Dr Dániel Barcza – Teaching the Unteachable

Sustainability in Education – Green Pedagogy
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1. **Learning the Unteachable – Teaching Sustainability at the Moholy-Nagy University of Art and Design**

2. I would like to welcome the conference participants. My name is Dániel Barcza; I am a professor at the Moholy-Nagy University of Art and Design and the head of the MOME Sustainability Office. I would like to thank the conference organisers very much for their kind invitation! Unfortunately, I am currently in Gothenburg, so I am unable to attend in person and can only join via this video message. In the following, I will outline how MOME students learn about sustainability and green competencies. I will also recount, through five short stories, the winding path—filled with both setbacks and successes—that our programme has taken to reach this point over the past 15 years.

3. I arrived at the Moholy-Nagy University of Art and Design in 2010. The rector at the time asked me to launch new courses and programmes on sustainability and ecological topics. Even then, 15 years ago, it was clear to all of us that the Earth's ecological system and humanity were in trouble. We were aware of the problems of climate change, overconsumption, environmental pollution and the destruction of nature. We knew what the causes were and what the expected consequences would be. We also knew that we needed to redefine the relationship between humans and nature. We must be able to imagine, plan and realise a sustainable future. And this requires a great deal of creativity.

4. At MOME, we believe that creativity is humanity's most powerful renewable resource. Our university is all about creativity and its development. This is the place from which László Moholy-Nagy, a leading figure of the Bauhaus movement, set off for the West, and the place where Ernő Rubik invented the Rubik's Cube. We currently offer courses in dozens of creative disciplines, ranging from architecture, through design, fashion and vehicle design, to photography, graphic design, animation and theoretical fields. We are training the creative professionals of the future, who will be responsible for our built, material, visual and digital environments.

5. My first story is about creativity and the early experimental courses.

6. "*Nearly 80% of a product's environmental impact is determined during the design phase*." I always began my first Ecodesign course with this dramatic opening line. I would then add to the students, "*You are the generation that must right the wrongs caused by my generation and that of my parents.*" It always worked. Their eyes would light up; the task of saving the world struck them as an exciting adventure rather than an unbearable burden. The task is huge but noble; there is time for it, and 80% means plenty of room for manoeuvre.

7. At first, we launched a series of pilot courses. Eco-design, Social Design, Art and Ecology, and other topics. We experimented to see what worked and what didn't. The courses weren't intended for the next fifty years, just as a test so we could learn from them. The teaching was project-based; students had to devise creative solutions to fictional challenges. They loved it. The subject was new and exciting, offering plenty of scope for creativity, carefree experimentation and creation. The students came up with one exciting concept after another.

8. One such example is design student Alberto Vasquez's off-grid street lamp, named Flow Lamp. The bamboo lamppost, which operates on the principle of a wind turbine, generates the necessary electricity itself. The design was created for the dark, deserted stretches of the Colombian coastline, with the aim of improving public safety. The concept was very successful, winning numerous international awards.

9. Or take Sára Gulyás, a textile and fashion design student, and her shoe collection called PikkPack, which is designed to minimise cutting waste, can be assembled by the user, and at the end of the product's life cycle can be taken apart and recycled according to material type.

10. And then there is Péter Toronyo's prototype of a heating device called KÁLHA, which offers homeless people a chance of survival during the winter months.

    The experimental sustainability courses gave plenty of scope for imagination, and the students really enjoyed them. But once the course was over, they moved on to the next topic, and after graduation, they took on conventional market-oriented roles. Sustainability and ecological thinking did not become an attitude or a commitment. It was an exciting excursion into the realm of fairy tales.

11. The following story is about experience and coming face to face with reality.

12. We changed our teaching strategy. We set up a creative research lab that tackled real-world problems and projects. This was the MOME EcoLab, which I founded with my colleague Bori Fehér. Initially, the focus was on ecological sustainability, but we gradually shifted our attention towards social issues. The pedagogical concept was exciting; we took learning outside the traditional curriculum. This meant we weren't constrained by academic administration, the pressure of credits, or the dynamics of the academic term. Students joined out of their own motivation, and in return, they could create in the real world.

13. We launched one of our early projects in one of Hungary's poorest regions, the Bódva Valley in Borsod.

14. Here, the students encountered a reality they could never have experienced on the elite Buda campus. Ninety per cent of the population of Bódvalenke lives in extreme poverty, with unemployment at a similar rate. Most homes lack running water and sewerage. Hunger is common, and during the winter months there is often nothing to heat the homes with. It was a shock for the students to be confronted with this reality.

15. We set ourselves the goal of promoting local produce and establishing a social enterprise. This would create jobs and generate income for local residents. The area is rich in wild herbs, fruits and mushrooms. We were able to build on this resource. By processing these in dried and dehydrated forms, and providing them with appropriate packaging and branding, we aimed to create high-value-added, marketable products.

16. In addition to the product range, we also designed the infrastructure required for drying and plant processing. We worked with inexpensive, locally available materials, using solutions simplified to the extreme. So that the locals could produce them themselves. We made up for the lack of resources with creativity and created new value. We were proud of the results and felt that the first phase of the project had been a success.

    The cold shower came on the last day of the creative camp. We were just saying goodbye to the local children and promising that we'd be back in six months' time. When one of the little boys piped up. "*These wooden structures won't be here by then*." "Why not?" we asked. "*Because we'll burn them in the winter. We need the wood so we don't get cold*."

This was one of the defining moments of my life: the realisation of just how blind we can be, both as designers and as educators. We had only scratched the surface of extreme poverty, this terribly complex and deeply rooted problem.

17. The following story is a continuation of this, but it is now about community and collaboration.

18. We changed tactics again. In Bódvalenke, we realised that we were the learners here. Our job was not to tell them what to do, but to listen and learn from the locals. We began working with the pupils of Bódvaszilas Primary School. They became our teachers for the next four or five years. Our shared goal was for the children themselves to be able to transform the school environment in their own image.

19. And we supported them as mentors. We helped them turn their ideas into plans, and those plans into reality. We showed them how to use a paintbrush, a screwdriver and a sander so that they could build what they had imagined. And gradually, over the years, they came to trust us, and we became part of their community.

20. By following them for years, we began to understand the complexity of structural deep poverty. How birth and social position determine a child's prospects in life. How segregation works in state education. How childhood dreams fall apart by the age of 16, when they realise that society has no need for them. We understood what we, as designers, can change, and what we cannot. And also that change can only be achieved by building on trust and through collaboration.

21. Let's now jump forward in time and talk about the nature of knowledge and the possession of knowledge.

22. "*What do we see in the picture?*" I usually start the introductory lecture for the *Ecology 2 Design* foundation module with this question. After many years of project-based teaching, we decided that a deeper and more structured theoretical foundation was necessary for mastering sustainable design. This became the *Ecology 2 Design* module system.

    In response to my opening question about what we can see in the picture, the obvious answer is, of course, the planet Earth. But there are always one or two photography students in the classroom who know that this is specifically the famous 'Blue Marble' photograph, one of the very first space images of Earth. Some even know that it was taken by the crew of Apollo 17, using a Hasselblad camera fitted with an 80mm Zeiss lens. I like to use this photograph. It vividly illustrates the finiteness of our Earth and the limits of growth. 1972, the year it was taken, ties in well with the early days of the environmental movement and the emergence of the concept of sustainability. And with other theoretical knowledge that is essential.

    Teaching lexical knowledge to art students is a serious pedagogical challenge, almost impossible. After two dates and a diagram, half the class is already asleep, whilst the other half is drawing, knitting or scrolling through Instagram. You have to pull out all the pedagogical and communicative stops to keep their attention. One such trick is visual storytelling.

23. With a striking visual gag, we can easily bridge the gap to the concept of the ecological footprint. *"How many Earths would humanity need for the planet to sustain our consumption needs in a renewable way?"*

24. Or, taking the narrative further, we can immediately be horrified by the ecological footprint of the average American citizen. Filled with emotion, the path to understanding the concepts of biocapacity, population dynamics, exponential growth and positive feedback loops becomes easier. At MOME, of course, everything has to be packaged in a story.

25. One such example is the case of St Matthew's Island, where a pair of reindeer were introduced and then left to their own devices. Over time, they grew into a huge colony, until they overgrazed their sole food source and died out almost without a trace. An art student will still be dreaming of the bohemian reindeer of St Matthew's twenty years from now, but will have forgotten the diagram by the very next day. Through storytelling, even drier topics such as climate adaptation or the functioning of a circular economy can be inspiring.

26. That's why I was surprised when, after one of the lessons, several students came up to me, looking a bit awkward. *"Sir, we know this is a compulsory subject. And it's all great, and, well… but we don't want to come to the class anymore."* I was taken aback; I'd never encountered anything like this before. As we talked, it became clear that they were terribly anxious about the future. I sensed that their anxiety wasn't just an act, but a deep, primal fear. Right then and there, I realised that this is no longer the generation of ten years ago, whose eyes would light up at the prospect of saving the world. For Generation Z and Generation Alpha, these problems already represent a daily reality that is hopeless and unsolvable. Their retreat into conscious passivity is a self-defence mechanism. According to a 2022 survey, 90% of Hungarian young people aged 13–25 are anxious about climate change, whilst 53% feel a sense of hopeless helplessness and an inability to act.

27. The next phase of our educational experiment could therefore be about nothing other than collective action.

28. In 2022, MOME made a major commitment: it decided to become carbon-neutral by 2030, the first among Hungarian higher education institutions to do so. Anyone familiar with sustainable architecture knows that an institution's greenhouse gas emissions can be significantly reduced through energy efficiency, optimisation and the use of renewable energy. But they can never be reduced to zero. Carbon neutrality can only be achieved through some form of supplementary carbon sequestration activity. MOME has chosen afforestation for this task.

29. The primary aim of the MOME Forest Programme is to establish 40 hectares of carbon-sequestering permanent forest within the nature conservation areas of two national parks. Every autumn, nearly 200 MOME students, lecturers and staff take part in a community tree-planting event lasting several days. On each occasion, nearly 40,000 saplings are planted across an area of 7–8 hectares, using climate-resilient, native tree species.

30. Tree planting is a trendy and romantic Instagram activity these days. But anyone who has ever planted on a forestry scale – thousands of saplings in the slimy cold and mud of November – knows there is nothing romantic about it. As the first-year students put it: "*it's a massive pain*". They don't understand why they have to do it, since they applied to an art university, not a forestry college. For many of them, this is far beyond their comfort zone, a torturous ordeal. The struggle is incredibly hard for them.

31. Yet, after two or three days of shared hardship, they look out proudly at the new, growing forest, which is, in a way, their own. They are proud of themselves for having done something tangible to combat climate change. They are proud that they have overcome the hardship, and also that they belong to the MOME community. Many describe these three days as a transformative experience, when they were able to step away from the digital world and connect with nature and their peers. They felt empowered once again. According to student feedback, 90% of them would like to return in the future and do more for nature.

32. Driven by the educational and community-building success of the reforestation initiative, the university has launched numerous sustainability action programmes in recent years. These are aimed not only at climate protection, but also at climate adaptation, increasing biodiversity, and circular and regenerative operations. MOME can only credibly educate a new generation of

environmentally conscious designers if, as an institution, it takes sustainable operations seriously itself.

We have transformed the park on the MOME campus into a living laboratory and an ecological learning environment. We have created a community garden covering nearly 500 m², which is tended by students and staff. In addition to fruit and vegetables, they also grow dye plants, fibre plants and medicinal herbs, which are later used in creative work. Attached to the garden is a composting facility, which collects the campus's green waste and provides nutrients for the community garden. Here, we experiment with various composting techniques and monitor the dynamics of decomposition.
A special feature of our campus is the MOME apiary, which is home to four bee colonies. At first glance, it may seem surprising that an art university shares its campus with 200,000 bees. But learning to live in harmony with nature is not something to be done in theory, but in everyday reality. The 150 kilos of honey produced by the bees each year certainly helps a great deal in fostering mutual acceptance.
Another exciting student initiative is the Leftovers Bank, where students can deposit waste materials left over from their creative processes and freely rummage through others' valuable waste. The principle of the circular economy thus does not remain a theoretical concept, but becomes an everyday treasure hunt.

33. These action programmes provide the ecological action component of our training. The modules providing structured knowledge, the aforementioned Ecology2Design I and II, are built upon this. But how is all this integrated and combined with disciplinary professional competences? This is ensured by creative future-building projects, where a green, sustainable future must be designed. Similar to the creative designs presented at the start of the lecture, this is no longer an irresponsible foray into Wonderland, but conscious design grounded in knowledge, skills and attitude alike. The synthesis of many learning impulses.
MOME offers a rich array of curricular and extra-curricular, individual and community-based, compulsory and optional learning opportunities. Students can then flexibly assemble their own learning pathways from these.

34. And this brings us back to the original question: how can green skills and sustainability be taught? Since 2010, we have travelled a long and winding road. Not with a disciplined pedagogical approach, but rather with the somewhat chaotic, iterative mindset of unrestrained design thinking. I would be wary of distilling a universal formula from these adventures for others. But over the years, the many failures and 'Aha!' moments, both for myself and in the context of teaching at MOME, have led to the following insights:

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- **Sustainability cannot be taught, but it can be learnt.** The main role lies with the learner. It is they who discover, experience, understand, struggle and create.
- **The educator is not a teacher, but a guide.** They create opportunities, offer support, and provide a framework for the students.
- **Green pedagogy is not a recipe, but an attitude. It is** experimental, curious and adaptive. Here, everyone learns, the professor just as much as the student.
- **Sustainability is not a theory, but action.** It is humanity's most pressing practical task. So let's do it first, and only then reflect on it.
- **Creativity is not a rare earth element, but our most powerful renewable resource**. It can be found everywhere, in the Bódva Valley or in Vojvodina just as much as within the walls of MOME.

Thank you for listening, and I wish everyone a further rewarding conference experience.