

Design thinking in education

Episode 1

Daniek Bosch - Host

Hi, welcome to this series on design thinking in education. I'm Daniek Bosch a learning experience designer at the Center for Innovation, at Leiden university. In my work, I try to inspire teachers to create engaging and effective learning experiences.

In this series, I interview teachers at Leiden University who are using design thinking as a didactical tool. In each episode you get practical tips on how to use this approach yourself.

In this first episode, you will hear what design thinking is and how students react to this approach.

I will talk with Min Cho, a teacher, an expert in global health and international development at Leiden University College, and with Nadia Teunissen an expert in design thinking and also a teacher.

Together, they taught the class Design for the future, wicked environmental problems in sustainability and health.

In this class, students solved a challenge around household hazardous medical waste using the design thinking methodology.

[Nadia can, you give a short explanation of what design thinking is.](#)

Nadia Teunissen

Well, to start off. I don't think there is one fixed definition for it. But I would say

[it's, a holistic, human centered approach or method, to innovate or to solve problems through creativity. And therefore, it's also a way to create positive impact in the world.](#)

Because I think by using this approach, you are able to address certain big or complex or as we call it, wicked problems in a structured but iterative way. Because you use divergent thinking and convergent thinking, and certain process steps. During these process steps, for example, the empathy phase or ideation phase, you use creativity activities that on the one hand, foster collaboration between different disciplines and point of views. You're trying to solve problems, of course. But you also try to critically, critically think about the core of the problem. And then also to come up with tangible solutions.

As an educational model, I think, design thinking therefore, or has therefore the potential to train students in certain important 21st century skills, such as what I mentioned, creativity, but also adaptability.

And I think, well, now we need those skills more than ever. Like the pandemic has shown us, that the ability to bounce back and come up with new ideas are crucial in order to move forward.

Daniek Bosch - Host

And Min, what made you decide to integrate Design Thinking into this course on household hazardous waste?

Min Cho

Yeah, I like the approach of the design thinking as a mindset. So it's more of a growth mindset of problem-solving. And it's also more learner centered attitude rather than the traditional mode of knowledge being transferred to the student. The student is more of the active, proactive role of trying to be yeah, the learning individual and try to have a more human-centered approach. So I was one of the reasons why I thought design thinking could be a good approach for education.

Daniek Bosch - Host

What did it look like, the design thinking in your course?

Min Cho

Well, the students were working as a team and they came up with their own projects. So they took a very proactive approach of what they wanted to do and how they wanted to solve wicked problems. And we can really see from the course of how they tried to engage and also try to explore what are the possibilities. Also you see them struggle a bit in terms of trying to find their creative aspects and try to solve problems.

And that I think that's also a learning opportunity for the students, but also engaging moments for us just to see how they could grow potentially.

Daniek Bosch - Host

Yeah, because in your class, all the students got a question that they had to solve right? What was the central question?

Min Cho

So they were given a context of the medical waste, the household hazardous waste. And they had to solve the wicked problem of the household hazardous waste and how find their own persona and try to see how they can actually solve it from there persona that they have created.

Nadia Teunissen

And to add to that we indeed have created a design brief as we call it. So household hazardous waste is quite a broad term and we specified it to medical waste. And then we posed them the question like, how can you either deal with or prevent household hazardous waste being medical waste at a household level. So that also gave, the program a bit of a focus, but then we brought it back to them and they could go broader. So that's again that the divergent convergent thinking you start at a certain point, but then they start to explore on their own. So it can go a little bit left or right, but that's what they started off with.

Daniek Bosch - Host

I visited this your class and I remember that the students really took different perspectives. So one had a persona with diabetes that they were solving this problem for. And so there are different aspects that they chose themselves, right?

Nadia Teunissen

Yes. And actually, the diabetes group changed from diabetes to acne to birth control. So they took various approaches. And so that was also learning moment for us in terms of trying to guide the students and as they converge and diverge. Of course, they also sometimes struggle in terms of how to make their own project work and make the prototype. So guiding them through that process and also helping them engage with their creative thinking was also fun for us.

Daniek Bosch - Host

That connects to my next question. Did you notice there was a difference in the way the students engaged with this class compared to other classes where it's more traditional approach.

Min Cho

All the courses that I teach normally, even if it's a seminar and discussion based, where we engage in a certain topic and we try to think critically and also have a meaningful discussion.

The benefit of having design thinking in education is that students are very active in terms of creating their own, making their own solutions and products per se. So I could really see that students come up with these out-of-the-box thinking. So one of the groups came up with the art

project with the medical waste. So they actually held a workshop. They were very proactive and explaining to other students of what medical waste was. All the art projects that came out from that they were actually quite impressive. And you normally don't see that in a traditional setting per se, we would never imagine having an art piece from medical waste. That was also fun to see from the class.

Nadia Teunissen

Yeah, yeah, I think that also shows what design thinking brings to scientific education. It really helps you put that theory into practice. Like in academia we teach critical thinking. We teach understanding the core of the problem or an issue. And I think design thinking really helps to bring these insights that you get into tangible solutions and also therefore put it in the real world.

And I think a nice thing to share is that some students said that they sometimes actually feel overwhelmed by everything that is wrong in the world without actually knowing how to act on it. But after learning design thinking and the steps, they said that they actually felt equipped with tools and skills to actually do something and well-being it a small piece of the puzzle, of course. But I think that as actually shows what design thinking can bring to education. Not only in a practical sense by coming up with the solution, but also more on a personal level. So what men said that they actually feel confident that they're able to bring about some change in the world around them. And I think that dealing with uncertainties and daring to fail during these are all steps that during the design thinking process definitely adds to that.

Daniek Bosch - Host

Yeah, great. So you're giving the students a tool to really start working on the problems that they are researching during their time at university?

Nadia Teunissen

Yeah, exactly. Yeah.

Min Cho

Yeah. And there's not that many opportunities where students are allowed to fail. So I think one of the surprising moments for us was that students were so afraid of failing and we kept telling them it's part of the process. There's going to be trials and errors. But as, as students, they, they're so used to getting that perfect grade or striving for the best grade possible. So they want everything to be as perfect as possible. That kind of goes against the whole process of design thinking because you are supposed to actually have these trials and errors and also failures and you're supposed to learn from your failures. So I think that was also surprising moment for us where students kept telling us, what is the right answer, what was the right approach? How do we get yeah, how do we get an a?

We kept telling them. It's not, that's not the point of the course. At the point of the course is for you to actually go through the motion of trials and errors and learn from the experience. So I think that also differentiates from the traditional education approach where we, we tried to give the students context and the knowledge and how they need to prove themselves and what they digested and what they learned from that, from that learning and knowledge, but from design thinking is more of an experiential. So they actually need to go through the process and try to learn from the experience per se.

Nadia Teunissen

Yeah, that really brings that ambiguity. And most students are uncomfortable with that. They don't like to make mistakes, mistakes or they don't like to fail. But it's a big part of design thinking. And of course it's part of life in general. So I think that's a critical skill that we actually need to teach our students more.

Daniek Bosch - Host

So very different indeed from handing in a draft of an essay that as a student, you've already hope that it's near perfect because then you don't have to spend that much work on it after the feedback from the teacher. And here it's just had in the first try and tried to make as many mistakes as possible in the beginning. So you end up with a better product in the end.

Nadia Teunissen

To add one thing. We also notice that indeed students are used to getting feedback on the things being made. And often that is, while it's in way, it can be positive criticism. It's always how to do better.

Whereas we also noticed that encouraging them and let them know what they are already doing well, what they're good at, actually help them in well, becoming more competent, but also to increase their motivation for the course. Although they not always felt comfortable or getting the process, that close connection actually well helped to overcome those uncertainties and well helps in dealing with ambiguity.

Daniek Bosch - Host

I can imagine that it's a different kinds of feedback that you get in this project than in a normal project.

Would you have some advice for teachers on how to make students more comfortable with this idea of failing is okay and it leads to learning.

Nadia Teunissen

I think just repeatedly mentioned it, to start with and also showing your own vulnerability that you also not always know the answer, that you also make mistakes. And of course, that's also difficult for us humans.

And so I will not say that I'm comfortable in showing all my mistakes, of course, but I think that's the start and I will also be said also give a conflict compliment every now and then. That really helps.

Min Cho

Actually this kind of leads to, I guess the teaching style aspect in all in this course and also in the previous courses.

I always approach to the students by saying that even though I may have more expertise and knowledge in the field. It doesn't mean that I have all the knowledge where all the, all the perfection of what I teach. So I always tell them that it's a learning process for both the students and for myself.

I've tried to see what the field is about and how do we engage with that field per se. So I think being open about that you yourself are not perfect. Trying to bring down that barrier of the professor student hierarchy rather than like a co-learning environment. I think that also helps in terms of engaging with the students and design thinking actually kind of brings the students as the main role because they, they have to navigate their own journey, own learning journey. So I think encouraging them that they are the owners of their learning journey and that they have the potential of doing that. And I think that also helps with the process as well. If other teachers also want to adopt design thinking, I think that that type of mindset would be helpful.

Nadia Teunissen

Yeah, and very practical. You may also use some exercises to sort of kick start this, to just do and see what happens to not be too perfectionist because a lot of students are perfectionists, at least in our group. So that also how to have these little small exercises that well, that aren't that bad if you well, mix it up. I wanted to use another word but I won't use it. But I think that helps.

So they had some of these creativity exercises that they were given, like five or ten minutes and they had to build a house or that they had to come up with various ways of how to use an orange, for example. So there are very simple and very easy ways to just start exploring we coming up with things, speaking them out loud.

Because that's also a big part of daring to fail that you say something and somebody disagrees, for example. That also really helps. So that's more of the practical side of this topic.

Min Cho

Another one, they had to describe each other, but not look at each other. And they had to draw their portraits. And of course, it wasn't perfect. But. Were, they were kind of also striving to have that perfect face. And then later when they, when they found out that everybody kinda screwed up with drawing the faces, they were a bit relieved and that was also funny to see. So any, any type of those exercises where they are encouraged to show and also show that they, they all can make mistakes. I think that that would be a good approach for just opening up these type of aspects.

Daniek Bosch - Host

So getting students used to this type of thinking, that it doesn't have to be perfect. But then in a more light setting where they're not going to get graded for your answers to, how can you use an orange. But that also makes it easier for the students I imagine to think of funny and crazy things.

Nadia Teunissen

Yeah, exactly. To trust the process more. Yeah.

Daniek Bosch - Host

And to round-up this part. What was your favorite moment in the class, Nadia?

Nadia Teunissen

Well, actually the one with the orange. I really like that one because it is really fun to watch the process if you do an activity like that, at first, there is confusion like what do we need to do, I don't get it. What's the point? But they just have to do it and they, because they're uncomfortable, they are trying to come up with ways of to succeed the assignments, so to say. But once they start brainstorming without, I don't know any boundaries, you really see that sparkle coming in their eyes. And afterwards they were actually amazed with all the things they came up with out of one single orange. So that one I really like, I and of course a really proud moment where the final pitches to see how they turned a very complex problem into actual tangible solutions so that they created something out of nothing. I really like that, that part. So it's the little things and a big things.

Daniek Bosch - Host

And how about you Min?

Min Cho

Yeah, I would say making a house of all the materials that they could find in their rooms. That was also fun. Like some of them actually really had artistic ones. Of course. Some of us had really basic

just boxes and stickers and all that. But that also surprise me because I didn't expect some of their creativity because I already knew some of the students before of my previous courses. So that was also quite positive surprise to find that some of my students had really good creativity. They had been hiding from me. And the final pitches I was, unfortunately I wasn't able to be there, but I heard from all the other stakeholders and all those were engaged that it was, it was an amazing, amazing presentation. So that was really good to hear because I know all of our team, they put in so much effort in terms of guiding the students to their final journey. And it was good to see that how it came as a fruit.

Nadia Teunissen

Yeah, maybe also one thing just but that's more like a thematic thing, but to see or reflect, to see, some students reflect on their creativity. And so they, they never felt that they were creative. And they actually said afterwards like, but I am, I am able to in my own way and not the artistic way, but I don't know my critical thinking or my ability to observe from a bird's eye view or to come up with things because I see something in my surroundings. I don't know, like that there are many ways to be creative and that they actually afterwards felt that. I think that's also what I found in a beautiful thing to see because I think we need more creativity in the world to solve all of our issues.

Daniek Bosch - Host

Yeah, that's probably something you really hope for when you start designing and teaching this kind of course. But it, it's not something that you can always design for because it's really also in what the students bring to the table. And it sounds like that in this class, the students were really open and the learned how to experiment and find out new things about themselves in the process. That's great.

Nadia Teunissen

Yeah, that's not to say that they weren't critical at times and they weren't because they were uncomfortable. Perhaps. They could also not like certain things. But like at first, me as a trainer, I could take it personally to oh shit, we did not create a good session. But afterwards I was more aware that this is part of the process that they are going through because I experienced it myself couple of times when I did design thinking myself. So that's also good for teachers to know that you might get these kind of question, you might get these kind of remarks. But it is, it is part of the process. And if you assure them that they can trust the process, that that really helps.

Daniek Bosch - Host

Yeah, So as a teacher, you also have to let yourself fail as a, as a teacher in the making, in the first parts where you're guiding them every step of the way. But that's brings out better result in the end.

Nadia Teunissen

Yeah. And I think we had like a little extra difficulty with the online sessions because while if you're working with a process, you, it, it helps if you can observe what's happening and that is more difficult to do online when people are in breakout, like if you bump into the breakout rooms, they immediately know you're there. We really notice the difference once we were allowed to come together in small groups of four to see how they worked and where they were stuck. Then you are able to take on then guiding facilitator role even better.

Daniek Bosch - Host

Yes, that does sound like an extra challenge that you also have to take into account the limitations of the online environments. Well, that was it for this first episodes on design thinking in education. In the next episodes, we continue the conversation with Min and Nadia around the role of the teacher in the design thinking process.