Designing pedagogical innovation for collaborating teacher teams
In this design-based research project, teachers co-created and used a new learning design model, the IT-Pedagogical Think Tank Model for Teacher Teams. This continuous-competence-development method enabled teachers to collaborate and develop innovative-learning designs for students in a new hybrid synchronous video-mediated learning environment. The article presents the IT-Pedagogical Think Tank Model and investigates how this new community of practice was supported and cultivated in the educational institution. The study took place at VUC Storstrøm, Denmark, where teachers taught students attending a full-time, two-year, upper-secondary, general-education programme. The findings were that various platforms, tools and social frameworks supported the pedagogical innovative process and established the team as a professional community of practice in the organisation. The team’s identity was strengthened as it added value to the organisation by inviting other communities of practice from the organisation into collaborative competence-development processes. The team members acted as good examples of innovative learning designers and were able to heighten the level of sophistication in the community’s pedagogical discussions. The school administration’s provision of resources and support was found to be a key factor in successful implementation of the new team meetings.
How Student Game Designers Design Learning into Games

This investigation examined how to support students in creating learning designs for specific learning goals in analogue and digital games as a means of learning. The study also explored the learning trajectories that emerged in the digital games created by the student learning-game designers. The DBR study was developed through three iterations over two years, involving teachers and students in co-design processes. Together with the teachers, an overall learning design supported the learning process for students by inviting them to be their own learning designers as they designed digital learning games for specific learning goals in cross-disciplinary subject matters. The findings were that the students succeeded in developing and implementing specific learning goals in their games. The students also developed learning trajectories through the games by designing various learning and evaluation opportunities for the player/learner playing the game.

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Conference: Games Learning Society 12.0, Madison, Wisconsin, United States, 17/08/2016 - 17/08/2016

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Learning and Design Processes in a Gamified Learning Design in which Students Create Curriculum-Based Digital Learning Games

This research project experimented with a gamified learning design enabling adult learners to design digital games while implementing learning goals from their curriculum. The aim was to develop a reusable learning design for upper secondary
teachers and students who are game design novices. The gamified learning design supported the innovative learning processes for the students, and the teacher participated as an inspirational guide for the students as they designed curriculum-based learning games. This article describes the learning design, how the teachers contributed to the students’ cognitively complex learning processes, and how four parallel types of processes for designing and learning supported this gamified learning design. The experiment took place in a hybrid synchronous learning environment. The project found that the students experienced deep and motivating learning and that the teachers found this problem-based and activating learning design inspiring and easy to use as a variation to more traditional teaching approaches.

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Reflective, Creative and Computational Thinking Strategies Used When Students Learn Through Making Games
Since the 1980s, scholars have had visions about how computers can change how we think and learn and may support more engaging learning processes. Recently many countries have extended their formal school systems to teach students about computational thinking, with the aim to support children in mastering digital materials, becoming digital producers, and using technology to develop the ability to use their creativity and develop problem-based digital projects. One of the questions in this new area of formal educational is whether acquiring computational thinking (CT) skills should be a goal in itself—that is, a new subject matter in the curriculum—or whether CT should become part of cross-disciplinary projects in school. The basis for the current experiment is a longitudinal (four years), design-based research experiment, where CT was used as one of the means to reach learning goals in cross-disciplinary academic subjects. In the current part of the experiment, adult high school students (K–11) created digital learning games using the game design tool Scratch. The purpose was to teach their classmates about specific learning goals in geography, chemistry, biology, and social studies within their digital learnings games while they themselves learned about these subject matters through the learning game creation process. The findings were that game design and CT could be used as means to reach learning goals and spark reflections about cross-disciplinary academic subject matter and that the learning game construction process involved the students’ considerations about four central areas and processes within these areas. Also, as the students transformed their games from a vision to a concept and into a concrete digital object, they were challenged to become innovative and creative and were supported in their thinking and learning processes, developing knowledge about problem-based work and CT competencies.

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Student Learning-Game Designs: Emerging Learning Trajectories
This article presents new knowledge about how students can implement learning and game elements into analogue and digital learning games as a
means of learning and teaching curriculum-based subject matter. The purpose of the analysis is to identify what learning-game design elements were used in four learning games created by students, to investigate how these elements were employed, to determine what learning trajectories emerged in the two digital game tools and to offer reflections and suggestions regarding the learning processes students experienced when building the various learning trajectories for specific learning goals into the digital games. The article examines how specific features in the two digital game tools, Scratch and RGBMaker, afford creation of learning trajectories in various ways, enabling deep learning and gameplay processes for the players of the games. According to the study, the level of complexity of the built-in learning trajectories in the games was mirrored in the cognitive complexity of the student game designers' learning processes. The article presents four student-created games that demonstrate a progression in the depth of potential learning experiences. The student learning-game designers re-interpreted and used the conceptualised game-mechanics in the game tools to create complex learning trajectories and engaging gameplay. The analysis can be used to guide teachers on what learning-game design processes and elements should be supported in order to facilitate deep learning in this teaching and learning approach.

The design-based research project used qualitative research methods; this included audio- and videotaped utterances and observations of the teachers and students as well as analysis of the students’ paper prototype and digital learning games. Teachers and adult students from a full-time upper secondary general education program at VUC Storstrøm participated in co-design workshops through two iterations.

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Learning Design Patterns for Hybrid Synchronous Video-Mediated Learning Environments
This article describes an innovative learning environment where remote and face-to-face full-time general upper secondary adult students jointly participate in the same live classes at VUC Storstrøm, an adult learning centre in Denmark. The teachers developed new learning designs as a part of their daily practices and also participated in a design-based research project exploring new learning designs for this environment (Weitze, 2015). The teachers' traditional learning designs were challenged, and this led to altered pedagogical approaches with less group-work and an extensive use of monologue-based teaching. The findings were, however, that the teachers, through pedagogically innovative strategies, developed knowledge about how their pedagogical patterns in this hybrid synchronous learning situation could be supported by an array of additional educational technologies and strategies to create activating and equal learning designs for the students. This article is written on the basis of a chapter in the PhD–thesis by the author.

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Designing for learning and play: The smiley model as a framework
This paper presents the Smiley Model as a framework for designing engaging learning experiences in games. In a design-based research project, student game designers learned inside a gamified learning design while designing and implementing learning goals from curriculum into small digital games. Project participants were adult students in an upper secondary general education program. The Smiley Model inspired and provided a scaffold or a heuristic for the overall gamified learning design and for the students’ learning game design processes, turning the learning situation into an engaging experience while integrating learning and play.1 The student game designers reached cognitively complex levels of understanding by designing learning situations into the digital learning games. They experienced motivating learning situations, and the social and collaborative learning processes in the class increased.

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Innovative Pedagogical Processes Involving Educational Technology
This design-based research project investigates the elements, methods, processes and practices that can contribute to the creation of reflected, innovative and motivating learning designs for teachers and students in a hybrid synchronous video-mediated teaching context, with a focus on how to create motivating learning for the students. This was done by examining the three actors in the educational institution (students, teachers and the surrounding organisation) individually and relationally. The design-based research project developed knowledge in co-design processes with the three actors about how design and learning processes can support continuous pedagogical innovation and competence development. The objective of the learning designs was to create motivating learning experiences for the students in the hybrid synchronous video-mediated learning environment, to which end it experimented with gamified learning designs. This involved the students designing digital games while implementing learning goals from their curriculum. The project thus created knowledge about which learning designs and competence development models were possible in this environment, which learning designs emerged and where difficulties were experienced.
Learning and Motivational Processes When Students Design Curriculum-Based Digital Learning Games

This design-based research (DBR) project has developed an overall gamified learning design (big Game) to facilitate the learning process for adult students by inviting them to be their own learning designers through designing digital learning games (small games) in cross-disciplinary subject matters. The DBR project has investigated and experimented with which elements, methods, and processes are important when aiming at creating a cognitive complex (Anderson and Krathwohl, 2001) and motivating learning process within a reusable game-based learning design. This project took place in a co-design process with teachers and students. The learning approach was founded in problem-based learning (PBL) and constructionist pedagogical methodology, building on the thesis that there is a strong connection between designing and learning. The belief is that activities that involve making, building, or programming provide a rich context for learning, since the construction of artefacts, in this case learning games, enables reflection and new ways of thinking. The students learned from reflection and interaction with the tools alone as well as in collaboration with peers. After analysing the students’ learning trajectories within this method of learning, this study describes seven areas of the iterative learning and game design process. The analysis also shows that the current learning design is constructed as a hierarchy supported through different roles as learning designers contained within one another. The study found that the students benefitted from this way of learning as a valid variation to more conventional teaching approaches, and teachers found that the students learned at least the same amount or more compared to traditional teaching processes. The students were able to think outside the box and experienced hard fun (Papert, 2002) - the phenomena that everyone likes challenging things to do, as long as they are the right things matched to the individual. They were motivated by hands-on work and succeeded in developing four very different and meaningful learning games and game concepts, which contributed to achieving their learning goals.

Developing Goals and Objectives for Gameplay and Learning

General information
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Activities:

**learnT DTU Conference 2017 - The 2nd Conference on Digital Learning Technology**

Period: 17 Nov 2017
Charlotte Lærke Weitze (Organizer)
Helle Rootzén (Organizer)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Degree of recognition: National

Related event

**learnT DTU Conference 2017 - The 2nd Conference on Digital Learning Technology**
17/11/2017 → …
2800 Kgs. Lyngby, Denmark
Activity: Attending an event › Participating in or organising a conference

‘The student as a game designer – What professional learning can students achieve when designing digital learning games?’

Period: 17 Nov 2017
Charlotte Lærke Weitze (Guest lecturer)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Degree of recognition: Local

Related event

**learnT DTU Conference 2017 - The 2nd Conference on Digital Learning Technology**
17/11/2017 → …
2800 Kgs. Lyngby, Denmark
Activity: Talks and presentations › Conference presentations

**Workshop: Create a concept for a learning game in one hour**

Period: 17 Nov 2017
Charlotte Lærke Weitze (Guest lecturer)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
Degree of recognition: National

Related event

**learnT DTU Conference 2017 - The 2nd Conference on Digital Learning Technology**
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Reflective, Creative and Computational Thinking Strategies Used When Students Learn Through Making Games
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Charlotte Lærke Weitze (Guest lecturer)
Department of Applied Mathematics and Computer Science
Statistics and Data Analysis
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05/10/2017 → 06/10/2017
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