GOVERNMENT OF MALTA

Co-funded by the European Union

EDUWEAR - Engineering Educational Competence Development on Customisable Wearable Rehabilitation Devices

Newsletter

February, 2026

Issue #03

FONDI.eu

EDUWEAR

eduwear-project.eu

#eduwear-project

Contents

03 **Introduction**

Welcome to the third EDUWEAR Project's newsletter.

04 **The Consortium**

The EDUWEAR Partners

06 **Meet the Team**

This edition will feature the team members from the University of Oulu, Finland.

08 **WP2 Outcomes**

WP2 is now officially wrapped up and its findings provide the backbone for the EDUWEAR curriculum.

10 **Course Development**

We invite you to learn more on how the course will be structured.

13 **Dissemination Event in Pisa**

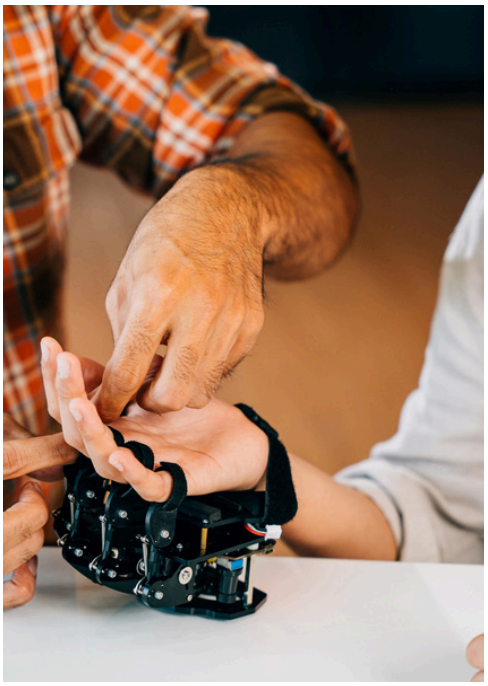
Our next event will be in Pisa, Italy. If you can't join us in person, make sure to join online!

14 **Dissemination Highlights**

Learn more about our recent publications.

15 **Stay Connected**

Ways on how to follow our journey as we shape the future of engineering education.



Introduction

As we welcome 2026, the EDUWEAR team is excited to share the progress made over the past few months. It has been an intense and productive period, with partners working collaboratively on shaping the full course curriculum - both for students and for trainers who will deliver the programme.

In this newsletter, you will find:

- A new “Meet the EDUWEAR Team” section, starting with the University of Oulu
- Highlights from our completed Work Package 2
- A preview of the EDUWEAR curriculum currently under development
- Preparations for our upcoming workshop and hybrid dissemination event in Pisa
- Recent dissemination achievements

We look forward to reconnecting as a consortium soon in Pisa for our third project meeting, where we will also host the hybrid event introducing the EDUWEAR programme and sharing insights from our research.

Welcome to the 3rd EDUWEAR project’s Newsletter!

The Consortium

The EDUWEAR project brings together a strong alliance of academic excellence:

Core Partners

University of Malta – Leading the project with expertise in engineering education and rehabilitation-focused innovation.

University of Pisa – Contributing in-depth knowledge in biomedical and industrial engineering.

University of Oulu – A pioneer in digital fabrication and wearable technologies, fostering hands-on learning.

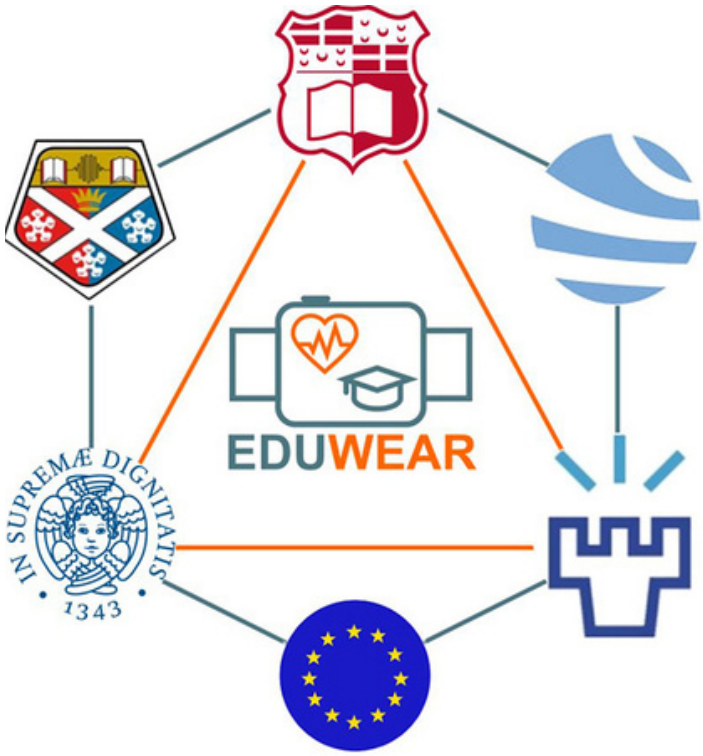
The EDUWEAR project is further strengthened by the expertise and collaboration of our associate partners:

Associated Partners

University of Strathclyde – Specializing in advanced technology and engineering education, supporting project innovation.

Nicomed - A leader in the healthcare and rehabilitation field, bringing invaluable industry insights and practical applications.

Make sure to subscribe to our mailing list – future newsletters will dive deeper into the expertise of each partner and team member!



Meet the Team

University of Oulu

Starting with this edition, each newsletter will spotlight the team members behind the EDUWEAR project. As we move through 2026, we'll introduce partners from each university to give our readers a closer look at the expertise and passion driving our work.

This issue features the team from the **University of Oulu**, who play a central role in research, pedagogy, and development of practical learning elements.

Georgi V. Georgiev

Georgi V. Georgiev is a Professor in digital fabrication at Center for Ubiquitous Computing (UBICOMP), University of Oulu, Finland. His experience and research interests encompass topics of digital fabrication and prototyping, design creativity, user interaction, user experience, and design cognition. He earned his Ph.D. in Knowledge Science from JAIST, Japan in 2009. Prof. Georgiev was a researcher of several collaborative research projects between universities and industry in Japan, including collaborative project with Denso Corporation and Toyota Foundation, co-funded by A-STEP (Adaptable and Seamless Technology transfer Programme through target driven research and development) of the Japan Science and Technology Agency (JST). Prof. Georgiev led different research projects as a Principal Investigator, including a design creativity project funded by the highly competitive Grant-in-Aid for Young Scientists (KAKENHI) of the Japan Society for the Promotion of Science (JSPS). He currently leads the research and teaching in digital fabrication at the UBICOMP and Fab Lab Oulu, the largest in Finland.

Sohail Ahmed Soomro

Sohail Ahmed Soomro is a Postdoctoral Researcher at the University of Oulu, specializing in digital fabrication, rehabilitation technology, and tangible interactions. Within the EDUWear project, he contributes to two crucial areas: the design of hands-on exercises that familiarise students with existing rehabilitation-related devices in the FabLab, and the delivery of a summer course in the FabLab environment, which includes competency assessment, hands-on rehabilitation tasks, design proposals, and evaluation to support continuous curriculum development.

He completed his PhD in Computer Science and Engineering at the University of Oulu. Sohail has previously collaborated on the PrimeVR-II project, where he designed embedded electronic systems, circuitry, and sensor-interfacing mechanisms. Sohail is passionate about impactful rehabilitation technologies; he aims to develop devices useful to all stakeholders, particularly through advancements in physical and electronics design, 3D printing, and sensor interfacing.

Roshan Fernando

Roshan Fernando is a Doctoral Researcher in the Design Creativity Group at the Center for Ubiquitous Computing, University of Oulu, Finland. He commenced his doctoral studies in 2025 after completing his Master's degree in Computer Science and Engineering from the University of Oulu in 2024. His research focuses on the intersection of Artificial Intelligence, Machine Learning, and User Experience Design, exploring how emerging technologies can enhance design creativity and human-centered design processes.

Roshan has contributed to peer-reviewed publications in AI-enhanced design education and VR-mediated empathy in design contexts. His work includes the development of DesignEDU, a web-based platform supporting documentation and feedback in digital fabrication education. His research has been published in Springer venues, including contributions to the SDPS conference proceedings and the Virtual Reality journal.

Ummi Latif

Ummi Latif is a PhD researcher with a background in IT Convergence Engineering and data engineering. Her research focuses on immersive Virtual Reality (VR) and Extended Reality (XR) systems, with particular emphasis on motion tracking, kinematic analysis, and data-driven evaluation using wearable and interactive technologies for health and rehabilitation applications.

Key Outcomes from WP2

Competence Gaps & Hands-On Insights

Work Package 2 is now officially completed, and its combined findings form the backbone of the EDUWEAR curriculum. Through a structured sequence of focus groups, surveys, hands-on experimentation, and curriculum mapping, the team built an evidence-driven understanding of what engineers and healthcare professionals need to effectively develop wearable rehabilitation devices.

D2.1 – Focus Group Insights

Educators and experts from engineering, occupational therapy, physiotherapy, industrial design, prosthetics and orthotics, and digital healthcare participated in focus groups across the partner universities.

Their discussions revealed major gaps in:

- Systems integration and connecting theory to real-world implementation
- Data analysis and computational skills
- Interdisciplinary collaboration, particularly between technical and clinical fields
- Human-centred design and information security

These findings established the foundation for EDUWEAR's curriculum and guided subsequent research activities.

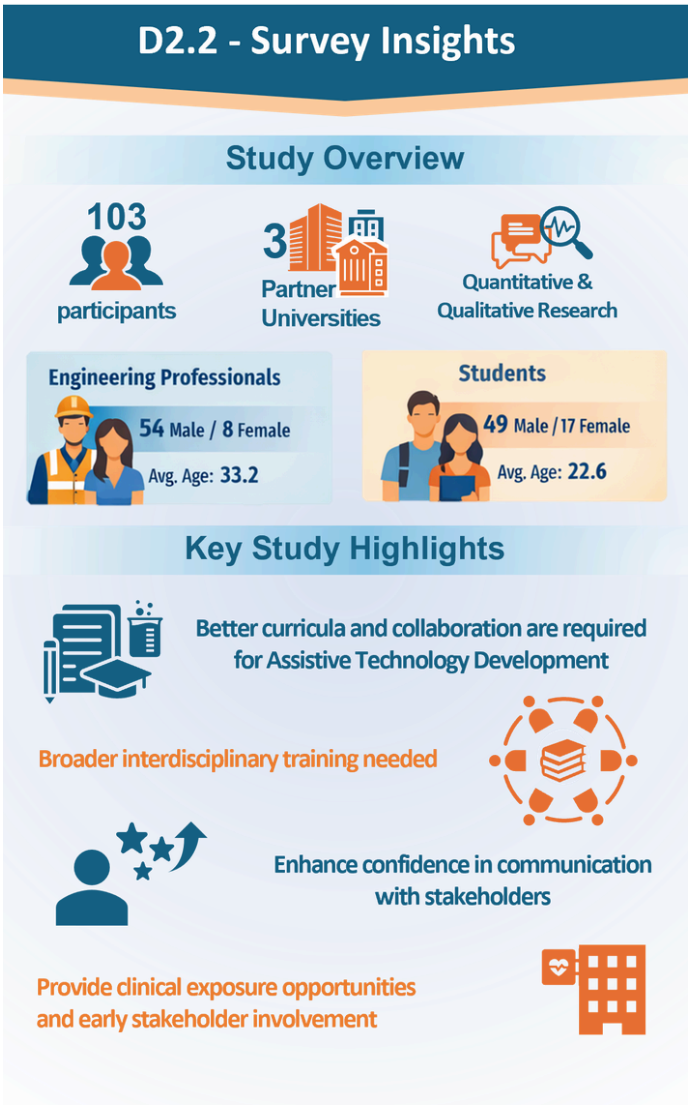
D2.2 – Survey Results Across Three Partner Countries

To validate and extend the focus group findings, over 100 students and professionals from Malta, Italy, and Finland completed the EDUWEAR survey.

Key insights included:

- Strong familiarity with traditional engineering concepts, but limited awareness of universal design and co-production
- Moderate confidence in cross-disciplinary communication
- Mixed perceptions of readiness for designing wearable rehabilitation devices
- Recognition of the need for clinical exposure, interdisciplinary learning, and early stakeholder involvement

The survey reinforced the necessity of an education model that blends engineering with health sciences.



D2.3 – Hands-On Workshop Evaluation

A multi-day practical workshop at Super Fab Lab Oulu allowed students to experience the full development cycle of a wearable rehabilitation device.

Participants engaged in:

- 3D scanning
- CAD modelling and 3D printing
- Sensor integration and embedded programming
- Testing sessions with occupational therapists

The workshop demonstrated the high impact of experiential learning. Students reported increased confidence and understanding, while also identifying areas needing improvement, particularly regulatory knowledge, clinical context, and embedded systems. Feedback called for more time, structured support, and deeper medical insights.

D2.4 – Establishing the Course Framework

Drawing from D2.1–D2.3, the EDUWEAR team created a curriculum requirements framework that now guides the course development phase.

The framework emphasises:

- Practical, hands-on learning opportunities
- Interdisciplinary collaboration between engineering and healthcare
- Clinical literacy and understanding rehabilitation pathways
- Material selection, manufacturing, and additive processes
- Ethical, user-centred, and regulatory considerations

This deliverable provided the structural blueprint for EDUWEAR's upcoming course, ensuring content directly addresses real educational gaps.

Course Development in Progress

Curriculum and Assessment Design

The EDUWEAR course is taking shape through three integrated modules, each featuring three lectures plus hands-on activities, totalling 24 ECTS.

Module 1: Rehabilitation Context & Human-Centred Foundations

Module 1 introduces students to the broader landscape of wearable rehabilitation technologies and builds the essential foundations needed to design meaningful, user-centred solutions.

Part 1 – Introduction to Wearable Rehabilitation Technologies

This opening section gives students a comprehensive overview of the wearable rehabilitation device ecosystem. It covers:

- How wearable technologies have evolved and the scope of their applications
- Market growth trends, emerging opportunities, and industry challenges
- Ethical considerations and regulatory frameworks governing medical wearables
- Key interdisciplinary terminology used across engineering, healthcare, and rehabilitation

Part 2 – Anatomy, Biomechanics & Understanding Disability

The second part builds the biomedical foundations engineers require when designing rehabilitation tools, hence equiping students with the knowledge to translate clinical realities into practical engineering considerations. Topics include:

- Essential human anatomy and biomechanics relevant to movement, support, and control
- Frameworks for understanding disability, function, and user needs
- The balance between inclusive design and customised solutions for individual users
- Biological constraints in design, such as muscle tone, tremor, fatigue, and anatomical variability

Part 3 – Understanding Users & Contexts of Use

The final part shifts focus to users, environments, and social contexts. Students will explore:

- Disability issues and practical considerations affecting real-world device use
- Cultural and contextual factors influencing adoption, usability, and trust
- Inclusive design principles and approaches to personalise devices for diverse users
- Considerations for different service-user groups: children, adults, and older adults

Module 2: 3D Acquisition, Digital Design & Additive Manufacturing

Module 2 provides the technical base for creating personalised devices, bridging high-level theory with practical design for real-world rehabilitation needs.

Part 1 – 3D Body Acquisition

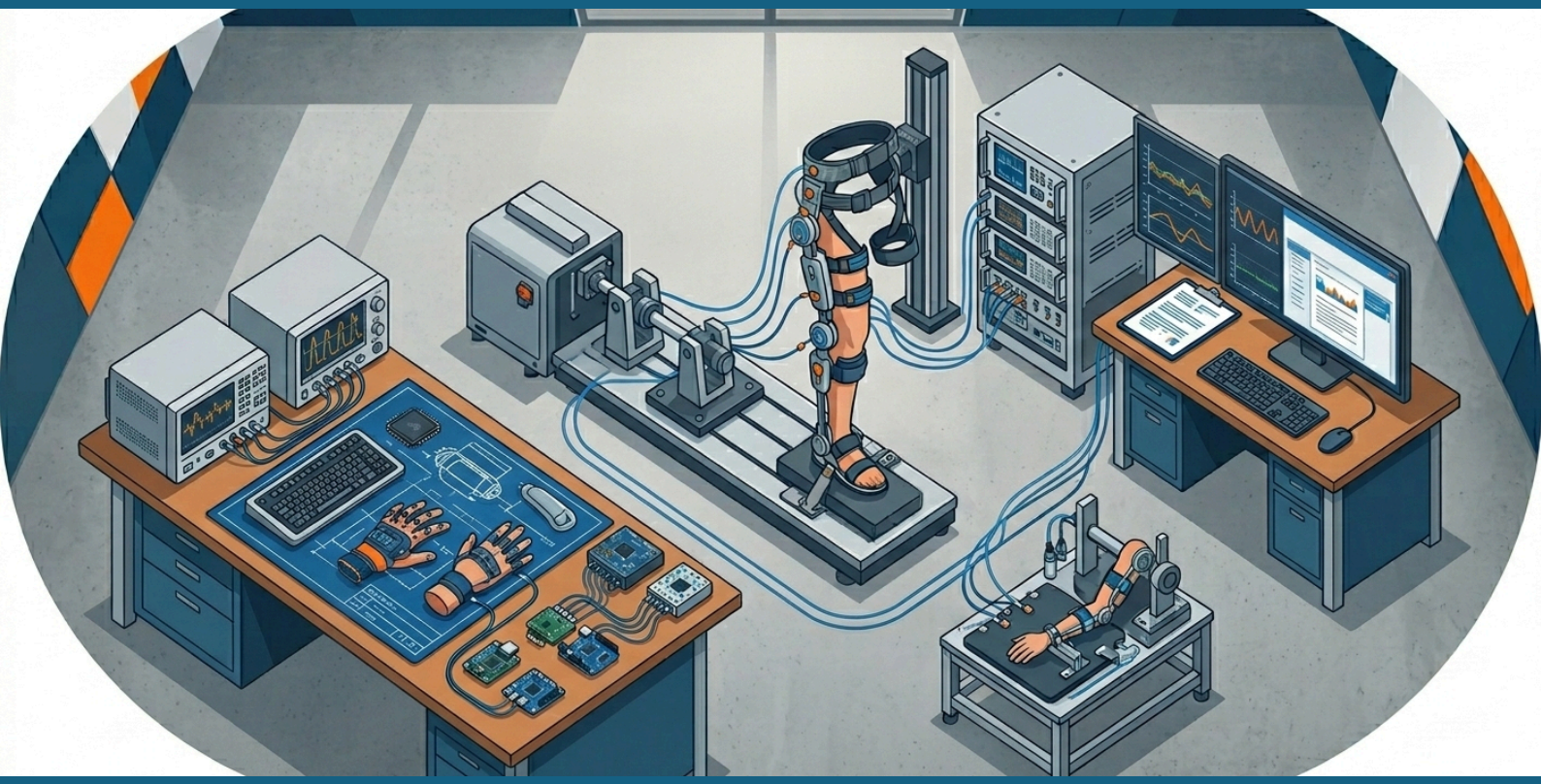
This part explores the technologies, methods, and applications that enable us to digitally capture human anatomy and translate it into customised rehabilitation solutions.

- Importance of scanning in rehabilitation
- Reverse engineering fundamentals
- Point cloud processing and CAD workflows
- Overview of commercial scanners and scalable custom rigs

Part 2 – Digital Design & AM for Wearable Devices

In Part 2, focuses on how Additive Manufacturing is reshaping rehabilitation engineering allowing various personalization, functional optimization, and clinical integration. The topics covered are:

- AM technologies relevant to orthoses and rehabilitation tools
- Advantages of AM: personalisation, integration, speed
- Design for Additive Manufacturing (DfAM) principles
- Materials, biocompatibility, comfort, durability
- Technical and regulatory challenges



Module 3 – Embedded Systems, Sensor Integration & System Testing

The final module transitions from static prototypes to functional, intelligent devices:

Part 1 – Sensors and Electronics

In this part, students are equipped with both the conceptual understanding and practical skills to build, integrate, and visualiSe an embedded system, and even package it in a custom 3D-printed enclosure. The topics covered are:

- Introduction to embedded systems for rehabilitation
- Working with boards such as Raspberry Pi Pico and Arduino
- Wiring, configuring, and reading a 9-DoF IMU sensor
- Visualising motion data and understanding signal behaviour

Part 2 – Testing & Validation

Testing and validation play a crucial role in guiding design decisions. In the final part of the course, students will learn how to evaluate prototype performance by interpreting meaningful test data. This section will equip them with the skills to:

- Perform mechanical, environmental, electronics, and communication testing
- Identify risks using DFMEA
- Apply the Verification, Validation and Testing (VVT) framework
- Map user needs to testing procedures
- Analyse performance data (fatigue cycles, IMU drift, usability feedback)

Preparation for the Pisa Workshop to evaluate the preliminary EDUWEAR course

The Pisa event will mark a major milestone as we present preliminary results and gather feedback from key stakeholders.

The programme includes:

- Introduction to competence gaps identified in WP2 (led by UoM and UoO)
- Overview of the EDUWEAR course structure (delivered by UoP)
- Two core interactive activities:
  - Stakeholder Survey Session with students, teachers, clinicians, and industrial partners
  - Focus Group Session to gather early feedback on course content and the handbook

These activities will help refine the EDUWEAR course to ensure it is relevant, realistic, and aligned with the needs of future learners and professionals.

Dissemination Highlights

The EDUWEAR project continues to gain visibility across Europe through publications and events:

E&PDE25 Conference

- A Comprehensive Methodology to Identify Competence Gaps in Product and Design Engineering Curricula

Engineering Today – COE Magazine

- Shaping the future of Engineering Education for Wearable Rehabilitation

THINK Magazine

- The EDUWEAR Project: Connecting Rehabilitation and Engineering Across Europe

Stay tuned as further dissemination activities unfold over the next months!

Stay Connected

Curious to learn more about our journey, upcoming events, and exciting developments?

Visit our website, and follow us on Facebook, LinkedIn, and Instagram for behind-the-scenes content, partner highlights, project updates, and snapshots from our workshops and summer courses. Whether you're a student, educator, or industry professional — there's something for everyone to discover!

Website
www.eduwear-project.eu

Facebook
www.eduwear-project.eu

LinkedIn
www.linkedin.com/groups/10003133/

Instagram
www.instagram.com/eduwear_project/

EDUWEAR

www.eduwear-project.eu