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GreenSIGNS:

Promoting high quality, digital transformation (VR gamification) and green transition in inclusive YW practices for youth with hearing impairment (or deafness) for better employability prospects

Design Brief

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This document has been created by the collaboration of the whole GreenSIGNS partnership

Consortium:

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Introduction

This Design Brief has been developed within Work Package 3 (WP3) of the GreenSIGNS project and provides the conceptual, pedagogical and technical framework for the creation of the GreenSIGNS Virtual Reality (VR) simulations and their accompanying learning activities.

The document defines the real-life work environments, professional contexts and interactive scenarios that are integrated into the VR platform, with the aim of promoting green skills and employability competences among Deaf and Hard-of-Hearing (DHH) young people through immersive and inclusive digital learning experiences.

In line with the project proposal, the Design Brief outlines:

- three case studies corresponding to green-focused professional sectors (Environmental Conservation, Upcycling-Handcrafts and Eco-Tourism)
- a total of twenty-one real-life scenarios (seven per work environment) to be developed within the VR simulations
- the pedagogical logic linking each VR scenario to structured online and offline accompanying activities
- accessibility and inclusion principles ensuring effective participation of DHH learners
- technical guidelines supporting the storyboard creation and Unity-based development of the VR environment

This Design Brief serves as the main reference document for partners involved in scenario design, activity development and technical implementation. It ensures coherence across project outputs, alignment with the GreenSIGNS Competence Framework, and consistency with the objectives of promoting digital transformation, green transition and inclusive youth work practices.

Purpose and Scope of the Design Brief

This Design Brief provides a shared reference point for:

- the VR design process (interaction logic, feedback approach, accessibility assumptions)
- the 3 case studies/work environments and their narrative intent
- the 21 scenarios total (7 per case study) and their instructional structure
- the systematic link between VR scenarios and the 32 accompanying activities

This brief covers:

- learning intent (green + employability skills)
- scenario structure and interaction patterns
- accessibility requirements for DHH users

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- environment notes and suggested objects/props
- mapping approach to accompanying activities
- implementation notes for Unity development

Pedagogical and Competence Alignment

Scenarios and activities are designed to:

- promote green skills (environmental literacy, sustainable practices, circular economy logic)
- strengthen employability skills (communication, teamwork, problem-solving, confidence, decision-making)
- remain practical, visual, and accessible for DHH youth

Accompanying activities are designed as online/offline tasks (quizzes, crosswords, role plays, hands-on projects such as composting and recycling), aligned to the three professional domains.

Target Groups and Use Context

Primary learner group

- DHH young people, approximately 16-30 (with flexibility depending on national context)

Secondary users

- Youth workers, facilitators, and trainers delivering inclusive youth work
- Youth organisations implementing the VR + activities blended approach

Use context

- youth centres, NGOs, training rooms, schools (where relevant)
- VR sessions facilitated in small groups or individually
- activities delivered as a follow-up and/or preparation for VR sessions

Technical Framework of the GreenSIGNS VR Simulations

Overall System Structure

The GreenSIGNS VR simulations operate as a real-time interactive learning environment developed through the Unity platform, translating real-life green professional contexts into immersive and task-based digital experiences.

Upon entering the application, users access a central navigation interface presenting the three professional work environments (Environmental Conservation, Upcycling-Handcrafts and Eco-Tourism). From this interface, learners independently select the environment they wish to explore and enter the associated VR scenarios.

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Each work environment functions as a self-contained immersive space where users interact with objects, tools and environmental elements directly related to green professional tasks.

User Interaction Logic

Interaction within the VR environments is designed to remain intuitive, visual and accessible for DHH learners. Core interaction types implemented across scenarios include:

- selecting and inspecting objects (e.g. materials, tools, environmental elements)
- placing or sorting items into correct locations (e.g. recycling bins, compost areas, crafting spaces)
- sequencing actions to complete practical processes (e.g. restoration steps, conservation tasks)
- confirming task completion through simple visual prompts or action buttons

These interaction mechanics reflect real-life professional actions while maintaining simplicity and clarity in the digital environment.

Accessibility & Inclusive Design Requirements (DHH)

The VR simulations and all scenario interactions minimise reliance on audio and ensure clarity through visual, structured and inclusive design approaches tailored to the learning needs of Deaf and Hard-of-Hearing (DHH) young people. Accessibility principles are embedded consistently across all work environments and scenarios, ensuring equal participation, comprehension and engagement throughout the VR experience.

Mandatory accessibility features implemented across the simulations include:

1. Visual-first communication: on-screen instructions, icon-based prompts and animated cues guiding user actionsCaptions/subtitles: for any spoken content (if used at all)
2. Captions and subtitles: provided for any spoken or narrative content where applicable
3. Clear feedback states: visual confirmation of correct and incorrect actions (e.g. green tick, red cross, celebratory animations)
4. Adjustable display settings: options for text size, contrast and comfort where technically feasible
5. Reduced cognitive load: uncluttered interfaces and limited simultaneous prompts to maintain focus
6. Audio-independent tasks: all scenarios fully operable without sound

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These measures ensure that the VR simulations function as inclusive learning environments that promote confidence, autonomy and effective skills acquisition for DHH learners.

Overview of the VR Simulations

Learning model

Each scenario follows a consistent micro-structure:

- brief introduction (context and role)
- task execution (interactive selection/placement/inspection)
- immediate feedback (visual confirmation, retry guidance)
- wrap-up (short reinforcement + transition)

Scenario types

Across the three case studies, scenario mechanics include:

- identification and matching (species, footprints, materials)
- inspection and monitoring (tree health, water quality)
- sorting and selection (recycling streams, compost inputs)
- crafting/creating (upcycling products)
- decision-making dilemmas (linked especially via role-play activities)

Work Environments (3 Case Studies)

GreenSIGNS VR is structured around three realistic work environments representing key green professional sectors. Each environment contains seven interactive real-life scenarios, resulting in a total of twenty-one VR scenarios across the platform.

1. Environmental Conservation (Forest / nature monitoring)
2. Upcycling-Handcrafts (Workshop / handicraft room)
3. Eco-Tourism (Hotel garden / hotel operations & sustainability)

These environments provide immersive contexts in which learners apply green and employability skills through practical, task-based activities.

Case Study 1 – Environmental Conservation (Forest)

Users take the role of a youth environmental assistant supporting conservation work in a forest setting, completing tasks related to biodiversity monitoring, ecosystem health, and responsible environmental action.

Environment notes / suggested scene elements

- forest with a pond
- mini-farm area with plants
- small garage and house (supporting "field base" logic)

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Case Study 2 – Upcycling-Handcrafts (Workshop / Handicraft Room)
Users take the role of a young maker/assistant in a workshop, learning how to transform "waste" materials into useful objects through basic upcycling processes that build creativity, problem-solving, and sustainable consumption habits.
Environment notes / suggested scene elements

- handicraft tables and seating
- materials shelves (paper/cardboard/plastic/fabric/wood)
- tool corner (safe scissors/glue/brushes)
- optional office corner with paper needs (planning/design)

Case Study 3 – Eco-Tourism (Hotel Garden / Sustainable Hotel Operations)
Users take the role of an eco-tourism assistant supporting sustainable practices in a hotel and its garden area (waste sorting, composting, water conservation and reuse), reinforcing responsible tourism and green decision-making.
Environment notes / suggested scene elements

- benches, trash cans, soil, plants
- garden compost area
- sorting baskets/bins for materials
- water/irrigation elements (as relevant)

Link to Accompanying Activities (32 total)

Purpose of the Accompanying Activities
The accompanying online and offline activities are an integral component of the GreenSIGNS learning methodology and function as a pedagogical bridge between the immersive VR experience and real-life youth work practice.
While the VR simulations provide experiential exposure to green professions and task-based learning, the accompanying activities reinforce knowledge acquisition, promote reflection, and support the development of transferable employability skills.

Through practical exercises such as quizzes, crosswords, role-playing scenarios and hands-on environmental projects (e.g. recycling, composting, creative upcycling), learners consolidate green literacy, strengthen problem-solving abilities and apply sustainable behaviours in real-world contexts.

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Distribution Across Case Studies

In line with the project proposal, a total of thirty-two accompanying activities have been developed and distributed across the three professional work environments as follows:

- 11 activities supporting the Environmental Conservation case study
- 11 activities supporting the Upcycling-Handcrafts case study
- 10 activities supporting the Eco-Tourism case study

This balanced distribution ensures comprehensive pedagogical coverage of all green sectors addressed within the VR simulations.

Flexible Implementation Before or After VR

The accompanying activities can be implemented either:

- before the VR experience, to introduce key concepts, terminology and context, or
- after the VR experience, to support reflection, consolidation and practical application.

This flexible approach allows youth organisations to adapt delivery according to their learners' needs, time availability and training setting, while maintaining coherence with the relevant VR environment.

Conclusion

This Design Brief establishes a coherent pedagogical and technical framework for the GreenSIGNS VR simulations and accompanying learning activities, ensuring alignment with the project's objectives on green skills development, digital transformation and inclusive youth work practices.

By defining realistic work environments, structured real-life scenarios, accessibility principles for Deaf and Hard-of-Hearing learners and the integration of complementary learning activities, the document provides a clear operational reference for scenario development, storyboard creation and technical implementation.

The Design Brief ensures consistency across project outputs, supports effective skills acquisition and lays the foundation for high-quality, inclusive and immersive learning experiences within the GreenSIGNS ecosystem.

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