

## ***Mission Impact: Higher Education as Catalysts for Sustainability Transformation***

Bas Van Den Berg, The Hague University of Applied Sciences, Netherlands

Thomas Wissingh, The Hague University of Applied Sciences, Netherlands

Gabriela Bustamante Castillo, The Hague University of Applied Sciences, Netherlands

### **The European Conference on Education 2021 Official Conference Proceedings**

#### **Abstract**

Higher education has the potential to act as ecosystem catalysts, connecting with the places our institutions which they are a part of, for learning-based changes with wicked (sustainability) challenges. This, however, calls for reorienting and rethinking of the higher educational narratives and subsequent practices towards more ecological and relational ones. In this study, a pilot aimed to connect a course at The Hague University of Applied Sciences (The Netherlands) to an industrial park next to the university which is undergoing transition towards a sustainable living space. The pilot, which ran from September 2020 to February 2021, included 17 students from 9 nationalities and 12 different bachelor programmes, and was designed according to the concepts of an ‘ecology of learning’. In this semester long course, called Mission Impact, students reflected every five-weeks, to capture their learning experiences using a combination of arts-based and narrative reflection methods. Two questions guided the analysis: (1) *what are the key design characteristics of an ecological approach to higher education that connects to sustainability transformations* (in times of COVID-19) and (2) *what does this type of education asks from to learners*. The reflective artefacts were analysed using Narratives of T-Mapping and juxtaposed with auto-ethnographic insights maintained by the first author for triangulation. Preliminary results of this pilot include the *structure in chaos, space for transformation, openness for emerging futures & action confidence* as components of such an ecological education that connects to and co-creates sustainability transformations.

Keywords: Ecologies of Learning, Narrative Mapping, Societal Learning, Relational Education, Qualitative Inquiry

**iafor**

The International Academic Forum

[www.iafor.org](http://www.iafor.org)

## Introduction

The ongoing COVID-19 crisis, while difficult in many aspects has put a magnifying glass on our unsustainable ways of living. The sustainability crisis that we collectively face poses a severe long-term threat for life to thrive (Kopnina, 2020). If business-as-usual continues, damage to natural eco-social systems could be catastrophic (e.g., Brandt et al., 2013; Markard et al., 2012). To prevent this systemic failure, we must transition towards more sustainability-oriented futures where eco-social systems are designed to balance human activity and natural ecosystem integrity (Raworth, 2018; Wahl, 2018). In other words, we must transform towards more sustainable realities. Higher Education (HE) has the potential to act as catalyst, through a transformation of educational praxis, to co-create these futures (Poldner, 2020; Wals, 2019a). As education is linked to all issues presenting the Sustainable Development Goals (SDGs) (Tafuni & Heß, 2019) rethinking and reorienting education towards sustainability by co-creating sustainability transformations (STs) could be a way for HE to contribute more meaningfully to the public good (Wals, 2019a).

While we know that STs require fundamental changes in complex adaptive systems, these systems cannot be controlled by traditional top-down or bottom-up approaches. STs can however, be facilitated through deep learning-based processes (Burford, 2015; Lotz-Sisitka et al., 2015). As such, the importance of learning as a basis for these STs is frequently mentioned in literature (e.g., Beers et al., 2016; Geels, 2018). Furthermore, the discourse on learning-based STs, - sometimes referred to as learning ecologies for sustainable transformations (Barnett & Jackson, 2019) - acknowledges the highly contextualized and place-based aspects of STs (Pisters et al, 2020). This discourse and practice have so far however, remained (largely) outside the frameworks of formal HE (Barnett & Jackson, 2019, Wals, 2019b). Their role as catalyst for STs additionally requires a combination of external transitions (e.g., changes in systems, businesses, technologies) and internal transformation (e.g., changes in our values, mindsets, worldviews) (Ives et al. (2020)). This reorientation towards more ecological approaches could be seen as rewriting the narrative of HE, made tangible through designing educational processes, structures and cultures that connect to and co-create STs (van den Berg, 2020).

This re-narration builds on an ecological understanding of education (e.g., Barnett & Jackson, 2019; van den Berg, et al, *in press*) that normatively seeks to balance ecological and societal wellbeing (Raworth, 2018). In this way, learning-based change towards more sustainability-oriented futures is seen as an emergent property of the interrelations between people, places and educational praxis. Where ecological approaches to HE act as ‘innovation ecotones’ or learning-based liminal spaces for a dialogic process through which more sustainable realities can emerge (Pendleton-Jullian, 2009). While the potential for ecological approaches to learning, and HE, for STs is philosophically clear, and innovations in practice that engage with this transformative work are dawning (e.g., the proliferation of living labs, design labs and challenges labs), persistent conceptual and empirical gaps remain (Barnett & Jackson, 2019). In this paper, we connect to this starting movement and dive into the action-knowing gap by presenting a pilot study in The Hague, The Netherlands. This pilot focussed on learning-based change for STs within the Binckhorst region near the institution, The Hague University of Applied Sciences. This area is currently in transition from an unsustainable, industrial past, towards a regenerative and circular urban living future. In this pilot, an experimental course (Mission Impact), was run to engage students with facilitating societal learning for the complex issues that arise in such place-based STs. This course was inspired

by the Challenge lab at Chalmers University of Technology (Holmberg & Larsson, 2017) as well as transformative learning in general (e.g., Litz-Sisitka et al., 2015).

The aim of this project is discovering what a more ecological approach to HE which acts as catalyst for STs could look like. This practice engages with an educational reality where the complexity of transition challenges, and the messiness of their contexts around the physical spaces of our institutions, guide educational praxis instead of simplifying complexity to fit within educational structures (Wals, 2019b). In this paper, the following questions guide us: (1) *what are the key design characteristics of this ecological higher education?* And (2) *what does this type of education offer ask from the involved learners?* A (post)qualitative analysis of the resulting data was conducted through a combination of abductively analysing autoethnography (coordinator/teacher), narratives of ‘T’-mapping (students) & design workshops (students, teachers & region representatives). The results include three main educational design propositions (*related to community, structure, and content*) and five (personal) design qualities (*balance, reflexivity, action confidence, vulnerability & openness*).

## 1. Background

### 1.1. Ecologies of Learning

Ecologies of Learning build on an ecological (and deeply relational) (e.g., Walsh et al, 2021; West et al., 2020) perspective on education and learning that ‘*involve us interacting with the world and the people and things in it, by experiencing and perceiving situations, trying to understand them, and responding in ways through new meanings emerges*’ (Barnett & Jackson, 2019; 2). From this ecological perspective, the purpose of HE is to create the structures, processes and designs that connect and facilitate learners to collaborate towards more sustainability-oriented futures, within innovation ecosystems, and to guide collective action to bring these into being. Or as Laininen (2019; 187) says ‘*The main goal of education would be to give future generations tools for thinking and seeing the world differently, constructing their own worldviews, and acting to create a sustainable future. Learning would be embedded in creating change.*’ This transgression of existing reality requires an education that welcomes, and nurtures risk (Biesta, 2013), invites genuine vulnerability (Brown, 2018) without the fear of negative judgement of competence (Leah et al., 2019) and links learning strongly to place (e.g., Pisters et al., 2020). These are markedly different than most HE practices now and call for a transformation of how education is designed and enacted towards a more ecological approach (Wals, 2019b; van den Berg et al., *in press*).

This more ecological approach entails that education is a (co)-creative process that inherently carries a ‘beautiful risk’ (Biesta, 2013). For educators, this risk emerges from designing and enacting an education that connects to and co-creates STs in the innovation ecosystems of which they are embedded. Thus, leveraging the societal position of students, and higher education more generally, as (relatively) a-political agents of change (e.g., Holmberg & Larsson, 2017) to make a positive impact. For students, this risk is presented in the intense nature of this type of learning, which combines working on external changes (Ferrer-Balas et al., 2009) and internal transformation (Ives et al., 2020). Thus, calling for t-learning<sup>1</sup> (e.g., Lotz-Sisitka et al., 2015).

---

<sup>1</sup> Transformative, Transcendent, Transgressive & Transdisciplinary

## **1.2. Transition Design**

Transition Design (TD) is an emerging transdisciplinary field of design practice that attempts to tackle the complexity and wickedness of contemporary challenges such as climate change, biodiversity loss, and social injustice (Irwin, 2015, 2018). TD is a collection of approaches centred around working towards more sustainable futures from a relational perspective. And highlights the importance of inviting a multiplicity of approaches and perspectives to this designing (Scupelli, 2015). Additionally, TD is marked by focussing on long time horizon's and the use of (participative) mapping (visual storytelling) to facilitate multi-stakeholder engagement making complex and wicked problems more accessible. Thus, the approach engages with the broader learning ecology, or innovation ecosystem, involved with a particular wicked problem and place.

This gives TD potential for ecological forms of education, as an approach to facilitate societal learning. Where the TD approach shines, is at challenging underlying societal assumptions and proposing alternative stories for more sustainable futures and making these tangible for a broad audience (e.g. Dunne & Raby, 2013, Candy & Kornet, 2017). In this sense, TD approaches could be seen as participatory or transgressive approach to learning-based change for STs (Andriessen, 2008, Macintyre, 2019).

In this way, both the ecological approach to HE and TD are inspired by Buckminster Fuller's perspective on teaching '*if you want to teach people a new way of thinking, don't bother trying to teach them. Instead, give them a tool, the use of which will lead to new ways of thinking.*' . Where the ecological approach to HE consists of the broader educational structures and processes and TD as a collection of methods for students to engage with wicked problems in the region. This engagement with TD can also serve as context for personal T-learning. Because of this potential complementarity, TD served as the main approach for the pilot of the Mission Impact course.

## **1.3. Applied Narratology**

The power of narratives in shaping our collective experience, as well as education, is well known. And narrative methods are used relatively frequently in education and t-learning sciences (e.g., Pisters et al., 2020; Macintyre 2019). There are also links between future-oriented studies, such as design, and applied narratology (Raven & Elahi, 2015). However, insights and practices derived from narrative studies are often uncritically translated to interdisciplinary practices of professional storytelling (Moenander, 2018), including in education (Gallagher, 2011). There is also strong emphasis on the power of stories in shaping our collective action in the discourse on sustainability-oriented futures (Wahl, 2016), e.g., in reference on alternative meta-narratives to organizing society such as the doughnut-, circular- or regenerative economies (Raworth, 2018, Poldner 2020). This then presents a twofold opportunity for the inclusion of applied narratology with ecologies of learning and TD. On one hand, applied narrative approaches can be powerfully leveraged to facilitate t-learning as well as societal change. On the other hand, engaging with practice-based storytelling approaches to facilitate societal learning may contribute to the further conceptual understanding of the role of narrative in STs.

As TD navigates multiplicity of relational co-constructed desirable futures. Of both a personal and societal nature. The task of ecological forms of HE includes both the telling and shaping of better stories (those that are more conducive to STs) and supporting in the

processes of (personal) transformation that accompany such praxis. It is in this nexus, between university, place, and story that a potential for these deep transformative learning processes can be. We explore one such nexus in the form of Narrative T-Mapping (NTM) in chapter 3. Simultaneously, this combination of narrative, TD and ecological education is limited and deserves further (academic) inquiry.

## 2. Methodology

### 2.1. Research Setting

To test this more ecological approach to HE that acts as catalyst for STs in the regions around our institution. A course (minor) of 30 ECTS was created called Mission Impact. This course was a semester-long educational that explored more ecological approaches to higher education, which combined working on external transition challenges (such as the transition towards a circular region) with internal transformation (the way we feel, perceive, and are in the world). The minor/course ran from September 2020 to February 2021 and was co-designed and conducted in close partnership with the Binckhorst region, next to our university in The Hague, to leverage the potentiality of higher education as catalyst of learning-based change. In this pilot, 17 students from 9 countries and 12 educational programmes joined to develop their regenerative leadership capacity — *the ability to connect to and guide collective learning towards sustainable future realities*. The participants were all near the end of their bachelor studies, with a majority coming from the Technology, Innovation & Society department (STEM). This included students from spatial planning, industrial design engineering as well as the applied mathematics programmes. In the course, they tackled transition challenges, such as sustainable homes of the future or the vulnerability of circular businesses in the face of rapid urbanization, in small transdisciplinary teams of three to four over a fifteen-week period.

To support the process of engaging with these challenges, externally oriented courses (such as on complexity and regenerative design) were combined with inner oriented workshops and sessions. These latter sessions were hosted bi-weekly and initially were highly scripted activities that included *storytelling<sup>2</sup> exercises, guided meditations, drawing*, and other forms of *arts-based learning* (Pearson et al., 2018). As the semester unfolded, these sessions became increasingly less scripted as it became clear that the students primarily needed a safe space (in the sense of a space where they felt they were able to be vulnerable) to share about how they were doing, feeling, and becoming in this process of inner transformation. Every fifth week of the semester, the students were asked to submit visual and written narratives of their reflections about their subjective lived experiences. The first two of these, weeks five and ten were open format. The last (week 15) purposely engaged with the Living Spiral Framework (Macintyre, 2019) as a method for reflection on relational processes of learning-based transformation through arts-based and story approaches.

### 2.2. Data Generation

For this research, a multi-method approach to data gathering was applied. Which included: (1) the recordings of the collective reflective sessions described above, resulting in seven recordings lasting between one and four hours in length respectively. (2) The narratives and

---

<sup>2</sup> For a great example of some of these materials please see: [https://www.thehagueuniversity.com/docs/default-source/documenten-onderzoek/expertise-centra/mz/impact-magazine-1-february-2021.pdf?sfvrsn=2df593cd\\_4](https://www.thehagueuniversity.com/docs/default-source/documenten-onderzoek/expertise-centra/mz/impact-magazine-1-february-2021.pdf?sfvrsn=2df593cd_4)

arts-based reflective assignments submitted every fifth week of the course, which resulted in 49 documents. (3) An auto-ethnography conducted by the author over the duration of the semester (Ellis & Bochner, 2016, Le Roux, 2016), and (4) through three co-design workshops conducted after the end of the minor. These design workshops were hosted on three subsequent days focussing on engaging with a representative of a new region that we will be adding for the next run in September 2021. Consisting of representatives of the Binckhorst ( $n=3$ ) and a selection of the teachers and students involved in the pilot ( $n=5$ ). In these workshops, a series of questions based on the insights derived from the student's work were posed. Participants were asked to sketch out their response, as a form of photo-elicitation (e.g., Atkins & O'Brien, 2009; Glaw, 2017) before engaging in a group dialogue. In the background, one research assistant was visualizing the dialogue as a sketch while two others were putting them on a Miro board. Towards the end of the sessions both modalities were presented back to the participants to corroborate the findings.

### 2.3. Data Analysis

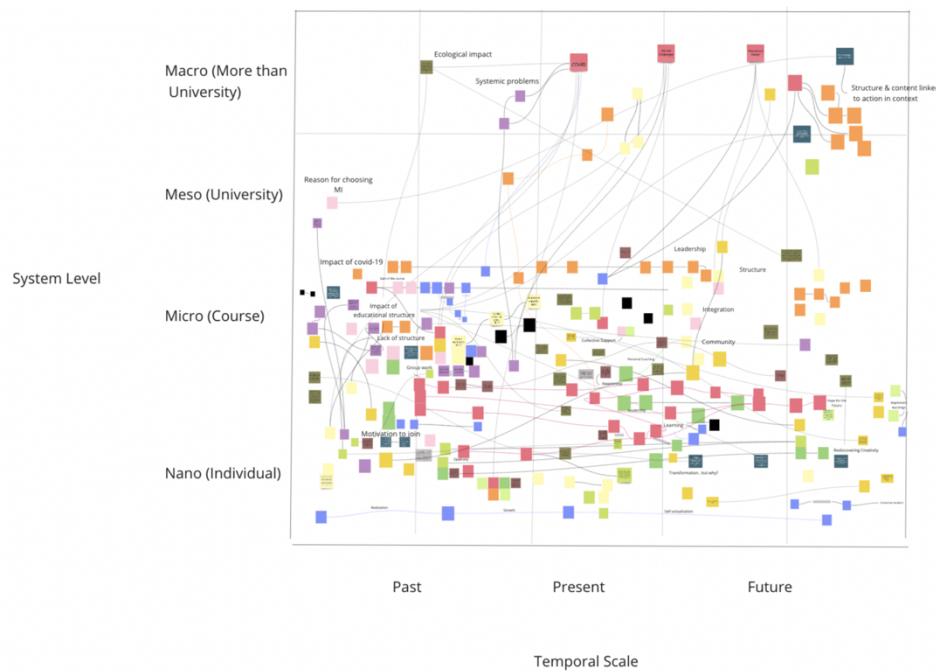


Figure 1: Transition/Transforming Narrative Mapping

### 2.4. Narratives of T-mapping

Fig 1. Example of one of the NTMs, where each colour post-it represents a different subjective viewpoint. The horizontal axis represents the temporal dimension, and the vertical axis represents the system levels axis.

The NTM, builds on a framework developed for TD (Irwin, 2018) but combines this with a narrative focus (temporal). Based on our proposition that stories act as subjective representations of lived-experience and that by mapping relationships across a multitude of viewpoints in a system can identify relational patterns which can be leveraged for change. This approach zooms in on patterns that emerge across and between time and system levels by mapping out the gathered materials from a narrative perspective. In this analysis, the included system levels were the following:

<b>System Level Scope</b>		<b>Examples</b>
Macro	Relationships with elements, forces, events, or items that influenced the experience beyond the scope of our university.	Covid-19, financial crisis, municipality, entrepreneurs
Meso	Relationships with elements, forces, events, or items within our university but outside the Mission Impact course.	University policy, departmental policy, colleagues.
Micro	Relationships with elements, forces, events, or items at Mission Impact level.	Assessment, educational structures, group dynamics, courses
Nano	Relationships within individual students and their experience	Feelings, thoughts, phenomenological experience.

Table 1: Overview of the System Levels Used with the NTM in the Context of this Pilot

This abductive analysis (Tavory & Timmermans, 2012) was done by mapping the elements of the materials, as narratives. Each item was mapped by two people independently, and a team of six met each day during the analysis period to discuss and debate placings and interpretations of these placements on the NTM. Additionally, the auto-ethnographic insights (from the lead author), were not discussed until the NTMs were completed. In total, three NTMs were created (one for each of the five-week intervals in the semester) to identify if, and why, patterns related to the research questions shifted and/or emerged over time.

The results of the NTM were juxtaposed with the autoethnographic insights, as well as those from the design workshops for triangulation. The results have been collated and are presented in the next chapter. In the spirit of post-qualitative inquiry, the results also include educational design and ethical considerations that warrant further exploration.

### **3. Results, Discussion & Ethics**

#### **3.1. Educational Design**

##### **3.1.1. Community**

Community building as well as engagement came back strongly across each of the NTMs. Both in the sense that facilitating community-based activities and learning is an educational design element that requires active work from educators (connecting to each other). As well that larger collaborative activities are (sometimes) required because of the scale and complexity of the work involved (connecting to place) (Pisters et al., 2020). This demands from an educator to act as connector, connecting students with (key) stakeholders in the place they are working with. Both of which were identified as a key consideration for educational design, particularly in times of COVID-19. During one of the workshops, it was also mentioned that this community engagement need may have been larger because of COVID-19. For the next iteration of the course, '*spider in the web*' people that can act as connectors between students and places will be recruited.

The side of community building (within the course) was strongly highlighted in the narratives as essential to co-creating a safe space for engaging with the complexity of the challenges. The collective reflective sessions were particularly identified as '*a moment of general vulnerability that wasn't only experienced by me but by most of [the] Mission Impact students*'. As a response the course was adapted by switching from individual tutoring to collective coaching, the incorporation of game nights, the co-hosting of a research workshop, and a reduction in structure in favour for open dialogue in the bi-weekly reflective sessions. This adaptation for more personal interaction was considered valuable '*A huge positive of the minor was the amount of support that was shown. By the tutors, by my teammates, by the other students, and even some of the lecturers. I felt very supported when I needed it and I tried to support others when they seemed to be in need. I hope to keep this up.*'

### **3.1.2. Content**

The Mission Impact pilot, like many other educational innovations, suffered from over ambition and limited resources. This resulted in the amazing charity of over 30 guests who contributed workshops and lectures. But because of this widespread generosity, these were all over the place (from eco-psychology to sustainable entrepreneurship) and rarely connected to the process of engaging with wicked problems in the region as it was unfolding. This variety and disconnection, as well as varying degrees of complexity, resulted in (frequent) confusion. As one student commented '*During some lectures, I feel empowered and motivated to make a change. I feel eager to contribute for a better world. There are lectures, which make me feel confused and as if I do not belong*'.

This presents a difficult design challenge, as on the one hand, ecologies of learning perspective build on relational self-guided learning and seeing education as living systems (Barnett & Jackson, 2019, Wals, 2019b), which requires just-in-time response that is potentially an unreasonable ask for external guest contributors. On the other hand, (most) students do not come from an educational system that operates as an emerging living system, and have in the case of transdisciplinary courses (wildly) differing degrees of knowledge and competence for transdisciplinary collaboration. They are still coming to grasp with a relational approach to their own learnings. Resulting in a difficult design problem where you as an educator must simultaneously educate towards a base level to engage with wicked problems and its complexity. While allowing as much possible space for (self-guided) learning to emerge from the living system as it unfolds. Through the analysis, three learning lines (*leadership for regeneration, creative research doing & personal sustain-abilities*) that constitute this baseline for our specific educational context were identified. These lines will be incorporated as courses based on t-learning (Sisitka et al., 2015) representing a relatively small percentage of the total course load.

### **3.1.3. Structure**

As preliminary research showed (van den Berg, *in press*) structure and complexity conflict with this ecological form of HE. In this first pilot, this led to a conscious decision to shy away from structure. This was done explicitly to create space for context-dependent emergence. However, in embracing complexity we have gone too far. The data highlights a need for improving the (supporting) structures, or processes of guiding students through engaging with the wicked problems. As many references to (lack of) structure were found in the narratives such as '*overall, the first couple of weeks felt hectic. Like too many online classes for one day, too little human interaction, too much sunshine to spend the whole day fixed behind a*

*screen inside. Juggling work, classes, and projects in the first five weeks, I probably dropped more than just one ball. But somehow, it turned out fine.*' This was also identified auto-ethnographically.

When working with complexity, uncertainty, and unclarity of context, such as with wicked problems, having some structures that acts as a place you know you can come back to if you get lost in complexity is vitally important. While lacking structure is not necessarily a bad thing for the facilitation of learning (Wals,2019b), in this pilot (almost) everything was unstructured. Adding this additional layer of chaos, presented a barrier for the students to engage with the unknowingness of the transition challenges. While the importance of structure was made clear, the form of it is not yet so. For example, if assessments and assignments are predefined (which is often the case) this may add structure but also robs away adaptive space for contextual complexity and the learning that can unfold from this. This dichotomy presents both a design and ethical challenge, an ethical dilemma between protecting (psychologically) by shielding from complexity of context (by adding structure) to reduce anxiety and stress. And creating the educational space for them to embrace complexity and the t-learning that this can facilitate (externally and personally). The educator's challenge for this dichotomy is, depending on the context in which you are educating, to identify and facilitate the minimum amount of structure required to facilitate (psychological) a safely embracing complexity while remaining adaptable to changes in (external) contexts. A way to explore this tension could be through the metaphor of a sailing ship where the hull represents safety and structure and the sail and environment represent dynamism and learning (see the work of Scott Barry Kaufman on transcendence for example). It is the architect's job to balance structure and dynamism because if there is a leaky hull, the boat sinks, but if the sails are faulty, you don't sail anywhere. Well, at first, the sails were flowing freely but our hull was leaking.

### **3.2. What does this education offer to learners?**

The results presented here do not differentiate between learners (e.g., students and educators) for engaging with these more ecological approaches to higher education. They do, however, exclude other learners involved in the ecology such as policymakers and entrepreneurs due to lacking quality data from these agents. In future iterations, integrating these '*spider in the web*' individuals more strongly as researchers-practitioners in designing, running, evaluating and researching the course aims to resolve this lack of data. The resulting categories are presented below, including links to existing literatures, the changes from this iteration of Mission Impact, and the design and ethical considerations that this involves. Where it is important to note that these response-abilities when seen from a relational perspective on human development (Faulkner et al, 2018; TESF, 2020) can only be nurtured in becoming-with the broader ecology of learning in which the course is embedded (Haraway, 2016).

Component	Description	Changes for Mission Impact v0.2	Ethical & Educational Design Considerations
<i>Balance</i>	The ability to recover from the stresses placed upon learners on an ongoing basis.	Stronger inclusion of mindfulness and contemplative practices, ongoing dialogue about the degree of stress and more individualized adaptability of the programme to accommodate different stressors across personal learning ecologies.	<p>What content elements of the course should be reduced or adjusted to create space for more mindfulness practices?</p> <p>How can fairness of education be safe guarded while providing individualization in the name of balance?</p> <p>When is it okay to push beyond balance in the name of facilitating t-learning for sustainability transformation?</p>
<i>Reflexivity</i>	The ability to critically (re)engage personal worldviews, perspectives, feelings, and thoughts based on lived experience.	Being more explicit about the goals of this ecological education and highlighting the ways that the course is designed to invite reflexivity.	<p>Who are we to judge which specific worldviews are just, and which are not?</p> <p>How can the conditions that facilitate learners to be reflexive be facilitated?</p>
<i>Action Confidence</i>	The ability to engage with the unknown with courage, through practices and action.	Clearer communication from the start that it is okay to be uncertain, and that it takes a lot of courage, vulnerability, and openness to act regardless of that fact. Strong integration in the learning journal that will be used throughout the semester. Inclusion of workshops on this topic.	<p>How can the (psychological) safety of the learners be protected without losing complexity?</p> <p>How much courage can be, or should be, expected from learners within a single semester?</p> <p>How do we create supportive structures of assessment to reward risk taking inherent with acting in confidence?</p>
<i>Vulnerability</i>	The ability to engage with uncertainty and risk from a place of strength.	See above	See above

<i>Openness</i>	The ability of being in service to emerging futures without being too attached to any particular outcome.	See above	See above
-----------------	---	-----------	-----------

Table 2: Internal Response-abilities Required for Engaging with Sts That Emerged from the Ntms.

The above components should be seen from their relationships with community, structure, and content, and it is precisely in that relationality that we can identify further opportunities for more ecological approaches to higher education. The central question for educators engaging with this type of education then is: *how would your educational practice look like, based on the uniqueness of the place and wicked problems that you engage with taking the above internal qualities into consideration?*

## Conclusions

This pilot, as well as this research, represent an empirical step towards a more ecological higher education that connects to and co-creates sustainability transformations. We have hoped, through this (post-)qualitative analysis and presentation of personal narratives that were generated during the pilot, to provide a sketch for designing and enacting this type of education. With the first steps taken and many ethical and empirical questions remaining, a few of which have been shared in table 2, higher educational narratives and subsequent practices need to continue evolving towards more ecological and relational ones. Starting with the next chapter of the minor Mission Impact. Besides warmly inviting more practitioner-researchers to engage with this type of education, we would like to stress the highly contextual nature of this type of ecological higher education. We see this form of education as a relational narrative that is currently being co-written by multiple people, times, and places, and while we are not able yet to articulate the conclusion of this ecological education as narrative. We look forward to the next chapter.

## Acknowledgements

This work could not have been possible without the many people who were kind enough to contribute their time, effort, passion, and energy to this project. We would like to highlight the contributions of Nicolas Landriati, Vladimir Genov, Luciana Santerre, Marieke Buisman & Ping Huang who have helped with the analysis of some of the data and are currently passionately working on redesigning the 2.0 version of the Mission Impact course. In addition, the first author would like to thank Silvana Beerends-Pavlovic and Sjoerd-Jeroen Moenander for the interesting dialogues about stories, narratives, and related topics. Finally, we would like to thank Professor's Arjen Wals, Ellen Sjoer and Kim Poldner for their guidance, particularly on the first two chapters of this work.

## References

- Andriessen, DG. 2008. Combining design-based research and action research to test management solutions. In Towards quality improvement of Action research: developing ethics and standards., Boog B, Slagter M, Zeelen J, Preece J (eds). Sense Publishers: Rotterdam; 125-134.
- Atkins, T.V., & O'Brien, M. (2009). From drawings to diagrams: maintaining researcher control during graphic elicitation in qualitative interviews. International journal of research & method in education. 32, 1. 53-67.
- Barnett, R. & Jackson, N. (2019). Ecologies for learning and practice: emerging ideas, sightings, and possibilities, 1st Edition. Routledge. ISBN: 978-113-8496-880.
- Beers, P., B. van Mierlo, and A.-C. Hoes. (2016). Toward an integrative perspective on social learning in system innovation initiatives. Ecology and Society, 21(1), 33.
- Van den Berg, B. den Hoedt, T., van den Eijk, E. (2021, in press). Learning for circularity – designing higher for education for circular economy. Chapter in Routledge Book – Circular Economy: Challenges and opportunities for ethical and sustainable business. Editors: Kim Poldner & Helen Kopnina.
- van den Berg, B. (2021). Mapping Transition Narratives & Mission Impact v0.2. Medium Article.
- van den Berg, B. (2020). Towards regenerative learning ecologies in higher education – designing mission impact. Medium article.
- Biesta, G.J.J. (2012). Giving teaching back to education: responding to the disappearance of the teacher. Phenomenology & Practice, 6(2), 35-49.
- Biesta, G.J.J, (2013). The beautiful risk of education. Routledge (first published by Paradigm Publishers). ISBN 13: 978-1-61205026-3.
- Bradshaw, C.J.A. (2021). Underestimating the Challenges of Avoiding a Ghastly Future. Front. Conserv. Sci., 13 January 2021 | <https://doi.org/10.3389/fcosc.2020.615419>
- Burford, G. (2015). Collaborative research for sustainability: an inside-out manifesto.
- Brandt, P. et al., (2013). A review of transdisciplinary research in sustainability science. Journal of Ecological Economics, 92, 1-15.
- Brown, B. (2018). Dare to lead – brave work. Tough conversations. Whole hearts. Penguin Random House UK. ISBN: 078-17850
- Candy, S. & Kornet, K. (2017). A field guide: ethnographic experiential Futures. Presented at Design Develop Transform Conference in Brussels, June 2017. 42140.
- Dunne, A., & Raby, F. (2013). Speculative Everything: Design, Fiction & Social Dreaming. MIT Press ltd. 9780262019842.

- Ellis, C., Bochner, A.P. (2016). *Evocative autoethnography: writing lives and telling stories*. Routledge – ISBN: 978-1-62958-215-3.
- Faulkner, L., K. Brown, and T. Quinn. (2018). Analyzing community resilience as an emergent property of dynamic social-ecological systems. *Ecology and Society* 23(1):24.
- Ferrer-Balas, D., Buckland, H., & De Mingo, M. (2009). Explorations on the university's role in society for sustainable development through a systems transition approach. Case-study of the Technical University of Catalonia (UPC). *J. Clean. Prod.* 17, 1075-1085.
- Gottschall, J. *The Storytelling Animal: How stories make us animal*. ISBN: 978-0-547-39140-3.
- Gallagher, K. M. (2011). In search of a theoretical basis for storytelling in education research: story as method. *International Journal of Research & Method in Education*, 34, 1. 49-61.
- Glaw, X., et al. (2017). Visual Methodologies in Qualitative Research: Autophotography and Photo Elicitation Applied to Mental Health Research. 16, 1-8. Doi: 10.1177/1609406917748215.
- Haraway, D. J. (2016). *Staying with the Trouble: Making Kin in the Chthulucene*. Duke University Press – Durham and London.
- Holmberg, J. & Larsson, J. (2017). Challenge lab – learning by engaging in society's sustainability transitions. 10th International Conference on Researching Work and Learning.
- Holmen, J. (2020). Navigating Sustainability Transformations Backcasting, transdisciplinarity and social learning. Doctoral Thesis, University of Gothenburg. Available on: [https://research.chalmers.se/publication/520462/file/520462\\_Fulltext.pdf](https://research.chalmers.se/publication/520462/file/520462_Fulltext.pdf).
- Hutchings, G. & Storm, L. (2019). *Regenerative leadership: The DNA of life-affirming 21st century organizations*. ISBN: 978-178324-199-4.
- Kopnina, H. (2020). Education for the future? critical evaluation for education for sustainable development goals. *The Journal of Environmental Education*, DOI: 10.1080/00958964.2019.1710444.
- Irwin, T. (2015) Transition Design: A Proposal for a New Area of Design Practice, Study, and Research, *Design and Culture*, 7:2, 229-246, DOI: 10.1080/17547075.2015.1051829.
- Irwin, T. (2018). The Emerging Transition Design Approach. *Design Research Society 2018 Catalyst Conference*. 25th-28th of June.
- Ives, C. D., Freeth, R., Fischer, J. (2020). Inside-out sustainability: the neglect of inner worlds. *Ambio* 49, 208-217. <https://doi.org/10.1007/s13280-019-01187-w>.

Macintyre, T. (2019). The transgressive gardener – cultivating learning-based transformations towards regenerative futures. PhD Thesis. Available on: <https://library.wur.nl/WebQuery/wurpubs/fulltext/505808>. Accessed 3rd of January, 2020.

Moenander, S-J. (2018). When not to tell stories: Unnatural narrative in applied narratology. *Frontiers of Narrative Studies*, 4, 1, 6-20. doi: <https://doi.org/10.1515/fns-2018-0002>.

Laininen, E. (2019). Transforming our worldview towards a sustainable future. Chapter 5 in *Sustainability, Human Well-Being & The Future of Education*. James, W. Cook. Springer. Palgrave Macmillan. ISBN: 978-3-319-78579-0.

Le Roux, C.S. (2016): Exploring rigour in autoethnographic research, *International Journal of Social Research Methodology*, DOI:10.1080/13645579.2016.1140965.

Lotz-Sisitka, H. et al. (2015). Transformative, transgressive social learning: rethinking higher education pedagogy in times of systemic global dysfunction. *Current opinion in Environmental Sustainability*. 16, 73-80.

Macintyre, T. et al. (2017). Towards transformative social learning on the path to 1.5 degrees. *Current Opinion in Environmental Sustainability*, 31, 80-87.

Macintyre, T. (2019). The transgressive gardener – cultivating learning-based transformations towards regenerative futures. PhD Thesis. Available on: <https://library.wur.nl/WebQuery/wurpubs/fulltext/505808>. Accessed 3rd of January, 2020.

Markard, J., Raven, R., & Truffer, B. (2012). Sustainability transitions: An emerging field of research and its prospects. *Research Policy*. 41(6), 955-967.

Pearson, K.R., et al. (2018). Arts-Based Methods for Transformative Engagement: A Toolkit. Wageningen: SUSPLACE. <https://doi.org/10.18174/441523>.

Pendleton-Jullian, A. (2009). Design education and innovation ecotones. Accessed 1st of June, 2020.

Poldner, K. A. (2020). Entrepreneuring a regenerative society. Inaugural Address. 18th of June, 2020.

Pisters, S., Vihinen, H. & Figueiredo, S. (2020). Inner change and sustainability initiatives: exploring the narratives from ecovillagers through a place-based transformative learning approach. *Sustainability Science*. 15, 395-409.

Raworth, K. (2018). Doughnut economics: seven ways to think like a 21st century economist. Random House UK. ISBN: 97818479-41398. Raven, P.G., & Elahi, S. (2015). The New Narrative:

Rittel, H.W.J., & Webbe, M.M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4, 155-169. <https://doi.org/10.1007/BF01405730>.

- Sterling, S. (2010). Transformative learning and sustainability: sketching the conceptual ground. *Learning and Teaching in Higher Education*, 5, 17 – 34.
- Scupelli, P. (2015). Designed transitions and what kind of design is transition design? *Design Philosophy Papers*, DOI: 10.1080/14487136.2015.1085682.
- Schlitz, M.M., Vieten, C., Miller, E.M., 2010. Worldview transformation and the development of social consciousness. *J. Conscious. Stud.* 17 (7–8), 18–36.
- Senge, P.M. (2006). *The Fifth Discipline: The Art & Practice of the learning organization*. Bantam Doubleday Dell Publishing Group Inc. 9781905211203.
- Tafuni & Heß, 2019. Education for Sustainable Development as a Catalyst and the Role of Students in the Future Management of HEIs. Keynote at the Bologna Process Conference.
- Tavory, L. & Timmermans, S. (2012). Theory construction in qualitative research from grounded theory to abductive analysis. *Sociological Theory*. 30(2), 167-186. DOI: 10.1177/0735275112457914.
- TESF, (2020). Mobilising capacities for transforming education for sustainable futures: opening spaces for collaborative action and learning TESF Background Paper.
- Wahl, D.C. (2016). *Designing Regenerative Cultures*. Triarchy Press. ISBN: 9781909470774.
- Wals, A. E. J. (2019a). Transgressing the hidden curriculum of unsustainability: towards a relational pedagogy of hope, *Educational Philosophy and Theory*, DOI: 10.1080/00131857.2019.1676490.
- Wals, A. E. J. (2019b). Sustainability-oriented ecologies of learning: a response to systemic global dysfunction. Chapter 5 in *ecologies for learning and practice*.
- Walsh, Z., Bohme, J. & Wamsler, C. (2021). Towards a relational paradigm in sustainability research, practice, and education. *Ambio*. <https://doi.org/10.1007/s13280-020-01322-y>.
- West, S.L. et al (2020) A relational turn for sustainability science? Relational thinking, leverage points and transformations, *Ecosystems and People*, 16:1, 304-325, DOI: 10.1080/26395916.2020.1814417.

**Contact email:** B.vandenberg@hhs.nl