there are many forms of disposal and management of solid waste: open burning of solid waste, process of sea dumping, solid waste sanitary landfills, method of incineration, process of composting, disposal by plugging into the forest, disposal by hog feeding, process of salvaging, and fermentation or biological digestion. (Pulp and Paper Technology, 2019), Also, Ruqiya Koser (2017) examines the role of media in raising awareness about household waste management in two distinct areas of Lahore, Pakistan (Shadara and DHA). According to the findings, overall reporting on household waste management in Pakistan is inadequate. Only a few environmental journalists in the country are tasked with reporting on household waste management issues, and only on rare occasions.

Waste sorting

Waste sorting is the central process that occurs after the recycling facilities have collected the separately collected packaging waste from residential, private, and industrial waste collection. Its primary objective is to reduce the amount of waste from businesses, local authorities, and households that end up in landfills transforming it into useful resources (Nassar et al., 2023). Five primary categories of waste exist: liquid waste, solid trash, agricultural waste, recyclable waste, and hazardous waste. Water waste contains contaminated water, organic oils, water for washing, detergents for waste, and even rainwater while strong waste consists of plastic, paper, metals, and glass.

Organic waste contains food waste, plant waste, manure, and rotten meat, which can be converted into micro-organisms. Recyclable garbage requires waste items that can be transformed into reusable goods, such as paper, plastics, furniture, and organic waste. Hazardous waste contains flammable, poisonous, corrosive, and reactive forms of garbage that damage the environment if they are not disposed of properly. (BYJU'S, 2019)

Social Media and Social Campaigns

According to Millar (2012), media is an effective tool for promoting sustainable development and social change. Media also plays a crucial role in disseminating relevant environmental information that provides solutions to environmental issues, which contributes in conservation and sustainable development. (Abdallah & Youssef, 2023)

Conversation is the key factor in the success of social media. When a social media site is used for business, it enlarges the conversation through buzzes that would call out the brand name. A company must be truly dedicated to conversation through social media, just as its customers are. Companies must take time to review the conversation and dedicate time and effort to respond to customers' responses. Social media is a cost-effective method for marketing activities (Paridon & Carraher, 2009). It was initially used by businesses to market products and services at a minimal cost. Therefore, researchers in Egypt are harnessing it to initiate effective communication about environmental issues and create citizen activism and pro-environmental behavior (Hamelin & Halawa, 2024). In addition, one of the most significant stages in citizen activism and pro-environmental behavior is to measure people's acceptance of being exposed to information on household recycling waste. Subsequently, an Android-based application that can serve as a platform for information on household recycling waste was created to assess user acceptance of an Android-based social media system for recycling household garbage (Pilah Matur App). Users generally accept the Android-based social media system for recycling household waste because it has 12 positive signs yet 2 negative ones. (Yunanto, 2018).

Awareness campaigns that have been undertaken in the previous year prove that the success of such an endeavor depends on both the medium itself and the attributes of the target audience. This can be corroborated by the examination of three awareness campaigns that were organized by an organization named “Keep America Beautiful”: Crying Indian (1971), Great American Cleanup (1999), and I Want to Be Recycled (2013). (Keep America Beautiful, n.d.).

In 1953, an organization called “Keep America Beautiful” was founded by a group of American businessmen, government agencies, non-profit organizations, and concerned individuals. The organization’s primary mission statement is “to engage individuals to take greater responsibility for improving their community environments.” They focus on litter prevention, beautification, community improvement, and waste reduction. Every four years, the organization launches a new campaign with a new theme. They are historically known for their acclaimed campaign in 1971 called “Crying Indian”, which is an advertisement that features a native American’s crossing pathway from past to future. It portrays life nowadays as being full of trash and that the more modernization takes place, the more destruction occurs. People are shown as senseless and careless individuals towards their environment. (Keep America Beautiful, n.d.).

The main aspect of this advertisement is to make the audience relate to its content and, consequently, feel their responsibility towards their community. This draws their attention to the disaster that is caused by simple acts of carelessness. It captures the audience’s attention since it portrays the reality of the current world in comparison to how things used to be—a change from a peaceful and livable environment into a disastrous one. Also, it highlights the fact that individuals alone are wholly responsible for the pollution of the environment, which is shown through the man’s eyes.

In 1999, a long-running campaign under the name “Great American Cleanup,” was launched. “Keep America Beautiful” took the initiative to encourage the public to volunteer to improve their environment through actions like planting trees, recycling plastic, and using daily waste products. It is a community improvement program that takes place annually. It mainly aims at creating a long-lasting impact on

society. Moreover, it serves the primary mission of the organization, which is to save the community; it also engages the audience and makes them take an actual part in the process of maintaining their community. In 2018, this Program was considered the nation's largest community improvement program, and more than 68 million pounds of recyclables were collected in return. (Keep America Beautiful, n.d.).

Another campaign called "I Want to Be Recycled" started in 2013 and lasted until 2016, featuring an online campaign on social media. It consists of several videos targeting those who usually don't recycle by playing on their emotions through touching story-telling. The story features talking objects that narrate their journey. The main plot states that objects became bigger than their actual size due to human indifference. This agitates the audience's emotions because it makes them feel responsible for their actions towards the objects they use on a daily basis, like plastic bottles. (Keep America Beautiful, n.d.).

The website of the non-profit organization "Keep America Beautiful," under the same name, features the history, goals, and impact of the organization on the environment. They also announce where they receive donations and offer a way for people to easily donate through the website. All their latest projects and initiatives towards the community are highlighted and always in sync on their website; therefore, people can access and be up-to-date with all their works. This website serves the audience in a way to make them more involved in the process of bettering the environment, making it seem like an easy process - just one click away.

In 2015, a documentary called "America Recycled", directed and released by Noah and Tim Hussin, is about the journey of two brothers who ride recycled bicycles through South America for over two years and watch their perspective on life's change. The film features 4 diverse themes, which show ways to live eco-friendly. It was highly acclaimed by several known film festivals and won the best American-feature documentary at the "American Documentary Film Festival" in Palm Springs, California, in 2015. (America Recycled, 2015)

In 2010, "Waste Land," another documentary filmed by Lucy Walker, follows the journey of the artist 'Vik Muniz' on his journey to Brazil,

where he goes to Jardim Gramacho, Rio de Janeiro, which is the world's largest garbage landfill. He chooses six subjects, the “catadores” (garbage pickers) to form a series of photographs of the individuals at the landfill itself that imitate the world's famous paintings in an artistic way. They separate garbage and fetch the valuable materials that can be recycled. Through this experience, Muniz learns more about each one of them, and is able to discover new things within his soul. He then projected the images he had captured onto the floor of a massive warehouse nearby. He worked hand in hand with the catadores to gather recyclable items from the landfill and use them to recreate the images on the floor. The end result was aesthetically pleasing, as the floor featured a series of human portraits made out of garbage. Each of the portraits portrayed the lives of those individuals through their eyes, which revealed both despair and dignity. Waste Land received solidly positive reviews as "an uplifting portrait of the power of art and the dignity of the human spirit." (Waste Land, 2010)

Waste management in Egypt

In Egypt, waste and the lack of proper management pose serious health and environmental problems for the country and its population (Simpson & Simpson, 2024). Waste is thrown anywhere, which leads to a huge environmental problem. (Galal, 2017). Solid waste management issues in Egypt have always been one of the most challenging problems faced by the Egyptian authorities. (*Waste Management in Egypt – an Overview - by Dr. Hisham Sherif, n.d.*). Egypt adopted the Structural Adjustment Plan (SAP) initiated by the International Monetary Fund (IMF) and the World Bank during the 1990's. (*Where Did Things Go Wrong With Egypt &Rsquo;S Waste Management? | Enterprise, 2020*)

One of the fundamental aims was to liberalize the economy by stepping up private sector participation in the execution of public projects. In this context, the Egyptian private sector, particularly multinational companies, became interested in solid waste management (Netherlands Enterprise Agency, 2023).

The situation has worsened, as stated by the Minister of State for Environmental Affairs in a study released in 2009, years after foreign

private sector involvement. The study estimated that there were nearly 75 million tons of solid wastes produced annually in Egypt, while there were around 20 million tons of municipal wastes. (I. Mohamed, N.Monem, 2016)

Garbage community “El Zabaleen community”

Manshiyet Nasser, more popularly known as Garbage Town, is a slum town with a population of around 60,000 in the suburbs of Moqattam Hills, inside the vast metropolitan region of Cairo. The village is known for being almost filled with garbage, including the settlement's streets and rooftops. Such piles of garbage are the product of having never developed an effective garbage collection network in Cairo Metropolitan City, despite having a population of nearly 20 million. Over the last 70 years, Manshiyat Nasser's inhabitants, mainly Coptic Christians, have filled the void. These informal garbage collectors, called the Zabbaleen or "Garbage Men," collect the garbage from Cairo's residents for a small fee in a door-to-door service and then transport it to their homes in Manshiyat Nasser via donkey driven carts or pick-up trucks.

They sort the garbage, once home, for recyclable content. Mens' jobs typically include sorting the trash, while women and children sort the garbage. The quality of Zabbaleen's recycling program is remarkable, though antiquated on its face. Nearly 90 percent of the garbage is recycled, four times the amount most Western recycling firms generate. (Tawsam, 2011)

The Zabaleen have built, arguably, one of the most effective resource recovery and MSW recycling programs in the world over the last decades. In addition, the continuation of this complex relationship between culture, climate, and wellbeing is threatened by the privatization plans of MSW services by official municipalities through the contracting of technology-intensive multinationals. Such a privatization approach undermines the socio-economic sustainability of the group of garbage collectors, as it does not enable people to expand on their technologically viable indigenous living patterns incrementally. Waste management has become much of Zabbaleen's inherited jobs and it has been for decades.

Since the authorities have no intention of compensating them for these improvements, the Zabaleen may lose access to their economic assets and waste garbage. This situation led the authorities to follow a strategy of moving the Zabaleen activities further out of the area, believing that this would turn the Zabaleen community into a safer living environment while still allowing the MSW to sort, recover, exchange, and recycle. However, these relocation plans would increase the travel distance of the Zabaleen and the cost of services provided to residential and commercial sites, thus posing new challenges to the sustainability of the Zabaleen's trade and livelihood footprint. (Fahmi & Sutton, 2010)

Media as a Tool in Environmental Awareness and its effect in Egypt

Mass media- including television, social media, and mass media in general- is one of the most effective methods of getting the message across to the largest possible audience in a country. Media plays a vital role in creating awareness or questioning things. Media has the potential to be extremely effective for environmental communication.

Campaigns and initiatives tackling environmental issues in Egypt have still failed, until the present day, to reach the country's mass population, but people in the media are not giving up. Local Egyptian photographer Taimour Othman launched his own campaign, #CleanYourOwnMess, on social media. The campaign is intended to raise awareness about how simple acts and habits in everyday life contribute greatly to either worsening or diminishing pollution.

Mass media started taking the initiative in raising awareness about how to save the environment and how environmental crises can negatively affect the present time and the future. "Trash to Treasure," an example in the media, is a composting project that tackles Egypt's rubbish problem. "With the help of some imported earthworms, the Plant a Tree group says anyone can start composting organic waste on their rooftop." (Mohamed Soliman, 2019).

"I got fed up with the rubbish on either side of the streets, so three years ago I decided to dabble in the state's activities to curb the garbage problem in Egypt by turning organic waste into organic fertilizer," Mahrous said. Also, he wanted to use the vacant space on his roof for

his new project, which is to turn his household waste into compost. (Mohamed Soliman,2019)

The literature review emphasizes the importance of waste sorting and management for environmental sustainability, emphasizing the role of public awareness campaigns in promoting responsible waste disposal practices. Egypt's Zabbaleen community offers innovative solutions despite systemic challenges, emphasizing the need for further research on waste sorting effectiveness and improvement, as the researcher noted the absence of prior studies investigating the causes of the sorting of garbage proven by previous studies and articles. The focus of this study is mainly on how sorting garbage can have a positive effect on Egyptian society. A quantitative research method is used to gain a rich insight into questions and research hypotheses.

Research Sample and Data collection

Research Sample

The research involved a sample of 1000 individuals residing in Egypt (Cairo -Alexandria- Beni suef), selected to represent a diverse cross-section of the population in terms of social class and educational level. The sample included teenagers and youth between 13 and 35 to capture the attitudes and behaviors of a key demographic group.

Sampling Technique: A stratified random sampling method employed to ensure fair representation across different socio-economic strata and geographic regions of Egypt. This approach will help to minimize selection bias and enhance the generalizability of the findings.

Data Collection Methods

Survey

The primary data collection method will be an electronic survey distributed to the selected sample. The survey consisted of both closed-ended and open-ended questions designed to assess: Demographic information, Knowledge and attitudes towards waste sorting, Waste sorting behaviors and Exposure to and perception of awareness campaigns.

In-depth Interviews

To complement the quantitative data from the survey, in-depth interviews conducted with a purposive sample of experts in the field of waste management and Media. This group included professors, practitioners from both the private and governmental sectors, and representatives from relevant NGOs. The interviews explored:

- **Evaluation of existing awareness campaigns:** Effectiveness of current initiatives, target audience, and communication strategies.
- **Barriers and facilitators of waste sorting:** Identification of key challenges and opportunities for promoting waste sorting behavior.
- **Recommendations for future campaigns:** Expert insights on effective messaging, target audiences, and implementation strategies.

Data Analysis

Quantitative data from the survey analyzed using descriptive statistics (frequencies, percentages, means, and standard deviations) to describe the sample characteristics and explore the relationship between different variables. Inferential statistical tests (e.g., t-tests, ANOVA, correlation analysis) employed to examine the association between variables and test the research hypotheses.

Qualitative data from the in-depth interviews analyzed using thematic analysis to identify key themes and patterns related to waste sorting behavior, awareness campaigns, and policy recommendations.

By combining quantitative and qualitative data, the research aims to provide a comprehensive understanding of the factors influencing waste sorting behavior in Egypt and to acknowledge the development of effective awareness campaigns.

Findings:

Quantitative Results: Survey

The targeted population for this survey was mainly people who varied in age from 13 to 35, as they are the most frequent users and deeply influenced by social media.

1. People sorting garbage in houses or schools:

75.4% of the respondents separate their garbage in houses or schools, while only 24.6% of the respondents don't, which means that most of the respondents take action by sorting waste in their houses and schools. This question had two options: the respondent sorted waste so he/she would continue to answer the following question, or he/she didn't sort waste so he/she would skip the next three questions.

Table (1) The reasons that drive/prevent people for sorting garbage

Reasons that drive people for sorting garbage	Percentages
1-The reduced amounts added to the electricity bill	66.7%
2- Reducing pollution	49.7%
3- To make the garbage separation process more manageable in the streets	16.4%

Reasons that prevent people from sorting garbage	Percentages
1- See the reduced amounts added to the electricity bills that the signs of recycling are unclear	61.4%
2- It takes a long time to separate the garbage	54.8%
3-There are not enough trash cans in the streets	35.6%

Table (1) presents the reasons that drive people to sort garbage in Egypt. 66.7% of the respondents mention the reduced amounts added to the electricity bill. 49.7% mention reducing pollution. 16.4% to make the garbage separation process more manageable in the streets. The

alarming fact is that the main reason and motivation to sort garbage is materialistic.

In contrast, several other mentioned reasons prevent people from sorting garbage in Egypt. There were only 376 respondents to this question. 61.4% believe that the signs of recycling are unclear, while 54.8% think it takes a long time to separate the garbage. 35.6% mention that there aren't enough trash cans in the street. These are expected results, depending on the first question.

Some respondents added their opinions that were not among the choices. For example: "all is "thrown in a large box" في كله بيترمي في الصندوق الكبير في الشارع".

Another example: "no need because we don't do recycling in Egypt" "عدم وجود داعي حيث ان لا يوجد إعادة تدوير".

2. Participation in garbage separation initiative:

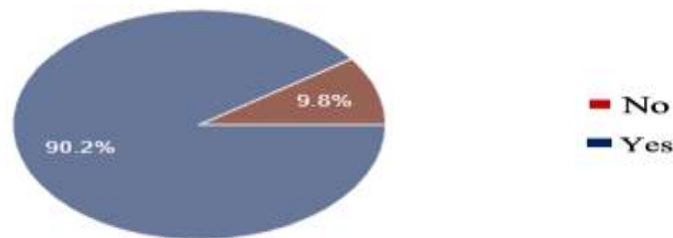


Figure 2: The percentage of participation in garbage separation initiative

The previous figure presents the percentage of respondents who will participate in the garbage separation initiative. The majority of the respondents will join (90.2%), while only 9.8% of the respondents will not participate. Therefore, most of the people who took this survey- the targeted candidates- have the intention to support the initiative.

The respondents who chose No have different reasons why. 9.8% of them explained that the sole reason they wouldn't participate is because

they have other interests, while almost 6.8% mentioned the hard-living conditions there and the rest chose the lack of information about the sorting of garbage. 3.6% of the respondents added other options, such as the government and not having time.

3. Respondent's opinion on Egyptian media coverage of waste sorting issues:

Table (2) Respondent's opinion on several media related statements

Selections	Agree	Neutral	Disagree
1-There is enough media coverage about the separation of garbage in Egypt	15.5%	25.5%	59%
2-Interested in knowing the stages of recycling and garbage separation through a documentary.	62%	14%	24%
3-I see that the media raised my awareness about the necessity of separating garbage.	28%	24%	48%
4-The media is playing its part in revealing the expected benefits of garbage separation technology.	14%	21%	65%
5-The media focuses on the expected benefits and ease of use of this technology.	2%	11%	88%
6-social media that is an effective element in the collective movement by the necessity of separating garbage	31%	25%	44%

The previous table represents the level of agreement of each respondent with some statements related to the Egyptian media coverage.

59% of the respondents agree with the statement, "There is enough media coverage about the separation of garbage in Egypt."

Additionally, 80% of the respondents were neutral with the statement "I see that the media raised my awareness about the necessity of separating garbage." Only 15% agreed with the statement and 5% refused it, which states that garbage separation is enhanced and most prominently promoted by the Egyptian media to be known to people.

70.5% of the respondents thought the statement "The media is playing its part in revealing the expected benefits of garbage separation

technology” to be true, while 8.8% wronged the statement and only 20.7 were neutral towards it. This again shows that the majority sees that the Egyptian mass media cares about shedding light on separating garbage.

50% of the respondents were neutral about the statement, when almost 45.8% agreed, which is a large percentage of the respondents. 4.2% disagreed with the statement “The media focuses on the expected benefits and ease of use of this technology.” That means the majority of people view media as focusing on the benefits of separating garbage.

In contrast, only 10% thought the statement “social media that is an effective element in the collective movement by the necessity of separating garbage.” to be wrong and the rest were neutral, which again highlights how the Egyptian mass media has a good effect on people and it can encourage or discourage their actions towards matters.

4. Respondent expected ease of use after Media Exposure:

Table (3) Respondent’s opinion on garbage separation easiness after media exposure

Selections	Disagree	Neutral	Agree
1-I think separating garbage is an easy process and doesn't take much effort	30 .5%	40%	24.5%
2-The media reflected the problem of separating garbage in a complex way that is difficult for everyone to understand,	8.8%	60.5%	30.7 %
3-I find the information available about garbage separation easy and simple.	10.7 %	10%	79.3%
4-I don't find it difficult to separate garbage compared to those who are younger	9.4%	60.4%	30.2 %

The researcher then moved on to specified questions about the process of separating garbage after concluding from the previous questions that the Egyptian media focused on the idea without detailing it or clarifying its method.

The previous table represents the level of agreement of each respondent, with some statements related to the expected ease of use.

Only 30.5% of the respondents disagreed with the statement, "I think separating garbage is an easy process and doesn't take much effort." yet almost 24.5% agreed with it. This is a normal result depending on the first question.

"The media reflected the problem of separating garbage in a complex way that is difficult for everyone to understand." 60.5% of the respondents thought this statement is neutral, 8.8% disagreed with it, and only 30.7% agreed with it. This again shows that the majority sees that the Egyptian mass media present sorting garbage as neither difficult nor easy.

79.3% of the respondents strongly agree with the statement, "I find the information available about garbage separation easy and simple. Additionally, only 10.7% thought this statement to be wrong and the rest were neutral, which shows that the information about sorting garbage is easily accessible to all people.

5. Respondent's opinion of behavioral intention toward sort garbage:

Table (4) Respondent's opinion of behavioral intention toward sort garbage

Selections	Disagree	Neutral	Agree
1-I will work to separate the garbage in the future for my personal benefit.	15.5%	25.5%	59%
2-I will start to spread awareness among those around me about the importance of separating garbage.	13%	57%	33%
3-I plan to adopt social campaigns on social media on the importance of separating garbage.	58 %	12%	30%
4-I am keen in the future to teach those around me how to separate garbage.	8.8%	20.7%	70.5 %

The previous table represents the level of agreement of each respondent, with some statements related to measuring behavioral intentions and how they think about sorting garbage now and in the future.

59% of the respondents agreed with the statement, "I will work to separate the garbage in the future for my personal benefit." While only

15.5% of the respondents disagreed with the statement, and almost 25.5% were neutral about it. 57% of the respondents were neutral with the statement” I will start to spread awareness among those around me about the importance of separating garbage," proving that in fact the only reason people will move to sort garbage is for their own good, as stated in the previous question. Only 13% of the respondents disagreed with the statement, and almost 30% agreed with it.

"I plan to adopt social media campaigns on the importance of separating garbage." Is a statement that 58% of the respondents didn't agree with, while only 12% thought it was wrong, and the rest were neutral. This highlights improving people's awareness of the importance of teaching garbage disposal at schools.

"I am keen in the future to teach those around me how to separate garbage." 70.5% of the respondents thought this statement to be true, 8.8% disagreed with it, and only 20.7 were neutral toward it. Again this shows that Egyptians prefer to know what the clear and directed personal benefits are.

6. Respondent's opinion of Separate garbage at the personal, local and international levels:

Table (5) Respondent's opinion of Separate garbage at the personal, local and international levels

Selections	Agree	Neutral	Disagree
1- I believe that the world's ecosystem will improve if garbage is separated continuously.	85%	5%	10%
2-When I separate garbage, I protect myself and my family from many diseases.	89.9%	6.9%	3.2%
3-I agree that it is necessary to teach the garbage class in schools to get young children to get used to it	63%	30%	7%
4-I think that the absence of garbage disposal behavior in the society has had a negative impact on the environment	48.5 %	21%	30.5%

Here, 85% of the respondents strongly agreed with the statement “I believe that the world's ecosystem will improve if garbage is separated continuously,” while only 10% refused the statement and only 5% were

neutral about it, which states the fact that the majority of people see that sorting garbage will improve the world.

“When I separate garbage, I protect myself and my family from many diseases.” 89.9% of the respondents agreed with the previous statement, while only 3.2% refused it, and 6.9% were neutral about it. This again reflects the majority believes that if they separate their garbage, they will save their family from diseases. Even though this statement, “I think that the absence of garbage disposal behavior in society has had a negative impact on the environment,” represents general knowledge about sorting garbage, 48.5% agree with it, as opposing to 30.5% who don't.

2-Research hypothesis

H1: Greater Direct Exposure to Media Positively Influences Individuals' Knowledge About Sorting Garbage

(F-statistic: 15.85 P-value: 0.00001)

The ANOVA results indicate that there are significant differences in knowledge about sorting garbage across different levels of media exposure ($p < 0.05$). Specifically, individuals with greater media exposure have significantly higher knowledge about sorting garbage compared to those with lower exposure. This supports the hypothesis that greater direct media exposure positively influences knowledge about sorting garbage.

H2: The More Effectively Media Spreads Awareness About Sorting Garbage, the Stronger the Behavioral Intention to Sort Garbage

(Pearson Correlation Coefficient (r): 0.45 -P-value: 0.0003)

The Pearson correlation analysis shows a moderate positive correlation between the effectiveness of media awareness and behavioral intention to sort garbage ($r = 0.45$, $p < 0.05$). This means that as the effectiveness of media in spreading awareness increases, the behavioral intention to sort garbage does as well. This supports the hypothesis that more effective media awareness leads to stronger behavioral intentions to sort garbage.

H3: Demographic Factors (Age, Gender, Social Level) Mediate the Relationship Between Media Exposure and Knowledge About Sorting Garbage

	Coefficient	P-value
Regression of Knowledge on Both Media Exposure and Demographic Factors:		
- Media Exposure	0.45	0.02
- Coefficient for Demographic Factors	0.25	0.03

The regression analysis indicates that demographic factors partially mediate the relationship between media exposure and knowledge about sorting garbage. When both media exposure and demographic factors are included in the model, the effect of media exposure on knowledge is reduced but remains significant. This suggests that while media exposure directly impacts knowledge, demographic factors also play a significant role in this relationship.

H4: Socioeconomic Factors Moderate the Relationship Between Media Exposure and Both Knowledge About Sorting Garbage and Behavioral Intentions

For Knowledge:

- Coefficient for Interaction Term (Media Exposure \times Socioeconomic Factors): 0.28
- P-value: 0.04

For Behavioral Intentions:

- Coefficient for Interaction Term (Media Exposure \times Socioeconomic Factors): 0.33
- P-value: 0.03

The moderated regression analysis indicates that socioeconomic factors significantly moderate the relationships between media exposure and both knowledge about sorting garbage and behavioral intentions ($p < 0.05$). This means that the effects of media exposure on knowledge and behavioral intentions vary depending on individuals' socioeconomic status. For instance, media exposure may be more effective in influencing knowledge and intentions among individuals from different socioeconomic backgrounds.

Qualitative Results: In-depth interview

The in-depth interviews were conducted with five media professionals with different educational backgrounds. The interviewees were Dr. Haitham, editor-in-chief of "See Thru" online magazine and former social media manager at the advertising agency. Timur El Hadidi, owner of the only house made out of garbage and recycling material, Dr. Mohamed Fouad, founder of Media Station Agency. Media Station Agency is a group of consultants in media relations and reputation management services and media consultants for Alexandria Governorate. Among the interviewees are Mr.Hisham Hamed, Marketing expert and Dr.Ahmed Taher, Assistant Professor at The American University in Cairo and Integrated Marketing communication expert in University of Georgia - Terry College of Business. The analysis will be segmented into 8 categories, which are Media Coverage and Awareness, Barriers to Adoption, Role of Government and NGOs, Influence of Social Media and Technology, Understanding the Audience Gap, Framing the Message for Impact, Utilizing Social Media Effectively and Building Trust and Overcoming Apathy.

The purpose of the in-depth interviews is to illustrate and complement the results of the statistical analysis. They were aimed at assessing the Egyptians' knowledge about sorting garbage and finding out all aspects of sorting garbage not presented by the Egyptian mass media in their coverage.

1. Media Coverage and Awareness:

Timour El Hadidi criticizes the inconsistent coverage of the media, drawing attention to a leading problem in which environmental movements in Egypt sometimes fizzle out soon after they get underway, as he said "There is not enough media coverage, and there is no awareness of the danger. It is always a campaign for a month and disappears and does not continue, and this is very disappointing." He added that he sees a glimmer of hope in the last months at the initiative "Et7adr lel Akhdar."

In addition, Dr. Mohamed Fouad and Dr. Haitham Bahey criticize the absence of consistent media efforts and clear message informing the

public about waste sorting. In order to successfully illustrate the advantages of garbage sorting, Dr. Fouad stresses the need for a well-defined business model, as he said “There is not a clear business model that shows people how to sort their waste and what the benefits are that they are going to earn after doing that. People are not aware that this will contribute to solving the waste crisis in Egypt and that they will also have individual benefits.”

Mr. Hisham Hamed also agrees with the other experts’ opinion, pointing out that environmental problems such as waste sorting are not given priority in the media until they are connected to significant political or economic event. He advocates for the media to stop focusing on news and instead integrate environmental issues as a social norm. Mr. Hamed said “Of course there isn’t enough media coverage about the environment, the problem is we deal with it as just news, as opposed to a new way of life, so it only gets covered when the government signs new deals/agreements related to renewable energy. Other than that we are dealing with the environment as a totally irrelevant topic.”

Consistently, Dr. Ahmed Taher highlights how social media may bridge the gap created by traditional media and promotes relevant, interesting information that appeals to a variety of Egyptian demographics and geographic areas, as he said “Absolutely, social media is the optimum platform for presenting new ideas for adoption by Egyptian society because it has a wide reach and allows for direct engagement with the audience. To ensure success: You need to understand the local culture which may differ from urban to rural areas, and from upper to lower Egypt, and across different governorates. It will be necessary to tailor your messages to resonate with the cultural values and norms of Egyptian society.”

2. Barriers to Adoption:

Mr. Hisham Hamed listed a number of challenges, such as cultural norms, a lack of infrastructure, and the difficulties that sorting waste is seen to cause. He believes that many Egyptians could not recognize the benefits of joining right away in the absence of incentives or widely available facilities, as he said “Why would people sort their garbage? What’s in it for me? There is no good reason or benefit as far as the

normal consumer is concerned. Moreover, there are no facilities or tools such as separate containers everywhere, and no set up or reward for it. Bear in mind that garbage separation started in the world more than 20 years ago and took a while to be established and even now not all first world counties can claim it's done successfully”

He also added “before convincing we should inform people of what garbage collection is and why it is good for them, then we can start finding out those who reject it and understand what their problem is and work on it”

Dr. Mohamed Fouad also agreed with Mr. Hisham Hamed, and he assured that there is a big knowledge gap about garbage sorting in Egypt, and many people are not aware of the advantages it has for their own health and the environment. Dr. Fouad said “People are not aware that this will contribute to solving the waste crisis in Egypt and that they will also have individual benefits.”

Dr. Ahmed Taher not only agreed with the previously mentioned opinions but also he suggests that utilizing influencers and interactive material could help close this gap by making the idea of waste sorting more approachable and enticing. He bases his proposal on social media engagement and education, as he said “make partner with local influencers and micro-influencers who have a significant following and credibility to promote the ideas. Select a different angle for each one of them to match their style and followers. They would like to take on a social cause, not a commercial one, to increase their credibility with their followers. You need to develop and use catchy hashtags and run campaigns to create buzz and encourage participation, he added “The influencers will use the hashtags and promote them.”

3. Role of Government and NGOs:

Dr. Mohamed Fouad emphasizes that because media campaigns are expensive and significant to society, the government should provide funding for them. He supports the argument that persistent campaigns to raise awareness of garbage sorting may not be viable in the absence of official support, as he said “In my opinion, the Egyptian media role needs to be stronger and clearer, as this role goes to the relevant ministries, due to how expensive the process is unless we have any

sponsors for those kinds of companies, especially on social media or TV ads, which is really expensive. Therefore, the government covers those expenses because of how expensive they are, and they work on them to make them accessible to all Egyptians." This was his opinion about what the Egyptian media covered in the issue of waste sorting; finally, he also added "The Ministry of Environment and Individual Initiatives should work hard on it."

The opinion of Dr. Ahmed Taher agreed with the other experts too, as he proposes partnerships with NGOs to enhance credibility and reach, emphasizing the need for collaborative efforts to promote waste sorting effectively, as he said "we need to collaborate with NGOs and nonprofit organizations, or better still create a new one for that cause specifically. You need to work with relevant organizations to give your idea more credibility and reach, and engage your audience(s) directly and indirectly. Create a song, create a cartoon character, and build a brand with a pleasant persona and consistent tone of voice. "

4. Influence of Social Media and Technology:

Both Dr. Ahmed Taher and Dr. Haitham Bahey stress how social media and digital platforms can reach a wide range of audiences, especially young people. They support engaging and educating Egyptians about garbage sorting using influencer advertising, interactive content, and customized message. Proving his point, Dr. Taher said "It will be necessary to tailor your messages to resonate with the cultural values and norms of Egyptian society.

Dr. Ahmed Taher also added a recommendation to modify content formats (such as infographics and quick films) to fit various platforms and cultural settings in order to maximize accessibility and engagement, as he said "we need to set a few workshops with copywriters to create a set of approaches for engaging content including short videos for YouTube shorts and TikToks, infographics for Instagram, and interactive podcasts and posts for Facebook, etc."

5. Understanding the Audience Gap:

Timour El Hadidi's personal narrative highlights the generational divide and gap. It's possible that before the revolution, people were less conscious about the environment. Depending on the level of

competency, different age groups should be the focus of media activities, as he said, “The January 25 Revolution made me think about this, and made it my goal to achieve it. Before the revolution, I never thought about this. My environmental awareness increased. In addition, we are now living in a world full of viruses, pollution and diseases that we need to put an end to. We consumed more than we produced, and it’s totally wrong. For example, I was brought up in a house that loves and respects nature and has always pushed me to love and respect the environment and that’s why I’m now environmentally aware. Therefore, all parents have to raise this idea in their children’s heads since childhood, because this will differ a lot.”

However, Mr. Hisham Hamed emphasizes teaching the audience before calling for action. This suggests that some Egyptians might not be familiar with the foundations of garbage collection and its benefits. He said “The problem is that there is nothing, no publicity about it, no incentive to do it, no communication on why I should do it. People are supposed to wake up and separate the garbage out of their own free will! With all the issues we have in this country this is such a low priority.”

6.Framing the Message for Impact:

Dr. Haitham advises concentrating on the waste sorting business model. He emphasized the financial advantages of recycling, such as the creation of jobs that might appeal to people who are struggling financially. He said, “That’s why it should start first with a campaign- with a clear business model- to raise awareness about the benefits of doing this process.”

Mr. Hisham Hamed proposes emphasizing the benefits of waste sorting for individuals, like better waste management that results in cleaner communities. This could eliminate the common misconception that "zabaleen," or informal waste collectors, are only in charge of sorting waste, as he exclaimed “Sorting garbage is a very slim segment of the environmental issue and its impact is minimal if not coupled with the bigger picture of recycling and its impact on the environment as well as financial impact on the consumer, right now garbage sorting is viewed as the domain of zabaleen and nabasheen, a very negative view and attitude.”

7. Utilizing Social Media Effectively:

The AI characters that Dr. Ahmed Taher proposed for social media interaction are creative. These characters may resonate with and appeal to younger, digitally native consumers (Gen Z), as he said “I would recommend two AI characters, a young couple, that would engage younger audiences, gen Z. You need to respond to comments, conduct polls, and host live sessions to interact with your audience and address their queries”

Also, Mr. Hisham Hamed pointed out that data-driven content production is essential. By examining audience feedback (likes, comments, and shares), future material may be customized to maximize interaction, as that he said “Social media thrives on numbers, mainly Reach and Views as well as opinion leaders/Influencers who bring the main idea into focus and reinforce consumer acceptance of it”.

8. Building Trust and Overcoming Apathy:

The public relations expertise of Dr. Mohamed Fouad recommends incorporating reliable local voices. Promoting waste sorting by local celebrities or community leaders could humanize and validate the message.

“Nowadays, ads are extremely expensive, whether TV ads or billboards; that’s why they fit the government budget. On the other side, ads on social media platforms go well with those kinds of social campaigns, as they help raising the issue. There are also other ways that suit every social class in Egypt and deliver the message of waste sorting in a simple and understandable way.”

He also added “We can’t deny the role of social media in our lives, but here in Egypt, we are 100 million citizens with different social classes, so the message should be accessible to all those classes through different channels, not only social media.”

Mr. Hisham Hamed suggests addressing the notion that "nothing will change." This can be countered by media initiatives that showcase successful waste sorting initiatives in other parts of Egypt or the globe. Despite the power of social media, a successful campaign should make use of a range of media channels, such as traditional media to reach a

larger audience, especially those who might not be engaged on social media, as to use radio, television, and newspapers. Another alternative is through public awareness campaigns that collaborate with governmental bodies or non-governmental organizations to plan gatherings, training sessions, and educational programs and initiatives in schools for communities. Highlighting his point, he said “The role of media is to put focus on that topic, focus and light and continue to do so until there is behavior change. There are currently no initiatives”.

Every expert stresses the need of sustained media campaigns. Campaigns run in brief spurts are unproductive. It is essential to monitor and evaluate. Evaluate the campaign's performance on a regular basis and modify your plans in response to data and audience input.

By linking together these different points of view, it becomes clear that dealing with garbage sorting in Egypt calls for a multifaceted strategy. Strong media campaigns, educational outreach, governmental assistance, and community engagement tactics should all be a part of this strategy. Egypt may move towards a more sustainable and environmentally conscious culture by utilizing social media, emphasizing the advantages of garbage sorting, and developing collaborations with influencers and non-governmental organizations.

The varied viewpoints of the experts and these extra details can help media efforts for rubbish sorting in Egypt to go beyond simple awareness-raising. They have the power to initiate a social movement in support of ethical waste management techniques. A multifaceted strategy that engages, educates, incentivizes, and cultivates a feeling of community duty is crucial. This strategy, shaped by the insightful opinions of these media experts, might make Egypt's future more sustainable and environmentally friendly.

Conclusion

The research has illuminated several crucial aspects of waste sorting behaviors and the influence of media in Egypt. The quantitative results reveal a significant engagement in garbage separation practices among respondents, with 75.4% actively sorting waste at home or school. Motivations for sorting waste are predominantly materialistic, as seen from 66.7% of respondents citing reduced electricity bills as a primary motivator. However, barriers persist, including unclear recycling signs, time constraints, and insufficient infrastructure, which collectively hinder broader participation.

The research also supports the hypothesis that greater media exposure positively impacts knowledge about waste sorting, with statistical evidence indicating significant differences in knowledge levels based on media exposure. This finding underscores the importance of enhancing media efforts to bridge the knowledge gap. Furthermore, the positive correlation between effective media awareness and stronger behavioral intentions suggests that improved media strategies could lead to greater public engagement in waste separation practices.

Demographic factors such as age and socioeconomic status partially mediate the relationship between media exposure and knowledge, highlighting the need for tailored media strategies that address diverse audience needs. Socioeconomic factors also moderate the impact of media exposure on both knowledge and behavioral intentions, indicating that media campaigns must be adapted to different socioeconomic contexts for greater effectiveness.

Qualitative insights from media professionals reinforce the need for a more consistent and strategic approach to media coverage. The experts' opinions emphasize the necessity of sustained campaigns, improved infrastructure, and the integration of environmental issues into daily social norms. Social media and technology are highlighted as potent tools for engaging younger audiences, while partnerships with NGOs and influencers could enhance credibility and reach.

In summary, the findings suggest that while there is a strong intent to support waste sorting initiatives, significant barriers remain. Effective media campaigns, coupled with improved infrastructure and public

education, are essential to overcoming these barriers. By addressing these issues and leveraging both traditional and digital media platforms, Egypt can foster a more sustainable culture of waste management and environmental stewardship. The multifaceted strategy proposed, drawing on expert insights and quantitative data, provides a comprehensive framework for advancing waste sorting practices and achieving long-term environmental goals in Egypt.

Research Recommendations:

- 1- Extensive educational programs are crucial for waste sorting, outlining its advantages and addressing cultural and infrastructure obstacles.
- 2- Governmental support is important for maintaining and supporting media campaigns, as it provides the necessary resources for long-term behavioral change.
- 3- Engaging communities through educational institutions, NGOs, and local influencers is a proven method for promoting local support for waste sorting programs.
- 4- A clear waste sorting business model should highlight its environmental, health, and economic benefits. It can reduce expenses, create jobs, reduce pollution-related diseases, and contribute to resource conservation. This makes waste sorting more appealing and encourages widespread adoption, making it a more sustainable and environmentally friendly option.
- 5- A multi-channel garbage sorting campaign should utilize digital and conventional media, collaborate with NGOs and governmental organizations, and provide training materials for public events, ensuring extensive coverage, community involvement, and efficient waste sorting education.

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