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ECO-DESIGN WORKSHOP





ZERO WASTE

ZERO WASTE is a Project whose main objective is to promote social inclusion in rural areas in the field of education, using content related to the reduction of food waste. At the same time, it is also focused on improving the professional development of the teachers through the creation of gamified educational tools with scientific content.

This guide is one of the tools openly available as part of the development of the project, so any interested person can access its content and learn from it. All the contents of the guide have been based on the methodological principles and scientific content developed by the IA2 expert committee.

Formative contents that are available on the website work as a support for the present guide, but also as a way to be introduced in new teaching methodologies related to gamification. Among these contents, the following can be found:

- Infographics
- Tips to reduce waste
- Eco-design Workshop
- Escapebox
- Online Escaperoom

The ZERO WASTE project is funded by the Erasmus+ programme and developed by a consortium of 6 institutions of Spain, Ireland, Portugal and Romania.

Introduction: Eco-Design

The ZERO Waste project is focused on raising awareness about food waste with the intention of reducing it. This is part of the strategies to meet Sustainable Development Goal 12 (Responsible Consumption and Production). However, to achieve effective sustainable development, these strategies need to be implemented at all levels. This is what Eco-Design is all about.

When we talk about the design of a product, we refer to the process by which that product is conceived and developed to be mass-produced. This idea of design traditionally focuses



on functionality and aesthetics, but if we add a component of environmental sustainability at the time of development, we arrive at what is called Eco-Design.

Eco-Design is characterised by focusing on the sustainability of the product when creating it. In this way, a series of criteria have been developed that can be used to determine whether a product has been eco-designed or not:

- **Material reduction**

One of the most frequent problems we encounter in many designs (particularly in packaging) is the excessive use of materials, which has a huge impact on the final environmental cost of the products. Optimising the number of materials needed to create the product is one of the basic principles of eco-design.

- **Design by disassembly**

A basic principle of eco-design is that all materials (or the maximum possible proportion of them) are recyclable and can be recovered for a new useful life or treated so that they do not end up in a landfill. To facilitate this recycling process and to be able to take each material to the most convenient place for treatment, an eco-designed product has to be able to easily separate each of its materials or make recognisable the material from which each part is made.

- **Mono-materiality or “bio” materials**

The separation of materials discussed above can also be replaced by mono-materiality, which involves making a product from a single material so that the recycling of the entire product is simple and in a single step.

- **Durability**

Eco-design tries to avoid single-use and disposable products and to ensure that they have a life as long as possible. That is why durability has to be a requirement in the case of products whose function is to be used frequently.

- **Multifunctionality, reuse and recycling.**

When we have a product that allows more than one function, we avoid the need to have a different product for each of them, which reduces the number of products produced globally.

On the other hand, if it can be easily modified to have new useful functions, we have a reusable product, which also avoids the need to produce new products.

Finally, a recyclable product is made of materials that can be recovered to make new products, so that even though the useful life of our product has come to an end, the life of its materials continues, avoiding the need to extract new raw materials.

- **Reducing the emissions**

The reduction of greenhouse gas emissions and pollutants is one of the fundamental objectives to achieve a sustainable world, which is why it is a fundamental point of Eco-Design. In this reduction of emissions, all stages of product design and production must



be taken into account: Extraction of raw materials, manufacture, transport, use and recycling.

- **Eco-advertising**

When the product is intended to showcase the efficient and limited use of resources that minimises the environmental impact it has, it is important to ensure that the advertising used to publicise the product does not have a greater impact. For this reason, eco-design of advertising is also important.

Workshop sequence

The Workshop is divided in three parts of different durations:

- **Introduction (10 minutes)**

In this introduction, a brief overview of the concept of eco-design is given and the example of the product proposed in the following section (Lactose-free chocolate milkshake) is explained.

- **Eco-designed product development - What would you eco-design? (25 minutes)**

During this phase, participants will have to agree on the product they are going to design and try to ensure that as many phases as possible meet eco-design criteria, aiming for minimum environmental impact.

- **The last few minutes of this phase will be used for the presentation with which the workshop ends.**

- **Products presentation (10 minutes)**

In this phase, each group will make a presentation as if the other groups were potential investors, highlighting the benefits of their product and its eco-design.

What would you eco-design?

The purpose of this workshop is for participants to think about eco-designed products they know and try to replicate the qualities they like most about them in their eco-designed food products. To do so, they will have to take into account all the steps of the production process and the food chain: primary production, manufacturing, distribution and consumption. But they will also have to take into account the waste disposal of the product.

As an additional challenge, they can put limiting characteristics in terms of ingredients on their products, such as making them suitable for certain types of allergies or intolerances (celiac disease, lactose intolerance, egg allergy...). To do so, participants will have to explain each of the steps, comparing with their peers and adjusting those parts they consider necessary based on the rest of the presentations.

To help them, they will have a guide of the steps they have to explain together with an example of an eco-designed product with each of its steps explained:





Lactose-free chocolate milkshake

- **Primary production** (origin of the raw materials)

o make this lactose-free chocolate milkshake we are choosing not to use milk, as this way it is possible to avoid having to eliminate the lactose in later steps. That is why we will use oat and cocoa drinks.

We will try to use locally produced oats for local consumption, as it will not be possible to do so with cocoa.

The cocoa will come from sustainable and fair trade plantations, which will guarantee that the product we obtain meets ethical and sustainability standards appropriate to our eco-design.

- **Manufacture (production process)**

For manufacturing, the first step will be to identify the processes required: the infusion of water and oats to obtain the oat milk, grinding the roasted cocoa and mixing the resulting products. Packaging will be the last step of this stage.

In this step, the most important thing to keep in mind is that the processing plant should be in an area close to the oat field, to reduce the transport of the oats as much as possible. After infusion of the water and the oats, the remaining oat residues will be reused to generate compost, so that they can be used as fertiliser for new crops nearby.

The plant will have solar panels to help generate the energy needed for the whole process. As for the packaging, there are two options. In the first, the packaging will be made of a single material to facilitate recycling: a biodegradable bioplastic that can be easily recycled, such as PLA or cellulose-based bioplastics.

In the second option, the packaging will be returnable for a refill and a discount on the next shake.

- **Distribution (transport y retail)**

Since there is little room for improvement in the transport step from our perspective as a producer, what we will do is to reduce the delivery radius of our product to the minimum feasible, so that it will not be sold too far away to avoid large transports.

The product will be pasteurised to avoid the need for refrigeration and thus reduce the amount of energy needed to keep it in optimum condition in the supermarket.

- **Consumer (Residues disposal)**

To make it easy for consumers to recycle, we have already mentioned the two possibilities for the packaging.



In the first, it is composed of a single piece of recyclable bioplastic. In the second, the packaging will be a recyclable bottle that can be used more than once by bringing it to the point of sale to be refilled at a price reduction compared to the first shake.

Proposals for other foods to be developed by the participants (in brackets are proposals for limitations in the recipe or design):

- Chickpea hummus with peppers
- Russian salad (vegan)
- Muffins (gluten-free)
- Orange juice
- Yoghurts (lactose-free)