



TexUnite

Project: 2024-1-DE01-KA220-HED-000253935 – TexUnite - Service Learning on Sustainability in Textile and Fashion Education

SL Project Title: Sustainable Knitting Lab – Scarves and Gloves from Recycled Yarns

Partner University: Ege University, Faculty of Engineering, Department of Textile Engineering, TexUnite Project Team, Ege University, İzmir, Türkiye

Name of the Stakeholder: +1 Down Kafe (Bornova Municipality)

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Executive Summary

Within the Erasmus+ TexUnite framework, 17 students completed a service-learning sequence that integrated sustainability education, hands-on production with recycled PET and cotton yarns, a virtual exchange with Albstadt-Sigmaringen University (ASU), and community engagement. Students produced scarves and gloves, documented their outputs as OER, and presented their results at a community event (+1 Down Kafe) and the Ege Science Festival 2025. Pre- and post-assessments indicated clear gains in sustainability attitudes, willingness to act, and perceived value of virtual exchange.

Background and Context

The textile and fashion sector faces significant environmental and social challenges. Contemporary engineering education therefore requires sustainability literacy, systems thinking, and ethical awareness. The SusTexLab concept provides a didactic framework for designing service-learning projects that connect curricular content with community needs through production, reflection, and dissemination.

Objectives

- ❖ Integrate sustainability concepts into textile engineering education.
- ❖ Provide hands-on experience with recycled PET and cotton yarns.
- ❖ Strengthen reflection on environmental and social implications.
- ❖ Promote circular economy awareness through tangible product outcomes.
- ❖ Build intercultural competence through virtual exchange activities.
- ❖ Produce Open Educational Resources for broader reuse.

Methodology

Teaching and preparation included lectures on sustainable yarns and the fundamentals of knitting, covering principles, stitch formation, and knitted structures. Laboratory practice involved mechanical V-bed hand knitting and Shima Seiki V-bed work. Students produced scarf and glove prototypes and completed product specification worksheets documenting yarn type, machine, gauge, structure, density, and the number of courses and wales. Assessment employed pre- and post-tests on attitudes, potential for action, and educational value of virtual exchange. Virtual exchange sessions with the student team at ASU included student presentations, short Q&A sessions, and discussions of project challenges and cultural topics. OER development comprised guides, worksheets, posters, photos, and videos, which were subsequently upload to ZOERR and EPALE for broader dissemination.

Implementation Details

Seventeen students participated in the spring–summer 2025 project. Laboratory work included:

- ❖ Mechanical V-bed hand-knitting for scarf production.
- ❖ Use of a 13-gauge semi-automatic glove-knitting machine for gloves.
- ❖ Shima Seiki V-bed practice and use of the SDS-ONE APEX environment for design-related tasks.

During scarf production, spirality appeared after washing and could not be corrected by ironing. The issue was traced to irregular twist distribution in a 20/1 Ne Z-twist yarn. Switching to 40/2 Ne yarn improved dimensional stability. Product specification worksheets were completed for each item to document processes and outcomes. Public engagement included a +1 Down Kafe event and an exhibition at the Ege Science Festival on 28 May 2025.

Results and Impact

Post-test results indicated increased preference for eco-fair products, greater willingness to donate or reuse clothing, and more frequent label-checking habits. Scores for perceived capacity to act sustainably and for educational value of virtual exchange also improved. Comparative observations across partner institutions showed that Ege students demonstrated consistent growth in attitudes, potential for action, and virtual-exchange-related learning. Community impact included enhanced inclusion and increased awareness of textile sustainability through the +1 Down Kafe activity, with further outreach at the Science Festival.

Challenges and Lessons Learned

Recycled yarns introduced technical challenges, such as spirality caused by irregular twist, which required adjustments in yarn selection and production process. These challenges fostered deeper diagnostic and problem-solving skills. While the cohort size of 17 limits generalisation, the project successfully linked technical skills and social learning outcomes.

Reflection and Feedback

Students reported greater confidence in presentations, stronger teamwork, and improved English communication during virtual exchange sessions. Reflections emphasized the value of connecting laboratory practice with tangible social contexts and documenting work for reuse as OER.

Future Directions

Two SL projects are prepared: Sustainable Braiding with Children and Zero-Waste T-Shirt Production. OER packages will be finalised and uploaded to the ZOERR and EPALE repositories for open access after internal checks.