



ПЛАТФОРМА 4 ГРАФІЧНИЙ ДИЗАЙН: СУЧАСНІ ТРЕНДИ

УДК 79.01/09

APPLICATION OF ECODESIGN STRATEGIES IN THE CREATION OF BOARD GAMES

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The study explores the implementation of the ecodesign strategy in the design of board games and their packaging. It also addresses the development of specialized skills in Design and Printing Technologies students, aiming to instill a professional attitude grounded in environmental responsibility across all stages of product creation, from concept to post-use transformation. The integration of ecodesign into academic teaching, supported by methods such as Problem-Based Learning, brings short-term, medium-term, and long-term benefits by promoting the use of natural resources, identifying sustainable solutions, and encouraging environmentally conscious decision-making.

Key words: *ecodesign, board games, packaging, natural materials, strategy, principles, sustainability.*

INTRODUCTION

Packaging design, especially for board games, is a complex process that requires a lot of preparation and preliminary analysis. An important part of the preparation is the aesthetic-constructive design stage, which requires considering environmental aspects in the design, production, use and post-consumption processes (fig. 1). The basic aspects of board game packaging development and design do not show significant changes through the ecological approach, but they obtain new values determined by the recognition of European standards and directives on sustainability. Thus, environmental effects and analysis must be present in all phases of packaging design. Here appears the need to emphasize the concept of eco-design, a concept introduced in 1990 as a strategy that companies can use to reduce their impact on the environment [1]. Currently, this concept is being addressed in Ecodesign Directive 2009/125/EC, Ecodesign for Sustainable Products Regulation 2024/1781 as well as in the standard family ISO 14000 Environmental management (ISO 14006.2011; ISO 14020; ISO 14021; ISO 14024; ISO 14025 ISO 14040, ISO 14044; ISO 14047) part of a package of measures that are central to achieving the aims of the Circular Economy Action Plan 2020. These trends have also become valid for the Republic of Moldova with the approval and implementation of the National Sustainable Development Strategy "Moldova 2030".



Under current conditions, packaging creators and producers can no longer have a traditional environmental approach, but an assumed and expanded one.

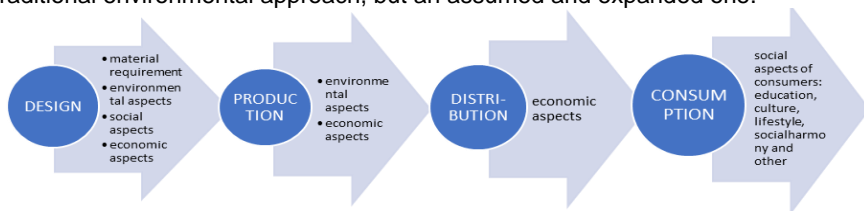


Fig. 1. Elements of the life cycle of an ecodesign product and their specific aspects [1, 3-5]

ECODESIGN: PURPOSE AND PRINCIPLES

Ecodesign can be defined as the systemic approach to the product at the design stage through the perspective of environmental aspects at the level of each process that transforms the idea into the final product in the user's use, starting with the product design. Another definition says that ecodesign targets the development of new and more environmental-friendly products that have the potential to result in innovative solutions with an enhanced sustainability performance, product service systems [2].

The fundamental goal of ecodesign is to create products that offer functionality, aesthetics and are in harmony with nature. To achieve this goal, it is important to take into account several basic principles of ecodesign (Fig. 2). Thus, designers must explore alternatives to traditional materials that can have a beneficial effect on the environment. Designers must encourage the use of innovative technologies to reduce resource consumption and minimize waste. They must be encouraged to create durable, resistant and easy-to-maintain products that will stand the test of time. Designers should choose recyclable materials and design packaging in a modular way that will facilitate disassembly and recycling of components. Designers together with manufacturers should educate and raise awareness of consumers on the impact of their purchasing decisions through labels and clear information found on the surface of packaging.

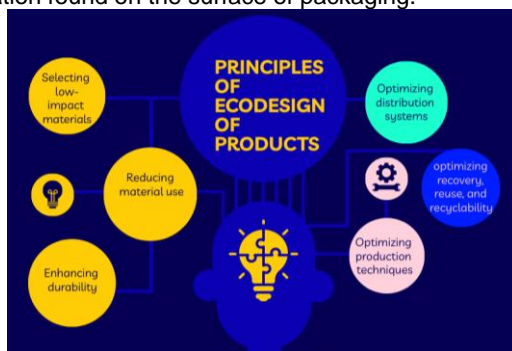


Fig. 2. The principles of ecodesign



RESULTS OF IMPLEMENTATION OF ECODESIGN IN BOARD GAMES

Ecodesign is involved in the first stage of packaging development and involves eliminating the environmental impact of the product. It is worth noting that 80% of the environmental impact of the product can be determined in the design phase [5]. Thus, it is crucial to approach this philosophy even during the professional training process by raising awareness and training students - future specialists - in the application of these design principles, educating them in the spirit of responsibility towards the environment by planning and assuming personal and professional strategies and decisions applicable in the field of design and printing engineering, and developing sustainable skills.

Table 1.

Short, medium and long-term impact on the study and involvement
of ecodesign by students

Short and medium term impact	Long term impact
Students will become more aware of the impact of packaging on the environment and the importance of using sustainable materials.	Students educated in the spirit of ecodesign and eco-friendly packaging design will become responsible adults who make responsible and sustainable decisions.
Students will adopt more responsible behavior, such as reducing the consumption of non-recyclable packaging.	A generation of more conscientious future specialists will drive companies in the field to adopt sustainable materials, technologies and solutions, creating sustainable packaging and labels.
Students will be able to generate new creative ideas for sustainable packaging, contributing to the development of innovation.	Education through the lens of ecodesign will lead to a significant reduction in packaging waste, contributing to a clean environment.
Stimulating the interest of students, future specialists and employers in sustainable design, waste management and environmental engineering.	Students will contribute to innovation and research in the field of biodegradable and recyclable materials, having a positive impact on the packaging and labeling industry.
Students will become more aware of the impact of packaging on the environment and the importance of addressing specific ecodesign aspects.	Educating a good awareness of environmental issues can favor the involvement of students as future employees in improving legislation in the field.

Students of the Design and Printing Technologies study program, Faculty of Design, Technical University of Moldova, through a partnership agreement with the Municipal Library "B. P. Hasdeu" in Chisinau, Republic of Moldova, applying Problem Based Learning focused on solving the problem related to the design of board games for children, applied the ecodesign strategy (table 2).



Tabel 2.

Students' involvement the ecodesign strategies in board games

Ecodesign strategy	Aspects of strategy involvement
Use of materials with low environmental impact	<ul style="list-style-type: none">- use of recyclable materials: paper and cardboard;- materials without hazardous substances: only printed without finishing;- minimum number of materials:<ul style="list-style-type: none">✓ printing support: some solutions involve only one type (only paper or only cardboard), others two types (both paper and cardboard);✓ ink: the chromatic solution involves a limited number of colors.
Reduction of materials	<ul style="list-style-type: none">- paper and cardboard with low or medium mass and thickness;- constructive solutions involving folding; assembly from separate component parts, without gluing.
Production optimization	<ul style="list-style-type: none">- alternative production techniques: digital printing and digital cutter;- involvement of fewer and ecological consumables (water-based ink).
Lifetime optimization	<ul style="list-style-type: none">- modular structures in cases of constructive solutions of packaging for board games;- classic or minimalist design;- good product-user correlation (specific information, QR-code, markings regarding the method of use, type of packaging materials, recycling, quality label, etc.).
Optimizing the end of product life cycle	<ul style="list-style-type: none">- reuse of boxes;- recycling of the paper and cardboard from which they are created.

CONCLUSIONS

Every product and activity can have an impact on the environment. Environmental aspects require addressing the cause-effect relationship and for this reason, education for time, economy and ecology, that is ecodesign, is very important to promote and involve.

The ecodesign of board games leaves a very important imprint on both creators and users, thus influencing all participants in the life cycle of this product and acting as a strategy to promote ecology, sustainability, durability and convincing everyone that ecological products are a correct response to a sustainable development of society.

Ecodesign as an approach implemented in the design stage of children's board games by students contributed to the interdisciplinary approach, the development of creativity, the encouragement of innovation, and the formation of



critical thinking among future professionals in the printing field.

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ACKNOWLEDGMENT: The study was carried out within the national project, 020408 Research on Ensuring Sustainable Development and Increasing Competitiveness of the Republic of Moldova in a European Context.

АДАСКАЛІЦА Л., КАЗАК В.

ЗАСТОСУВАННЯ СТРАТЕГІЙ ЕКОДИЗАЙНУ ПРИ СТВОРЕННІ НАСТІЛЬНИХ ІГОР

У роботі досліджено реалізацію стратегії екодизайну в дизайні настільних ігор та їхнього пакування. Акцентовано увагу на розвитку спеціалізованих умінь і навичок студентів спеціальності «Технології дизайну та друку» з метою прищеплення професійного ставлення, заснованого на екологічній відповідальності на всіх етапах створення продукту, від концепції до трансформації після використання. Інтеграція екодизайну в академічне викладання за допомогою таких методів, як проблемно-орієнтоване навчання, приносить короткострокові, середньострокові та довгострокові вигоди, сприяючи використанню природних ресурсів, визначенню сталих рішень та заохочуючи до прийняття екологічно свідомих рішень.

Ключові слова: екодизайн, настільні ігри, упаковка, природні матеріали, стратегія, принципи, стійкість.