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AN INTERACTIVE EDUCATIONAL APPROACH TO PLASTIC POLLUTION: INTEGRATING EBOOKS AND QR CODE TECHNOLOGY

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ABSTRACT

This project introduces an innovative way to raise awareness about plastic pollution using an interactive eBook called “Ocean Plastic Pollution” and printed design tags with QR codes placed on plastic bottles. These tags are more than labels; they connect consumers directly to educational content. When someone buys a bottle with the tag, they can scan the QR code to access a free eBook, which features engaging videos, quizzes, and activities about the impact of plastic waste and practical ways to make a difference. Plastic pollution, especially from single-use bottles, is a global problem that harms wildlife and the environment. Many people are unaware of the consequences of careless plastic disposal. By placing QR-coded tags on everyday products, this project brings vital information directly to consumers, making learning accessible and interactive. The eBook is designed for all ages, encourages group activities, such as clean-up events and recycling challenges, making it useful for schools and community programs. Businesses and organizations, such as beverage companies and environmental groups, can support or sponsor the project by branding the tags, demonstrating their commitment to environmental responsibility. This approach not only promotes the initiative but also encourages positive corporate involvement. In summary, this project leverages simple technology to connect daily habits with environmental education, making it easy and enjoyable for people to learn about plastic pollution. By integrating digital learning with physical products, it empowers individuals and communities to adopt sustainable behaviours and showcases how technology, education, and corporate responsibility work together to address environmental challenges.

Keywords: *Plastic pollution, interactive eBook, QR code, tags, plastic bottles, worldwide problem, environment, community programs.*

INTRODUCTION

Plastic waste harms animals, contaminates water sources, and sabotages the aquatic ecosystem, and thus the plastic pollution is a global environmental concern bottles particularly add significantly to these issues since they are commonly used and discarded in a haphazard fashion. As beverage labels are an important aspect of bottle packaging, they can have a critical impact on the successful recycling of PET plastic bottles (Gwenner, 2023). Even though awareness is increasing, consumers remain unaware of the negative impact of plastic pollution in the long term and the requirement for sustainable consumption. Traditional methods of teaching do not come through to the public so well, particularly in everyday life.

To address this gap, this project offers a new, accessible solution in combining digital learning with physical consumer products. The ocean plastic pollution" interactive eBook is used alongside QR-coded design labels put over plastic bottles. As a gateway to the eBook, these tags enable visitors to scan and see interactive material that debunks popular myths, discusses the causes and effects of plastic waste and promotes doable environmental actions. Through the use of captivating media, this strategy seeks to build environmental awareness while incorporating learning opportunities into everyday life. It also provides the opportunity for cooperation with groups and companies to promote sustainable activities.

Another option for enforcing environmentally friendly behaviour at the individual and group level is provided by the introduction of a hybrid learning framework, combining technology, physical products and environmental education.

METHODS

Concept Development

The first step was to think of a way to combine a QR-coded tag on plastic bottles with an interactive eBook. Making a clear connection between learning and everyday objects was intended to increase accessibility to environmental education. The concept was created to be easy to use, accessible to all age groups, and straightforward. The team prepared the eBook's functionality, topic it would cover, and how readers could quickly access it through QR codes at this phase.

The project integrates two main components:

- **QR-Coded Tags**: Specially designed tags featuring QR codes are affixed to plastic bottles. These codes, when scanned using smartphones, direct users to the interactive eBook.

- **Interactive eBook:** The eBook titled "Ocean Plastic Pollution" includes multimedia elements such as short educational videos, interactive quizzes, and group activity suggestions like clean-up drives and recycling challenges.

Content Creation

Next, the eBook titled ″Ocean Plastic Pollution″ was created. The content was written in simple language and focused on explaining what plastic pollution is, the different types of plastic, where pollution comes from, and how it affects our oceans. It also included a “Myth vs. Facts” section and fun, interactive activities like videos and quizzes. The design was made using Adobe InDesign to ensure that the layout, colors, and visuals were attractive and easy to follow. The eBook was tested to make sure it worked well on different devices, such as smartphones and tablets. The materials were reviewed by environmental experts, educators, and design specialists to ensure accuracy and appeal

The eBook content was developed with the following key objectives:

- Simplify complex information about plastic pollution for general audiences.
- Engage users through interactive elements.
- Encourage actionable behaviour change.

Tag Design and Production

Creating and printing the QR-coded tags was the third stage. With straightforward visuals and instructions for scanning the QR code, each tag was made to be both visually appealing and educational. The code directs people to the digital eBook when it has been scanned. Plastic bottles and other single-use items can have these tags attached to them. High-quality printing was done on the tags to make sure they would withstand handling and could be used in conjunction with businesses like beverage companies or environmental projects. The tags were designed to be visually appealing and durable. They feature eco-friendly ink and biodegradable materials.

RESULTS AND DISCUSSION

The outcome of this project is a comprehensive and easy-to-use environmental education platform that links everyday plastic items to interactive learning. The eBook "Ocean Plastic Pollution” as shown in Figure 1 has been warmly welcomed because of its colorful layout, easy-to-understand language, and entertaining features including films, quizzes, and suggested activities. Early feedback from community members, teachers, and students indicated that users found the eBook enjoyable and easy to understand. Many users said they feel more inspired to change their regular routines including using less plastic and participating in cleanup efforts after learning new information about plastic waste.

The eBook was successfully shared with a larger audience using the QR-coded tags. The tags reach individuals in real-life settings since they are attached to objects like plastic bottles (Figure 2), which gives the learning process a more personal and relevant sense. This method encourages consumers to consider how much plastic they use when handling or utilising plastic objects.

Furthermore, the project has opened doors for collaboration. Businesses, NGOs, and educational institutions expressed interest in utilising the tags to promote their eco-friendly brands or support

environmental initiatives. This demonstrates how digital education can engage communities and businesses in real-world problem-solving outside of the classroom.

Overall, the findings demonstrate that using physical QR tags together with digital content is an effective strategy to raise awareness of environmental issues and motivate action.

Table 1.: Description of output items

Output Item	Description
Interactive eBook	Includes videos, fun facts, and educational content
QR Code Design	Links directly to the eBook
Bottle Tag Design	Visually appealing tags for sending messages in physical products

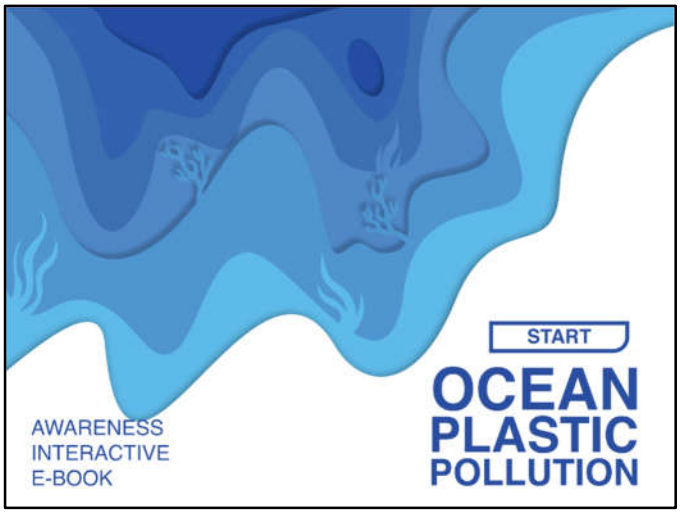

Figure 1.: eBook front cover

Figure 2.: Plastic bottle tag

CONCLUSION

The Ocean Plastic Pollution initiative effectively raises awareness about plastic waste by combining actual products with internet education. The initiative makes it simple and efficient for individuals to learn about environmental challenges in their daily lives by using an interactive eBook and QR-coded tags applied to plastic bottles. The eBook is entertaining, instructive, and age-appropriate, and the QR tags expand its audience by using everyday items. This strategy invites companies to participate in raising awareness while also promoting environmental education. All things considered, the initiative demonstrates how straightforward technology, and imaginative design can combine to encourage sustainable behaviour and safeguard the environment.

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