Digital Didactical Designs
Teaching and Learning in CrossActionSpaces

Chapter 1

In the digital age, new ways of learning are evolving, especially outside educational institutions, we see a change how people learn, for example, how they connect to each other's resources. This is different to the world inside schools and universities. Educational programs do approach today's learners with yesterday's ways and yesterday's tools – a gap between Homo Interneticus and Homo Didacticus. Chapter 1 introduces the challenges of designing for teaching and learning. When using web-enabled technology, the traditional classroom co-expands into CrossActionSpaces where learners become reflective makers in groups. Teaching under those conditions turns into process designs for learning expeditions.

Chapter 2

In the digital networked and data-driven world a new space for communication is co-expanding – CrossActionSpaces. Chapter 2 introduces the character of CrossActionSpaces. They do not replace existing socio-technical systems or communities rather it can be understood as a new substitute form of communication. The spaces emerge through human inter-action and mainly cross-action grounded on communication. The underlying knowledge of what communication is, how communication organizes itself in social and sociotechnical systems, and how they differ from technical systems, is discussed. CrossActionSpaces are characterized by a higher tension between openness and constraints than in the non-digital world.

Chapter 3

CrossActionSpaces are constituted by communication but they are not totally open. Chapter 3 reveals the character of closeness, boundaries and re-codings. People make decisions about what space to enter, while doing, they exclude and include. Even if they want, they cannot participate at all spaces due to limited resources (time, cognitive load). Boundaries are built through expectations. Chapter 3 points to those dynamics using the lens of social patterns known as roles. Where people interact, they create roles. Instead of neglecting these, it is time to include them in designs that learners reflect and change them towards reflective makers of learning.

Chapter 4

When human *inter*action is evolving towards *cross*actions, the question is, what learning is. Learning is reflective communication, more specifically, learning is communication in forms of reflective performance of cross-actions. Chapter 4

illustrates what learning as cross-action requires; how it can be understood. The chapter reveals how education has been understood over years and argues to go beyond the concept of classrooms. A candidate for shifting from course-based learning into 'learning expeditions' is research-mode learning. It results in a model for future schools and universities where the curriculum provides half of the aims but learners create the other half.

Chapter 5

What is the purpose of teaching in CrossActionSpaces and how can it create quality designs for learning? Chapter 5 introduces into the approach of Digital Didactical Design (DDD) and how it is useful for studying the interrelationships of learning, ICT, teaching and innovative pedagogy in education. It requires a design perspective. Teaching is process design for learning. This design view is not only a matter for science or researchers; it also claims that teachers together with students become reflective and collaborative designers for learning. Teacher education needs to integrate this view into study programs – 'teaching and learning as design science'.

Chapter 6

Do educational programs approach today's learners with yesterday's tools? Chapter 6 illustrates five projects towards new designs for learning expeditions and reflective CrossActionSpaces. InPUD shows technology-embraced informal-*in*-formal learning. PeTEX created remote labs in engineering education across three countries where its learning walkthroughs support different learner skills. DaVinci asked teachers how they grasp student creativity. The findings reveal conditions for creativity in learning expeditions. In IPM, students did not use the mobile devices for learning. In studying the reasons, it discusses the challenges when designing for cross-actions. In our tablet-classroom studies, we saw how teachers design 'learning through reflective making'.

Chapter 7

Chapter 7 provides a summary of the main messages. Enlightening E1: Our world is not one sphere but appears as many CrossActionSpaces. E2: Learning is reflective cross-action. E3: Teaching neglects designs for learnerpreneurs. E4: Teaching is process design for learning. E5: Education needs designs for learning expeditions. E6: Not all learning is measurable but can be made visible. E7: ICT is more than just a tool; it is a mediator and part of human communication. E8: Learning analytics requires an ethical discussion. E9: There are no simple models for digital didactical designs but empowering teachers and learners towards Design Thinking.