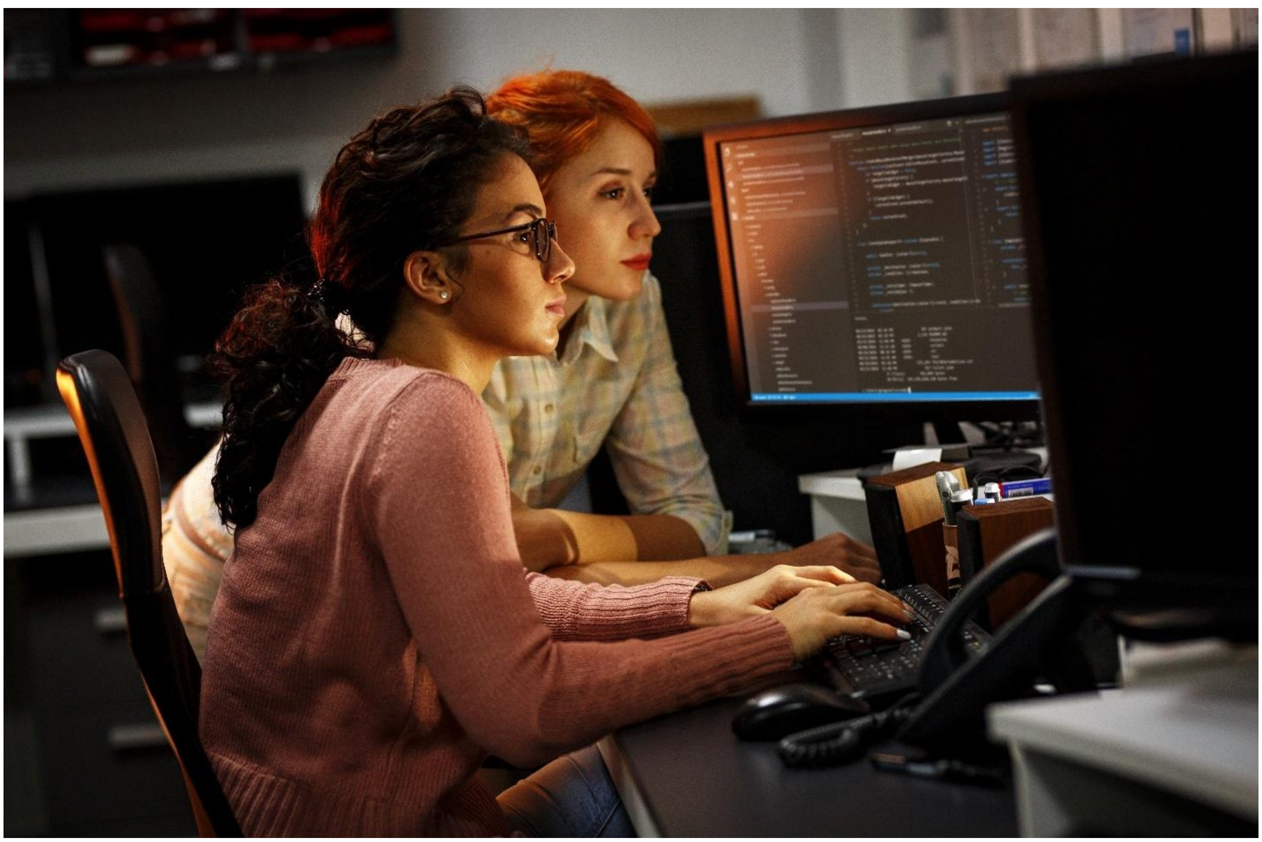
HER TECH – Her Tech, Her Terms. Engagement as the key

D3.3 Case studies compendium



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HER TECH

Her Tech, Her Terms. Engagement as the key

D3.3: Case studies compendium

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SEN	Sensitive (limited under the GA conditions)	
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Executive summary

This deliverable presents a compendium of eleven European case studies documenting educational initiatives that have successfully engaged girls in computing, informatics, and STEM-related learning environments. The cases illustrate a broad range of approaches implemented across school and community contexts and highlight recurring factors that appear particularly effective in supporting girls' participation and confidence in technology-related education.

The findings demonstrate that girls engage more positively with computing when activities are collaborative, creative, practically relevant, and delivered within supportive learning environments. Visible female role models, low-pressure participation, interdisciplinary projects, and sustained exposure over time emerged as especially important elements across the analysed initiatives. The case studies also reinforce findings from previous HER TECH research showing that the transition from primary to lower secondary education represents a particularly sensitive period in which girls' confidence and interest in technology often decline.

Rather than focusing on statistically measurable impact, the compendium provides qualitative and practice-based insight into how educational environments can create stronger feelings of belonging, recognition, and engagement among girls in ICT-related fields. The documented practices provide an important empirical foundation for the development of future HER TECH pedagogical resources, training materials, and gender-sensitive engagement strategies.

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1. Introduction

This document constitutes Deliverable 3.3 of the HER TECH project – Her Tech, Her Terms. Engagement as the Key – funded under the Erasmus+ programme (Grant Agreement 101195742). The deliverable forms part of Work Package 3 and focuses on documenting and analysing educational practices that have demonstrated positive engagement outcomes for girls in computing, informatics, and STEM-related education.

The compendium includes eleven case studies drawn from the seven HER TECH partner countries (Sweden, Finland, Belgium, Germany, Ireland, Italy, and Croatia), together with one additional reference case from Poland. The cases were identified through the research activities conducted within D3.2 (Interview Findings Report), which involved 43 semi-structured interviews with principals, educators, and NGO representatives across partner countries. Interview participants were asked to identify initiatives that they considered particularly effective in supporting girls' engagement with technology and computing.

The selected initiatives were reviewed against a shared set of criteria, including gender relevance, evidence of positive engagement, sustainability, and the inclusion of authentic computing-related activities. Particular attention was given to initiatives operating at primary and secondary school level, as previous findings within HER TECH consistently identified this period as especially important for shaping girls' confidence, participation, and long-term relationship with technology-related subjects.

The structure of the compendium was designed to support the development of D3.4 (Gender-Sensitive Engagement Framework). Each case study was therefore analysed through four interconnected dimensions: Access, Belonging, Recognition, and Progression. These dimensions support cross-case comparison and enable the identification of recurring patterns, barriers, and enabling factors across different educational and national contexts.

Beyond its analytical role within WP3, the deliverable also contributes directly to Work Package 5, where practical outputs such as pedagogical resources, training materials, and implementation guidelines will be developed. The case studies presented in this document therefore serve both as examples of practice and as an empirical basis for future transferable and scalable engagement approaches.

2. Methodology

2.1. Definition: What Counts as a Case Study?

For inclusion in this compendium, initiatives were required to meet the following criteria, developed collaboratively by the consortium and presented at the T3.3 kick-off session in December 2025:

- Real computing content – students learn and practise computing concepts such as programming, robotics, game design, web or app creation, data or algorithms; not merely office tools or general internet use.
- Gender relevance – a clear focus on girls or under-represented genders in ICT, or documented evidence that the initiative affects girls' engagement positively.
- Evidence of positive impact – some data or observations demonstrating effect: numbers, retention, feedback, interview reports, logs or evaluations.
- Some maturity - the initiative has run at least one full cycle (a school year, course run or camp cohort).
- Access and consent – key people were available for interviews or provided documentation, and the organisation agreed to be described.

Additionally, the consortium aimed for diversity across cases, prioritising: representation across education levels (primary, lower secondary, upper secondary, VET and higher education); a mix of urban and rural or small-town settings; and diversity in actor type (school-led, NGO, industry partnership, hybrid). Where multiple cases were available from the same country, preference was given to programmes addressing complementary contexts or populations.

2.2. Case Study Structure and Analytical Framework

Each case study is structured using a common template developed for T3.3, organised around six sections:

- Case Study Profile – a quick reference summary providing key metadata for classification within the compendium.
- Context and Challenge – the background and motivating problem; the specific gender barriers the initiative was designed to address; and alignment with national or local strategy.
- Engagement Strategy – the pedagogical approach; specific content and tools; and the gender-sensitive design elements employed, covering learning environment, role models, content relevance and group dynamics.
- Implementation Process – structured around the four WP3 analytical dimensions: Access (how girls enter and participate), Belonging (how the learning climate is designed to be inclusive), Recognition (how girls' technical contributions are valued), and Progression (how the programme supports continued interest and pathways).
- Outcomes and Impact – quantitative indicators, qualitative evidence and any unexpected results.

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- Transferability and Scalability – success factors, barriers and lessons learned, and potential for replication.

This structure ensures comparability across all cases and directly supports the synthesis work in T3.4. The four dimensions in the Implementation Process section – Access, Belonging, Recognition, Progression – reflect the WP3 Interview Methodology developed in T3.2, enabling coherent cross-national comparison.

2.3. Selection Process

Case studies were identified primarily through the T3.2 interview process. Interviewees – school principals, educators and NGO representatives across the seven partner countries – were asked to describe concrete programmes or initiatives that had been particularly effective in engaging girls in computing or ICT. These recommendations were followed up with additional documentation review and, where available, supplementary interviews with programme coordinators.

Partners reviewed candidate cases against the eligibility criteria and submitted case study files using the common T3.3 template. The case from Poland (Dziewczyny na politechniki!) has been included as a reference case to provide comparative context from Central and Eastern Europe; Poland is not a HER TECH partner country.

A deliberate scoping decision was made to focus the compendium primarily on initiatives operating at primary and secondary school level. As consistently highlighted across the T3.2 interviews, the compulsory education years – and in particular the transition from primary to lower secondary school – represent the most critical window for shaping girls' relationship with technology. It is during this period that interest most commonly dips, that stereotypes about who "belongs" in computing tend to solidify, and that the choices girls make (or are steered away from) have lasting consequences for their educational and career trajectories. Intervening at this stage, rather than later, offers the greatest potential for sustained impact.

Two defining characteristics are shared by all the cases in this compendium. Most of the initiatives presented here were designed gender-neutral. They are mixed-gender or universally accessible programmes that have nonetheless demonstrated meaningful positive engagement of girls in computing and STEM. This reflects the evidence: many of the most effective approaches work precisely because they redesign the learning environment for everyone, rather than treating girls as a separate group requiring special accommodation. Second, none of the cases included here can be said to offer statistically robust evidence of success. The data available is largely qualitative, contextual and self-reported – a reflection of the realities of practitioner-led initiatives operating in real school and community settings, where long-term tracking and controlled evaluation are rarely feasible. The cases are selected and presented not because their impact has been proven beyond doubt, but because they represent credible, well-documented examples of practice that the field can learn from.

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2.4. Overview of Cases

The compendium presents ten case studies across eight countries:

Country	Initiative	Level	Key Approach
Sweden	TechLab Linköping	Primary	Mandatory municipal STEM centre
Sweden	Integrated VR and creative computing	Primary	Digital tools throughout school subjects
Belgium	CoderDojo Belgium	Primary-Upper Sec.	Free community coding clubs
Belgium	CodeNPlay	Pre-primary-Lower Sec.	Gender-neutral curriculum integration
Croatia	Coding4Girls	Primary (gr. 5-8)	Game-based programming
Croatia	STEM Supergirls / Mentoring Byte	Upper Sec.-Career	Events and mentoring ecosystem
Germany	Plus-MINT	Upper Secondary	STEM talent boarding school track
Ireland	I Wish	Upper Secondary	Large-scale girls-only STEM events
Italy	IC Laives STEM & Robotics	Primary-Lower Sec.	School-led robotics curriculum
Finland	LUMA Centre Finland	All levels	National university STEM network
Poland*	Dziewczyny na politechniki!	Upper Sec. to HE	National university open-day campaign

* *Reference case; Poland is not a HER TECH partner country.*

3. SWEDEN | TechLab Linköping

Municipal mandatory STEM centre for primary schools

3.1. Case Study Profile

Initiative	TechLab
Country & Location	Sweden – Linköping (urban)
Education Level	Primary (grades 3, 5, 6 and 8)
Type of Actor	Municipal / NGO-hybrid
Duration & Status	Ongoing since 2024
Target Group	All municipal primary school students (mixed classes, gender focus)

3.2. Context and Challenge

3.2.1. Background

TechLab is a municipal tech centre in Linköping, run by two lead teachers specialising in STEM. Operational for approximately one and a half years, the centre serves 22 primary schools and reaches nearly 6,000 students annually.

A primary motivator is the research-backed observation that pupils' interest in technology often 'dips' during lower secondary school. The centre was designed to prevent this by creating a 'red thread' of mandatory technical education through grades 3, 5, 6 and 8.

The teachers identified critical curriculum gaps: although programming is included in national curriculum goals, it is frequently not taught in practice because teachers lack the necessary resources. Traditional technology education had become 'stagnated', repeating the same projects across grades without progression.

3.2.2. Specific Gender Barriers Addressed

The initiative addresses three interconnected gender barriers. Structural barriers: mandatory participation for all students ensures every girl is reached regardless of prior interest. Stereotypes: the centre deliberately 'tones down' the focus on technical 'geekery' and emphasises creativity, collaboration and design, framing workshops as a 'digital woodshop'.

Lack of role models: by training predominantly female classroom teachers and hosting family nights that engage mothers, the programme ensures girls see women as tech-competent leaders.

3.2.3. Alignment with National Strategy

The initiative was pitched to municipal authorities in alignment with an anticipated national STEM strategy. It addresses the national curriculum mandate for programming. Regional collaboration with Modda Sörmland’s

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EU-funded project provides access to VR/XR equipment. The programme operates under full municipal management, approved by the area's school principals.

3.3. Engagement Strategy

3.3.1. Pedagogical Approach

The approach deliberately moves away from abstract 'tech-geekery' toward creative, hands-on and collaborative learning. Workshops follow a 'digital woodshop' metaphor: students create a digital blueprint and manufacture a tangible physical product to take home.

For younger students (grade 3), the focus is on playful experience using Lego combined with programming. The curriculum is scaffolded across grades – from basic concepts to Microbit programming and 3D design – creating a 'red thread' of continuous technical education.

An inquiry and challenge-based element is embedded in each workshop: students face a challenge for which they do not initially have all the 'keys', making problem-solving feel like a rewarding achievement.

3.3.2. Content and Tools

Tools vary by grade: Lego construction and programming for grades 3, 5 and 6; Microbit programming and 3D design for older students. Stop-motion film, 3D printing and digital blueprinting are also used. Through the Modda Sörmland partnership, VR/XR glasses are available. Teachers may borrow specialised equipment to continue STEM activities between visits.

3.3.3. Gender-Sensitive Elements

Learning Environment: Mandatory attendance for all students in grades 3, 5, 6 and 8, preventing the self-selection bias typical of elective programmes that predominantly attract tech-interested boys.

Role Models: Predominantly female classroom teachers are trained and serve as immediate tech role models. Family nights specifically engage mothers, normalising technology as a viable path for daughters.

Content Relevance: Linking technology to aesthetics, craft and tangible physical products ('digital woodshop') makes the subject feel inclusive beyond a narrow 'tech-geek' identity.

Group Dynamics: Collaborative projects require diverse skills – programming, blueprint reading, colour coordination – ensuring girls take a natural place in the group and their contributions are essential to collective success.

3.4. Implementation Process

3.4.1. Access

Participation is mandatory for all municipal school students in grades 3, 5, 6 and 8. No recruitment is required. Optional elements include voluntary family nights (free of charge) and elective profile classes from grade 7. A typical student meets TechLab staff at least five times. The programme is free, removing cost barriers.

3.4.2. Belonging

Workshops are framed as a 'digital woodshop', making the environment feel familiar and artistic. For younger grades, the climate is built around a playful, joyful experience. Because the programme is mandatory, girls are not an 'exception' in the room but present as a natural part of their schooling. Family nights, where students act as the 'expert' teaching their parents, reinforce each student's identity as a technology knower.

3.4.3. Recognition

Diverse skill sets – programming, aesthetic design, blueprint reading – are structurally necessary to complete projects, ensuring girls' contributions are recognised as vital. The 'digital woodshop' approach produces a tangible physical product students take home, providing visible proof of technical achievement. One-third of applicants to the new 7th-grade profile classes are girls, serving as an early indicator that students feel their technical abilities are valued.

3.4.4. Progression

The 'red thread' structure ensures progression across grades: from playful Lego construction in grade 3 to Microbit programming and 3D design in grades 5-8. The long-term goal is to increase the number of students choosing technical or vocational upper secondary (gymnasiet) programmes. From grade 7, students can apply for elective 'profile classes' meeting 90 minutes per week.

3.5. Outcomes and Impact

3.5.1. Quantitative Indicators

- ~6,000 students reached annually across 22 municipal primary schools
- One-third of applicants for the new grade 7 profile classes are girls
- Five mandatory touchpoints per student throughout primary and lower secondary education

3.5.2. Qualitative Evidence

Teachers report higher levels of engagement than anticipated. Family nights have created 'ripples on the water' extending interest beyond the classroom. An unintended benefit is the empowerment of female classroom teachers who, after receiving training and loanable materials, become immediate tech role models for their students – a 'bonus' the lead teachers did not plan for.

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3.5.3. Unexpected Results

The majority of primary school teachers trained through the programme are women, meaning female role models are embedded in everyday classrooms rather than limited to occasional external guests. This was not a primary design goal but has become one of the initiative's most impactful outcomes.

3.6. Transferability and Scalability

3.6.1. Success Factors

- Mandatory participation as the structural cornerstone – prevents self-selection and ensures all girls are reached
- Creative, arts-integrated framing broadening the perceived audience for technology
- Empowerment of female classroom teachers as immediate role models
- Municipal-level support and commitment by school principals
- Scaffolded curriculum creating a 'red thread' rather than one-off events

3.6.2. Barriers and Lessons Learned

The initiative does not yet have long-term data on whether participation translates into upper secondary technical choices. Data collection on long-term outcomes is a stated next step.

3.6.3. Potential for Scaling

The model is replicable in other municipalities with political will to make STEM education mandatory. Key requirements: municipal-level backing, dedicated STEM lead teachers, loanable equipment, and a progressive curriculum structure. The 'digital woodshop' framing can be adapted to different cultural contexts.

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4. SWEDEN | Modda Sörmland - Integrating VR and Creative Computing

A classroom-embedded approach using VR, stop-motion and structured collaboration in a Swedish primary school

4.1. Case Study Profile

Name of Initiative	Integrated VR and Creative Computing
Country & Location	Sweden
Education Level	Primary (years 2-6, ages 8-12)
Type of Actor	School-led
Duration & Status	Ongoing; teacher has followed the same cohort for 3+ years
Target Group	Mixed-gender primary school classes with focus on girls' engagement
Enabling Project	Modda Sörmland (EU-funded regional digital education project)

4.2. Context and Challenge

4.2.1. Background

A qualified primary school tech and science teacher has been teaching Swedish, mathematics and technology to the same cohort of students since year 2. This longitudinal continuity – unusual in Swedish primary education – has allowed a deliberate and patient approach to building students' relationship with technology. The school operates with 1:1 computers for all students and, through the EU-funded Modda Sörmland regional project, has access to VR headsets. Students also visit KomTek, a municipal tech centre, twice per term for Lego programming, Minecraft and other hands-on digital activities.

4.2.2. Specific Gender Barriers Addressed

Girls consistently arrive less familiar with computers and gaming environments than boys, who have more prior exposure through console gaming. This translates into greater initial hesitancy with unfamiliar technology, particularly VR. A secondary barrier is language: because boys more commonly engage in online multiplayer gaming, they have stronger incidental English skills, while girls find English-language computing interfaces more daunting. Performance anxiety – fear of being watched while trying something new – is the most frequently observed barrier, and is reported as almost exclusively expressed by girls.

4.2.3. Alignment with National Strategy

The initiative operates within Sweden's national curriculum mandate for programming across subjects including mathematics. The Modda Sörmland EU project provides regional infrastructure and equipment. KomTek provides a shared municipal resource for hands-on tech education across all local schools.

4.3. Engagement Strategy

4.3.1. Pedagogical Approach

The approach integrates computing into art, history, science and language lessons rather than treating it as a standalone subject, making technology purposeful and lowering the threshold for students who do not identify as 'tech people'. Activities are designed around creative output – films, artworks, animated stories – that have aesthetic and narrative value beyond technical execution. Structured role assignment and pair work reduce competitive pressure and create clear entry points for all learners.

Activities are typically organised in simultaneous stations: while one group uses VR or digital tools, another creates a physical or artistic representation of the same subject, and a third produces a written text – ensuring that digital engagement is always embedded within a broader, multi-modal learning experience rather than isolated as a separate technical task.

4.3.2. Content and Tools

- VR headsets used in structured rotation across subjects including art, science and history
- Scratch for programming on computers
- NTR (Science, Technology and Programming) for curriculum-linked programming tasks
- Stop-motion animation combining Lego construction with digital film-making
- KomTek (municipal tech centre) for Lego robotics, Minecraft and iPad-based activities
- 1:1 computers used as a standard cross-curricular learning tool

4.3.3. Gender-Sensitive Elements

Learning Environment: The 'round mat' VR method places one student on a designated mat with the headset while the rest of the class works on parallel station activities simultaneously. This removes the 'being watched' dynamic that most commonly causes girls to refuse to try, and is described as the single most effective structural adaptation for hesitant learners.

Role Models: Girls who develop confidence are actively repositioned as peer teachers and demonstrators for younger year groups, making female technical competence visible within the school.

Content Relevance: Stop-motion and creative storytelling – building Lego scenes, animating literary characters, recreating historical settings – are identified as the activities most effective at engaging girls, linking technology to narrative, aesthetics and craft.

Group Dynamics: Pair and small-group work requires students to explain what they see and do, creating communication-driven collaboration. Clear role assignment reduces ambiguity and performance pressure.

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4.4. Implementation Process

4.4.1. Access

1:1 computers and EU-funded VR headsets ensure equitable technology access with no financial barriers. Computing is embedded in mandatory subject teaching, reaching all students including those who would not self-select for tech activities. Comtech provides two expert-led sessions per term across all classes.

4.4.2. Belonging

The round mat method is the primary belonging strategy: by running VR as one of several simultaneous stations, the student using the headset is never a spectacle. Integration across subjects also reduces belonging barriers – computing appears inside art and history rather than as a separate 'tech lesson', so students who do not identify as technical are less likely to feel out of place. The longitudinal teacher-student relationship (3+ years with the same class) builds the sustained trust needed for students to take risks.

4.4.3. Recognition

Creative outputs – stop-motion films, VR artworks, Minecraft historical reconstructions – produce visible, shareable artefacts that are recognised by peers and families. Girls who gain confidence are placed in visible leadership roles as peer teachers for younger classes, explicitly framing technical competence as expertise worth sharing.

4.4.4. Progression

Following the same cohort across years 2-5 allows individual progression to be tracked and supported deliberately. Students move from simple Scratch programming and physical construction in early years to VR exploration and cross-subject project work as they get older. The teacher explicitly waits for student readiness rather than forcing participation, then leverages gained confidence to create peer teaching opportunities.

4.5. Outcomes and Impact

4.5.1. Quantitative Indicators

- 90 VR headsets available school-wide via Modda Sörmland EU project
- 1:1 computer provision for all students
- Cohort followed continuously for 3+ years

4.5.2. Qualitative Evidence

The teacher reports a clear shift in confidence across the cohort: students who were initially hesitant now describe technology as something they can do. One girl who observed VR use for two to three months before attempting it has become a peer teacher for younger students. The question 'no, this is not for me' is no longer heard in the class, though it remains common among younger students in the school encountered during cross-class activities.

4.5.3. Unexpected Results

The English language barrier emerged as an unexpected and underreported finding: girls' lower exposure to English-language online multiplayer gaming limits both tech familiarity and incidental English acquisition, creating a compounding disadvantage in computing contexts. This connection is rarely addressed in educational interventions but has direct practical implications for software and tool selection.

4.6. Transferability and Scalability

4.6.1. Success Factors

- Longitudinal teacher-student relationship enabling patient, trust-based progression
- Round mat VR method: a simple structural adaptation removing the 'being watched' dynamic
- Cross-subject integration making computing accessible regardless of prior tech identity
- Creative, tangible outputs giving technology a purpose that resonates with diverse learners
- Institutional digital infrastructure (1:1 computers, EU-funded VR, Comtech access)

4.6.2. Barriers and Lessons Learned

The case depends on a teacher with both technical competence and pedagogical creativity, and on above-average digital infrastructure made possible by EU project funding. Replicating the round mat method and cross-subject integration requires no special equipment; replicating the VR component requires resourcing. The longitudinal relationship required an explicit individual request to follow the class – school systems would need to consider whether such continuity could be supported structurally.

4.6.3. Potential for Scaling

The core adaptations – round mat structure, creative output framing, subject integration, patient pace-following – are transferable to any classroom with standard digital tools. The underlying design principle (making new technology low-pressure and observation-safe) applies beyond VR to any novel device or platform. The key recommendation is to wait for readiness rather than force participation, and to deliberately use confident early adopters to model competence for peers.

5. BELGIUM | CoderDojo Belgium

Community coding clubs creating inclusive tech learning spaces for ages 7-18

5.1. Case Study Profile

Initiative	CoderDojo Belgium – coderdojobelgium.be
Country & Location	Belgium – nationwide
Education Level	Primary / Lower Secondary / Upper Secondary
Type of Actor	External NGO
Duration & Status	Ongoing since 2013
Target Group	Children and teenagers aged 7-18, with focus on girls' participation

5.2. Context and Challenge

5.2.1. Background

CoderDojo was created in response to the growing importance of digital skills and the recognition that many children had limited opportunities to learn coding in formal school settings. A key motivation was the persistent underrepresentation of girls in STEM and digital fields, driven by social stereotypes, lack of confidence, and limited exposure to female role models. The initiative establishes free, community-based coding clubs (Dojos) in accessible locations – schools, libraries, universities and youth centres – where children and teenagers can experiment with technology in a supportive, non-formal atmosphere.

5.2.2. Specific Gender Barriers Addressed

CoderDojo Belgium addresses gender stereotypes by promoting coding as accessible to everyone. It tackles lack of confidence through a playful, experimentation-focused approach where mistakes are normalised as part of learning. The lack of role models is addressed by involving female mentors and volunteers from the technology sector. Structural barriers are reduced by offering all activities free of charge and in accessible community locations.

5.2.3. Alignment with National Strategy

The initiative aligns with Belgian regional and local efforts to strengthen digital skills, European initiatives promoting coding in education, and EU priorities on digital inclusion and closing the gender gap in STEM.

5.3. Engagement Strategy

5.3.1. Pedagogical Approach

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CoderDojo uses non-formal, project-based and collaborative learning methods rather than traditional theory-focused teaching. Activities such as coding games, robotics challenges and digital storytelling make STEM subjects engaging and accessible for diverse learners.

5.3.2. Content and Tools

Participants work across a wide range of tools depending on age and interest, including Scratch, Python, HTML/CSS, robotics kits and game development platforms. The flexible nature of the Dojo allows participants to self-direct their learning with mentor support.

5.3.3. Gender-Sensitive Elements

Learning Environment: Welcoming, collaborative clubs in community settings; non-judgemental atmosphere where all skill levels are welcome.

Role Models: Mentors and volunteers include women active in STEM, increasing the visibility of women in technology.

Content Relevance: Projects span digital storytelling, game design and robotics, offering diverse entry points beyond narrow programming stereotypes.

Group Dynamics: Peer learning model; collaborative rather than competitive; children help each other, normalising mutual support.

5.4. Implementation Process

5.4.1. Access

CoderDojo sessions are free of charge and held in accessible community locations. Sessions are open to anyone aged 7-18 without prior experience. The decentralised, community-led model allows Dojos to be established in diverse geographic contexts across Belgium.

5.4.2. Belonging

The non-formal, playful atmosphere removes the pressure of formal assessment. Participants explore at their own pace and choose their own projects, creating a low-stakes environment where girls feel comfortable experimenting. The presence of female mentors helps girls see themselves as part of the tech community.

5.4.3. Recognition

Participants share and showcase their projects within the Dojo community. The focus is on creation and experimentation rather than grades, with recognition coming through peer appreciation and visible achievements – working games, apps or robots.

5.4.4. Progression

Participants can progress from beginner tools like Scratch to more complex languages over multiple sessions. The flexible, self-directed model allows each participant to move at their own pace. Experienced participants often become junior mentors, creating a visible pathway from learner to community leader.

5.5. Outcomes and Impact

5.5.1. Quantitative Indicators

- Active Dojos across Belgium serving thousands of young people annually
- Nationwide coverage in diverse community settings
- Ongoing since 2013 – more than a decade of consistent delivery

5.5.2. Qualitative Evidence

The community-building aspect is one of CoderDojo's strongest outcomes: participants return regularly, form peer networks and develop a sense of identity as young makers and coders. Girls report finding a supportive space where their contributions are welcomed.

5.6. Transferability and Scalability

5.6.1. Success Factors

- Free participation removes financial barriers to access
- Community-based locations increase geographic accessibility
- Volunteer mentor model enables scaling without large institutional budgets
- Non-formal, project-based approach reduces stereotype threat
- Long track record builds brand recognition and trust

5.6.2. Barriers and Lessons Learned

Without mandatory participation, Dojos may still attract disproportionately tech-interested boys. Active outreach to schools and communities is needed to ensure girls are actively recruited rather than waiting for self-referral.

5.6.3. Potential for Scaling

The CoderDojo model is designed for replication: communities can establish their own Dojos using the global CoderDojo Foundation framework. Adapting communication strategies to actively recruit girls is the main adaptation needed for stronger gender impact.

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6. BELGIUM | CodeNPlay

Integrating gender-neutral digital education into schools from the earliest ages

6.1. Case Study Profile

Initiative	CodeNPlay – codenplay.be
Country & Location	Belgium – nationwide
Education Level	Pre-primary and Primary (extending into Lower Secondary)
Type of Actor	External NGO
Duration & Status	Ongoing since 2017
Target Group	Children aged 6-14; priority for girls, socioeconomically deprived and SEN students

6.2. Context and Challenge

6.2.1. Background

CodeNPlay was founded in 2017 with the aim of educating all children in digital skills. The organisation operates on two tracks: extracurricular activities that finance the operation, and integration of digital education into the formal school curriculum. The starting focus on pre-primary and primary education is deliberate: reaching children before gender stereotypes become entrenched.

The initiative specifically prioritises schools with the lowest socioeconomic index, ensuring access to families who cannot provide devices at home. All content is validated by a researcher at the University of Namur specialising in gender issues, who ensures materials are gender-neutral – 'not unicorns for girls and astronauts for boys'.

6.2.2. Specific Gender Barriers Addressed

CodeNPlay addresses gender stereotypes by presenting coding and robotics as accessible and enjoyable for everyone, starting from an age when gender bias in technology perceptions has not yet solidified. Content is systematically reviewed by a gender specialist to eliminate gendered assumptions. Lack of confidence is tackled through a playful, hands-on approach. Female role models are increased through visible women in workshops and public activities.

6.2.3. Alignment with National Strategy

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CodeNPlay aligns with Belgian regional efforts to strengthen digital skills and EU priorities on digital inclusion. Its evidence-based, university-validated content approach places it within the academic discourse on gender-sensitive pedagogy in ICT education.

6.3. Engagement Strategy

6.3.1. Pedagogical Approach

The approach is built on early intervention: reaching children before gender biases around technology solidify. Learning is inclusive, playful and collaborative, with an emphasis on creating rather than consuming technology. Content is systematically validated to be free of gender-oriented framing. The programme also extends into lower secondary school using the same philosophy, prioritising deprived areas, special needs students, and maintaining explicit attention to gender inclusion.

6.3.2. Content and Tools

Activities include robotics, coding, AI awareness and digital citizenship. Tools are selected for age-appropriateness and accessibility. The organisation provides both in-school workshops and extracurricular activities, ensuring continuity across formal and informal settings.

6.3.3. Gender-Sensitive Elements

Learning Environment: Inclusive, accessible settings including schools serving the most deprived communities; no digital divide assumption.

Role Models: Women involved in technology and digital education are visible through workshops, mentoring and public activities.

Content Relevance: All content validated by a gender specialist to be neutral and appealing to diverse learners from the earliest age.

Group Dynamics: Collaborative, supportive environments where mistakes are treated as learning opportunities.

6.4. Implementation Process

6.4.1. Access

CodeNPlay prioritises schools with the lowest socioeconomic index, ensuring access reaches families who cannot provide technology at home. Activities are financially accessible and delivered in schools, removing the need for families to arrange separate attendance.

6.4.2. Belonging

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By targeting children before gender stereotypes around technology become anchored, CodeNPlay creates a foundational sense of belonging at an age when identity formation is more fluid. The gender-neutral content ensures no child receives the implicit message that technology is 'not for them'.

6.4.3. Recognition

The programme's emphasis on creation and participation means all students – including girls and students with special educational needs – are active producers of digital content, not passive consumers. Achievements are celebrated within the group and school community.

6.4.4. Progression

By embedding digital education from pre-primary through to lower secondary, CodeNPlay creates a longitudinal learning journey. The extension into lower secondary maintains engagement at the age when girls typically begin to disengage from technical subjects.

6.5. Outcomes and Impact

6.5.1. Quantitative Indicators

- Nationwide reach across Belgium from pre-primary to lower secondary
- Priority access for schools with lowest socioeconomic index
- Content validated by gender-specialist researcher at University of Namur

6.5.2. Qualitative Evidence

Teachers report that the early introduction of digital activities in a gender-neutral framing prevents the typical divergence in interest between boys and girls that emerges later in primary school. Principals of schools serving deprived communities note that CodeNPlay provides the only substantive digital education their students receive.

6.6. Transferability and Scalability

6.6.1. Success Factors

- Early intervention before gender stereotypes solidify
- Academic validation of gender-neutral content by university partner
- Structural priority for under-served communities
- Dual-track model: extracurricular funds school integration

6.6.2. Potential for Scaling

The model requires NGO capacity to validate content and manage school partnerships, but the core approach – early, gender-neutral digital education prioritising under-served schools – is transferable across national contexts.

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7. CROATIA | Coding4Girls (C4G)

Game-based programming for girls in primary school – a university-school partnership

7.1. Case Study Profile

Initiative	Coding4Girls (C4G)
Country & Location	Croatia – Rijeka (urban)
Education Level	Primary, grades 5-8 (ages 11-15)
Type of Actor	Hybrid – school-led with University of Rijeka support
Duration & Status	Pilot implementation and validation (February-June 2020)
Target Group	Mixed-gender classes with explicit focus on increasing girls' engagement in programming

7.2. Context and Challenge

7.2.1. Background

Coding4Girls was developed in response to persistent gender imbalance in ICT education. Programming is often perceived as difficult and abstract, reducing motivation especially among girls. Traditional teaching approaches do not adequately address engagement, confidence or content relevance. The initiative integrated game-based and game development-based learning into the formal informatics curriculum. The pilot was conducted online due to COVID-19, demonstrating the approach's adaptability to digital delivery.

7.2.2. Specific Gender Barriers Addressed

The initiative primarily addressed lack of confidence, stereotypes about programming as a male domain, and low engagement caused by abstract teaching methods. Strategies included: contextualised, real-world problem-solving tasks; non-competitive, creative learning formats; gradual progression from simple to complex tasks; and use of the visual programming tool Snap!

7.2.3. Alignment with National Strategy

The initiative aligns with European and Croatian national efforts to increase girls' participation in STEM and ICT, particularly through early intervention and innovative pedagogy.

7.3. Engagement Strategy

7.3.1. Pedagogical Approach

The core approach is Game-Based Learning (GBL) combined with Game Development-Based Learning (GDBL). Students learn programming by creating their own games, progressing from guided tasks to independent development in a constructivist framework. Projects address real-world themes such as recycling and environmental issues, making the content feel relevant and purposeful.

7.3.2. Content and Tools

Snap! – a visual programming language designed for accessibility. Game-based learning scenarios with environmental and daily-life themes. Video tutorials and interactive materials. Online platforms (Microsoft Teams, Edmodo) for remote delivery.

7.3.3. Gender-Sensitive Elements

Learning Environment: Mixed-gender classes with structured support; emphasis on collaboration rather than competition.

Role Models: Teachers and university student teachers – including female participants – involved in delivery.

Content Relevance: Real-world topics – recycling, environment, daily-life – intentionally selected to be relatable and not stereotypically 'tech-coded'.

Group Dynamics: Guided independent work with teacher support; opportunities to present work and receive peer feedback.

7.4. Implementation Process

7.4.1. Access

Implemented as part of regular Informatics classes – compulsory in grades 5-6 and optional in grades 7-8. No financial barriers. Delivered fully online due to COVID-19 restrictions, demonstrating the feasibility of digital delivery.

7.4.2. Belonging

The safe online learning environment, combined with emphasis on experimentation and learning through mistakes, fostered psychological safety. Students were encouraged to share and present their work, making contributions visible to the group.

7.4.3. Recognition

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Students presented their completed games at the end of sessions, receiving peer feedback and teacher acknowledgment. The game-creation format made technical contributions concrete and shareable, ensuring girls' programming work was directly visible and credited.

7.4.4. Progression

Learning scenarios were structured from simple to complex, guiding students from understanding basic programming concepts to applying them in independent game development. The initiative created initial exposure to programming as a potential future pathway.

7.5. Outcomes and Impact

7.5.1. Quantitative Indicators

- 773 students participated across the pilot
- 38 classes involved
- 8 teachers and 35+ future teachers engaged
- 347 students included in pre/post analysis

7.5.2. Qualitative Evidence

Students reported learning programming 'in a fun way'. Motivation increased through real-world problem-solving. The approach proved effective for both girls and boys – suggesting that gender-sensitive design improves outcomes for all learners.

7.5.3. Unexpected Results

Online implementation proved feasible and effective, expanding the potential reach of the model. Technical issues with Snap! on tablets highlighted the importance of adaptable tool selection.

7.6. Transferability and Scalability

7.6.1. Success Factors

- Well-designed learning scenarios grounded in real-world contexts
- Teacher support and training through university partnership
- Visual programming tools lowering the barrier to entry
- Non-competitive, game-creation format appealing across gender lines

7.6.2. Potential for Scaling

The model is replicable with university support and teacher training. The Snap! platform and online delivery make it low-cost and geographically flexible. Adaptation to local thematic contexts is straightforward.

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8. CROATIA | STEM Supergirls / Mentoring Byte

From inspirational events to a long-term mentoring ecosystem for women in ICT

8.1. Case Study Profile

Initiative	STEM Supergirls / ICT Supergirls (original) / Mentoring Byte (evolved component)
Country & Location	Croatia – Zagreb (primarily urban; national reach through events)
Education Level	Upper Secondary to Higher Education to Early Career
Type of Actor	Hybrid – industry-led with community and mentoring components
Duration & Status	Ongoing since 2015; Mentoring Byte since 2020
Target Group	Girls and young women: secondary students, university students, early-career professionals

8.2. Context and Challenge

8.2.1. Background

STEM Supergirls emerged in response to persistent gender gaps in ICT, especially in leadership positions. Despite growing demand for ICT professionals, women remain underrepresented and face limited visibility, support and progression opportunities. What began as a single inspirational event has evolved into a broader ecosystem spanning annual events, structured mentoring (Mentoring Byte) and ongoing community engagement – serving participants from secondary school through to early career.

8.2.2. Specific Gender Barriers Addressed

The initiative targets lack of role models, low confidence and self-efficacy, limited understanding of career pathways, and drop-off of women along the career pipeline into leadership. These are addressed through exposure to successful women in ICT, storytelling of real career journeys (including failures), mentorship, and sustained community-building.

8.2.3. Alignment with National Strategy

The initiative aligns with the global Girls in ICT Day movement, EU priorities on gender equality in STEM, and national labour market needs for ICT talent.

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8.3. Engagement Strategy

8.3.1. Pedagogical Approach

Rather than teaching technical skills directly, STEM Supergirls focuses on motivation, identity-building and career orientation. The approach combines role model-based learning, experiential and inspirational engagement, and formal/informal mentoring through Mentoring Byte.

8.3.2. Content and Tools

Live events and conferences featuring talks and panels with industry professionals; networking sessions; real-life career stories including challenges, failures and leadership paths. Mentoring Byte matches mentors and mentees for structured ongoing support.

8.3.3. Gender-Sensitive Elements

Learning Environment: Safe, inclusive space focused on women; community-driven atmosphere building collective identity.

Role Models: Central element: women in ICT sharing real career paths including challenges and non-linear journeys; both female and male speakers supporting gender equality.

Content Relevance: Real-life stories of career changes, failures and leadership paths; focus on real opportunities and challenges rather than idealised narratives.

Group Dynamics: Strong emphasis on networking, peer exchange and community; access to mentors creates sustained support structures beyond individual events.

8.4. Implementation Process

8.4.1. Access

Events are free and open through registration. Mentoring Byte is accessible to a broad audience. The scale of events in Zagreb with national reach ensures visibility across different demographic groups.

8.4.2. Belonging

A strong community identity has been built over a decade. Participants connect with peers and mentors who share their experiences, creating a sense of collective belonging. Authentic storytelling – including failures and doubts – makes the community feel genuine rather than aspirational.

8.4.3. Recognition

Women in ICT are made visible as leaders and experts through speaking roles and public recognition. Diverse career paths are validated, communicating that there is no single 'correct' way to build an ICT career.

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8.4.4. Progression

A clear pathway exists: event inspiration to structured mentoring (Mentoring Byte) to career development. Mentoring Byte supports ongoing professional decisions with guidance from experienced mentors, including navigating leadership transitions.

8.5. Outcomes and Impact

8.5.1. Quantitative Indicators

- Over 1,500 participants in STEM Supergirls events over 10 years
- 170+ active mentors in Mentoring Byte
- 720+ applications for mentoring received
- 480+ mentoring sessions started
- 220+ mentoring sessions completed

8.5.2. Qualitative Evidence

Participant feedback consistently highlights increased motivation and confidence, broader understanding of ICT career possibilities, and the importance of meeting real role models. Events are described as 'inspiring' and 'motivational', with participants emphasising the emotional impact of encountering women sharing honest accounts of their journeys.

8.5.3. Unexpected Results

The initiative evolved from a one-off event into a long-term community with cross-generational support – an outcome not anticipated in its original design. The emergence of Mentoring Byte as a distinct programme reflects how the community's needs expanded beyond inspiration into structured, ongoing support.

8.6. Transferability and Scalability

8.6.1. Success Factors

- Long-term consistency – 10+ years builds trust and brand recognition
- Community-driven identity that participants feel ownership of
- Authentic storytelling including failures and transitions, not only success
- Evolution from event to ecosystem, responding to participant needs

8.6.2. Potential for Scaling

The event model can be replicated in other cities and countries with industry partnerships. Mentoring Byte's infrastructure could be adapted to other national contexts. The key success factor – sustained community rather than one-off events – requires long-term commitment not easily achieved through single-cycle projects.

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9. GERMANY | Plus-MINT Talent Promotion Program

Excellence-oriented STEM boarding school track with active gender inclusion measures

9.1. Case Study Profile

Initiative	Plus-MINT Talent Promotion Program
Country & Location	Germany – national (six boarding schools)
Education Level	Upper Secondary (grades 10+, leading to Abitur)
Type of Actor	Non-profit – Verein zur MINT-Talentforderung e. V.
Duration & Status	Ongoing since 2016
Target Group	High-achieving and highly motivated students in STEM; explicit outreach to gifted girls

9.2. Context and Challenge

9.2.1. Background

Young people with exceptional STEM talent are not always sufficiently nurtured within the regular school system. The Plus-MINT program was developed as a nationwide initiative for particularly high-achieving and motivated students, run by the Association for STEM Talent Promotion in cooperation with six selected boarding schools acting as centres of excellence.

The programme offers a four-year educational track leading to the Abitur (High school diploma), with content exceeding standard academic requirements. It combines academic excellence with project-based learning and intensive cooperation with universities, research institutions and companies. The boarding school structure enables deep subject-specific support alongside the development of teamwork, independence and personal development skills.

The programme is explicitly open to all genders, with targeted measures to attract more gifted girls – recognising that many girls with strong STEM aptitude are less likely to choose STEM career paths despite academic performance, partly due to lack of role models and lower self-confidence in technical contexts.

9.2.2. Specific Gender Barriers Addressed

The programme targets stereotypes and lack of role models. Female scientists such as Dr Suzanna Randall (astrophysicist) serve as role models, demonstrating concrete STEM career paths and strengthening self-confidence among female students. The programme's explicitly gender-inclusive framing challenges the assumption that elite STEM environments are male-dominated.

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9.2.3. Alignment with National Strategy

Plus-MINT participants regularly engage in national and international competitions such as 'Jugend forscht' (Youth research), aligning with Germany's national talent development goals. It complements initiatives to increase STEM participation among female students in talent development and support for high-achieving learners.

9.3. Engagement Strategy

9.3.1. Pedagogical Approach

The educational concept is based on research- and practice-oriented learning. Core elements include learning in small, high-performing peer groups; project-based independent research; collaboration with universities and industry; and a boarding school community that normalises intense STEM engagement as part of daily life. Intrinsic motivation is the primary selection criterion – the programme brings together students who genuinely want to engage with STEM.

9.3.2. Content and Tools

Subject-specific project supervision in chemistry, biology, physics, mathematics and technology. Access to university facilities and industry partners. Participation in national competitions (Jugend forscht). Advanced laboratory and research equipment at boarding school premises.

9.3.3. Gender-Sensitive Elements

Role Models: Female scientists from academia and industry visit the programme and demonstrate STEM career paths. Dr Suzanna Randall (astrophysicist) is highlighted as a specific role model.

Learning Environment: Boarding school community normalises deep engagement with STEM; peer cohort creates a culture where scientific interest is valued rather than stigmatised.

Content Relevance: Cross-disciplinary skills – teamwork, leadership, communication – are developed alongside technical expertise, aligning with broader career preparation.

Group Dynamics: Small groups enable close collaboration and deep discussion; students are selected for mutual motivation and commitment to STEM.

9.4. Implementation Process

9.4.1. Access

Any student can apply regardless of current school type. Students can join in year 10 or 11 for either a three or four-year track. Selection is based on intrinsic motivation and cognitive and social assessment during four-day 'selection days' – not on grades alone. There is no numerus clausus.

9.4.2. Belonging

A central feature of the boarding school model is that it creates a peer community of motivated STEM learners. Students who previously felt isolated in their scientific enthusiasm – often 'the only one' in their class interested in Jugend forscht-level work – find a peer group that reflects and reinforces their identity as scientists.

9.4.3. Recognition

Academic contributions are recognised through research projects, competition placements and university cooperation. Female students' work is recognised equally alongside male peers, and the presence of female role models sends the implicit message that girls' STEM achievements are expected and celebrated.

9.4.4. Progression

The programme provides a four-year structured track to Abitur with strong links to higher education and research. Students develop the skills, networks and confidence to pursue STEM degree programmes and careers. Boarding school immersion and competition participation create an early career pathway identity.

9.5. Outcomes and Impact

9.5.1. Quantitative Indicators

- Six boarding schools across Germany as consortium partners
- 150 students per school, selected through national process
- Regular participation in Jugend forscht and equivalent national and international competitions

9.5.2. Qualitative Evidence

The programme coordinator at Schloss Neubeuern describes the initiative's central achievement as bringing together students who are passionate about STEM but feel alone in that passion in their home communities. The boarding school model creates a sustainable peer culture that outlasts the formal programme.

9.6. Transferability and Scalability

9.6.1. Success Factors

- Boarding school environment creating a sustained peer community of motivated learners
- Intrinsic motivation as the primary selection criterion
- Female role models from academia and industry integrated into the programme
- University and industry partnerships providing access to real research environments

9.6.2. Potential for Scaling

The model requires significant institutional infrastructure. A lighter version – regional talent days, university collaboration without boarding – could extend the approach to more students. Gender-specific outreach to identify and recruit high-achieving girls is critical in any adaptation.

10. IRELAND | I Wish

Large-scale, girls-only STEM inspiration events building confidence and belonging at scale

10.1. Case Study Profile

Initiative	I Wish
Country & Location	Ireland – national (events in Cork, Limerick, Dublin and other cities)
Education Level	Upper Secondary (links to Lower Secondary)
Type of Actor	NGO / Industry partnership
Duration & Status	Ongoing since 2014
Target Group	Girls aged 13-18

10.2. Context and Challenge

10.2.1. Background

I Wish was developed in response to the persistent underrepresentation of girls in STEM education and careers in Ireland. Despite strong academic ability, many girls were not choosing STEM-related subjects at key decision points in secondary school. The underlying causes included lack of awareness about STEM careers, limited exposure to role models, and low confidence in engaging with technical subjects. The programme aims to change perceptions rather than ability, helping girls see STEM as a viable and appealing option.

10.2.2. Specific Gender Barriers Addressed

I Wish specifically targets lack of confidence, lack of role models, and limited awareness of STEM pathways. By providing exposure to female professionals, creating supportive girls-only environments, and helping girls understand the real-world relevance of STEM, the programme changes the emotional and social landscape around girls' relationship with technical subjects.

10.2.3. Alignment with National Strategy

I Wish aligns with national Irish priorities around increasing STEM participation and improving gender balance in ICT and related sectors. It complements school-based efforts and national awareness campaigns aimed at encouraging girls into STEM pathways.

10.3. Engagement Strategy

10.3.1. Pedagogical Approach

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The programme uses experiential learning, role model engagement, and informal, event-based learning. The focus is on inspiration and exploration rather than formal instruction. Career awareness and identity formation are the primary pedagogical outcomes.

10.3.2. Content and Tools

STEM career talks by industry professionals; interactive demonstrations; discussions connecting STEM to real-world applications in health, environment and innovation. The emphasis is on understanding STEM fields broadly rather than teaching specific technical tools.

10.3.3. Gender-Sensitive Elements

Learning Environment: Girls-only events create a supportive, non-intimidating space free from the social pressures of mixed-gender technical environments.

Role Models: Strong emphasis on female professionals from industry sharing authentic career stories, including challenges and non-linear paths.

Content Relevance: STEM is linked to real-world social impact – health, environment, innovation – making it more relatable and purposeful.

Group Dynamics: Large-scale shared experiences reduce feelings of isolation; girls see thousands of peers engaging with STEM, normalising participation and dismantling the perception that STEM is for a specific 'type' of girl.

10.4. Implementation Process

10.4.1. Access

Access is facilitated through schools, ensuring participation is not limited to girls who would independently choose to attend. By embedding participation within the school day or school trips, the programme reaches a broader group including those who may not initially identify with STEM. Events are financially accessible through sponsorship. Geographic factors remain a consideration, though the programme has expanded to multiple regional cities.

10.4.2. Belonging

The girls-only environment removes social pressures typical in mixed-gender settings in traditionally male-dominated fields. The scale of events is deliberate: seeing thousands of peers engaging with STEM normalises participation. There is no formal assessment; students are encouraged to explore freely and ask questions, creating psychological safety for girls who may have already internalised beliefs that they are not 'technical' people.

10.4.3. Recognition

The event format celebrates girls' presence in and curiosity about STEM. By inviting girls into professional STEM environments and treating them as future colleagues, the programme implicitly validates their potential. Schools are encouraged to build on the experience through follow-up activities.

10.4.4. Progression

I Wish is designed as an inspirational intervention at a critical decision point – typically when girls are choosing Senior Cycle subjects. The goal is to open up subject choices and career considerations. The collective experience seeds long-term openness rather than providing a sustained programme.

10.5. Outcomes and Impact

10.5.1. Quantitative Indicators

- Thousands of girls reached annually through events in Cork, Limerick, Dublin and other cities
- Ongoing since 2014 – more than 10 years of continuous delivery
- National reach across Ireland's secondary school system

10.5.2. Qualitative Evidence

Participants report increased openness to considering STEM subjects and careers. Teachers note that girls return from I Wish events with changed perspectives on what is possible for them. The collective experience of thousands of girls together in a STEM space has a normalising effect that individual mentoring cannot replicate.

10.6. Transferability and Scalability

10.6.1. Success Factors

- Scale – large events create a powerful collective experience and sense of normalcy around girls in STEM
- Girls-only format removing social inhibition
- School participation ensuring access beyond self-selecting tech-interested students
- Industry sponsorship enabling financial accessibility
- Authentic female role models sharing honest career experiences

10.6.2. Potential for Scaling

The event model can be replicated in other national contexts with industry partnership and school engagement. The key insight – that scale itself is a pedagogical tool, normalising girls' presence in STEM – should be preserved in any adaptation.

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11. ITALY | IC Laives: Integrated STEM and Inclusive Robotics

School-led curriculum innovation embedding STEM deeply in an inclusive, diverse community

11.1. Case Study Profile

Initiative	Integrated STEM & Inclusive Robotics at IC Laives
Country & Location	Italy – Laives (BZ), South Tyrol (suburban/peripheral)
Education Level	Primary and Lower Secondary (ages 6-14)
Type of Actor	School-led
Duration & Status	Ongoing since 2022
Target Group	All students; focus on girls' empowerment; 23% migrant background, 17% SEN students

11.2. Context and Challenge

11.2.1. Background

IC Laives is the largest comprehensive school in the Province of Bolzano, serving approximately 1,000 students across four primary schools and one lower secondary school. The community has a medium-low socioeconomic profile, with 23% of students from a migratory background and 17% with certified Special Educational Needs.

Since 2022, under the leadership of the Principal, the school has pivoted towards an innovation-led curriculum placing STEM and ICT at the heart of its identity. This transformation has been supported by PNRR (National Recovery and Resilience Plan) funding and membership in the STAAR Network (South Tyrolean Schools for Educational Robotics).

School self-assessment identified that girls displayed lower self-confidence, perceived mistakes as personal failures, tended to stay in the background during technical tasks, and held preconceptions that girls are 'less suited' for coding or hardware assembly.

11.2.2. Specific Gender Barriers Addressed

The initiative targets low self-confidence among girls, stereotype-driven retreat from technical tasks, and lack of female role models in STEM. Strategies include: inspirational storytelling with female role models from universities; explicit rotation of girls into team leader roles during robotics competitions; and a formal Gender

Equality Charter (developed with Oxfam and INDIRE - National Institute for Documentation, Innovation, Educational Research) ensuring inclusive language and non-stereotypical teaching materials.

11.2.3. Alignment with National Strategy

The project is funded by PNRR lines for digital equipment and STEM training. It is a key member of the STAAR Network and collaborates with INDIRE through the HERB project on the emotional dimensions of students' interaction with robotics.

11.3. Engagement Strategy

11.3.1. Pedagogical Approach

The school implements a 'Horizontal and Vertical' curriculum across three axes: team working, inclusive peer tutoring, and emotional analysis of students' experiences with technology.

In the 'Abilitarte' project, group work is structured with a sports-team logic: roles (programmer, assembler, project manager) are clearly assigned and rotated. Older or more experienced students mentor younger ones in mixed-gender settings. The HERB project with INDIRE studies how students emotionally interact with robotics, fostering a more 'human' and less intimidating approach to technology.

11.3.2. Content and Tools

Educational robotics with LEGO Spike and Ozobots. Digital Storytelling ('Robot Stories'): students transform literary texts or creative writing into digital animations or robotic paths. A dedicated mandatory ICT hour – unlike many Italian schools where ICT is only cross-curricular. PNRR-funded digital infrastructure including devices and connectivity.

11.3.3. Gender-Sensitive Elements

Learning Environment: Mixed-age and mixed-gender groups break down social barriers; 'Science in Depth' projects position girls as 'experts' presenting to external audiences.

Role Models: Inspirational storytelling sessions with female scientists and professionals from universities reshape girls' professional expectations.

Content Relevance: Linking coding to storytelling and social impact increases engagement for students who find 'pure' coding less appealing.

Group Dynamics: Girls are explicitly rotated into Team Leader roles during robotics competitions, building management skills and public visibility.

11.4. Implementation Process

11.4.1. Access

ICT is a core, compulsory subject for all students, including through the dedicated mandatory ICT hour. Extra-curricular STEM projects use mixed-age and mixed-gender groups. PNRR funding has ensured that all students – including those from deprived backgrounds – have access to devices and digital resources.

11.4.2. Belonging

The school motto 'Innovation and Relation' frames technology as a medium for wellbeing. Peer tutoring ensures girls feel safe to experiment. The Principal notes a significant shift in 'reputational capital': students previously considered 'difficult' – including those from migrant backgrounds and with SEN – are now engaged and confident in robotics labs.

11.4.3. Recognition

Technical contributions are explicitly valued in formal assessments. The school celebrates achievements at national festivals (Didacta, Innovation Festival) where girls present their own scientific research to external audiences. 'Science in Depth' projects position girls as experts and public communicators of STEM knowledge.

11.4.4. Progression

Girls who develop confidence through robotics and STEM projects are encouraged to pursue technical upper secondary schools. The school's participation in national networks and competitions creates visibility and connection to further educational pathways.

11.5. Outcomes and Impact

11.5.1. Quantitative Indicators

- ~1,000 students enrolled at IC Laives
- 23% students with migrant background successfully integrated into tech activities
- 17% SEN students participating in robotics and STEM
- 4 PNRR funding lines secured

11.5.2. Qualitative Evidence

Girls report feeling 'empowered' to pursue technical upper secondary schools. The Principal notes that the 'reputational reward' for teachers – recognition for innovative work at national festivals – has increased teacher engagement and motivation to sustain the programme.

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11.6. Transferability and Scalability

11.6.1. Success Factors

- Committed, innovative school leadership driving institutional change
- PNRR funding enabling infrastructure without financial barriers for students
- Mandatory ICT embedding technology across the whole school population
- Role rotation ensuring girls experience technical leadership positions
- University and national network partnerships providing external validation and resources

11.6.2. Potential for Scaling

The model requires strong school leadership and external funding for infrastructure. The key transferable elements – role rotation in project teams, narrative-linked STEM content, and the Gender Equality Charter process – can be adopted by other schools independently of full programme replication.

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12. FINLAND | LUMA Centre Finland

National university network providing STEM inspiration, teacher support and girls' engagement across all levels

12.1. Case Study Profile

Initiative	LUMA Centre Finland – luma.fi/en
Country & Location	Finland – national (13 regional centres at all Finnish universities of science and technology)
Education Level	Primary / Lower Secondary / Upper Secondary (all levels)
Type of Actor	NGO – university network
Duration & Status	Ongoing since 2013; national mandate renewed for 2025-2028
Target Group	Schools, classes, individual students and teachers

12.2. Context and Challenge

12.2.1. Background

LUMA Centre Finland is a science education network of 11 Finnish universities, serving as the umbrella organisation for 13 regional centres at all Finnish universities of science and technology. The goal is to inspire children and young people to engage with STEM through free study visits to universities, pedagogical innovations, after-school clubs and camps.

LUMA has been granted a national task by the Ministry of Education and Culture for 2025-2028, ensuring a strong future for STEM competence and teacher education across Finland.

Despite Finland's strong education system, girls' interest in technical fields – particularly programming and robotics as hobbies – remains lower than boys'. The University of Helsinki's Science Education Centre 'Linkki' pays particular attention to reaching girls, providing positive first experiences in technology to help them recognise their own potential. The ZAU project (Zonta Antaa Uskallusta, 2018-2021) specifically targeted girls aged 10-12 and their families.

12.2.2. Specific Gender Barriers Addressed

LUMA addresses girls' lower interest in technical STEM fields by connecting programming content to themes that could interest everybody – food, environment, arts, space – avoiding the narrow 'tech-geek' framing. The ZAU project specifically gave girls and their close networks the courage to choose educational pathways atypical for girls, and encouraged parents to support STEM choices.

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12.2.3. Alignment with National Strategy

LUMA Centre Finland has a statutory national task from the Ministry of Education and Culture. The ZAU project was co-developed with Zonta International. The network's work directly supports the Finnish national curriculum goals for STEM.

12.3. Engagement Strategy

12.3.1. Pedagogical Approach

Activities are marketed by connecting programming content to engaging everyday phenomena rather than promoting programming for its own sake – an approach documented to work particularly well for girls. The ZAU clubs used hands-on, phenomenon-based and experimental learning. Collaborative challenges built team spirit and self-confidence. LUMA also provides extensive teacher professional development, recognising teacher confidence as a critical lever for girls' engagement.

12.3.2. Content and Tools

A wide range of tools across regional centres, including robotics kits, programming environments, science laboratory equipment, and VR/AR resources. Clubs and camps use physical, hands-on materials. Teacher training materials and loan equipment support schools between visits.

12.3.3. Gender-Sensitive Elements

Learning Environment: Free study visits to universities normalise the idea of women in STEM spaces from an early age. Girl-targeted clubs (Linkki, ZAU) provide safe and supportive spaces.

Role Models: Female university researchers and STEM professionals are visible in all LUMA activities. ZAU specifically showcased women in STEM to girls and their families.

Content Relevance: Phenomenon-based, multidisciplinary themes – food, environment, arts, space – make STEM accessible to students with diverse interests beyond a technical identity.

Group Dynamics: Collaborative challenges and clubs build peer networks around shared STEM interest, creating community belonging.

12.4. Implementation Process

12.4.1. Access

LUMA offers free study visits, clubs and camps. Regional coverage across all Finnish universities ensures geographic accessibility. Teacher professional development is also provided freely, ensuring benefits reach students in schools that cannot organise their own STEM enrichment.

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12.4.2. Belonging

The university setting of LUMA visits makes higher education in STEM feel normal and accessible from an early age. Girls see themselves in university STEM spaces before they have fully formed expectations about whether they 'belong' there. The ZAU family engagement model extended belonging beyond school into home and community.

12.4.3. Recognition

Clubs and camps celebrate participants' work and curiosity. Teacher training recognises teachers' professional development in STEM. The national mandate from the Ministry of Education validates LUMA's contribution to Finland's STEM ecosystem.

12.4.4. Progression

LUMA provides a coherent pipeline from primary school engagement through to teacher training and university-level STEM activity. Girls who participate in clubs and camps build on these experiences as they progress through school. The organisation's ongoing national mandate ensures structural continuity.

12.5. Outcomes and Impact

12.5.1. Quantitative Indicators

- 13 regional LUMA centres across all Finnish universities of science and technology
- National mandate from Ministry of Education 2025-2028
- ZAU project reached girls and families across Finland 2018-2021
- Girls' interest in programming as a hobby rising nationally, though some clubs remain male-dominated

12.5.2. Qualitative Evidence

Teachers who participate in LUMA professional development report increased confidence in delivering STEM content, translating into more engaging lessons for all students including girls. Families who participated in ZAU clubs reported increased willingness to encourage daughters toward STEM pathways.

12.6. Transferability and Scalability

12.6.1. Success Factors

- National mandate and university network providing structural sustainability
- Phenomenon-based, interest-driven content framing avoiding narrow 'tech-geek' identity
- Explicit teacher professional development as a gender equity lever
- Family engagement (ZAU) extending influence beyond the school
- Free access removing financial and geographic barriers through regional distribution

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12.6.2. Potential for Scaling

The LUMA model requires a national university network as its infrastructure. The key transferable element is the pedagogical principle: connecting STEM content to students' existing interests and everyday phenomena, and supporting teachers as the primary lever for girls' engagement.

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13. POLAND (REFERENCE CASE) | Dziewczyny na politechniki!

Largest Central and Eastern European campaign bringing girls into technical universities

13.1. Case Study Profile

Initiative	Dziewczyny na politechniki! (Girls to the Technical Universities!)
Country & Location	Poland – national, multiple universities; primarily urban academic contexts
Education Level	Upper Secondary to Higher Education transition
Type of Actor	Hybrid – universities, foundation and industry partners
Duration & Status	Ongoing since 2006 (15+ annual editions)
Target Group	Female secondary school students, with indirect outreach to mixed audiences
Note	Poland is included as a reference case; it is not a HER TECH partner country. The case provides comparative context from Central and Eastern Europe.

13.2. Context and Challenge

13.2.1. Background

Dziewczyny na politechniki! was created in 2006 in response to the persistent underrepresentation of women in technical and engineering education in Poland. Despite growing demand for STEM professionals, girls were still less likely to choose technical fields due to stereotypes and limited exposure. Since its launch, the campaign has reached over 200,000 participants, making it one of the largest initiatives of its kind in Central and Eastern Europe.

The campaign is endorsed by the Conference of Rectors of Polish Technical Universities and carries honorary patronage from four government ministries: Education, Science, Digital Affairs, and Family, Labour and Social Policy.

13.2.2. Specific Gender Barriers Addressed

The campaign focuses on gender stereotypes coding technical fields as 'male', lack of awareness of career opportunities, and limited direct exposure to women in technical careers. These are addressed through direct interaction with women in STEM, showcasing real career paths, and hands-on exposure to technical university environments.

13.2.3. Alignment with National Strategy

The initiative aligns with Polish and European priorities on female STEM participation, innovation capacity and technical labour market needs. Its four ministerial patronages demonstrate integration with national policy across education, digital and employment domains.

13.3. Engagement Strategy

13.3.1. Pedagogical Approach

Rather than formal teaching, the programme focuses on inspiration, awareness and decision-making support through a 'try-before-you-choose' model. Open days at technical universities give prospective students access to labs, workshops and current students and faculty before making subject choices.

13.3.2. Content and Tools

Open days and campus tours at technical universities; workshops, lectures and lab visits; meetings with students, lecturers and STEM professionals; school visits by university representatives; mentoring and networking sessions.

13.3.3. Gender-Sensitive Elements

Learning Environment: Girl-focused events create a safe, informal and supportive atmosphere at university campuses.

Role Models: Female students, lecturers and professionals share personal experiences of technical careers; visibility of women in engineering is central to the campaign identity.

Content Relevance: Real-life examples of careers and applications; focus on future opportunities and employability in a growing sector.

Group Dynamics: Peer-based interaction and networking; community-building among girls interested in technical pathways.

13.4. Implementation Process

13.4.1. Access

Participation is free and open, delivered through schools, universities and events. Nationwide scale across 12 cooperating universities from across Poland provides broad geographic coverage.

13.4.2. Belonging

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Dedicated events for girls at university campuses create a sense of welcome and possibility in environments that might otherwise feel inaccessible. Normalisation – showing that many women study and work successfully in technical fields – is the primary belonging strategy.

13.4.3. Recognition

Female success stories in engineering and technology are made visibly prominent. Participants' potential in STEM is validated through access to real university environments and interactions with successful women in technical roles.

13.4.4. Progression

The campaign specifically targets the school-to-university transition. It provides information on study paths and careers, connecting girls with ongoing networks and resources beyond the initial event.

13.5. Outcomes and Impact

13.5.1. Quantitative Indicators

- Over 200,000 participants since 2006
- 15+ annual editions
- 12 cooperating universities across Poland
- Patronage from 4 government ministries and the Conference of Rectors of Polish Technical Universities
- Steady increase in female participation in technical university education documented over the campaign's lifetime

13.5.2. Qualitative Evidence

The campaign has contributed to growing visibility of women in engineering fields and a positive shift in perceptions of STEM careers. Strong engagement not only from girls but from institutions and industry partners has created a durable ecosystem of events, reports and partnerships.

13.6. Transferability and Scalability

13.6.1. Success Factors

- Strong institutional backing – universities, foundation, ministries – providing legitimacy and resources
- Long-term consistency over 15+ years builds trusted brand and cumulative culture change
- Scale and visibility across the national higher education system
- Direct contact with female role models at the moment of major educational decision-making

13.6.2. Barriers and Lessons Learned

Deep-rooted stereotypes require long-term intervention; awareness alone is not always sufficient and requires follow-up support. The campaign's focus on the school-university transition means it does not address barriers at earlier ages, where stereotypes already form.

13.6.3. Potential for Scaling

The model is transferable to other national contexts with strong university system backing. The key elements – free access, open days at technical campuses, female role model visibility, and ministerial endorsement – can be adapted to different national higher education structures.

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