

Games and Gaming in Education

University of Agder, Kristiansand, January 30th -31st, 2025

Pre-conference workshop (Wednesday, Jan 29th)

Workshop 1: Game design and storytelling (Eva Capková, Juraj Grečnár)

Learn how to implement basic narrative arcs into game design through interactive mechanics. Explore how game elements (e.g., rules, challenges, progression) can support storytelling. Create a game concept that integrates storytelling and game mechanics seamlessly.

Workshop 2: CreATe - Creating Adventure games for Teaching (Rolf Kreyer)

The workshop will introduce participants to the tool CreATe, an Active-Presenter-based tool which allows the user to create their own point-and-click adventure without any need for programming expertise. The tool allows the user to create a world together with navigation. It provides ways to interact with in-game objects (including an inventory function) and to integrate typical LMS-tasks, such as fill-in-the gap or multiple-choice exercises. The tool also enables the user to provide a hotspot function in the game. This workshop aims to provide participants with the opportunity to take their first step with the tool and to experience how easy it is to create exciting point-and-click adventures for teaching and learning.

Please bring a laptop with the free version of Active Presenter (<https://atomisystems.com/activepresenter/>) installed on it. At the beginning of the workshop a link for the download of further materials will be provided.

Workshop 3: Designing text-based games with Inky (Timo Glaser) and RenPy (Zahir Mohamed, Filip Lewandowski)

Interactive stories, or interactive fiction, are text adventures that engage readers by allowing them to make choices that shape the storyline. Combining traditional literature with interactive elements, readers take on the role of the protagonist, influencing the story's progression and outcome. Tools like ink (by Inkle Studios) and the inky editor enable the creation of such stories. In this workshop, you'll learn the basics of ink, including nodes, loops, conditions, and variables, to build choice-driven narratives. You'll also export your story as an HTML file for browser-based play. Install inky beforehand: <https://www.inklestudios.com/ink/>.

Conference day 1 (Thursday, Jan 30th)

Xavier Good (HEIG-VD): Draw me a serious game

This session will discuss what makes a serious game effective and how to create one. Developing serious games is a complex process that requires collaboration across multidisciplinary teams, integrating expertise in game design, pedagogy, psychology, and subject matter domains. We will explore the core principles of serious game design and present a conception framework to guide their development. The use of this framework will be demonstrated through the example of a real-world game about emergency intervention, highlighting its impact on design decisions and team collaboration.

Magnus Henrik Sandberg (University of South-Eastern Norway), Eirik Brazier (University of South-Eastern Norway) & Ragnhild Hutchinson (Tidvis): The esthetics and ethics of history game design

This paper explores the historic authenticity of *The Widows Boutique* and the design ethos of its developer.

The Widows Boutique (<https://widowsboutique.com/>) is a Visual Novel-styled game where the player is involved in running a drapery business in 1820's Christiania. Playing the role of a businesswoman, the player must maneuver prejudice as well as challenging economic times. The game is closely inspired by the epoque it is set to, as well as actual persons and events. *Fru Sems valg*, the Norwegian version of the game, won three categories at the Norwegian game awards *Spillprisen 2023*. This study will use *The Widows Boutique* as an entry point into a discussion of the relation between historical material and the narrative and aesthetic design choices that have been made.

The data for the analysis will be the game itself as well as its paratexts and historical records of the developer's previous work. Thus, the Oslo-based game developing studio Tidvis who made the game, is also subject to the study. Rather than being game designers probing into the discipline of history, Tidvis can be accurately described as historians exploring new ways of disseminating historic research to make it available to wider audiences. Much of their work is with digital media, and some projects are about creating games. The fact that the CEO of Tidvis is part of the group of authors gives both unique access to deeper understandings of the design choices and adds complexity to the analysis as it necessitates an auto-ethnographic approach.

On the theoretical level, the game's historical authenticity will be explored with reference to Adorno's aesthetics and Rüsen's concept of historical consciousness (Adorno, 2014; Rüsen, 2004). The link between the game analysis and how the developing company works will be framed by Bódi's concept *design ethos* (Bódi, 2022). We will also apply the MDA-framework to better understand how design choices may lead to an aesthetic (Hunicke et al., 2004).

Juraj Grečnár (Comenius University) & Marcela Katuščáková (Comenius University): Storytelling in games

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Liv Lofthus (University of South-Eastern Norway) & Magnus Henrik Sandberg (University of South-Eastern Norway): Playful collaboration among students from diverse national backgrounds

In an ongoing project students of two countries are challenged to create escape games together. The project aims to enhance learning outcomes by fostering playful collaboration among students from diverse national backgrounds. Through structured lessons, students are introduced to the concept of learning through play, gaining insights into how interactive and playful approaches can foster deeper engagement and understanding. The project is a collaborative initiative between teacher education students at the University of South-Eastern Norway and mathematics/ICT students at the University of Rennes, organized through the European Digital UniverCity (EDUC) alliance.

The project is organized into two main phases: learning about play-based education and engaging in game creation as a form of playful learning. In the first phase, students participate in lessons designed to explore the principles of learning through play, laying the foundation for a playful, interactive approach to education. In the second phase, students are grouped with peers from other countries and collaborate virtually to plan a unique escape room experience. Working together, they develop the scenario, design puzzles, and structure the gameplay for an escape room (Taraldsen et al. 2020) that will be constructed and played in person during an international exchange at the end of the semester. This final, physical exchange brings students together to execute their escape room designs, culminating in a hands-on, immersive experience that emphasizes collaboration and creativity.

The project cultivates essential 21st-century skills, such as teamwork, creativity, problem-solving, and critical thinking (Thornhill-Miller et al. 2023). The collaborative nature of game creation provides a platform for experiential learning, where students gain practical insights into the dynamics of teamwork and the creative process.

Additionally, this initiative serves as the basis for a research study aimed at exploring the potential of international, student-led game design projects as a medium for developing key competencies. The study will investigate how collaborative game creation across borders can serve as a catalyst for skill development, while also examining pedagogical methods that support playful, inquiry-based learning. The findings from this research will provide valuable insights into the role of game-based learning in fostering critical skills and inform strategies for integrating language learning, creativity, and teamwork into cross-cultural educational experiences.

Marielle Juveng (University of Agder): Designing for engagement: Integrating self-designed games in English education for Norwegian lower secondary students

Games have the potential to be beneficial learning tools, as they can foster engagement and intrinsic motivation (Rigby & Ryan, 2011; Ryan & Deci, 2017) while promoting student-centered learning techniques (Coleman & Money, 2020). However, it can be challenging to find games that are suitable to implement in classroom contexts. This presentation examines my experiences with developing and integrating two games as learning activities in English classes within Norwegian lower secondary education.

The first game, which is a digital text-based adventure, was implemented with the primary objective of fostering a joy for reading and encouraging creative writing through the exploration of narratives and decision-making processes. The second game, a board game inspired by commercial "dungeon crawler" games, was specifically designed to include mechanics that address our fundamental

psychological needs for competence, autonomy, and relatedness (Rigby & Ryan, 2011; Ryan & Deci, 2017), through promoting language learning, strategic thinking and teamwork. Research has shown that the fulfillment of these needs can foster intrinsic motivation and engagement (Rigby & Ryan, 2011; Ryan & Deci, 2017). Particular attention was given to crafting the game mechanics to ensure that players could experience a sense of competence, even when they only partially overcome the presented challenges. This was deemed a crucial component, as the game was also planned to be implemented as a learning activity with special education students, who typically experience low proficiency or confidence in the subject.

The results, obtained through observation and dialogue during and after the play sessions, show that the students perceived the game-based learning activities as fun and engaging approaches to practicing their skills in the English language and increasing their vocabulary. Following the text-based adventure, the students voluntarily participated in an optional creative writing project and subsequent reading activities. While engaging in the board game activity, the special education students in particular showed higher endurance regarding prolonged participation, compared to when working with more traditional learning activities. However, due to its complexity and often unfamiliar mechanics, the game could be experienced as difficult to learn and participate in without frequent guidance from the instructor. This highlights the importance of scaffolding and the beneficial potential of supplementary resources to reduce the barrier of entry (Juveng, 2018).

Odd Kjartan Aksnes (University of Agder): King of Norway – A counterfactual history game about the unification and christianization of the country

There has been little research on board games in education in the Norwegian context, but some master's theses have been written that represent possible board games, e.g. Øyvind Amundsen Østby. In an article from 2018, "Game-based learning in secondary schools" (based on his thesis), he highlights that board games are communicative, and facilitate interaction between students in a way that is not possible when working on a screen. Students follow each other's moves, meet each other's eyes, express frustration and laugh together. They are present in the classroom with each other. There is also the built-in competitive element that may even be further reinforced in such a social group situation. Østby also points out that board games are very divisive because they provide a harmless learning situation with a low threshold for speaking up. Another affordance is that the game board can visualize what is being learned in a powerful way. The game board itself is a multimodal text that combines and integrates meaning-making resources and reinforces learning.

Since the summer of 2022 I have been developing the board game "King of Norway" based on my experience teaching about the viking age in the history lessons in upper secondary school. My starting point was more my wish to further knowledge of and interest about the themes involved than making a game in itself. I wanted to put the conflicts and strategy making related to both the unification and the Christianization of the country into a strategic board game with maps of Norway and Europe. It is counterfactual, and has to be so for it to work properly as an engaging game. Whatever the outcome of a game played is, it will always give the player an understanding of what kind of forces and conflicts of interest were at play in the end of the viking age and what kind of opportunities and resources did the real actors in the quest for kingship and change of religion have. Much of the development of the game has been about finding the right balance of historicity and functionality. It must work as an engaging game, and

can not be too circumstantial or – to work with a school class – too complex. The more historical knowledge put into it, the more complex the game becomes, and the more time is needed to explain the rules. Using the game will and should require something from the teacher, and it may well be used as an integral part of a comprehensive teaching program, more than just a break from the regular teaching. The current version of the game has three modes: simple, medium and advanced, so the complexity can be adjusted by adding or removing elements, for example religion or trade.

The game has been tested several times with different groups: school classes at upper secondary, student groups at the university as well as with colleges and friends. With a certain level of complexity it needs a lot of adjustments on its way to the final form. I have collected written responses from pupils and students, strongly confirming what Østby is pointing out in his article. For the coming year I am planning to carry out a project with the board game in schools, and to do research on it.

Helga Dis Isfold Sigurdardottir (Nord University): Leveling up learning: Redefining education through play and collaboration

This presentation explores innovative approaches to game-based learning, focusing on the integration of non-digital game creation as a pedagogical tool and insights from the Game Lab method. Drawing from recent projects, it examines how board game design can deepen student engagement with complex topics such as ludology, storytelling, and game systems, while fostering collaboration and creativity. Through participatory methods and iterative prototyping, these projects have demonstrated the potential of analogue games to contextualize theoretical knowledge and motivate learners by emphasizing tangible outcomes.

Additionally, reflections from educators engaged in Game Lab initiatives underscore the value of game development in enhancing teamwork, constructivist learning, and the integration of educational content with real-world contexts. The findings reveal how these practices not only improve subject mastery but also encourage critical thinking, problem-solving, and emotional resilience—key competencies in today's educational landscape.

Expanding the discussion, the presentation will touch on emerging intersections of game-based learning with AI, social-emotional development, and mental health, highlighting the potential for games to drive meaningful social impact. This session aims to inspire educators, researchers, and game designers to harness the transformative power of games to foster deeper learning and broader societal benefits

Conference day 2 (Friday, Jan 31st)

Prof. Dr. Greta Hoffmann (Cologne Game Lab): Topics nobody likes, games everybody loves - Insights into the development of three serious games

Games are selective representations of reality. Through abstracted, reproducible interaction loops, they enable players to experience a wide variety of systems and aspects of life. This makes them powerful tools for conveying complex topics.

At the same time, their design layer offers the potential to make content appealing, using metaphors, striking visuals, and musical guidance to build an emotional connection with players—even when dealing with topics that might initially seem less engaging.

Every game is a serious game, but not every topic is inherently challenging to translate into gameplay. This talk will present three games that center on difficult or seemingly unappealing topics, tackling the challenge of delivering compelling entertainment value without compromise: "Trash Monsters" - waste sorting, "InvestNuts" - financial literacy, and "Uuugh" - grooming strategies.

Line Reichelt Føreland (University of Agder & University of Lapland): Using digital games to further Indigenous knowledge in formal education

The use of digital games in educational settings to promote Indigenous knowledge has received growing attention, but there is a noticeable research gap in the identification of advantages and challenges of this approach. This presentation showcases a scoping review that maps current research on using digital games to further Indigenous knowledge in formal education, with a focus on teacher education. The review includes 16 relevant articles examining how digital games are employed to teach and promote various aspects of Indigenous knowledge. In the presentation Indigenous knowledge serves as an umbrella term encompassing various aspects of culture, history, society, and language from diverse Indigenous communities.

The presentation identifies benefits of using digital games, such as enhancing motivation and engagement, and offering new ways to learn about and interact with Indigenous cultures and stories for both Indigenous and non-Indigenous students. The findings suggest that digital games can play a role in fostering cultural awareness, language acquisition and reconciliation. However, challenges such as a shortage of prior knowledge, inadequate cultural representation, and the need for teacher involvement is also identified.

The presenter is currently undertaking a doctoral project about the use of game-based learning to further Indigenous, and specifically Sámi, knowledge at the University of Lapland. This presentation showcases the potential of game-based learning to enhance Indigenous knowledge in formal education, particularly for teacher education purposes. Overall, the presentation contributes to identifying the benefits and challenges of using digital games to advance Indigenous knowledge in formal education, as well as highlighting future research needs.

Adina Nydahl & Mathilde Dahlen Svendsen (both University of Agder): Exploring the use of digital learning games to enhance workplace relevance in pedagogy education

The Norwegian government has prioritized enhancing workplace relevance in higher education through several initiatives. In Meld. St. 16 (2020–2021) "Utdanning for omstilling", the government emphasizes strengthening quality and relevance to prepare graduates for active

participation in the workforce of the future. Discipline programs, in particular, often lack strong workplace connections, with limited structured learning activities such as internships (Meld. St. 16, 2020–2021). The University of Agder (UiA) further highlights in its 2024 strategic plan the importance of adopting new technologies and artificial intelligence in education and research (UiA, 2024), emphasizing digital technology as a vital factor in learning processes (Klunge, 2021, p. 11). Addressing the need for stronger ties to the workplace, especially in pedagogy education, we explore how digital learning games can simulate real-world contexts and offer an alternative to traditional internships—a relatively underexplored area in pedagogy education (Zeybek & Saygi, 2024).

The aim of our ongoing project in pedagogy education has been to investigate how digital technology, specifically learning games, can provide students with practice-oriented simulations and opportunities to reflect on the role and purpose of digital tools in educational contexts. Learning games enable meaningful and embodied experiences, fostering insights, discussions, and identification with others' perspectives (Skaug et al., 2020). By doing so, they can support students in developing insights into the pedagogical role and professional contexts they will encounter in their careers. This year, we piloted a project within the course PED128 – Learning and training at UiA, developing a learning game in Twine, a free and open platform for creating games without advanced coding skills (Thompson, 2020). The game was based on a real-world case from the workplace, presenting an authentic pedagogical scenario. To ensure the learning game positively impacts the learning process, meaningful storytelling was emphasized (Carlson et al., 2022). Students engaged with the game by making decisions and responding to challenges in a simulated course setting.

After completing the game, students answered two questions about their experiences. Preliminary analyses suggest that students found the game relevant for safely exploring the pedagogical role. Many highlighted how the game encouraged them to reflect and apply course content. However, areas for improvement were identified, including the need for more game elements, such as rewards, penalties, and entertainment features, to enhance engagement and learning outcomes.

Rolf Kreyer (University of Marburg): Game-based teaching in linguistics – looking back moving forward

Linguistics has a special position in TEFL programs: It occupies a position comparable to that of literary and cultural studies or language practice but, in contrast to these three, linguistics is not a part of the school curriculum. In addition, linguistics is often perceived as somewhat more demanding than the other disciplines. As a consequence, it takes more effort to teach linguistics to TEFL students and, in particular, to motivate students to tackle linguistic problems.

The linguistic escape-the-room game 'The Linguist's Lair' (https://ilias.uni-marburg.de/goto.php?target=html_2716735&client_id=UNIMR) is one attempt to increase students' engagement with linguistic topics and questions. In the game, a student, after an unsuccessful attempt to find out about the questions of an upcoming exam, find themselves locked up in the corridor of my team and they have to solve linguistic riddles in five rooms to escape.

The paper will give an overview of the game, it will explore how principles of game design have been implemented in a linguistic setting and it will describe how the game was experienced and rated by students. The paper will briefly sketch out lessons learnt during the creation of the

game and, by way of conclusion, it will formulate some desiderata when it comes to making the creation of serious games available as a resource to every teacher.

Rune Andersen (University of Agder): Three approaches to using games in education: motivation, tools and contextualization

Games have been a part of training and education for a long time, but over the last few decades, it has become much more prominent. Many struggle with trying to understand it. A few years ago, I conducted an experiment using games as motivational elements, tools for teaching, and fully contextualized projects in order to see if it had an impact on the learning effect. Some of the results surprised me a lot. Over the last few years, I have attempted to look deeper into the issue and will discuss some of my thoughts here.

Christian Simonsen (University of Agder): Arete: What we learned developing an AI-assisted mixed reality serious game

We have been working on an AI-assisted mixed reality game, “Arate”, on and off for about a year. Our driving forces have been twofold: creating an always accessible, novel, and engaging play-experience, and doing so in a way that requires minimal skill and shoestring resources to adopt in teaching.

Arate is AI-assisted in the sense that it leverages a harnessed large language model (LLM) to color in the game experience. While this is conceptually similar to what GPTs do, our custom harness and client are fully developed and formed by us, allowing for better control and enabling multiple interaction modalities with the LLM.

Arate is mixed reality in the sense that parts of the gameplay can occur in non-digital contexts, employing multiple strategies to connect the digital and physical. In our view, this approach is the most cost-effective and intuitive way to create novel play experiences.

The short term goal of Arate is to serve as a proof of concept for a semi-automated game-based teaching and evaluation tool. By the time of presentation, the game will have been used as a teaching tool in four different courses (both undergraduate and graduate levels).

We would like to present the Arate platform, share lessons learned, and offer insights gleaned from this project.

Apostolos Spanos (University of Agder): AI-assisted and game-based flipped classroom in history teaching

AI4Plato (Artificial Intelligence and Immersion for Personalized Learning And Teaching Optimization) is a project converging artificial intelligence to various educational and digital gaming technologies to create a genre-bending serious mixed-reality co-op game as a game-based and AI-assisted learning and grading platform for university courses. The platform will support a game-based flipped classroom teaching strategy. It aims at improving student-active learning, the optimization of learning outcomes and the implementation of AI in teaching and the examination process. To do so, we will develop an AI-assisted game platform, which will give the students the opportunity to “play” the same course, with the same learning material, but experience a personalized version of the game.

Our plan is that after getting tested in a specific course on historical consciousness at the University of Agder, the XR game template and the AI-algorithm we will develop, will be available as teaching and examination platform for any course, in any academic subject. In its final

version, the game/platform will include AI-based assessing methods, so that the performance of the students in the game will generate part of their final grade. Finally, the project will examine the ethical challenges related to using an AI algorithm as a learning assistant and examiner in a university course.

AI4Plato is a co-creation project, putting together representing various fields (history, AI, AI ethics, game design, game based learning, educational technology). As such, it has an added metacognitive value related to the experience of working across fields having different theoretical and methodological approaches and traditions.

A prototype of the game was piloted in Autumn 2024 in a first-year Bachelor course on historical consciousness at the University of Agder. The paper will present the goals of the project, our work and experience so far, challenges related to the realization of the project, and our plans for our next steps.

Tobias Scholz (University of Agder): Game on: Leveraging esports for educational assessment and competency evaluation

The intersection of education and competitive gaming presents unprecedented opportunities for innovative assessment methods. This presentation explores how esports titles can transform traditional evaluation approaches in both educational and professional settings. By integrating game-based learning principles with competitive gaming environments, institutions can effectively measure critical competencies such as strategic thinking, problem-solving, and team collaboration. Esports-based assessments enhance student engagement while providing real-time, data-driven insights into learning outcomes and skill development. This approach bridges the gap between traditional academic assessment and practical skill evaluation, particularly resonating with digital-native learners. The framework emphasizes immersive, skill-focused experiences that prepare students for future workplace demands while revolutionizing how we evaluate competencies in educational contexts.