



ПЛАТФОРМА 4 ГРАФІЧНИЙ ДИЗАЙН: СУЧАСНІ ТРЕНДИ

УДК 74

ACADEMIC SUSTAINABILITY EXPERIENCES A PACKAGING IN THE REPUBLIC OF MOLDOVA

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Global strategies to secure the planetary ecosystem include packaging as technological factors with a significant impact on the environment. In the tendency to reduce the economic effort required by packaging found in the cost of the finished product, economical packaging solutions were developed, but unsustainable in relation to the environment. The paper presents functional packaging solutions designed within the framework of academic activities with students, aligned with the requirements of current European directives aimed at the need to update the market with sustainable packaging.

The study was carried out within the State Program "Research on Ensuring Sustainable Development and Increasing Competitiveness of the Republic of Moldova in the European Context", subprogram 020408.

Key words: *packaging, cardboard, competitions, sustainability, students.*

INTRODUCTION

In the context of global strategies to safeguard the planetary ecosystem, reducing the impact of polluting factors is a primary strategic objective. In order to solve this objective, it is important to clearly identify the influencing factors and keep them under control.

PURPOSE

Considering the mentioned, the study was directed towards the analysis and identification of the possibilities of reducing plastic packaging from the circuit and replacing them with packaging made of paper, cardboard or other environmentally friendly alternative materials.

Achieving the goal implied the establishment and pursuit of objectives: identifying the promoters of cardboard use as a material for packaging creation, reflecting the ways in which the younger generation, such as the training students in the field of reference, such as those from the Design and Printing Technologies program, Technical University of Moldova - involved in raising awareness of the need to use recyclable materials in the process of creating prototypes and presenting the results obtained in this regard.



RESULTS AND DISCUSSION

The factors of influence on the planetary ecosystem

Several reference sources focused on the topic of defining polluting factors mention the following [7, 8]:

- environmental factors; biotic and abiotic;
- physical factors;
- agricultural factors;
- radioactive pollutants;
- human factors;
- technological factors.

Technological factors are among the multitude of polluting factors with a significant impact on the ecosystem. Packaging is the result of evolving technologies related to user expectations, thus generating products to be made from different materials.

The packaging with the most negative repercussions on the environment, health and human life are those made of various plastic materials [9]:

- **PET** – Polyethylene terephthalate: beverage containers, oil, etc. Code 1;
- **HDPE** – High-density polyethylene: containers for chemical products (shampoos, liquid detergents, chlorine, cleaning solutions, etc.). Code 2;
- **PVC** – Polyvinyl chloride: plugs, foil, pipes, tubes, light furniture, cards, stickers, etc. Code 3;
- **LDPE** – Low density polyethylene: bags, sacks, foils. Code 4;
- **PP** – Polypropylene: margarine boxes, glasses, syrup and ketchup bottles, various food packaging, etc. Code 5;
- **PS** – Polystyrene: trays, disposable cups, yogurt boxes, cassette and CD cases, etc. Code 6.
- **Other plastics:** Code 7-19. Packaging marked with this number cannot be recycled.

On the global, European and national levels, various rules and measures are established that must ensure the reduction of plastic quantities (fig. 1), the use of biodegradable, compostable or biological types of plastic, or its replacement with other materials.



Fig.1. Pastic packaging markings and their compositional significance

European legal approaches to regulating the impact of packaging

The aspects related to the sustainability of packaging are supported and promoted including through Directive (EU) 2018/852, the modified version of Directive 94/62/EC, regarding the management of packaging and packaging waste, the European Green Pact and the Action Plan for circular economy of the European Commission. Thus, it is planned that by the year 2030, it will be possible for all



packaging to become recyclable, to prevent the production of packaging waste, to stimulate the reuse and reloading of packaging [1-4].

However, consumers have significant implications for positive changes regarding the green economy, determining how humans produce and consume resources, to reduce environmental impact and promote sustainability. Consumer education is done in various ways and at different stages of learning and studying (preschool, school, gymnasium, high school, university) which encourages positive thinking about a greener future, more responsible towards the environment.

Academic experiences developing sustainable packaging concepts

Every year, at the international level, several competitions are organized focused on the identification of solutions related to environmentally friendly packaging. Some of these competitions are open to students, focused on promoting ideas to use cardboard as the main material for packaging or developing sustainable ideas valid for the packaging industry. In fig. 2 some of these contests are presented.

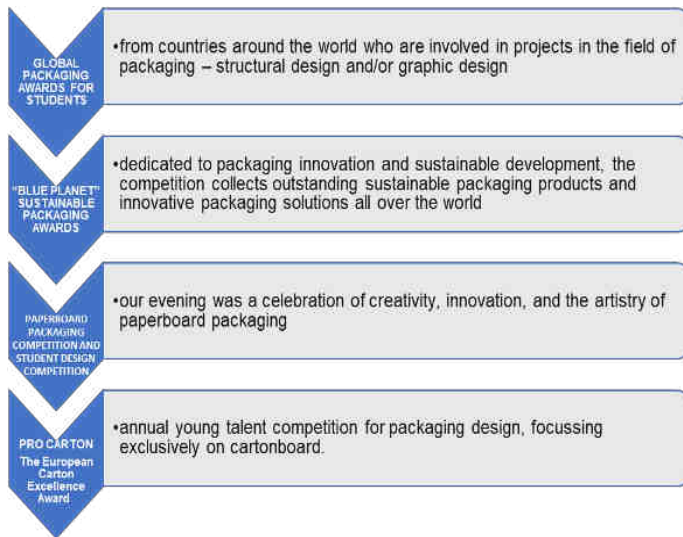


Fig. 2. Some international competitions focused on the packaging industry, dedicated to students

One of the most popular, which is established by the number of participants and the increased interest of the packaging industry, is Pro Carton, which implements the advantages of cardboard packaging solutions among the young generation through the Pro Carton Young Designers Award competition. Focusing exclusively on cardboard, the award plays a pioneering role in promoting sustainable packaging and innovation among students across Europe [6].

Students from the Technical University of Moldova, Faculty of Design, Department of Industrial and Product Design, starting in 2022, annually participate



in the Pro Carton Young Designers Award competition. Student participation in competitions aimed at the sustainable packaging industry brings countless benefits: encouraging students to develop innovative and creative solutions; helps students become aware of the problems related to traditional packaging and their impact on the environment, motivating them to look for greener and more responsible solutions; provides the opportunity to develop skills in a real and applicable context as students engage in practical skills such as design, prototyping, testing, optimization; contributes to the promotion of the concept of sustainability among students and in the academic environment; teaches students to approach complex problems in a systematic inclusive manner by involving biodegradable, recyclable and compostable materials; interaction with related fields, which occur within the competition, favors the development of collaborations; ideas developed by students can have a significant impact on the packaging industry by contributing to transformations towards more sustainable and socially and environmentally responsible models; prizes offered in these contests may include scholarships, internships, or other valuable opportunities that can help advance students' careers.

In this context, it is worth noting the packaging design "Gift Packaging for Liquids" (fig. 3a) winning at the Pro Carton Young Designers Award 2022 competition, made by the student Oxana Zaporoniuc under the auspices of the teaching staff - prof. Valeriu Podborschi, head of department, and assistant. university Mircea Zubcu. The author developed packaging focused on avoiding unnecessary use of materials, protecting the product and allowing for attractive shelf display of the container itself.



Fig. 3. Packaging created by the students of the Industrial and Product Design department, intended for participation in competitions that promote cardboard as a sustainable material: *a – Oxana Zaporoniuc [5], b – Codjebaş Cristina.*

In the same manner, the students of the Polygraphic Design and Technologies program from the Industrial and Product Design Department, participating in the same competition, proposed to optimize the packaging for bathroom and toilet freshener balls, from a constructive point of view and the materials involved.



Fig. 4. Sustainable bathroom freshener packaging solutions developed by students:
a – Popa Evelina, b – Carcea Sorin, c – Rața Nadejda.

Various solutions were generated that focused on reducing the number of materials involved in making this type of packaging and replacing plastic with cardboard, and as a layer to protect the balls from emanating perfume before use, the students proposed the use of soluble film in water (fig. 4).

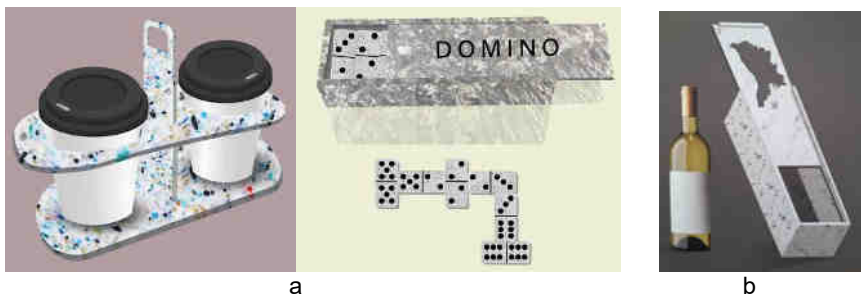


Fig. 5. Solutions for involving recycled plastic in the creation of industrial packaging, developed by students of the Design and Printing Technologies program: *a – Cosonea Iulia, b – Rudaia Irina.*



The need to participate in packaging competitions, including with innovative materials, pushed the students to find alternatives for plastic materials, which laid the foundations for collaboration with the local producer of recycled plastics - Reciclyne, led by Cristina Tocari. As a result, the students generated several ideas for involving recycled plastic in the process of creating reusable and multifunctional packaging (fig. 5).

CONCLUSIONS

Eco-friendly education and the development of consumer awareness starting from schools and universities are crucial in the development of the sustainable and sustainable economy. This objective can also be achieved by involving students in international competitions focused on packaging which promotes environmentally friendly solutions. The personal and dedicated involvement of the students, of the teaching staff from the Department of Industrial and Product Design of the Technical University of Moldova, aims at the development of functional and contextual solutions developed both by students and in multilateral partnerships, useful for the academic and economic environment, society civil, etc.

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