Hybrid Learning environments

Designing innovative, participatory and sustainable solutions for complex issues

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Abstract

This whitepaper describes Hybrid Learning as an approach to learning, innovation and collaboration. Hybrid Learning typically takes place in Living Labs where stakeholders from different disciplines, generations and cultural backgrounds work together on complex issues.

Hybrid Learning refers to the (physical) zones where disciplines and stakeholders with a variety of backgrounds come together. It builds on concepts such as community learning, experiential learning and practice-based learning. We claim that, through this exchange between fields, or transdisciplinary approaches to complex issues, the capacity for (radical) innovation increases significantly. It accelerates more diverse creativity and refreshing solutions than a monodisciplinary approach. This transdisciplinary way of working in Hybrid Learning environments in turn, requires new skills and organizational forms.

In this whitepaper we describe the background and theory behind Hybrid Learning (1.) and how Hybrid Learning is tailor-made and contributes to innovative solutions and the development of 21st century skills (2.). After our conclusion (3.) we'll end this white paper with a call (4.) for contributions to extend this concept from other cultural backgrounds and to share case studies to further expand this concept.

1. Introduction

We are living in increasingly so-called networked ecology - a knowledge society where interactions between people, devices, software and robots takes place in ever growing and changing roles. (Nigten, 2016) The complexity and intertwined-ness of this networked-ecology brings forth complex social issues (wicked problems) with unpredictable outcomes. (Rittel & Webber, 1973; Nigten, 2015). These wicked problems ask for new working methods and multiple perspectives, thus knowledge and expertise from different fields and disciplines are required. With the knowledge from one single discipline, only part of the question can thus be analyzed or solved. However, a complex issue often requires unraveling and analytics from multiple disciplines due its connection with other actors and the anchoring with other (knowledge) domains. In many cases, it will also be apparent that the initial issue does not directly

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address the problem but is a response to, or arises from, the issue (Nigten, 2013). This requires new skills in communication, problem analysis, collaboration and new organisational forms.

1.2. Problem definition

What kind of complexity do we refer to in this context? The rapid development of technology causes an increasing number of interactions at all levels. Such is demonstrated by something simple as a Whatsapp group, a one-to-many application, where the number of interactions with friends and colleagues increases dramatically.

For example, two very new categories of services and products have recently emerged at the market; using co-design (joint design of services/products) and co-creation (user generated content). For these types of innovation, the organisation or company considers how one can involve the end user in the value creation prior (co-design) or during the commissioning of the service or product by adding content (co-creation). More generally, the central question is how the human experience and the developments that are driven by new technological capabilities can be better matched or rather connected. Consider, for example, the introduction of new technologies and the (socio-cultural) issues that arise from this. This is illustrated by, among other things, Blockchain, Smart Cities, Big Data, Internet of Things, Robotics in health-care, autonomous vehicles and related issues that are essential for its perception and assigned value of privacy, transparency, ownership and responsibility, security and liability. (Nigten, 2016; Ballon, 2016; Greenfield, 2013). This forces organisations to seriously reassess their service model and calls for innovative solutions and a radical reassessment (innovation) of our problem solving ability.

1.3 Sustainable solutions

The above mentioned complexity is further enhanced by a growing need for sustainable solutions. Sustainability in this context goes further than a sustainable use of material or production method as is required by the circular economy. We live in a network society that has a growing need for collaboration. One-dimensional solutions do not suffice anymore because they don't resonate the complexity of issues and they do not have the sufficient support of all stakeholders (co-ownership) to be successful in the long term. Learning and working in networks creates value, social as well as (increasingly) commercial, and co-exists with traditional ways of learning and working. Due the its networking approach it is a different way of working, it requires other / new skills and tools. It demands collaborative working towards a shared solution, whilst all collaborators bring along their own interests and/or ambitions. That can collide and therefore it is a true art of designing and monitoring this process (actually a process of decision-making). The joint involvement, as known from communities of practice (Wenger, 1998) is essential for solutions or innovation, as all parties share ownership of the application or its sustainability.

1.4 Participatory solutions (empowerment)

Since the end of the last century, patients and students are increasingly referred to as clients. Although this implies a certain degree of customer orientated service, this term also refers to serving and pleasing

(top down, hierarchical) where the client (patient, student) fulfills a receptive and passive role. Today the focus has shifted towards resilience; the development of 21st century skills such as critical attitude and empowerment (of patients/students/citizens). The transition from the old to the new customer-, education- or work relationships and new ways of working, may lead to (temporary) dissatisfaction, which requires a lot of attention from the management or teachers during the transition process from 'pleasing' through 'engaging' to 'empowering'

1.5 Learning in practice

We set out an approach aimed at innovating whilst learning, based on case studies. Learning in practice refers to learning as an individual actor within a network and to learning as an institutional actor. There is no blueprint (yet) for developing new skills for Hybrid Learning. Hence our approach is based on learning by doing and thus practical and iterative. Because in the context of (daily) practice we meet the necessity for professionalisation, learning as well as for innovative and sustainable solutions. In the realm of learning, we may think of courses or formal education but learning (as an understanding and as an activity) is subject to a paradigm shift. We are used to learning as an activity that one does as an individual or as an organisation. But learning takes on a new dimension when the learners (individual and organisation) find themselves in challenging situations outside their own (familiar) environment. The ability to develop one selves (learning) increases as the complexity increases. Learning is no longer an independent or autonomous activity, instead it takes place in the focal point of social issues. Hands-on learning through action and reflection (Bradbury & Mainemelis, 2001) in practice is therefore essential for innovation 'on the job'.

1.6 Stakeholders

In Hybrid Learning, primary stakeholders involved in the particular case are collaborators. In Figure 1, we outline a common format inspired by Van Waart et al (2015) and Carayannis & Rakhmatullin's (2014) quadruple helix, that represents support and co-ownership in finding solutions to complex social issues between academics, industry, government and civil society or the citizen. Complex issues transcend the well-known areas of expertise and increasingly seek cooperation in the area where the four domains meet. This contrasts with the traditional or monodisciplinary setting, as the issues are usually addressed in the far corners of a single domain (and the other domains are consulted). In the Hybrid Learning process design, one is working in the overlapping field for transdisciplinary cooperation from all the domains and fields of expertise.
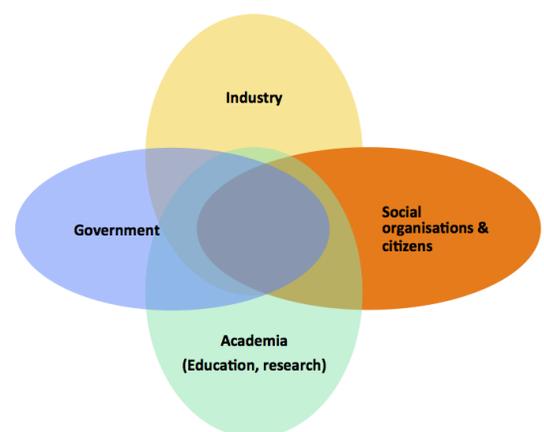

Figure 1, where 4 domains meet: Quadruple helix

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Of course, depending on the subject or issue, one can also choose to work with a few groups of stakeholders; For example, in the image, this may involve cooperation between business, education and research and social organisations or the end-user.

2. Process design

The whole approach relies on collaboration. At the heart of the above outlined quadruple helix, the area where all four domains overlap, the complexity of the innovation question increases and the need for innovative collaboration is reinforced. All stakeholders involved relate to one another in new, often unknown roles. For example, if we plan to investigate a complex issue in health-care seriously with the intention to identify new (possible) solutions, we work with a handful of disciplines, a table of stakeholders; the target group and everyone who's needed to find the solution. A tailored learning and innovation process is required for this purpose.

The approach is inspired by the creative practice and transition design (Transition Design 2015). It combines a number of aspects of Co-design (Sanders & Stappers, 2008), Design Thinking and Process Patching (Nigten, 2007). Co-design refers to the design and development (making) of more or less horizontal teams. Our emphasis on the end user experience reflects the influence of Design thinking. We connect (patch) the expertise of different though relevant fields of expertise that are related to an innovation issue according to the Processpatching principle.

2.1 Steps

The results in a process of joint research, design, (prototype) development, testing and learning. Herein we distinguish the following steps:
1. Understand: [Understand] analysing the problem through creative thinking. Determine if the initial problem is the real problem and not a symptom of another problem. (desk research, observation and interviews)
2. Stakeholders: Identifying and involving stakeholders or actors and determining who does what and who gets which responsibility (process design, metrics and indicators)
3. Empathise: [Empathise] understanding, learning and determining the level of involvement in the end-user experience through and with the stakeholders involved (actors)
4. Define: [Define] demarcation of the issue and sub areas to be worked on and agreement about the solution space (framework)
5. Concept: [Ideate] devising a multitude of concepts within the given solution space from the previous step, through brainstorming, workshops, sketching and so on.
6. Prototyping: [Prototyping] Developing selected concepts (from previous step) to paper prototypes, mock-ups or working prototypes through appropriate techniques.

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7.   Testing: [Testing] collecting feedback from the end users / audience, through appropriate testing methods/approaches.
8.   Reflection through critical thinking on each step of the process.
9.   Iteration loops.

Step 8 and 9 are underlying principles for the whole process, by doing so we aim to establish learning through action and reflection (Kolb, 2014)

(In the summary of the steps, if applicable, the Design Thinking steps are listed in brackets.)

Although not mentioned above as a step, transparency of decision-making in Hybrid Learning is of great importance throughout the process. All participants have their own interest in participating in this innovation issue. The emphasis in the process must, however, remain unchanged on the shared ambition; Not all steps in the process will always contribute as much to the different individual interests. In these occasions, individual interests should not hamper progress.
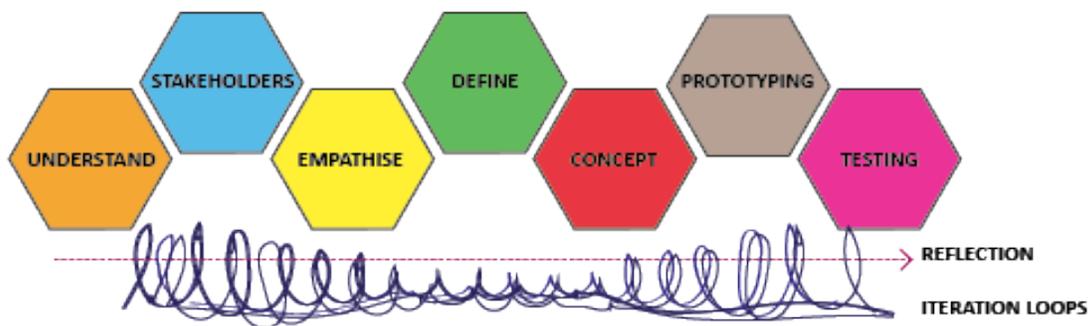

Figure 2. Illustration of the process

2.2. Co-design

The Living Lab's objective is to serve as a base for focus (direction, mission and goal) on the process, leaving enough space for the unforeseen and for implementing wishes and agendas of all stakeholders that may come forward. The active participation of stakeholders throughout the process is encapsulated in the co-design; This method comes from co-operative (participatory) design where stakeholders are directly involved in the design and realisation process (Sanders & Stappers, 2008, Ehn, 2008, Nigten et al., 2014, 2015, 2016)

2.3. Design Thinking

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Over time design thinking has evolved from a 'designerly' approach to an innovation approach for complex issues. The original concept for this was developed by David Kelly, founder of IDEO and d.School, Stanford University, USA (Plattner, n.d.). The main features consist of focus on end-user, empathy, collaboration and (self)-reflection throughout the entire process (Brown & Roger, 2015). The steps in our approach are based on the overall steps developed by d.school.

We (re)introduced the first Understand step where one makes a thorough analyses of the problem, as we learned from practice that the problem and symptoms are often confused. So this step deals with the question behind the question. We added the second step; mapping the stakeholders, to ensure the selected representatives are authorised for further decision making in the process. Furthermore, we made minor adjustments in communication around the process design and emphasised the iterative cycles and reflection (learning) throughout the whole process.

2.4 Processpatching: Transdisciplinary cooperation

A traditional single expertise approach will address the aforementioned complex issues in a simplified, handy problem statement and try to solve them in an existing, monodisciplinary field. Such an approach does not address the complexity and the disruptive nature of these issues. We call for the pooling of knowledge and expertise that yields more than the sum of its parts. We therefore use the transdisciplinary model for collaboration. There are different visions and interpretations of transdisciplinary collaboration, especially regarding the underlying theory. Our preference goes to the basis, as described in Nicolescu Manifesto (Nicolescu, 1994, 2002, 2013) and Somerville and Rapport (Somerville & Rapport, 2000). It sees transdisciplinary collaboration as a necessary pooling of knowledge and experience to solve major, super-wicked problems such as climate change and growing inequality between poor and rich in the world. The concrete impetus we propose for complex issues on a smaller scale is based on practical experience (Nigten, 2009, 2013) and will be further developed to match a particular issue. The added value of transdisciplinary collaboration is the pooling of expertise from different disciplines and domains around a (newly formulated) issue. The integrated knowledge this yields, is exactly what we need for complex and thus discipline-exceeding issues. Here the resulting new perspectives often lead to a revision of the initial question (see step 1. the question behind the question) and are directly linked to a shift in the solution path.

Transdisciplinary collaboration requires open-minded specialists who can and dare to work with all-round specialists from other disciplines. In this sense, transdisciplinary collaboration can also be placed in the so-called 21st century skills framework. After all, the more people get intertwined in a networked ecology, the more important these collaboration skills become. The collaboration skills, however, should also be supported by shared knowledge and skills between the collaborators, this is the core of *processpatching* (Nigten, 2007, 2016).

2.5 Working model

The practical cases are worked out in a so-called Living lab. Such a Living Lab is designed in close cooperation with partners in adjoining sectors and is usually situated in the context of the complex issue; at the workplace, in the city etc. There's a number of types of Living Labs. We place Hybrid Learning in a user-oriented Living Lab that represents all stakeholders. Here, both top down and bottom up approaches can be used depending on the subject, product or service.

> *A living lab is a user-centred, open-innovation ecosystem, based on a systematic user co-creation approach integrating research and innovation processes. This approach allows all stakeholders involved to concurrently consider both the global performance of a product or service and its potential adoption by users. A living lab constitutes an experiential environment, which could be compared to the concept of experiential learning, where users are immersed in a creative social space for designing and experiencing their own future. (source: Wikipedia)*

2.6. Badges

The achievements, results, skills, references etc. are recorded in open digital badges. A digital badge is an encrypted symbol of the achievements that is issued by the learning environment. The concept of open digital badges was developed by Mozilla and supports learning environments in the realization of practice based learning or personal (lifelong) learning goals. The badges can subsequently be shared by the owner (the lifelong learning professional) as part of his / her cv with the outside world. The professional concerned owns his / her badge and saves them online. It goes without saying that the quality of the one who receives the badge also radiates on the one who issues a badge; it's a reflection of the provider's reputation. (Kerver & Riksen 2016); Open Badges, 2017)

2.7 Conditions

A prerequisite for the successful realisation of a living lab-like learning environment is that it conforms to existing policies or is recognized as input for new or complementary policies of the relevant organizations, companies and stakeholders. To this end, it is important that the stakeholders concerned are facilitated (time / money) to work together on a complex issue and that reflection and evaluation are considered to be part of their activities during and after the work process. Next to the innovative results, revenues include learning outcomes at both an individual and organizational level. It is therefore important that the learning outcomes are implemented in the process of a next assignment, but also in the learning environment itself.

2.8 Benefits: outcome and impact

The premise of an innovation experiment is uncertainty. This means that other markers have to be used for measuring results than the regular project or control mechanisms. The often used quantitative measurement of results are unfit for use in a process approach. Metrics in an experimental environment are often qualitative and will focus on impact, for example, by measuring open character, participant

participation, value creation, stakeholder engagement, as well as professionalization or behavioral change. In the process approach, participants (stakeholders) determine which metrics are important to them, so they design the indicators.

3. Summary

In this whitepaper we've suggested a practical approach for innovation that is based on a lifelong learning concept for professionals and scholars alike. Our approach is situated in a living lab environment where learning and practice converge. We refer to this as Hybrid Learning. Co-design, Design Thinking and Processpatching are the main components for Hybrid Learning. Our approach is tailored for transdisciplinairy teams to discover new directions or solutions for today's complex issues (or wicked problems) whilst reflecting upon their daily professional practice.

4. Call for action

The above outlined model is based on the authors' Western experience, literature and innovation reference model. We strongly belief that the model could gain strength and depth from more culturally diverse input, local and indigenous wisdom and experiences. We therefore encourage creative minds from our network and beyond to give feedback and input. We are also interested in additional community formats that complement the suggested *living lab* setting. Furthermore we are interested to analyse case studies from diverse practices such as innovation in healthcare, education, citizens' participation, resilience projects and so on. We plan to pursue these ideas in collaboration with the ISEA international community as well as on other occasions. We are open to suggestions and ideas for other exchange platforms and events.

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