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, 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.