

“Green” Plantable Ecopencils

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ABSTRACT

Students from the Vocational School of Design „Elisaveta Vazova“ in Sofia developed six prototypes of “green” plantable eco pencils, each containing an integrated capsule or barrel filled with various seeds. These were made from eco-friendly, renewable materials using a sustainable, zero-waste, circular production process. The students also designed packaging, usage instructions, and promotional materials for the pencils. They proposed hypothetical manufacturers, developed company branding, including logos and slogans, and applied these to the pencils, packaging, and promotional items such as T-shirts, hats, and badges.

Keywords: “green” plantable ecopencils with embedded capsule/barrel containing seeds, ecodesign, ecoadvertising, ecobranding, ecoentrepreneurship.

INTRODUCTION

In the world of sustainable and socially meaningful innovation, one small yet compelling idea is gaining popularity-green plantable ecopencils with capsules or barrels for planting [1 - 3]. These pencils are not just writing tools; they are part of nature’s cycle, merging practicality with environmental consciousness, shifting mindsets from waste to creation, from consumption to cultivation. The concept behind plantable ecopencils is simple and constructive: “from waste to plant.” Once the pencils become too short to use, they can be planted in soil, where the biodegradable

capsule or barrel decomposes and releases seeds to grow herbs, spices, or ornamental plants. This innovative product promotes sustainable consumption and serves as an ecofriendly promotional item for campaigns, initiatives, and environmentally conscious companies and individuals.

EXPERIMENTAL

Exposition

Objectives

1.1. To develop a green production technology for “green” plantable ecopencils made from ecofriendly, reused, and recyclable materials-

creating innovative, ecological, usable, and sustainable products that can be used as promotional materials by environmentally focused companies and individuals.

1.2. To design logos, slogans, advertisements, and marketing strategies for hypothetical ecocompanies that could manufacture these pencils.

1.3. To create packaging, bases, and user instructions for the ecopencils.

Project relevance

The project is timely and relevant because:

- It does not use natural wood, a resource increasingly scarce in Bulgaria due to fires, logging, erosion, and its use in other economic sectors;

- It uses biodegradable materials such as paper and biodegradable straws, recycled paper, polymer and paper clay, and biodegradable plastic capsules;

- The used eco-pencil can be planted, closing the production loop and ensuring the project's sustainability;

- These are unique products that give a second life by becoming a plant—a pencil with a dream to grow.

Curriculum integration

3.1. The products are part of elective classes in the extended professional training module “Green Technologies in Design” piloted as an innovation and now a best practice at the school;

3.2. Market research for the ecopencils was conducted within the subject “Innovative Design - Business Design”;

3.3. The development of ecocompanies with branding elements (logo, slogan) aligned with students' training in graphic and advertising design and ecoentrepreneurship.

Project implementation

The project was carried out in the following stages:

4.1. Research phase;

4.2. Development of conceptual and design proposals;

4.3. Selection of eco-friendly, waste, and recyclable materials;

4.4. Green production technology for the products;

4.5. Creation of packaging and usage instructions;

4.6. Development of brand identity elements (logo, slogan) and branding of the pencils and packaging;

4.7. Market research and analysis;

4.8. Ecoentrepreneurship, marketing, and advertising of the developed ecopencils.

Methods

5.1. Scientific methods: exploratory, research-based, and experimental regarding materials and construction techniques;

5.2. Infographic methods for ecodesign and advertising of the hypothetical manufacturers;

5.3. Business research and market analysis of ecopencil production and the Bulgarian market.

RESULTS AND DISCUSSION

Developed competencies

Ecological thinking (ecoawareness), environmental education, ecobehavior, sustainable ecopractices in life and business, ecodesign, and ecoentrepreneurship.

Technological steps for prototype creation

7.1. Plantable ecopencils with capsule, packaging, and user instructions by “PenPot” company (Fig. 1) [4]:

7.1.1. The first prototype (a) was made of:

- handmade recycled paper wrapped around the graphite core and stabilized with C200 glue;
- a biodegradable medical capsule filled with flower seeds;

- attaching and fixing the capsule to the pencil body.

7.1.2. The second type (b) was made of:

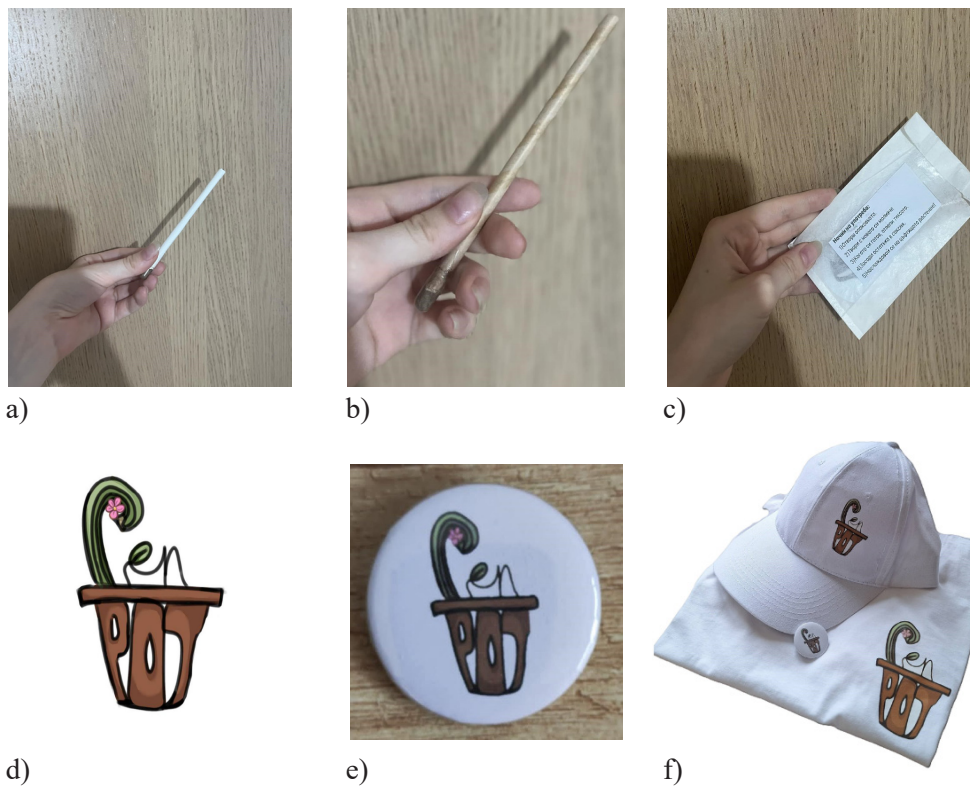


Fig. 1. Two ecopencils with usage instructions, manufacturer “PenPot,” and promotional products.

- thick graphite layered with paper straws of various diameters;
- stabilizing the body with C200 glue;
- a biodegradable antibiotic capsule filled with herb seeds;
- attaching and fixing the capsule to the body;
- usage instructions (c);
- creating the “PenPot” eco-company that would produce these “green” pencils (d);
- designing the logo and slogan “We Write and Grow”;
- branding the logo on promotional materials - badges, caps, and T-shirts (e);
- developing a strategy for ecoadvertising and marketing.

Approximate price per pencil: 1.50 BGN.

7.2. Ecopencil with built-in capsule, base, and usage instructions by the company “Baliliil” (Fig. 2) [5]:

- the prototype casing is made of biodegradable paper straws, whose interior is reinforced with

polymer clay (a);

- a biodegradable capsule made from Easter egg dye has been additionally embedded;
- a base with usage instructions for the product has been created;

- the ecocompany “Baliliil,” which would manufacture the pencil, has been established (b);

- a company logo has been designed and branded on the pencil, the base, and promotional products (c).

The estimated price of the final product is around BGN 2.00.

7.3. Ecopencil with built-in capsule, base with usage instructions, and promotional materials (Fig. 3) [6]:

- the ecopencil is made entirely of handmade recycled paper, reinforced with C200 glue (a);
- a base with instructions for using the “green” pencil has been created (b);
- a logo for the potential manufacturing company has been created (c);
- the logo has been branded on badges, caps,

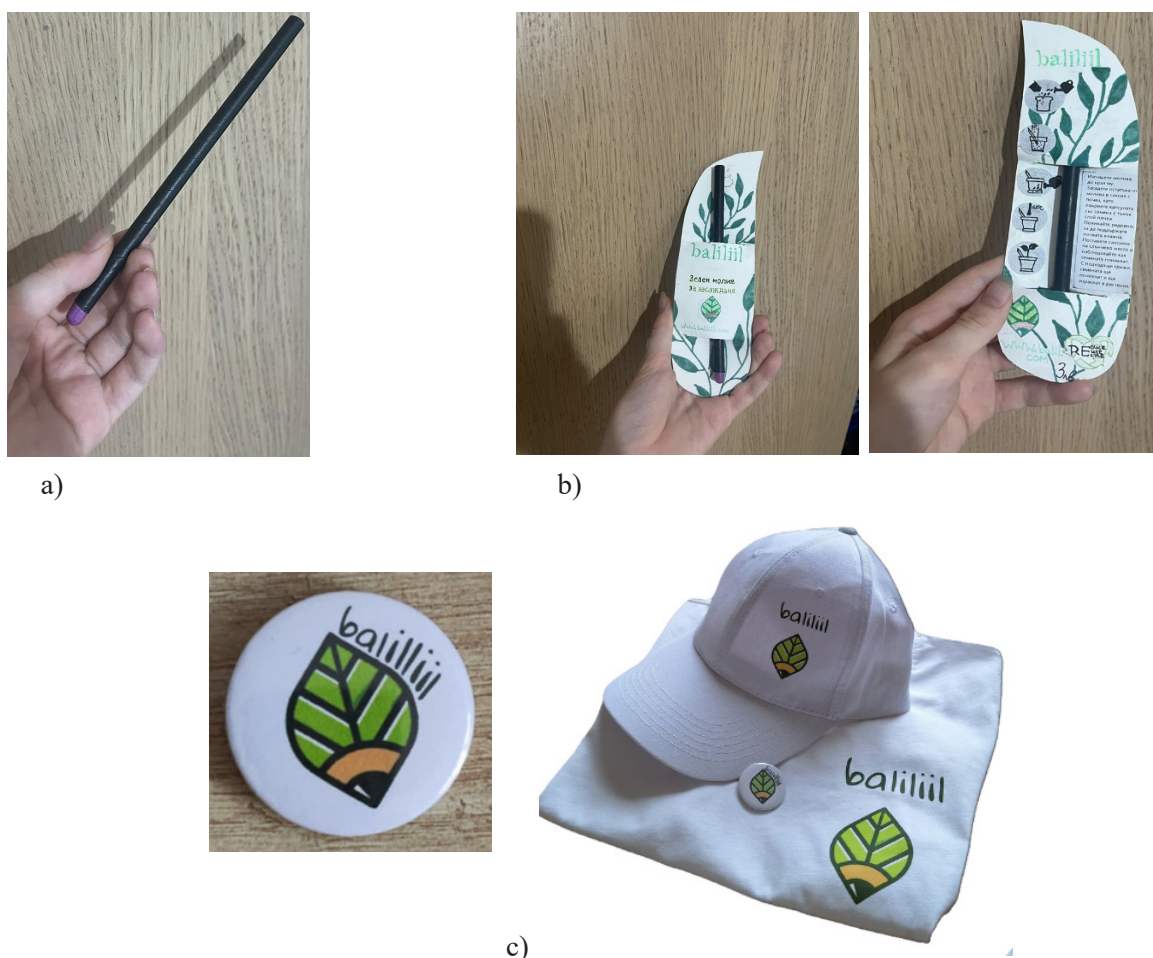


Fig. 2. Ecopencil with base, produced by the company “Baliliil” and promotional products.

and T-shirts (d).

The estimated price of the pencil is around BGN 1.50.

7.4. Ecopencil with seeds in the body by the company “Clarity” (Fig. 4) [4 - 6]:

- the two ecopencils are made from paper straws, in whose cavity the graphite is secured with silicone (a);

- the inside of the straws is filled with seeds of flowering plants;

- a logo and slogan have been created for the potential manufacturing company “Clarity” (b). The estimated price of these pencils is about BGN 1.00.

7.5. Ecopencils with seeds by the company “EcoPen” (Fig. 5) [4 - 6]:

- the ecopencils are made from paper straws, whose interior is filled with herb seeds;

- the graphite is secured and reinforced in the cavity of the straw with paper clay;

- instructions for using the pencils have been prepared;

- a logo for the company “EcoPen” has been created.

The approximate price of this pencil is about BGN 1.00.

Market research on ecopencils with biodegradable seed capsules [7 - 12]

Only two companies in the world manufacture this item from wood: *Sprout* (Denmark) and *Pen Seed* (Costa Rica).



Fig. 3. Ecopencil with base and promotional materials.

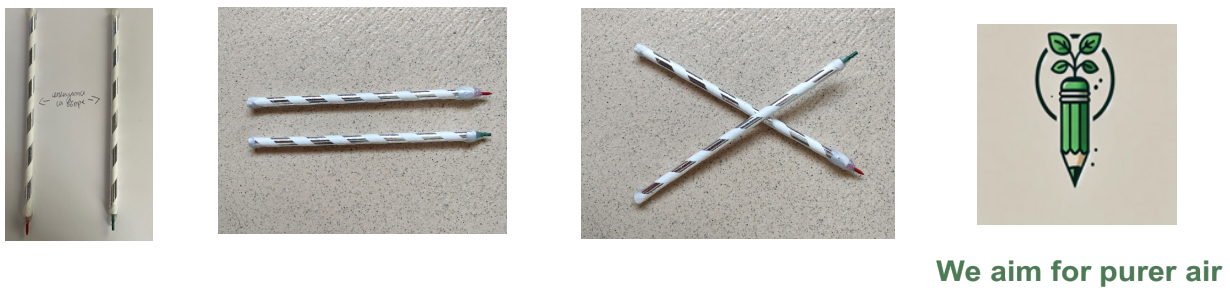


Fig. 4. Ecopencils and manufacturing company "Clarity".

Sprout ecopencils are offered on the Bulgarian market by commercial firms, online stores, and advertising agencies at an average

price of about BGN 4.00 per piece (Fig. 6). Pen Seed ecopencils are available on the global market, including in Bulgaria, England, Finland,

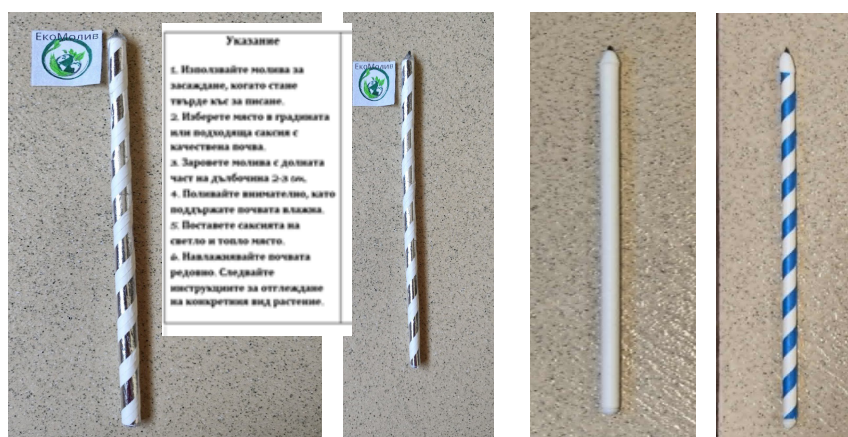


Fig. 5. Ecopencil with usage instructions and company “EcoPen”.

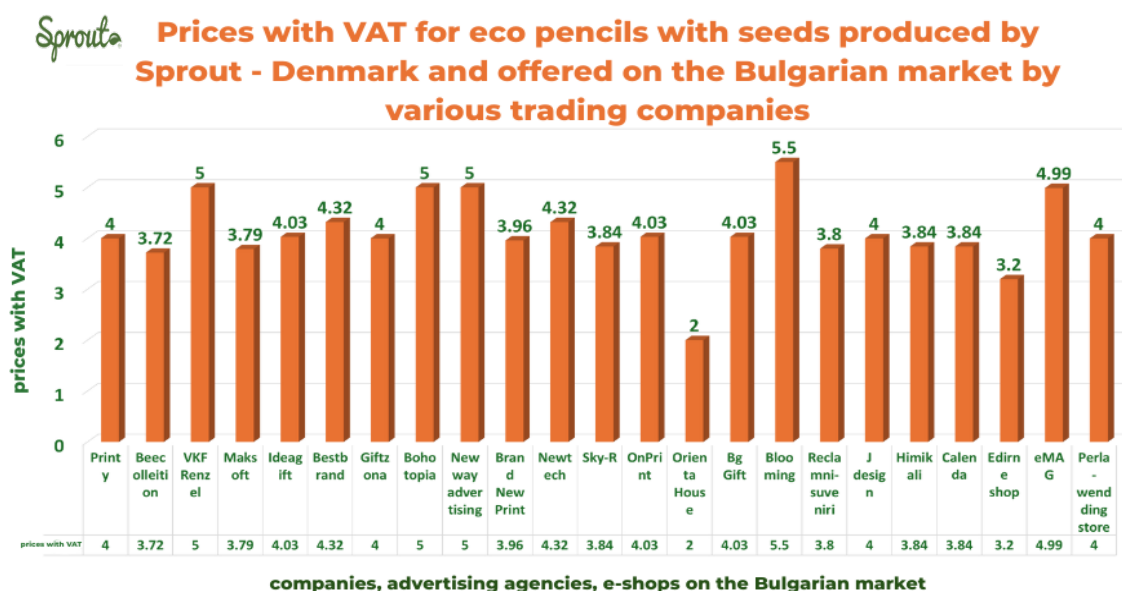


Fig. 6. Prices with VAT for seed capsule ecopencils produced by Sprout (Denmark) and sold on the Bulgarian market by various distributors.

and Slovenia, at an average price of about BGN 3.25 per piece (Fig. 7).

These pencils are used by companies as attractive corporate promotional materials to raise brand awareness, advertise, and demonstrate their eco-orientation and environmental commitment.

Advantages of the prototype products

Ecopencils with built-in capsules/bodies containing seeds for planting offer the following

advantages:

- made from paper or biodegradable straws, recycled paper, polymer or paper clay, biodegradable plastic capsules, and seeds of herbs, spices, and ornamental plants - i.e., renewable resources;
- handmade;
- can be planted with various types of seeds – i.e., seed choice;
- possibility for personalization;

Prices with VAT for eco pencils with capsules with seeds produced by Pen Seed - Costa Rica and offered on the world market by various trading companies

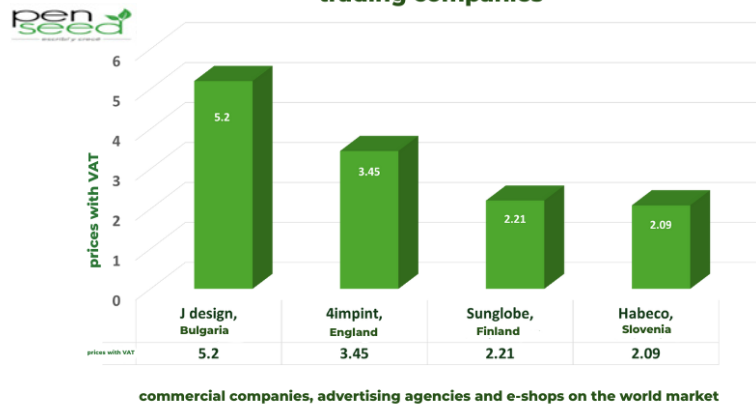


Fig. 7. Prices with VAT for seed capsule ecopencils produced by Pen Seed (Costa Rica) and sold on the global market by various commercial companies.

- functional;
- instructional inserts, packaging, and usage guidelines have been created;
- a unique ecodesign (logo, slogan) and ecobranding have been developed for potential ecopencil manufacturing companies;
- possibility for promotional printing on pencils, inserts, and packaging;
- long-term environmental impact;
- reduced carbon footprint/waste;
- encourage sustainable consumption;
- competitive price of BGN 1.00-2.00 per unit, which is significantly lower than similar products (around BGN 4.00) offered by other manufacturers or intermediary companies.

CONCLUSIONS

The results of the project are:

- A green technology for producing ecopencils has been developed - simple, accessible, environmentally friendly, and low-cost;
- The technology, products, and design are practical, sustainable, and capable of further development and enhancement;
- The “green” planting pencils are made from ecofriendly, inexpensive, waste, used, and

recyclable materials, and planting them after use ensures their sustainability and circularity;

- Corporate identity components have been developed for companies that might produce the ecopencils;
- A marketing and advertising strategy for the products has been proposed, using methods from graphic and promotional design.

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