Network for Innovative Care Competence Learning through Labs

Roadmap and matrix for CTL's

Roadmap and matrix for CTL's that will help for (further) and play a role in 'learning through labs' approach in education

Introduction

The goal of the NICCoLLa project was to create a plan (instructions) for the development of a test platform/laboratories (called Care Technology Lab (CTL) in the project) and how to integrate it into curricula and training to promote international and interdisciplinary learning. In addition, how to implement the cooperation with clients/patients and technology companies for the joint development of technological solutions intended for the welfare sector.

During the project it was noticed that the choices made in the different labs, many times influenced the current functioning of the lab. In many cases things developed naturally, depending on the starting point. For new labs this handbook can be a tool to help focus from the start and to reach the goals intended with the development of the lab.

In the NICCoLLa project, citizens are at the core of our focus. Clients and patients in health and welfare but also the different professionals. Our activities focused on resolving the challenges of these groups. Also how to support the needs of all stakeholders and the contribution of technology in this. Through continuous loops of co-creative multilevel and interdisciplinary collaboration, the NICCoLLa project made clear that this is an ongoing development. New technological developments and transdisciplinary education should be created by the cooperation between education, research, client/patients (organizations), professionals, care organizations, local government and business.

Creating a network of ongoing sharing of knowledge, expertise and collaboration to develop technology that actually meets the needs of the client/patient and health and welfare care professional, is needed to meet up to this in the future.

For existing and new labs, it is of importance to see how they fit in this collaboration and developments of technology and ICT in the field of health and welfare. To help new labs with this, this handbook contains tips that can help future labs to start and focus from the beginning on the desired goals. Or can help existing labs to overview their activities and further development.

Aim

The aim of a technology lab or testbed operation can be divided purely for educational or business purposes -or a combination of both.

Background of the decision (why)

Education: The main focus is on the professional development of future professionals. In the lab students of different educational backgrounds can work together on discovering technology, learning to develop and use technology and to implement technology in their professional field. By working together in different educational teams, students can explore each other's expertise and cooperation. The focus is not on the business approach but on the learning perspective of all involved.

Business: The main focus is on bridging the gap between Higher Education Institutions and Companies. The CareTechnologyLab (CTL) can be developed to deal with technology challenges from companies, help companies developing innovative technology solutions and also provide companies know-how. The CTL can operate as an innovation catalyst, facilitating innovation processes and transfer of technology for care and wellbeing through companies to be market scaled.

Consequences

If you are starting to build a testbed or create a lab and you have made a choice based on your goal, each choice has different consequences that you need to consider.

If the main aim is *Education,* the following points are of importance*:* it has to be embedded in the curriculum of the different educational departments. The framework of the educational system (criteria of competences, national frameworks, learning goals) has to be taken into account. This means that with the development of education labs have to be integrated in the learning materials and classes. Also financial support of the lab can be restricted by national law and legislations (for example: in some countries it's not allowed for higher education institutions to make profit with their developed technologies). Another consequence is staff development: teachers should be able to work together with the teachers from other departments (for example a health teacher and ICT teacher). This requires opportunities and possibilities to have time and space to work together that has been ensured in the personal staff development.

If you want to create a lab from the perspective of Education, you can ask yourself the following questions:

1. Which educational departments/faculties will be involved in the lab?
2. How will the lab be involved in the curriculum of the different faculties?
3. What is the framework of the educational system that has to be taken into account (learning goals, criteria of competences, accreditation or diplomas)?
4. How will the lab be integrated in the learning materials and classes?
5. What financial funding limitations or opportunities does the university have?
6. Which educational staff will be involved in the lab?
7. Where should the lab be located?
8. What are the possibilities of the lab to create new opportunities for higher educational objectives on more specialized degree/education and research?
9. How can the lab support blended learning for students and staff?

In terms of Business also should be determine the approach for implementing each innovation initiatives:

1. Crowdsourcing within an organization in a permanent or temporary arrangement;
2. Collaboration;
3. Partial investments;
4. External funding opportunities.

If the aim is to build a CTL for cooperation and co-creation with universities and companies, the following things should be taken into account:

1. The needs of CTL activities have been investigated with a regional survey for key stakeholders or tested in previous projects.
2. The operation is based on the common vision of key stakeholders , the needs of organizations and regions and collaboration of all stakeholders.
3. Determining CTL's operational facilities, necessary technology and personnel funding
4. Management commitment from all parties
5. People involved in the operation who can make decisions and take responsibility.
6. A wider understanding and common language about what needs to be developed and done.
7. Building a permanent model for research and development cooperation.
8. The operations must have diverse and multidisciplinary expertise.
9. Building a physical place or a simulated environment for testing.
10. Creating concrete tools, like document templates, and operational processes.

Illustration

Education

An example for education is The Getlab of Avans university. In Avans University of Applied Sciences' GET lab, care providers experience how to use technology in a valuable way in caring for the elderly, for example. The Getlab is part of a Wmo workshop. Wmo workshops are partnerships between universities of applied sciences and practitioners. They help bring about the necessary innovations in care and welfare.

In the GET labs on Avans, education, research and the professional field come together. The aim is to join forces and provide a place where (future) care professionals can develop into care providers who deliver customized care using technology.

Business

Wellbeing technology companies can benefit from CTLs, which offer them product validation and development, piloting and pre-testing of well-being and health technology products. LAB University of Applied Sciences' LAB WellTech (LWT) is a wellbeing technology innovation, test and development environment and is an example of this kind of cooperation with business.

LWT activities also combine testbed and innovation activities with education, developing the competence of future professionals, i.e. students and current professionals in the field, related to wellbeing technology. Such functions include e.g product testing with real customers in real environments, implementation of pilots, innovation platforms and idea workshops.

Scope

During the desk research and interviews different scopes were noticed. The main differences were on the following points:

1. Implementation or development of technology:

   The focus can be on the implementation of technology in daily care for clients/ patients. The use of technology, adapting this to the needs of clients and patients, learning how to work with the technology in care and focussing on service design. Another focus is on technical innovation. In cooperation with business and start-ups the focus is more on the development of new technological solutions for clients and patients in care.

2. Testing in real life or testing in the lab:

   The focus on the environment of testing technology can differ. In some labs the focus is more on testing in real life with individual clients or patients or with focus groups. The implementation in daily life is the main focus for (future) professionals and end users. The focus can also be on testing in the lab. It also includes the co-creation with end users but the focus is more on the improvements and testing of the technology itself.

The choices that will be made by creating a lab have consequences. When the lab is starting you have to think about the stakeholders that have to be involved, the most efficient and effective environment for the lab and the way the lab is funded.
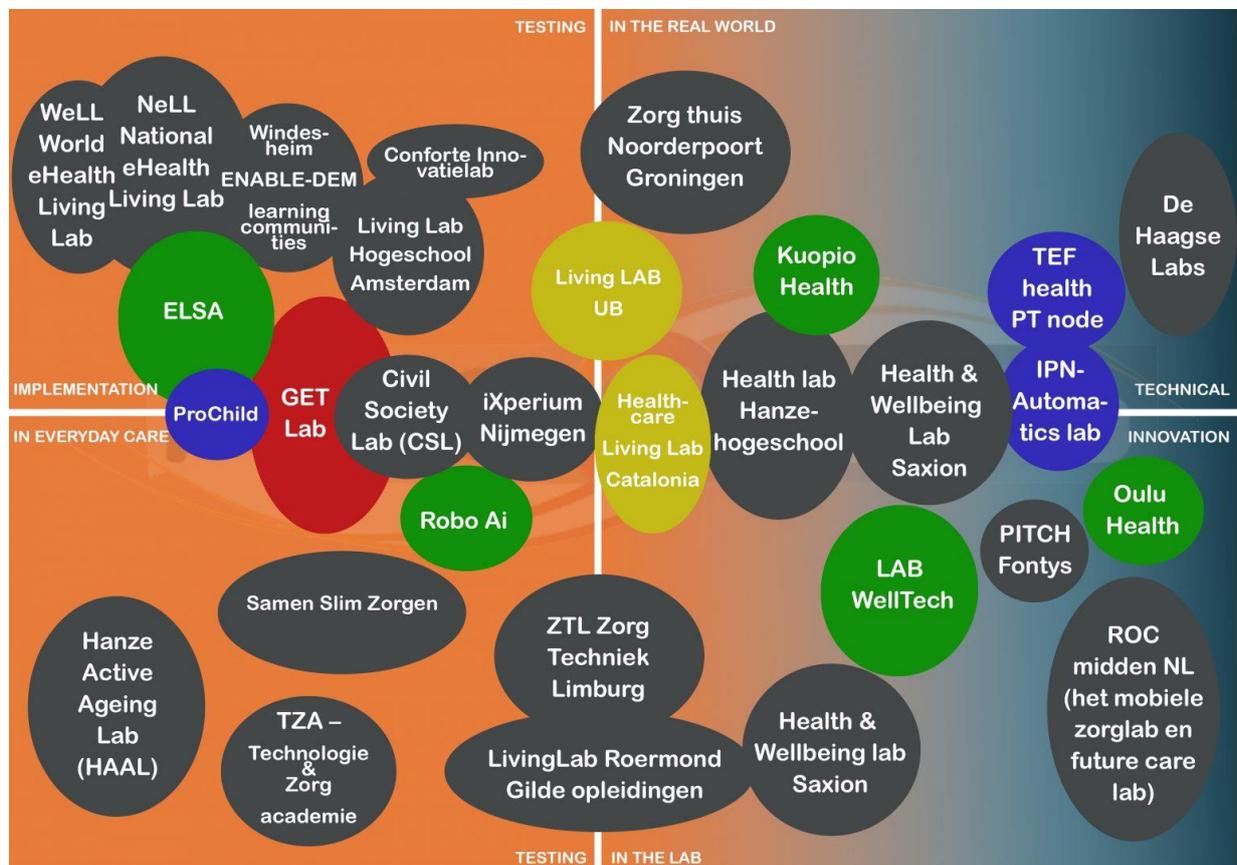
MATRIX

People

Depending on the choices made on the aim, consequences and scope of the to develop lab, it becomes clear who the stakeholders will be in the lab. If the stakeholders are clear from the start, all stakeholders can co-create the lab together which will help to reach the aim much quicker.

For education the following stakeholders can be identified:

- Students of different faculties
- Staff of the different faculties
- Technological ICT support team of the university
- Examination board of the HEI
- Clients and patients or client/patient organizations
- Management of the university

Eventually business and start-ups.

For business the following stakeholders can be identified:

- The management of the university of applied sciences
- The management of the regional hospital district
- Public and private social and health sector operators and companies
- Staff and students of the different faculties at UAS
- Companies and startups in the field of wellbeing technology
- Clients and patients or client/patient organizations

Space

If the focus is on education, the lab should be accessible for all students and staff involved. It should be in or close by the HEI so students and staff can have access in an easy way. This means that the management of the HEI has to create the space where the lab can be located.

Accessibility and easy-to-use also apply to CTLs which work with businesses, or in combination with companies and education. The easier the CTL is located, the more various development activities can take place there, which in turn increase visibility and attractiveness among, for example, students. In addition, clients/patients and professionals must also be taken into account and their ability to easily participate in technology development and learning how to use technological solutions in care and wellbeing.

The CTL space, when it is on the premises of a university of applied sciences, must be approved by the management and of a permanent nature, so that continuous development of the space is possible.

Equipment and technologies

If the lab uses existing technologies to implement in the daily life of clients and patients, the technologies should be accessible for students and professionals. The consequence is that the lab should have different technologies available. Since technology becomes obsolete quickly, you have to also be prepared to renew it constantly. It would also be good if human resources were reserved for the maintenance and upkeep of various technological devices.

Funding

Funding of the CTL can be a complex and multifaceted issue. If the CTL operation starts in a project, it makes the initial phase easier. A physical space of the CTL, human resources, and also technology to be acquired for the premises can be funded in the project. New financing solutions must be made at the stage when the project ends.

Often at this stage, the university of applied sciences takes over the funding of CTL operations. Especially in the case that the activity is mainly focused on teaching and cooperation with e.g. technology end users and professionals.

In the case when you want to build and start a CTL-type activity, e.g. with important stakeholders in the area/region, agreeing and collecting funding is more complex. Then you need careful planning and negotiations with different actors, what kind of financial contribution each one is involved in, how the activity is controlled and how it generates value for the involved financiers. In such cases, CTL activities, i.e. evaluations, testing and piloting of technological products etc., are paid for by companies.

Testbeds' network in the NICCoLLa project

Many medical districts, university hospitals, universities of applied sciences, universities and laboratories offer excellent cooperation opportunities for developers of products and services in the health and wellbeing sector for testing them.

User-oriented development and testbed activities produce benefits for various actors. Activities are carried out based on the needs of different parties: companies, organizations, professionals, end users and educational institutions.

It is important to intensify the interaction between the testbeds and to enable cooperation also from abroad in order to increase the visibility and attractiveness of various testbeds both in their home country and internationally. In the NICCoLLa project, various testbeds and laboratories in the project's partner countries have been identified in a desk study or interviewed. These actors cooperate at the national level, either closely or in cooperation at some level.

Testbeds and labs in collaboration in the project's partner countries

PORTUGAL

- IPN-Automatics lab, Instituto Pedro Nunes https://www.ipn.pt/laboratorio/LAS

- 4Lifelab, Collaborative Laboratory - Knowledge and Technology for Improved Health, https://www.4lifelab.pt/

- I3S, Institute for Research and Innovation in Health, https://www.i3s.up.pt/

- ProChild, ProChild CoLab Against Poverty and Social Exclusion – Association, https://prochildcolab.pt/

- INOV, Technology and Innovation Centre, https://www.inov.pt/

- Healthy Ageing@LAB, Collaborative lab for innovative products and services in the area of ageing, webpages available soon

- TEF-health PT node, Testing and Experimentation Facility for Health AI and Robotics, webpages available soon

FINLAND

 - ROBOAi, Research and Development Centre with topics related to robotics and artificial intelligence, www.roboai.fi/en

- KuopioHealth, New ideas and innovations, experts in the field of health and nutrition, www.kuopiohealth.fi

- OuluHealth, Co-creating health innovations, business development and research, www.ouluhealth.fi

- LAB WellTech, Innovation, test and development environment for wellbeing technology, www.labwelltech.fi

- HealthHUB, Community and meeting place for the joint development of the health and well-being sector, www.healthhub.fi

- Health Campus Turku, Testbed and research cooperation for health and food technology, diagnostics and pharmaceutical development, www.healthcampusturku.fi/

SPAIN

-Healthcare Living Lab Catalonia, The solution for innovators in the social and health field
 www.healthcarelivinglab.cat/
-Living Lab UB,Social Innovation Laboratory, www.ub.edu/livinglabub/en/