

**Student Sustainable Entrepreneurship in Action:**  
Design thinking and Co-creation *on Hvaler, Norway*  
*as Part of the INTERREG FREIIA Project*

Ellen Winnem Bjerga<sup>a</sup>, Linnea Margrethe Johansen<sup>a</sup>, Gunnar Andersson<sup>a</sup>, Frode Ramstad Johansen<sup>a</sup>, Hong Wu<sup>a</sup>, Mathew Lynch<sup>a</sup>, Eivind Andre Leister<sup>a</sup>, Bjørn Gitle Hauge<sup>a</sup>, Mathew Lynch<sup>a</sup>

<sup>a</sup>Department of Engineering, Østfold University College, Fredrikstad, Norway

**Abstract**

*FREIIA (Facilitating Resilience Embracing Islands Innovation Approaches) is an INTERREG North Sea Region project funded by the European Union, aimed at enhancing resilience and innovation capacity in island communities across six countries. (FREIIA FREIIA | Interreg North Sea, u.å.)*

*Østfold University College is responsible for Work Package 4 (WP4), which focuses on fostering student entrepreneurship. The main objective of WP4 is to integrate entrepreneurship students into the strategic governance of island innovation, strengthening their role in green transitions. When referring to the FREIIA project in this paper, it refers to WP4 of the FREIIA project.*

*In the first phase of this project, we identified innovation gaps on the Hvaler archipelagos through semi-structured interviews with stakeholders from the public, private, and civil sectors. Key challenges included limited cross-sector collaboration, an aging population, and insufficient platforms for community engagement.*

*The following section presents the next phase of the project, which uses design thinking and the double diamond framework to co-create solutions to the identified challenges through workshops. Initiatives include a Mobile Innovation Hub to facilitate entrepreneurship, community-centered educational programs, and new digital platforms to enhance municipal-citizen dialogue.*

*This study offers a model for fostering sustainable development through collaboration, creativity, and local ownership and offers a model for other island communities facing similar challenges.*

(students  
at hvaler)

1



## Introduction

Through the project, the current and desired state and challenges faced by the island community of Hvaler are

examined to identify potential gaps in between these. In these gaps lies the opportunity for innovation and to improve development capacity. Development capacity, in this context, refers to the ability of diverse stakeholders- public officials, private enterprises and civil society- to collaboratively drive sustainable innovation and growth.

This project is part of the EU Interreg North Sea Region FREIIA initiative and aligns with Østfold University College's 2030 vision: Knowledge for human development and a sustainable society.

Hvaler, located at the outer edge of the Oslofjord in southeastern Norway, was selected as the pilot site for FREIIA. The initial phase of the project, conducted between April and May 2023, involved qualitative interviews with over 20 stakeholders, including municipal leaders, local business owners, returning tourists, and representatives from NGOs.

The initial phase of the FREIIA project revealed five key gaps to innovate in on Hvaler:

1. **Limited Cross-Sector Collaboration** – Despite existing networks, such as the Hvaler Business Association, stakeholders identified a fragmented approach to community development, leading to overlapping initiatives and missed opportunities for greater impact.
2. **Aging Population and Youth Migration** – High housing costs and limited job opportunities are driving younger residents away. The municipality's desire to attract young entrepreneurs requires tangible solutions, including affordable housing and accessible business infrastructure.
3. **Over-Reliance on Seasonal Tourism** – Tourism is concentrated in the summer months, limiting economic diversification. To align with Hvaler's vision of becoming a year-round destination, more diverse offerings and infrastructure are needed to attract off-season visitors.
4. **Insufficient Platforms for Innovation** – A lack of formal spaces for interdisciplinary collaboration hinders progress. Many private sector actors and external developers face challenges in cooperating with the municipality and navigating local regulations.
5. **Conflicts Between Conservation and Development** – While Hvaler is committed to preserving its natural environment, the desire for economic growth, including attracting younger residents and increasing tourism, creates tension with the island's traditional peaceful lifestyle.

In response, the second phase of the project, initiated in August 2023, focused on co-creation workshops that aimed to develop tailored solutions for these five challenges. Drawing on the principles of Design Thinking and the Double Diamond framework, these workshops fostered

collaboration among diverse stakeholders, emphasizing a user-centered approach to innovation.

By grounding the workshops in the insights from the initial phase, UNIC analysis, the FREIIA project aimed to create scalable and sustainable solutions that align with Østfold University College's 2030 vision: Knowledge for human development and a sustainable society. (*Strategy 2030 - Østfold University College, u.å.*).

This paper outlines the process and outcomes of these workshops, offering a potential model for other island communities facing similar socio-economic and environmental challenges.

2

## Hvaler

Hvaler is an island municipality in southeastern Norway, located at the outer edge of the Oslofjord. It comprises 833 islands and islets, covering a total land area of 20 km<sup>2</sup>. The administrative center, Skjærhalden, is situated on Kirkøy, the largest island in the archipelago. In 2023, Hvaler had a population of 4,762, which swells to over 30,000 during the summer months as tourists flock to the area.

Renowned for its natural beauty, Hvaler is home to Ytre Hvaler National Park, Norway's first marine national park. This protected area features unique ecosystems, including kelp forests and cold-water coral reefs, making it a haven for biodiversity and marine conservation. Cultural landmarks such as the 12th-century Hvaler Church showcase the municipality's rich history, while the rugged coastline and tranquil bays attract enthusiasts of boating, fishing, and hiking.

Strict housing regulations, which permit only registered residents to purchase homes, are designed to preserve the local community's character. However, this policy has sparked debates, particularly in relation to a potential merger with the neighboring city of Fredrikstad, located 28 km away. With a population of 85,230 in 2024, Fredrikstad serves as a regional hub for services and infrastructure.

The municipality is led by Mayor Mona Vauger from the Labor Party, whose priorities include balancing sustainable development with the preservation of Hvaler's unique environmental and cultural heritage. Hvaler's commitment to protecting its natural resources while navigating modern challenges reflects the community's determination to secure its future for both residents and visitors. (*Hvaler – Island by Island, u.å.*)



(Skjelsbusund Bridge that connects Hvaler to the mainland, making it possible to drive to the islands by car.)

## Methods: Theoretical Frameworks

In this study, we applied principles from Design Thinking and the Double Diamond framework to guide the co-creation workshops aimed at addressing sustainable development challenges on Hvaler. Both methodologies share a user-centered approach, making them ideal for tackling complex challenges faced by island communities.

### Design Thinking: Define, Ideate, and Prototype

(*Innovation as a Learning Process*, u.å.)

Design Thinking emphasizes empathy, creativity, and iteration. In this study, we utilized the Define, Ideate, and Prototype phases to co-create solutions:

3

- **Define:** Insights gathered from earlier interviews with stakeholders were synthesized to identify the core challenges facing the community, including youth retention, economic development, and collaboration gaps.
- **Ideate:** During the co-creation workshops, stakeholders collaboratively brainstormed a wide range of potential solutions. These sessions were designed to encourage creativity and generate diverse ideas to address the identified issues.
- **Prototype:** The most promising ideas were developed into low-fidelity prototypes. These prototypes were simple, testable models that allowed for iterative refinement based on stakeholder feedback.



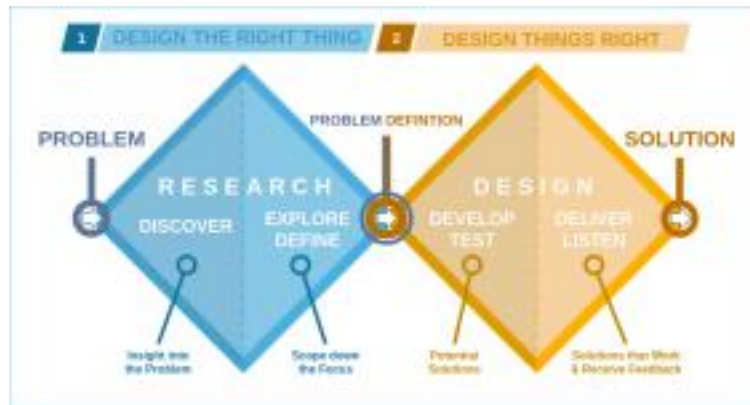
### Double Diamond: Define, Ideate, and Prototype

(«The Double Diamond Model», 2024)

The Double Diamond framework structures innovation into four phases: Discover, Define, Develop, and Deliver. In this study, we focused on the Define, Ideate, and Prototype phases:

- **Define:** This phase involved synthesizing insights from the Empathize phase (interviews) into clear problem statements. This ensured all stakeholders had a shared understanding of the core issues.
- **Ideate:** Collaborative brainstorming sessions allowed participants to explore multiple solutions, ensuring that ideas were generated with input from a diverse set of perspectives.
- **Prototype:** The most promising solutions were turned into prototypes, which were evaluated and iterated upon during the workshops.

Both Design Thinking and Double Diamond provided a structured approach to problem-solving, ensuring a creative and collaborative process that focused on real-world needs.



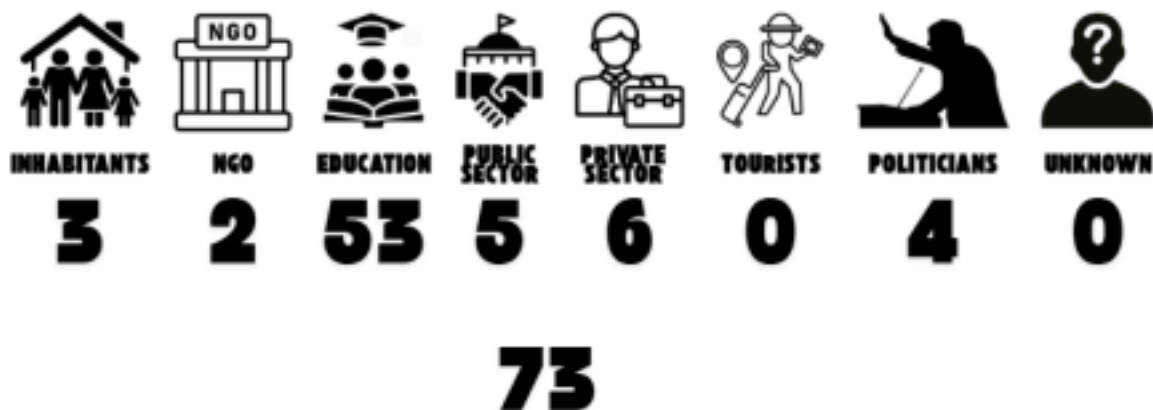
4

## Methods: Applied in practice

Building on the findings from the Empathize and Define phases of Design Thinking from Workshop 1, the FREIIA team organized two co-creation workshops on Hvaler to engage stakeholders in developing solutions to the identified challenges. The workshop aimed to move into the Ideation and Prototyping phases, fostering collaboration between a diverse range of participants.

### Stakeholder Involvement

After analyzing the transcribed interviews and identifying core challenges from Workshop 1, we invited stakeholders and students to participate in the next phase. Participants included Belgian students from Artevelde University of Applied Science, stakeholders from both the public and private sectors, and students from Østfold University College's Innovation and Project Management program. This diverse composition ensured a range of perspectives, which was essential for addressing the identified challenges effectively.



(This model provides an overview of the participants in the two co-creation (design thinking) workshops and word cafe session, categorized into group)

### Ideation Phase

The workshop began with stakeholders being divided into interdisciplinary teams, consisting of both Norwegian and Belgian students with local stakeholders from different sectors. Following the principles of the Ideation phase of Design Thinking, each team worked on the problem statement of their choosing. Sitting together at tables, brainstorming potential solutions to the core challenges identified. Participants were encouraged to think creatively, focusing on generating a wide range of ideas without immediate judgment or constraints. This process emphasized open dialogue, inclusion of diverse perspectives, and exploration of innovative possibilities.

### Prototyping Phase

The teams then selected their most prominent solution and transitioned into the Prototyping phase. Here, the task is to develop the idea into low-fidelity prototypes. These prototypes took various forms, from conceptual models and visual representations and theatricals. The goal was not to create perfect solutions but to develop tangible concepts that could later be tested and refined.

5



Emphasis on

### **Collaboration and Inclusivity**

The workshop's success was rooted in the interdisciplinary teams, and the structured but creative format. By involving a range of stakeholders and students, the process ensured that the solutions were grounded in local needs while incorporating fresh, innovative perspectives. The participation of Belgian students also introduced new cultural and methodological insights, enriching the overall outcomes.

### **World Café Session**

Following the two co-creation workshops, a World Café session was organized. This provided opportunities for the Norwegian and Belgian students to come together and reflect on the outcomes of the workshop. During this session, students shared their perspectives and experiences, discussing the collaborative process and the solutions developed. The World Café format encourages open dialogue, enabling participants to exchange insights and learn from each other's viewpoints. This session led to a deeper understanding of how diverse perspectives contribute to innovative problem-solving. («(PDF) The "World Café" as a Participatory Method for Collecting Qualitative Data», 2025)



*(From the  
World  
Café  
Session)*

6

## **Results**

The second phase of the FREIIA project on Hvaler focused on transforming the challenges identified during Workshop 1 into actionable, community-driven solutions. These concrete solutions were co-created by students and stakeholders from various sectors during an interactive workshop. The interdisciplinary collaboration fostered creative problem-solving and provided a platform for addressing key challenges, including limited cross-sector collaboration, youth engagement, and the need for greater innovation capacity.

Through structured discussions and collaborative activities, participants developed several innovative concepts tailored to Hvaler's context. Below are the key solutions proposed during the workshops:

### **Mobile Innovation Hub**

A flexible hub designed to support the creation of new business models. The hub would include dedicated spaces for different stages of the innovation process, facilitate external participation, and streamline support for startups.

### **Decentralized School Facilities**

This concept aims to strengthen ties with research and development (R&D) environments and higher education institutions. It seeks to attract young people back to Hvaler by fostering collaboration between students and local businesses and demonstrating the relevance of education to the island's economy.

### **Project House for Collaboration**

A dedicated physical space to facilitate interaction between the municipality, businesses, and academia. This "Project House" would serve as a hub for collaboration, providing a

structured environment for partnerships and fostering innovation.

### **Improved Transport Solutions**

Proposed initiatives included better school transport, the introduction of high-speed boats, and free boat services between schools and islands. These measures aim to improve connectivity and accessibility for both residents and visitors.

### **Community Collaboration Platforms**

Recognizing the need for stronger communication channels between residents and the municipality, proposals included monthly dialogue meetings, physical idea boxes, and digital platforms to encourage participatory development and collect community input.

### **Mobile Sauna Initiative**

A student-driven idea to attract both tourists and locals by introducing a mobile sauna by the water. This initiative combines entrepreneurship with local tourism development, offering a unique experience that connects the community and visitors.

These proposals reflect the combined efforts of local stakeholders and students, demonstrating the power of collaboration and creative thinking in addressing Hvaler's challenges. By leveraging diverse perspectives and innovative methods, the FREIIA project has laid a strong foundation for sustainable development and actionable solutions tailored to the island's needs.

7



*(Students and Stakeholders during the Workshop)*

### **Discussion**

The results of the workshops highlighted the importance of collaboration in addressing Hvaler's

development challenges. Many of the proposed solutions, such as the Project House and monthly dialogue meetings, emphasize creating structured arenas for interaction. These collaborative spaces are essential for building trust between stakeholders and reducing duplication of efforts that we uncovered is a recurring thing. While also fostering shared goals and a common vision for the communities.

Collaboration is particularly important in island communities where resources are limited, and the integration of individual initiatives into a unified framework can significantly improve the effectiveness of solutions. By working together, diverse stakeholders can achieve better results and develop innovative solutions that benefit the entire community. This collective approach is essential for Hvaler to meet its challenges effectively and sustainably.

### **Entrepreneurship**

The workshops also underscored the need to attract and retain young people in Hvaler. Initiatives like the Decentralized School Facilities and Mobile Innovation Hub connect education, entrepreneurship, and local industries, offering valuable opportunities for youth. These initiatives seek to address the gap between wanting and fostering. By providing a pathway for young people to contribute meaningfully to their local economy, while promoting creativity and innovation, we can bridge this gap.

Finally, balancing traditional community values with the introduction of progressive solutions will be crucial for Hvaler's long-term development. While modernizing infrastructure and creating new opportunities, it is essential to maintain the island's cultural identity and sense of community. This balance will ensure that the development is sustainable and supported by the community, reinforcing the importance of local ownership and participation.

8



*(Students and Stakeholders during the Workshop)*

### **Conclusions**

The FREIIA project's investigation into innovation gaps on Hvaler has highlighted critical challenges that must be addressed to support sustainable growth and resilience. The research, conducted through the application of the UNIC method and Design Thinking, identified several barriers, including:

- Limited collaboration across sectors and between stakeholders
- Challenges in attracting and retaining young people,
- A lack of accessible platforms for community engagement.
- Lack of shared vision and/or common understanding
- Development VS conservation

The Interdisciplinary workshops played a pivotal role in addressing these challenges by bringing together stakeholders from different sectors—municipality, education, businesses, and local residents. This collaborative framework led to the development of several key initiatives, such as:

1. A Mobile Innovation Hub to stimulate local entrepreneurship and support emerging businesses.
2. Decentralized School Facilities aimed at fostering stronger ties between the education sector and local industry to retain young talent.
3. A Project House for Collaboration, which would serve as a dedicated physical space to facilitate partnerships across sectors.
4. Improved Transport Solutions, including the potential for high-speed boats to enhance accessibility.
5. Community Collaboration Platforms to improve communication and engagement between residents and the municipality.

These solutions demonstrate how co-creation and shared ownership of initiatives can effectively address complex local issues and foster innovation. The workshops also emphasized the importance of balancing Hvaler's traditional values with progressive solutions, ensuring that future development aligns with the community's identity.

9

One key insight from the Co-creation workshop is the necessity of creating structured arenas for collaboration. Initiatives like the *Project House for Collaboration* highlight the importance of providing physical spaces where stakeholders from the municipality, businesses, and academia can engage in regular dialogue and co-create solutions.

In conclusion, Hvaler's future development will depend on its ability to effectively balance local knowledge with innovative approaches tailored to its specific context. While the island community faces significant challenges such as limited collaboration, an aging population, and constrained infrastructure, the proposed solutions offer a pathway to gradual improvement. By fostering continuous collaboration across sectors and leveraging targeted interventions, Hvaler can build resilience and enhance its capacity for sustainable development.

### **Next Steps**

The next phase of the FREIIA project on Hvaler will focus on refining and pilot-testing these solutions to evaluate their impact on the community. A continuous feedback loop between stakeholders will be crucial to ensuring these initiatives remain adaptive to evolving needs and contribute to the island's long-term sustainability. The idea is that the stakeholders involved in the workshops now take ownership to their solutions based on their participation and involvement in their creation and that they feel a sense of ownership to the problem question.

By fostering ongoing collaboration and learning, Hvaler can serve as a model for other small island communities facing similar challenges in the North Sea Region, By demonstrating how collaborative innovation can drive sustainable development even in resource- constrained environments.

## Acknowledgements

We wish to thank our mentor and project leader from the Norwegian partner, Bjørn Gitle Hauge for his mentoring, trust and support throughout the project duration. Thank you to Dr. Gunnar Andersson for his invaluable feedback and guidance throughout the project. Special thanks to Dr. Mathew Lynch for his expertise in Design Thinking and for developing the workshop material with us. Thank you to Mr Eivind Andre Leister, Dr. Houngh Wu and Dr Frode Ramsvik Johansen for their contribution to the projects whole.

This work was made possible by the generous support of the Interreg NSR and the EU. We would also acknowledge Innovation and Project management students at Hogskolen i Østfold and International relations students and professors from Artevelde University of applied science, Belgium, for contributing immensely in both co-creation workshops and reflection workshops.

Lastly, we extend our thanks to the stakeholders from Hvaler, who shared their time and perspectives, creativity and engagement in the co-creation workshops. Without them, there would not be a project to write about.

## References

- FREIIA FREIIA | Interreg North Sea. (u.å.). Hentet 31. januar 2025, fra*  
*<https://www.interregnorthsea.eu/freiiia> Hvaler – island by island. (u.å.). Hentet 31. januar 2025, fra*  
*<http://www.visitfredrikstadhvaler.com/en/the-hvaler-islands/hvaler--island-by-island/>*  
*Innovation as a Learning Process: Embedding Design Thinking. (u.å.). <https://doi.org/10.2307/41166415>*  
*(PDF) The “World Café” as a Participatory Method for Collecting Qualitative Data. (2025).*  
*ResearchGate. <https://doi.org/10.1177/1609406920916976>*  
*Strategy 2030—Østfold University College. (u.å.). Hentet 27. november 2024, fra*  
*<https://www.hiof.no/english/about/strategy/index.html>*  
*The Double Diamond Model: In Pursuit of Simplicity and Flexibility | Request PDF. (2024). I*  
*ResearchGate. [https://doi.org/10.1007/978-3-030-79879-6\\_2](https://doi.org/10.1007/978-3-030-79879-6_2)*

