2024

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I2023-1-DE04-KA210-YOU-000155718

ECO TECHNOLOGY: EDUCATE CREATE ORGANISE

Content

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ECO technology: Educate Create Organise

— 003.

PROJECT LOCATION
Berlin, Germany - Kielce, Poland

DATES OF THE PROJECT
01.11.2023 - 28.02.2024

NUMBER OF PARTICIPANTS
around 80

ABOUT

This project "ECO technology: Educate Create Organise" seeks to empower young Ukrainian refugees by offering them valuable skills in 3D printing and upcycling, making a link between ecological responsibility and technology. With the active participation of NGOs, educational institutes, and local communities, the project aims to bring in a sense of belonging, provide sustainable vocational training, and address the issue of fast fashion waste. We believe this project was helpful for the refugees to integrate but also contributed to the goal of promoting sustainability and responsible consumption,

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Target of the project

OBJECTIVES

1 To promote the understanding of recycling and the usage of recycling practices among Ukrainian refugees

2 To introduce 3D printing as a part of learning new technologies

3 To introduce 3D printing as a part of learning new technologies

OUR MAIN APPROACH

Training and Workshops

We have introduced the workshops for 80 young people with refugee background to learn both 3d printing and sustanability workshops.

Cultural events

As a part of the integration programme we offered a range of extra cultural activities to boost integration .

Partner meetings

Several partner meeting were held within the scope of the project to ensure the well-designed management process.

Dissemination and Follow-up

We organize a range of dissemination activities like webinars and meetings at schools, to spread the informations

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OVERVIEW

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Overview

The Russian invasion of Ukraine in 2022 led to a large-scale humanitarian crisis, forcing millions of Ukrainians to flee their homes. **Germany and Poland** have been among the primary destinations for these refugees. In Berlin, local authorities have been offering comprehensive support, including housing, language courses, and assistance in finding employment. However, many refugees, especially younger individuals, struggle with entering the job market due to language barriers and a mismatch between their skills and local labor demands.

Poland, given its proximity to Ukraine, has received an even larger number of refugees, with cities like Kelce becoming key hubs for refugee support. The integration efforts in Poland are particularly vital, as many refugees may remain there for an extended period. Both countries have implemented various educational and vocational programs to help refugees adapt, but there is still a need for innovative solutions that offer long-term sustainability and skill development.

The city of Berlin has been a major center for Ukrainian refugees arriving in Germany. As of mid-2022, around 867,000 Ukrainian refugees had entered Germany, The city's existing infrastructure for supporting refugees, such as language schools and employment agencies, has been mobilized to handle this large inflow yet challenges remain in areas such as long-term housing and integration into the workfplaces.

By the end of 2022, **Poland had taken in over 1.1 million Ukrainian refugees.** Kelce, while smaller compared to cities like Warsaw, has seen its share of refugees and has set up community-based initiatives to support them.

Needs we address — 007.

Fast fashion

The project addresses two critical problems: the lack of sustainable practices and the need for innovative vocational training for refugees.

Fast fashion is a growing issue in today's consumer culture. The fast production cycles and the disposable nature of the fashion industry result in massive amounts of textile waste,. Refugees, particularly young people from Ukraine, may not have had extensive exposure to sustainable practices in their home country, which presents an opportunity to introduce these concepts in their new environments.

3D printing + upcycling

3D printing offers a sustainable alternative by using of recycled materials in production. For example, plastic waste can be repurposed into new products through 3D printing, minimizing environmental impact. In addition, 3D printing technology can be a gateway for Ukrainian refugees to acquire modern technical skills, thus enhancing their employability in both Germany and Poland. Upcycling, or the creative reuse of materials to create higher-value products, will not only provide refugees with practical skills but also instill a sense of responsibility towards sustainability.

Target audiences — 008.

Non-governmental organizations

The project holds significant potential to attract and inspire various non-governmental organizations (NGOs), educational institutes, and other organizations, especially those working at the intersection of youth development, technology, and sustainability.

Educational institutions

Schools and technical institutes interested in promoting vocational training, especially those looking to integrate refugees into their programs, would find value in adopting the 3D printing and upcycling modules for their own students.

Businesses

Organizations that focus on social entrepreneurship and the creation of sustainable products would be inspired by the workshop's integration of technology with recycling. This could also lead to partnerships that foster innovation in both refugee communities and the broader local economies.
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TERMINOLOGY

Fast fashion

Fast fashion refers to the rapid production of inexpensive clothing in response to the latest trends. While it makes trendy clothes accessible, it often leads to poor-quality items and significant environmental harm due to high resource use and textile waste.

Recycling

Recycling is the process of converting waste materials into new products to prevent waste, reduce pollution, and conserve resources. Commonly recycled materials include paper, plastic, and metals.

Upcycling

Upcycling involves creatively reusing waste materials or old products to create something of higher value or quality, often giving items a new purpose and reducing environmental impact compared to traditional recycling.

3d printing

3D printing is a technology that creates three-dimensional objects by layering materials based on a digital model. It allows for efficient, customizable production and can use recycled materials.

Innovative course — 010.

The innovation in the "ECO technology: Educate Create Organise" course lies in its **unique combination of technology, sustainability practices, and social integration,** specifically created to meet the needs of young Ukrainian refugees in Germany and Poland. This course stands out by connecting the concepts of 3D printing, recycling, and upcycling into a cohesive educational experience that addresses both ecological and social challenges.

One of the most innovative aspects of this course is the use of 3D printing technology alongside upcycling. While upcycling typically focuses on repurposing waste materials, this course introduces the concept of **transforming recycled plastics and textiles into new, functional products through 3D printing**. Participants not only learn about sustainability and waste reduction, but they also gain practical, modern technical skills in using 3D printers—a technology that has applications across numerous industries.

Activities Report

3D ECO printing - 2023-1-DE04-KA210-YOU-000155718

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3D-PRINTING WORKSHOPS
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Methodology

Our 3D printing workshops are designed to cover the entire process of 3D printing, from concept to finished product, with a focus on empowering participants to create custom objects. The workshop is structured around several key components:

OUR MAIN APPROACH

3d Modeling

Participants learn how to design their own custom objects using 3D modeling software, developing the skills needed to bring their ideas to life

Slicing

We teach the process of "slicing," which involves preparing a 3D model for printing. This step converts the model into instructions that a 3D printer can understand

Understanding 3D Printers

Participants understand of how 3D printers work, including their basic mechanics and operation.

Materials for 3D Printing

The workshop introduces participants to the different materials used in 3D printing and how to choose the right one for each project.

Understanding 3D Printers

We show participants how to find pre-designed models online, modify them, and adapt them to their specific needs

Workshop process

We begin by demonstrating the typical workflow of a 3D printing project:

1 Start with an idea or a specific need for what to print

2 Search online for a suitable model and download it

3 Import the model into a 3D modeling tool and adjust it as needed.

4 Export the adjusted model and import it into slicing software.

5 Slice the model and send it to the 3D printer for printing.

6 After printing, we explain post-processing techniques, such as removing excess plastic or refining the print.

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Workshop process

Once participants have a clear understanding of the entire process, they begin hands-on learning. We guide them through:

3D Modeling

They learn the basics of creating their own 3D designs from scratch

Slicing

Participants practice preparing models for printing using slicing software.

Printing

Together, we print their first models, allowing them to see their designs come to life

Continious learning

After the initial workshop, participants are given tutorials and assignments to practice at home. They also begin working on their own personal projects, which often involve combining their 3D prints with upcycled pieces of clothing or other materials.

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SUSTANABILITY WORKSHOPS

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SUSTAINABILITY WORKSHOPS
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Workshop components

Our sustainability-focused workshop integrates both hands-on activities and educational components to explore the environmental impact of plastic use, fashion, and 3D printing

1 Introduction to Plastic Recycling: We begin by educating participants on the importance of plastic recycling and how it relates to sustainability in 3D printing.

2 Plastic Types and Categorization: An overview of different types of plastic (such as PET, ABS, PLA) is provided, along with an explanation of how plastics are categorized and their properties

3 Hands-on Sorting Activity: Participants are given various plastic waste items and tasked with sorting them into categories based on recyclability.

4 Challenges in Recycling: We discuss what makes some plastics more difficult to recycle, such as complex chemical compositions, additives, and the limitations of recycling facilities.

5 Demonstration of Filament Creation: Using the Felfil recycling system, we demonstrate how to convert recycled plastic into filament for 3D printing. Participants see how plastic waste can be transformed into new raw material for their creative projects.

Sustanability in fashion

1 **Fast Fashion vs. Slow Fashion:** We explain the differences between fast fashion (and ultra-fast fashion) and slow fashion, emphasizing the environmental and social impacts of each.

2 **Environmental and Social Impacts of Fast Fashion:** This section covers the negative effects of fast fashion, such as pollution, excessive resource use, exploitation of labor, and waste generation.

3 **Bio-Based vs. Synthetic Fabrics:** We provide an overview of bio-based fabrics (such as cotton, hemp, and bamboo) and synthetic fabrics (like polyester and nylon). Participants learn about the environmental footprint of each, including issues such as microplastic pollution from synthetics and the resource intensity of natural fibers

4 **Circular Economy in Fashion:** We introduce the concept of a circular economy, where materials are reused and recycled in contrast to the traditional linear economy, which follows a 'take-make-dispose' model.

5 **Upcycling and Downcycling:** We explore the concepts of upcycling (transforming old clothing into higher-value products) and downcycling (repurposing waste materials into something of lesser value). This leads into how 3D printing can enhance upcycling efforts, adding value to used garments.

3D Printing with Sustainable Fashion — 018.

1

Hands-on Sewing and 3D Printing: Participants are taught how to use a sewing machine, creating upcycled clothing pieces or accessories from old garments or waste fabric. In parallel, they learn to design simple 3D-printed components that can be integrated with their upcycled fashion projects.

2

Creative Collaboration: Participants design and 3D print decorative shapes, buttons, or other accessories that can be incorporated into their upcycled pieces. For example, they can use 3D printing to create embellishments or functional components like clasps,.

3

Designing with Sustainability in Mind: The participants are encouraged to think about sustainability throughout the design process, whether by minimizing material waste, selecting eco-friendly materials (like recycled filament), or using 3D-printed components to extend the life of clothing.

Exploring nature and urban waste — 019.

1 **Collection of Waste Materials:** Participants are asked to collect plastic and fabric waste from natural and urban environments, which will later be used in the workshop. This step helps them see firsthand the prevalence of waste and reflect on their consumption habits.

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SUSTANABILITY WORKSHOPS

2 **Creative Use of Waste in Fashion and 3D Printing:** Participants take the waste they have collected and use it as part of their final project. They create shapes and patterns using a 3D printer and integrate those designs with the waste materials, sewing them into new, upcycled fashion items.

Additional information

Supportive materials

1 We provide participants with a list of resources, including YouTube videos, tips, tricks, and best practices for sustainable design, sewing, and 3D printing. These resources also include guidance on how to overcome common challenges in upcycling and recycling.

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Final aspects

2 Participants combine all the skills they've learned to create a final project, such as an upcycled piece of clothing or accessory, enhanced with 3D-printed elements. They are encouraged to apply both their technical and creative skills, blending traditional and modern techniques.

Workshops takeaways

1 A solid understanding of plastic recycling and its challenges.

2 Practical skills in using recycled plastic to create 3D printing filament.

3 Knowledge of fast fashion's environmental and social impacts, and how slow fashion and circular economy principles offer more sustainable alternatives.

4 Hands-on experience integrating 3D printing with upcycled fashion projects, creating innovative designs that reflect sustainability.

5 A deeper appreciation for sustainability in both fashion and digital fabrication, with the confidence to apply these principles in their daily lives.

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VISITS AND EXCURSIONS

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Visits and excursions

The part of the workshops took place in neigbouring centres and facilities connected to the topic of the project.These workshops took place at the **Energetyczne Centrum Nauki Industria** and the **Park Technologii in Kielce,** where participants explored key sustainability topics.

1 **Waste Sorting and Recycling:** The participants learned how robots can assist in waste sorting and the proper way to dispose of common items, such as milk cartons They also discovered the connection between plastic bottles and fleece fabric, understanding how plastic waste can be recycled into everyday materials

2 **Technology and Sustainability:** Participants were introduced to how modern technology, like 3D printing, can support ecological initiatives. They learned about the basics of plastic recycling and its role in sustainable development

3 **Ecology and Environmental Responsibility:** Workshops emphasized the importance of personal responsibility for the environment and introduced participants to the concepts of sustainable living and conservation. Discussions focused on major environmental challenges and practical ways individuals can contribute to a healthier planet.

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CHALLENGES & SOLUTIONS

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CHALLENGES

ENGAGEMENT

One of the common challenges in projects like these is **maintaining the engagement** of participants throughout the program and ensuring that the skills they acquire have a lasting impact. Some participants may lose interest over time, or may not see immediate benefits, which can lead to a drop in motivation.

Solution:

To sustain engagement, the project can be structured to show quick wins and visible progress. For instance, allowing participants to complete small projects early on, like 3D-printed items or upcycled clothing, gives them a sense of accomplishment. Offering follow-up support, such as advanced workshops or access to 3D printing equipment after the course, can help maintain their interest. To ensure long-term impact, the project can provide connections to local job markets, offering guidance on how participants can use their new skills for employment or entrepreneurial activities.

LOGISTICS CHALLENGES

Organizing a project involving 3D printing and upcycling requires access to specialized equipment, materials, and suitable facilities. Additionally, coordinating schedules for multiple participants, particularly refugees who may have other obligations such as language classes or jobs, can be challenging.

Solution:

Planning is crucial to mitigate logistical challenges. Securing reliable suppliers for 3D printing materials (such as recycled plastics) and ensuring the availability of functional equipment is essential. It's also important to have contingency plans for technical failures—such as backup printers or extra materials on hand. Creating a flexible schedule that accommodates the diverse availability of participants will reduce the risk of absenteeism

TECHNICAL KNOWLEDGE GAP

Many refugees may have limited experience with technology, especially 3D printing and upcycling, which are relatively advanced fields. This knowledge gap could lead to frustration and disengagement if participants struggle to keep up with the pace of the workshops.

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Solution:

The key here is to ensure the course structure is flexible and accommodating. Start with introductory-level workshops that cover the basics of 3D printing and upcycling. Use simple, accessible language, and break down complex tasks into smaller, manageable steps. Offering additional support, such as one-on-one mentoring or supplemental tutorials, can ensure that participants feel confident and are able to keep up with the material.

CHALLENGES & SOLUTIONS

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LANGUAGE BARREER

One of the most significant challenges in working with refugees, especially in technical or skill-based workshops, is the language barrier. Many refugees may not be proficient in the local language, making it difficult for them to fully understand instructions, participate in discussions, or express their needs.

Solution:

To address this, the project can incorporate multilingual support. Hiring trainers who speak the refugees' native languages or providing interpreters ensures that all participants can follow along. Additionally, using visual aids such as diagrams, videos, and hands-on demonstrations can help overcome language barriers. Providing instructional materials in multiple languages and simplifying the technical jargon will also ensure participants have the necessary tools to succeed.

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CONCLUSIONS

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Evaluation results

Course Satisfaction

Participants rated the course highly in terms of meeting their expectations (average rating: 5.00 out of 6), quality of learning materials (5.14), and practical relevance (5.21). he course difficulty was seen as moderate, with an average rating of 2.79. 93% of participants said they would recommend the course to others (4.93). n Poland, more participants took the course due to a strong desire to work within a team environment. The social and collaborative aspects of the course significantly increased interest and engagement.

Funding Objectives

Participants were particularly impressed with the 3D printing section, highlighting its versatility and ease of use At least 70% of participants rated all seven funding objectives as "completely" (5) or "surpassed" (6). The objective "Develop new skills in the areas of technology and ecology" received the highest rating, with 100% of participants giving it a rating of "mostly" (4) or higher.

Key takeaways

Participants were particularly impressed with the 3D printing section, highlighting its versatility and ease of use.

The course **raised awareness of the possibilities** in recycling and sustainable fashion.

Many participants felt **inspired to pursue** more 3D printing and upcycling projects in the future.

93% of Polish participants **expressed satisfaction** with their visits and excursion experiences, which enhanced their integration into the program.

Many Polish participants mentioned **a desire to repeat the experience,** showing enthusiasm for the course and its benefits.

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"If you look at history, innovation doesn't come just from giving people incentives; it comes from creating environments where their ideas can connect."-

STEVE JOHNSON