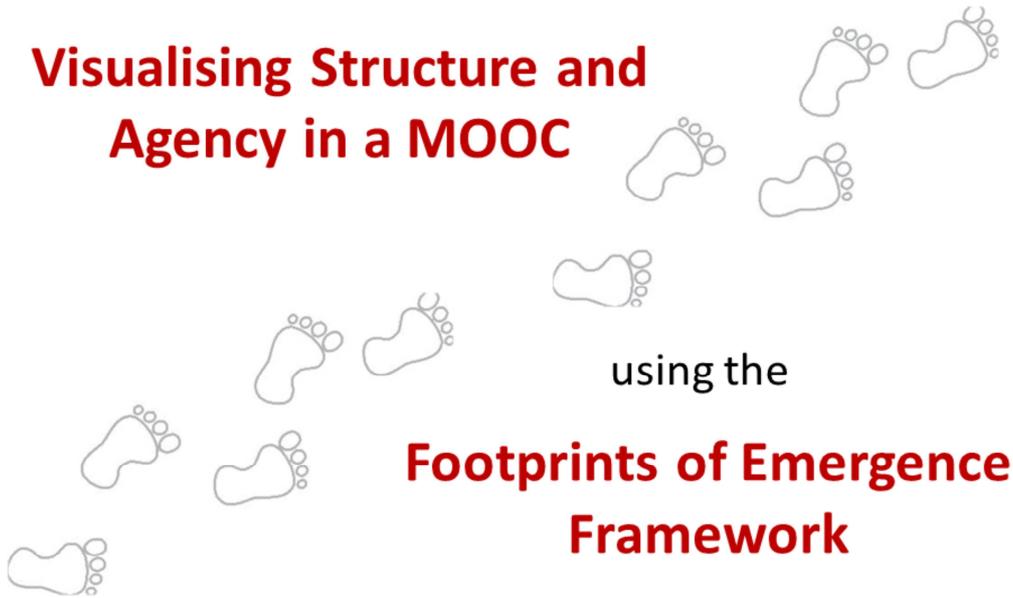


Visualising Structure and Agency in a MOOC



using the

Footprints of Emergence Framework

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Jenny Mackness. I have been working as an independent researcher for 10 years. The Footprints of Emergence Framework which Jutta and I used for this research was initially published in 2012 (in the proceedings of the Networked Learning Conference 2010) following collaborative research I worked on with Roy Williams, Simon Gumtau and Regina Karousou in which we explored emergent learning in MOOCs. This research is on going – hence the collaboration with Jutta.

Jutta Pauschenwein. I am a former physicist and now head of an e-learning centre of a small Austrian university of applied sciences in Graz. I'm teaching and training learners in diverse online rooms from Moodle courses to Slack communication to MOOCs. In my understanding the teacher should support the learners in autonomous and collaborative learning scenarios. My learning designs are open and I'm looking for tools to evaluate them.

Jenny and I met in the Change11 MOOC run by Stephen Downes and George Siemens which was the most challenging learning experience of my whole life. Jenny was already a blogger and within Change11 I started to blog continually. In August 2012 we met again as online participants in the BEtreat seminar run by Etienne and Beverly Wenger-Trayner. Jenny presented the method of the footprints of emergence and I was immediately fascinated because I thought that with the footprints of emergence I could understand better what's happening in my online classes.

Characteristics of Open Learning Environments



Characteristics arranged in clusters of factors

The Footprints of Emergence

Jenny: Roy Williams and I had been participants in the first MOOC in 2008 and in doing research on the MOOC we ultimately realised that in open learning environments it is difficult to capture the learning experience or evaluate it. Open learning environments such as CCK08 (the first connectivist MOOC) are distributed and complex. There are no prescribed learning outcomes and learning is unpredictable and emergent.

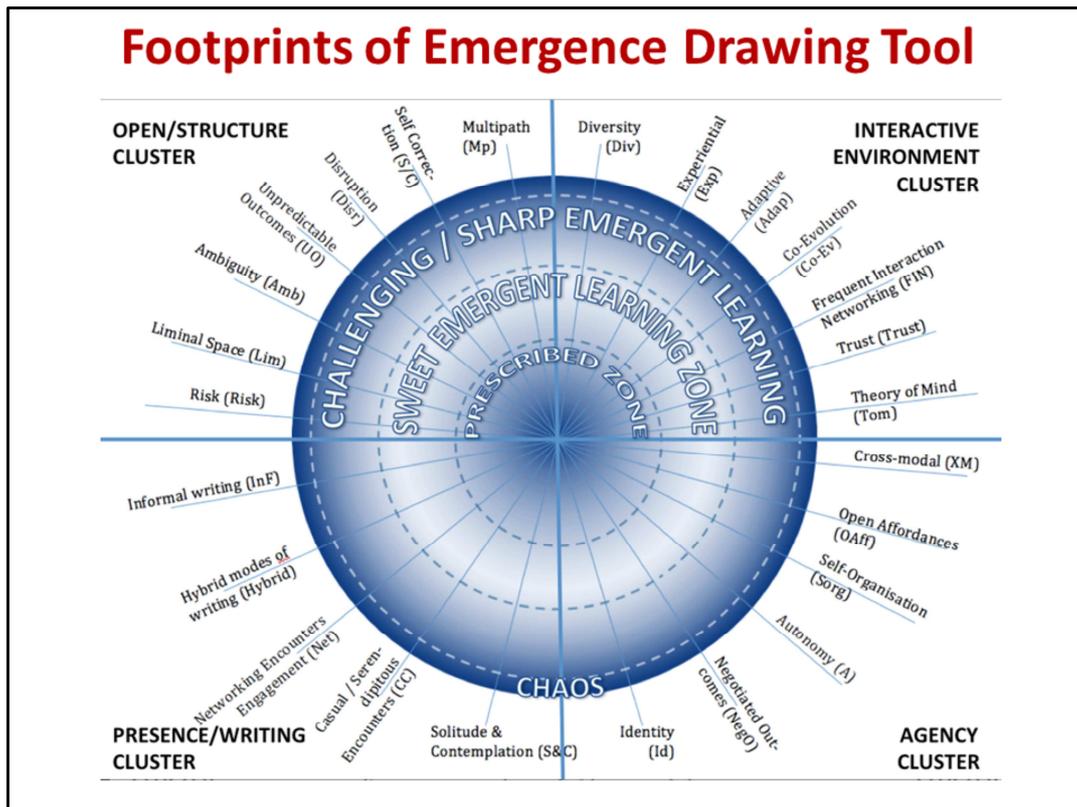
We were interested in what it was about open learning environments that might lead to emergent learning. What are the characteristics of these learning environments?

We drew on our knowledge of connectivism, social constructivism and communities of practice, our backgrounds as teachers/ educators and our interest in complexity theory, learning ecologies, and Gibson's theory of affordances to determine 25 factors that we thought might be characteristics of open learning environments. This is not a definitive list of characteristics. We think of them as a palette from which the desired characteristics can be selected or added to. We then arranged these characteristics into four clusters.

1. Open/Structure. What is the balance between Openness and Structure in the learning environment?
2. Interactive Environment. How is the learning design implemented?
3. Agency. Do learners develop their own capacity for action, or just compliance with given roles?
4. Presence/writing. What traces do you make and leave behind you in an online environment?

These clusters of factors can help us to understand the balance between structure and agency in any learning environment.

We then decided that we wanted learners to be able to visualise the outcome of their reflection on each of the 25 factors/characteristics.



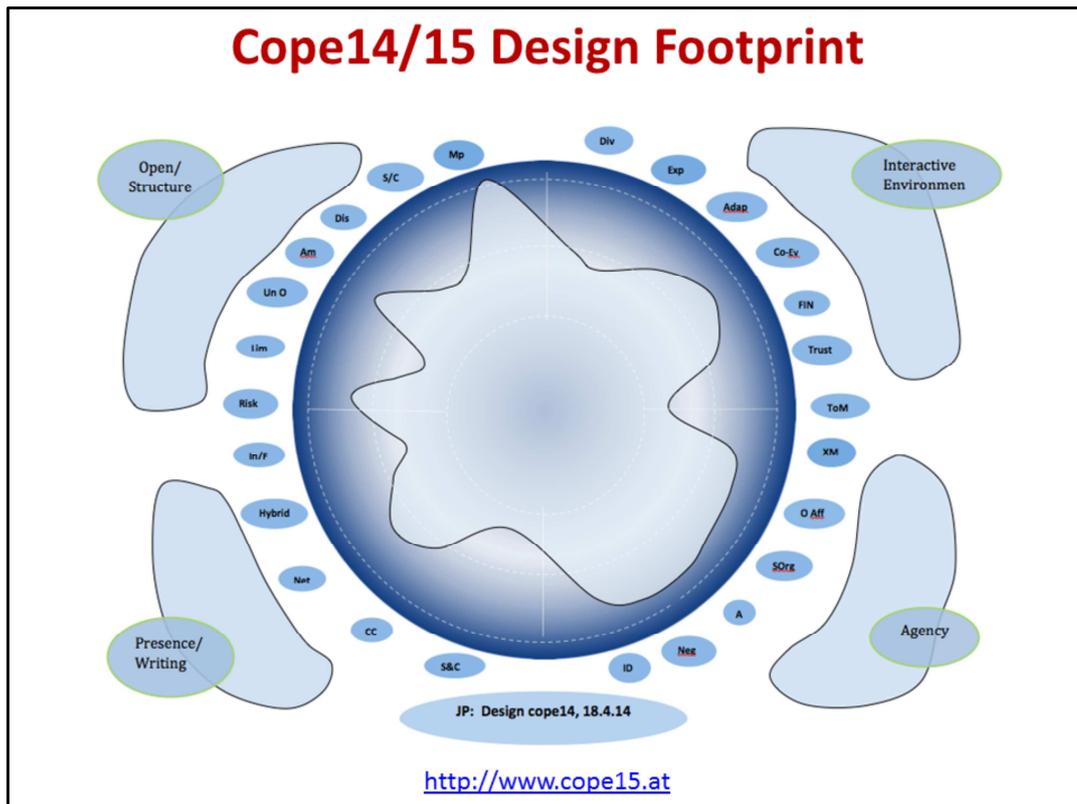
The Footprints of Emergence Drawing Tool with the 25 factors

Jenny: In the drawing template you can see the four clusters each with a set of factors/characteristics. Users of the template are asked to reflect deeply on each of the factors in turn. They are given a sheet explaining the factors to help them do this.

On the template we have a dark blue zone in the middle. We think of this as the prescribed learning zone. Outside this is a white zone. We called this the sweet emergent learning zone, where learning is comfortable and emergent. Beyond this there is a darker blue zone where learning is more challenging – the sharp emergent learning zone. This can be good for the learner or not, depending on the context. At the edge there is the dark blue edge of chaos where learners can easily fall out of the course. We know that MOOCs can be experienced as chaotic.

To draw the footprint users place a point on the continuum of prescribed to chaos for each factor according to whether their experience was more or less prescribed, more or less sweetly emergent, more or less sharply emergent or on the edge of chaos. This is done intuitively without any measurement.

When all the points have been placed on the template, they can be joined to create a footprint.

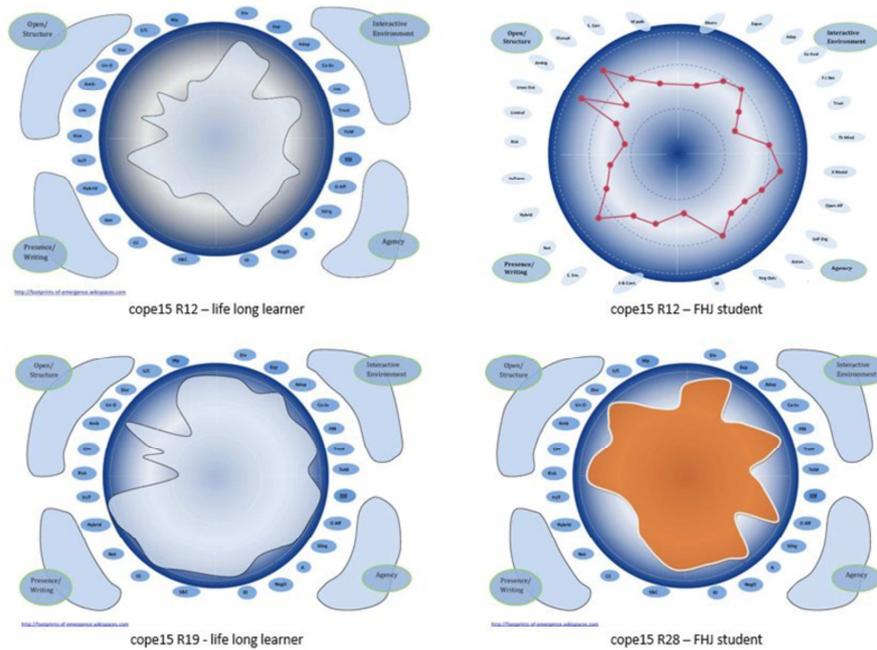


Jutta's design footprint for her cope14/15 MOOC

Jutta: In the cope14 and cope15 MOOCs we were a team of about 10 people from different disciplines and with different roles in the MOOC. Some of the team had experiences of MOOCs, others not at all. From a pedagogical point of view I wanted to integrate connectivist principles of diversity, autonomy, openness, interactivity/connectivity in our MOOC and I used a footprint to explain the balance between structure and agency in the cope14/15 MOOCs. The clusters address the approach of a learning scenario (open/structure), the learning environment, the potential for development of the learner and the learner's presence. With the visualization provided by the design footprint we could cover all aspects of our MOOC and discuss culture and values and the balance between structure and agency.

As well as drawing a footprint to support the design of the MOOC, we also asked the learners to draw footprints.

Examples of cope14/15 Learners' Footprints



Wiki URL : <http://footprints-of-emergence.wikispaces.com/Competences+for+Global+Collaboration+%28cope+15%29+MOOC+footprints>

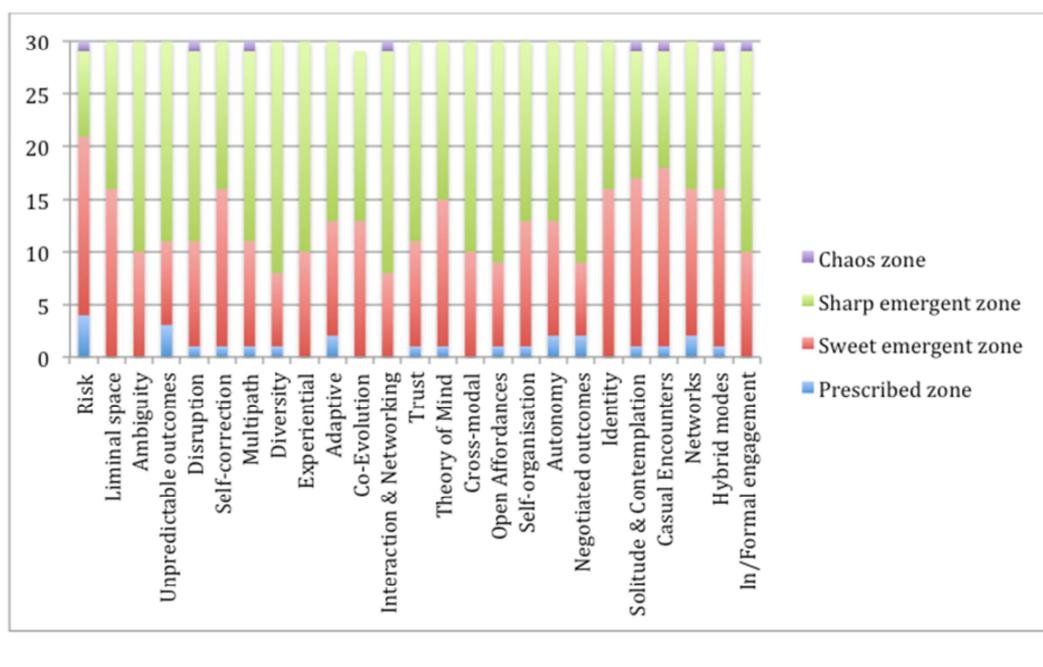
The learners footprints

Jutta: The last week in our MOOC was the week of transfer and reflection. In the advanced assignment of this week we invited the learners to draw a footprint of emergence. None of the assignments was obligatory in our MOOC. I included the footprints of emergence in our MOOC because I expected that the experience of learning in a MOOC was troublesome and exciting for the learners (as it was for me in my first MOOC). I wanted to give them the possibility to visualize their learning experience and make them realize their development during the six weeks.

I was very touched that 49 participants drew footprints (16% of the learners who were active at least once).

Jenny: In the slide there are only 4 examples. The rest are on our open wiki - <http://footprints-of-emergence.wikispaces.com/home>. But even from just these four footprints it is possible to see similarities between them and with the design footprint. They are all in the sweet or sharply emergent zone. None of the four learners experienced the MOOC as prescribed or chaotic to the extent of falling out of the course. The footprint on the bottom left shows that this learner experienced the course as sharply emergent/challenging for factors in three of the four clusters. The fact that two of these learners drew the footprints idiosyncratically, seems to indicate that they felt comfortable with the process.

Retrospective scoring of learners' footprints



Looking for patterns in the 49 footprints (30 learners allowed us to use the footprints for research)

Jenny: We realised that in order to see patterns across all the footprints we would need to adopt a less subjective way of analysing them.

So we retrospectively scored the footprints. We don't use a scoring system for drawing the footprints. We find it works better if they are drawn intuitively – but scoring retrospectively means we can look for patterns across all the footprints. Each point on each footprint was scored between 1 (prescribed zone) and 30 (edge of chaos). Jutta and I did this independently and then compared our scores. There were surprisingly few disparities, but where there were we resolved them through discussion. The scores were then entered into a spreadsheet to generate this chart.

Retrospective scoring and analysis of footprints in this case showed that learners' experience of cope15 was in the emergent learning zones – which was the intention of the cope 15 design. The learners experienced the MOOC as neither chaotic nor prescribed, but there were more sharp emergent learning scores than sweet emergent learning. Overall the footprints aligned with Jutta's MOOC design intentions.

We recognise that this is a rough outcome and that we need to do further work. The students self-selected to draw the footprints, so we could expect the confident successful students to do this. The majority were also the University's students so might have been trying to please their tutors. To overcome this the students would need to be

interviewed by an independent interviewer and we plan to do this in future work.

MOOC Participant Reflections

I did not always know what the factors meant for this MOOC experience - I liked the **challenge** because **every time I reflect something I understand it a bit more** and so it was very useful to **sum it up** for me.

Further reflections from the MOOC learners

Jutta: You should of course speak about the footprints, use them as basis for discussion and further reflection. In our cope-MOOC this wasn't planned as time was short. Therefore we were very happy that some of the learners wrote about drawing the footprints and what they learned by creating them . I copied some of their remarks into the next 3 slides.

This person wrote that s/he didn't understand all the factors which is understandable because of the complexity of the factors. Nevertheless s/he wrote that drawing the footprints was helpful for reflection.

MOOC Participant Reflections

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The footprint revealed one thing about me **that I didn't know before**: I found out that I really can enjoy not only the stressful style of learning (like in Russia :) but also a relaxed and **self-regulated way of MOOC**.

Jutta: One of the learners stated that his/her footprint revealed something new for him/her. I like this comment because it's what is happening with me all the time. I draw a footprint, look at it and get new ideas.

MOOC Participant Reflections

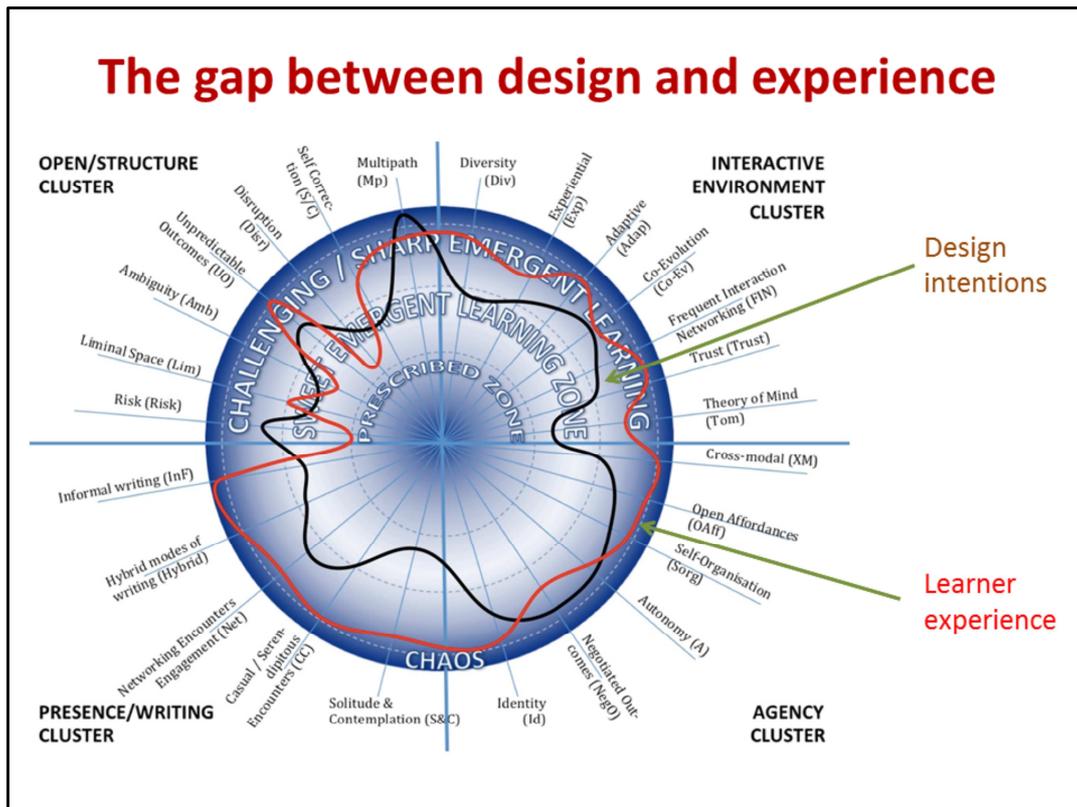
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First of all I think that my advantage was that I have already participated in cope14 and therefore I was **not threatened by chaos**.

Secondly I think that it helped me that I was more concentrating on doing the assignments **on the website instead of on other platforms**, as I am a quite structured person.

Jutta: In the comment of this learner we can see that using the footprints gives the learners ideas about prescription and chaos in learning. By focusing on the cope-website and therefore reducing the complexity of the factor "multipath" this learner influenced his or her learning environment.



The balance between structure and agency

Jenny: Here we have superimposed one learner's footprint (red line) over Jutta's design footprint (black line)

Through doing this the footprints can be compared. We would never expect there to be a perfect alignment, but through this it is possible to see the extent of any misalignment and adjust the course design accordingly. The learner can also be interviewed to find out more about their experience.

From the teacher perspective drawing footprints can help the teacher reflect on the balance between structure and agency, prescribed and emergent learning.

From the learner perspective drawing footprints can deepen reflection on learning. Drawing footprints is not a quick reflection and requires deeper engagement than a survey approach that is often adopted for end of course evaluations. The intention is to elicit tacit knowledge and understanding and users are often surprised by their footprints. Learners can also draw footprints as they progress through a course.

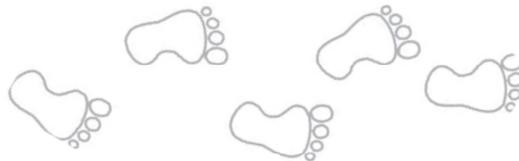
The Footprints of Emergence drawing template is a practical tool for:

- Helping designers and teachers to think about what they are trying to achieve and how they intend to do this
- Helping designers, teachers and learners to deepen their reflection on experience and to learn something new
- Helping to identify the balance between structure and agency in any given learning

environment

Ways forward

- A longitudinal study with physiotherapy students who will draw footprints to reflect on their learning in hospital/clinical placements
- Use of the footprints with teenagers in school
- A project for carers of the elderly to encourage reflection on their learning and practice



Future Work

Jutta: We have three main projects which will make use of footprints in the future.

1. We aim to conduct a longitudinal study with physiotherapy students which will include working with the students after each of their placements during their bachelor study (about 10 placements). We will be interviewing some of the students to get further insight into their learning processes based on their drawing of the footprints.
2. In about two weeks I will do a footprints workshop with school students. It will be the second time I will use the footprints with school students. After translating the factors into German we made an easier to understand version which we use with university and school students. The last time in school the students chose a very high or very low value for the factor trust. So the footprints showed us that in this class there was a problem with trust, which neither the teacher nor the head of school realized before. After the footprints workshop they decided to give the students extra support in group dynamics.
3. And now we are starting a new project with German partners where we will support online learning processes with carers of the elderly and we will introduce the footprints of emergence as a tool for reflection of learning and practice.

References

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Open wiki: <http://footprints-of-emergence.wikispaces.com/home>

Further information and resources:

<https://zmldidaktik.wordpress.com/footprints/footprints-of-emergence-english/>