

# DA VINCI MASTER PROGRAM

## Why a new Program?

Sustainable development and the strive to make our economies circular are grand challenges the world faces. These can only be solved via an interwoven collaboration of society, science, and technology. Academic education should be at the forefront of training the new generation of connectors, who are skilled in collaborating outside their comfort zone and in creating viable and practical solutions with different stakeholders. This manner of working requires strong disciplinary and transdisciplinary knowledge and skills, such as collaboration, integrating knowledge and practice, creative thinking, prototyping, and experimenting. Academic education has proven to be more than capable of educating professionals with strong disciplinary scientific knowledge and skills. But scientific education with its focus on transdisciplinary knowledge and skills, attitude and behavior required for sustainability problem solving is still rare. Educating changemakers is something completely different than knowledge transferal. It is about encouraging the future professionals to challenge the status quo. We must stimulate their connector skills so they can build bridges between scientific disciplines and between organizations outside the academic world. And we must inspire them so they can become innovators that can develop

the solutions for a sustainable future. This is what we aim for in the Da Vinci Program.

## Introduction to the Da Vinci Program

Building on the success of the Da Vinci Project for bachelor students at Utrecht University, we are developing the Da Vinci Program in cooperation with the EWUU Strategic Alliance. It will be an interdisciplinary track for master students from Eindhoven University of Technology, Wageningen University & Research and University Medical Centre Utrecht. The Da Vinci Program will offer students an immersive learning experience with the aim of educating a new generation of changemakers, connectors, and innovators. In collaboration with a societal partners interdisciplinary student teams will attack sustainability-related challenges. The pilot will run from September 2023 to January 2024 with 30 master students from a variety of scientific disciplines, ranging from Chemistry and Environmental Sciences to Engineering and Industrial Design.

The Da Vinci Program consists of 20 weeks full-time challenge-based education in which students will work in innovation hubs at public and private partners outside university. Several aspects distinguish the Da Vinci Program from other interdisciplinary education. Most distinguishing aspect is that students will work at the partners workspace, like an internship, but in an interdisciplinary student team, dedicated to the challenge. Five or six societal partners will facilitate a team and provide real-life challenge, such as AkzoNobel, Province of Utrecht, Energy Transition Campus Amsterdam (at Shell) and UMC Utrecht. In several iterations and by applying design thinking methodology, the teams will move from challenge to feasible, viable and desirable solutions. Students spend two third of their time on this challenge. The remaining time they co-work with fellow students in the Da Vinci community and build a personal development portfolio. The Da Vinci community is an important platform for knowledge exchange, peer learning, and personal growth. Students have workshops together and operate in squads with fellow students from other teams to co-create the Da Vinci Program.

## Program Design

Challenge-based learning, community-based learning, community engaged learning, experiential learning and design thinking are the guiding principles for the program design. Learning from experiences and learning through reflection on doing as experiential learning is narrowly defined is the most powerful way to learn the skills, attitude, and behavior required for sustainability problem solving. Thus, we designed a program in which the learning process takes place in an authentic context with real-life challenges and real-life stakeholders.

But a lot of uncertainty comes along when working on complex challenges and collaborating in an interdisciplinary team and in a network of societal partners. Therefore, we offer a clear structure and methodology of design thinking, and we will train the students to apply this method and its toolset on their challenge. The design of the program follows the theory of *social technology of design thinking* (Liedtka, 2021). According to this theory professionals experience a certain personal transformation when they work on innovation. The experiences that are triggered by doing design thinking activities change the innovators themselves (Liedtka, 2021). In other words, doing design thinking activities ultimately leads to certain personal transformation.

The program is divided into three parts according to the iterations in the team challenge as shown in the visual on the next page. In every iteration the teams follow the whole design thinking cycle from gathering data to experimentation and at the end of the iteration the team presents its results to a panel of experts. The team will be guided in their performance by a mentor from academic staff and by a supervisor of the societal partner. Every iteration is anticipated by a Jam in which the community comes together for a whole week. The first Jam has the goal of boosting the community and kickstarting a specific way of working. During the first iteration there will be weekly workshops on design thinking and interdisciplinary co-working. The second at third iteration other activities such as field trips will be organized. The Da Vinci Program finishes with an 'End Game' as a large showcase of results.

Reference:

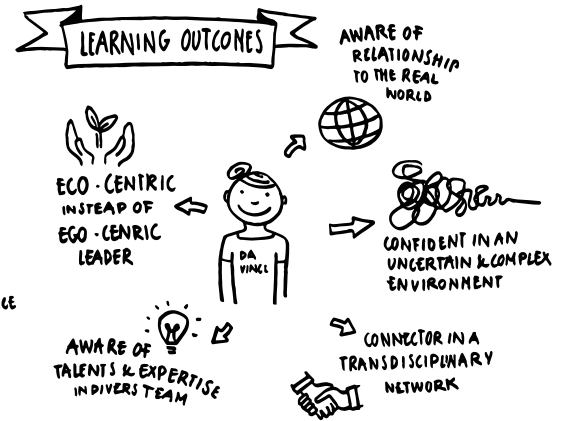
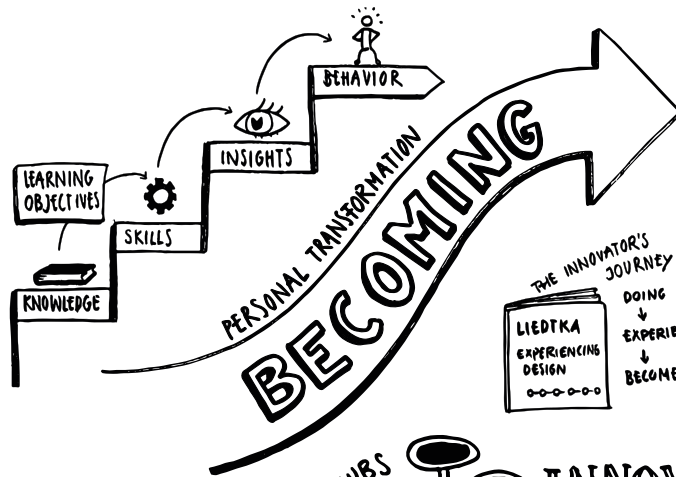
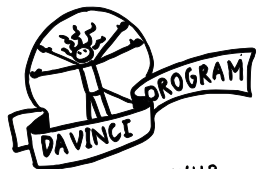
Liedtka, J., Hold, K., & Eldridge, DJ. (2021). *Experiencing Design. The Innovator's Journey*. New York: Columbia University Press

## Competencies & Assessment

We chose a competency-based assessment. We selected nine core competencies from a combined set of competencies of design thinking, interdisciplinary research, and sustainability science: *Immersion, Sensemaking, Alignment, Emergence, Imagining, Learning in Action, Critical thinking, Communication, and Collaboration*. These competencies will be assessed in two ways. First, the assessment of the team challenge (2/3 of the final grade) consists of three presentations and progress reports, one at the end of every iteration. The first two are formative and dedicated moments for constructive feedback from a panel of experts, the third is summative. Second, the students work on a personal development plan and show proof of competence in a portfolio (1/3 of the final grade). This individual assessment will be done by incremental grading. The deliverables of the team challenge and the individual development will be assessed by a panel of experts from academic staff. The mentor and supervisor provide the panel with advice. Both assessments are focused on process and progress rather than end results. There is a concept version of the assessment plan available.

## Overview of the Da Vinci Program

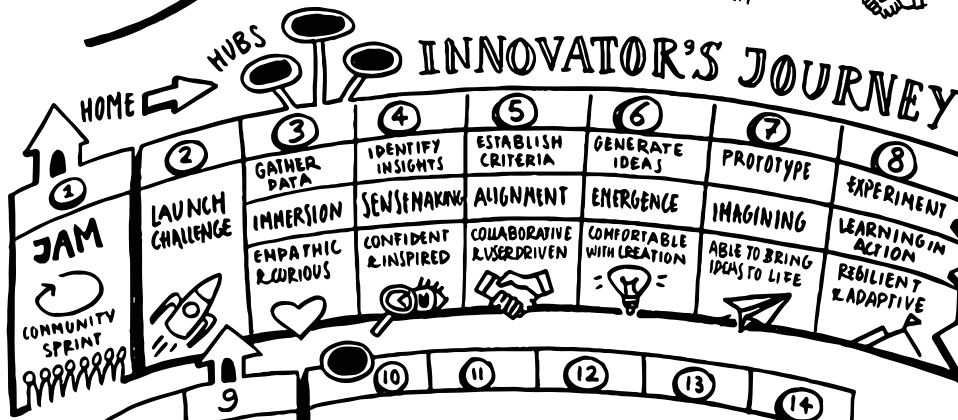
- Master students from TU/e, WUR, and UU
- Pilot September 2024 - January 2025
- 30 EC (20 weeks full time education)
- Challenge-based education: interdisciplinary teams work at societal partners on sustainability challenges
- Design thinking as methodology applied for developing feasible, viable, desirable, and sustainable solutions
- Workshops Design Thinking and Interdisciplinary Co-working
- Jams with Da Vinci community for peer learning
- Squads to co-create the program
- Field trips to all societal partners & sustainability projects
- Competency-based assessment. Competencies: Immersion, Sensemaking, Alignment, Emergence, Imagining, Learning in Action, Critical thinking, Communication, and Collaboration.
- Assessment: 2/3 Team Challenge, 1/3 Personal Development Plan



### DESIGN PRINCIPLES

1. COMMUNITY BASED LEARNING
2. GUIDED MASTERY
3. EXPERIENTIAL LEARNING
4. CHALLENGE BASED LEARNING
5. STRUCTURE, METHODS & TOOLS TO DEAL WITH COMPLEXITY

WITH SUSTAINABILITY AS THE CENTRAL GUIDING PRINCIPLE



DO EXPERIENCE  
BECOME

