



Game Design as a Pedagogical Tool for Learning and Reflection: The Case of the Ethics Experience

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Abstract. This paper sets out to present an ongoing pedagogical project where game design is used to let students both learn and reflect upon different perspectives of ethics relevant to the master program they are enrolled in. The paper explains the underlying logic behind the pedagogical process where students develop their own game and at the same time learn about different perspectives of ethics in relation to courses that they are currently taking. With an open and iterative method, we let the students explore, discuss and design a game that can be used by future students. By letting the students decide and lead the development we democratize the learning-process and engage them in a learning experience. More so, this approach to game design as a pedagogical tool to engage and democratize the learning experience is new and increasingly relevant for both students that play games on an everyday basis, but also students that are new to games. Also, it is a constant and dynamic process for both students and teachers.

Keywords: Experiential learning · Game design · Gamification · Pedagogical tool · Experience design

1 Introduction

In 2013, the highly anticipated sandbox video game “Grand Theft Auto V” by American publisher Rockstar Games/Take-Two Interactive sold copies for 800 million USD on its first day [1]. Stores opened up at midnight to long lines of prospective buyers, the likes of which we have come to associate with Apple. “Grand Theft Auto V” is far from being an isolated exception: in a remarkably short period of time, the video game industry, a behemoth worth 147 billion USD in 2019, has become the most lucrative entertainment industry, eclipsing the film industry, grossing 42 billions USD, and the music industry, worth 20 billions USD [2].

If, in 2007, a survey conducted by the NPD Group revealed that 72% of the US population aged 6–44 had played video games in the course of the year [3], statistics for 2021 place the number of video game players at 2.8 billion worldwide, forecasting that the 3 billion threshold will be crossed in 2023 [4]. The games market is maturing and

diversifying under these generational and gender changes that see more older players and more women players make up a substantial part of its customer base, with video games acquiring a position of cultural influence and of increasing “artistic sophistication” [5, p. 7]. Convergence phenomena (Jenkins 2008) are also extending this influence through the dissemination of game content, game logic, and game culture in a variety of media, for example through live streaming of gameplay or esports competitions on Twitch or YouTube reviews, walkthroughs, and reactions. Additionally, the 2020–2021 COVID-19 pandemic has pushed many towards mediated forms of remote interaction, including online games. Established success stories such as Epic Games online multiplayer game “Fortnite” have seen their numbers surge [6], and forgotten games such as “Among Us” have become overnight successes [7, 8].

What is true of video games is true of games in general: while smaller, the global board games market has been growing steadily in the past twenty years and has been projected to keep growing at a 13% rate in the next five years, for a total of 30 billion USD worth in 2026 [9]. Games and gaming, that is the activity of playing games, also have a consolidated history of proven efficiency as educational tools [10], and they have been variously used in educational contexts [11] to “enliven teaching topics”, to “appeal to different learning styles”, to “encourage collaborative problem solving” and “peer support”, and have proven “especially effective for dealing with problem solving and key concepts” [12, p. 3]. Recent developments have education innovators such as Prensky [13] discuss game-based reforms that do not just see schools using games to teach students, but thoroughly recast the ideal school as “a game, from start to finish: every course, every activity, every assignment, every moment of instruction and assessment would be designed by borrowing key mechanics and participation strategies from the most engaging multi player games” [14, p. 128].

During the coming two years, a cohort of students from the Master’s in Digital Service Innovation (DSI) at Halmstad University will engage in a design exercise that will see them working in groups and moving through a number of clearly specified stages to conceptualize, design and prototype a game that centers on specific ethical or sustainability problems, such as intersectionality, the common good, norm-critical design, judicious development, the tragedy of the commons, and human flourishing. The plan is to This design exercise is meant to help develop a pedagogical path for design education structured around the design of a game that deals with a yearly chosen core theme, ethics and ethics in design in this case, to be thoroughly explored throughout the two year study period.

A common way to use games in education is to play them and reflect after play so that extrinsic perspectives may be brought into the game’s own context. For example, investigating the problematic relationship between ludic gameplay and narrative fiction in the video game “Grand Theft Auto” as a way to discuss in-game actions and behavior from a civic ethics standpoint [15]. In research, games have been developed to both allow students to “practice real life clinical settings”, for example in the context of healthcare [16], or to develop critical thinking skills by “try(ing) out various choice paths and while doing it gain knowledge about how to make more appropriate choices” [17, p. 69].

While it is not uncommon for educational institutions to apply game logic or game approaches to individual courses, as it is the case for example for the undergraduate

course on Interactive Prototyping at Halmstad University, it is fairly less common to introduce such an approach across the length of an entire program, and further intertwine its primary design task throughout all of its courses in order to infuse the program with a specific core topic, in this case ethics, and a specific pedagogical approach, that of game design. This unusual and organizationally demanding situation has its own challenges, besides those that traditionally accompany the development of such initiatives: organizational ones, such as how to engage students in a learning process that runs as a parallel addition to mandatory program courses; and pedagogical ones, such as how to make sure such a process is consistent, coherent, relevant, and meaningful for the students, and how its outcomes should be evaluated, reused, and improved upon.

1.1 Organizational and Pedagogical Challenge

“Nothing ever becomes real ‘til it is experienced” John Keates (1795–1821).

The authors used an experiential learning approach to closely follow that provided by games and formalized in game design. Experiential learning is based on a learning cycle that includes experiencing, reflecting, thinking and acting (Miettinen 2000). Students developing their own learning materials have a more concrete and direct experience of the subject of interest. At the same time, students gain new practical and theoretical insights as they act their way throughout the preparations, development and implementation [18]. In this sense, experiential learning is learning as a *“holistic process of adaptation of the world”* [19, p. 5] and has been used in several areas such as tema development [20], entrepreneurship [21], and engineering education [22].

Using problems as a foundation for learning assists in developing life-long knowledge and skills. Being tasked with solving a concrete, situated problem, one learns not only how to factually apply knowledge in a given context, but is also forced to reflect on what knowledge is missing. The problem itself is then an incentive to learn [23], meaning that instead of having to understand theories, concepts, and methods because a course plan says so, students learn in order to solve a problem they face and that they find relevant and interesting. Games, and especially video games, play an important gateway role here, as they are an extremely influential cultural artifact for current convergence culture [24] and especially for the Millennial and Gen Z generations, comparable to film and TV for previous generations [25]. Methods and styles from old media are retained and reinterpreted, for example narrative from film, and new *“forms of engagement, or media consumption, that are distinct to games and media properties, such as interactivity”* become more central [26, p. 4].

In collaborative settings, the process of solving a problem is not only a way to gain new knowledge but also training for important soft skills such as the capacity to listen, critical thinking, empathy, and rhetoric [27]. Collaborative problem-based learning helps in the process of constructive linking [28] as students *“enter”* a problem with certain knowledge assets, which throughout the process they develop and refine as they interact with teachers, peers, and the learning environment.

1.2 Game-Based Approach

Games can be described as “*a closed formal system that subjectively represents a subset of reality*” [29, p. 7] in a way that it can be experienced safely by players, since “*the results of a game are always less harsh than the situations the game models*” [29, p. 14]. More generally, “(r)educed to its formal essence, a game is an activity among two or more independent decision-makers seeking to achieve their objectives in some limiting context” [30, p. 6] Fullerton, echoing Crawford [29], describes a game as “*a closed formal system that engages players in structured conflict and resolves its uncertainties in unequal outcomes*”.

A number of important characteristics of games that matter in the context of design education are introduced by these definitions: the idea that games can be used to model real or fictional events or activities, what Crawford calls “*representation*”, the fact that players experience these by actively engaging in conflicts that are nonetheless safe, since the “*game is an artifice*” [29, p. 14] that excludes the physical realization of any situation of play, and their being structured, subject to rules, what Abt calls the “*limiting context*”. Rules constitute a framework that players use to understand and enact play situations and for structuring relationships within the game.

Games are also extremely valuable learning tools [14, 30] as they are adaptable, flexible, and “*can be moulded to suit a variety of learning settings and environments*” to support peer learning, collaborative knowledge creation, and divergent thinking amongst students [12]. Additionally, they have been found to facilitate distance learning students [12], which was also an important factor when conversations started in the spring of 2021.

In terms of design education, they offer a safe, controllable, and observable space for simulating experiences. Playing a game means to directly experience the interplay of information flows, human agency and desires, within the settings of hard environmental constraints that maintain focus on a specific “goal” and avoid “spillovers” [29–31]. Remixing existing games, that is altering their design and behavior to obtain a somewhat different game, is a significant hands-on way to learn how to creatively repurpose parts of a service or product to provide a different or improved experience, a common activity in the design professions. Analyzing a game and then modifying it in ways that allow it to fit “*an enhanced purpose, a new audience, a new level of complexity, or a new learning outcome*” [32], as much as designing a game anew to explore a specific problem, teaches students to manage complexity while considering coherent, clearly defined boundaries in relation to a manageable problem space. In this sense, game design theory offers a consolidated body of knowledge dealing with both formal (rules, players, resources, mechanics) and dramatic (premises, themes, characters, story, settings) elements that can be used for (re-)designing any type of experiences [31, 33].

Fullerton [33] highlights that games share characteristics with complex systems: for example, the fact that their outcomes cannot be predicted from their initial setup. In game terms, these “*unequal outcomes*” mean that while it is known that there will be one or more winners and one or more losers by the end of the game, it is impossible to determine at the beginning who will be what and through which precise steps that outcome will be achieved. This has two important consequences. As “*closed formal systems*”, games offer the possibility to model a complex system and to provide rules

of engagement for players to experience it first-person, for any number of times during which they can decide to follow varying strategies. For example, place players in the role of commanders whose army needs to defeat their opponent's, in a game of chess.

As systems of formalized relationships between “*formal elements*” such as rules or resources, games can be “*dressed up*” through the use of what Fullerton calls, in opposition, “*dramatic elements*” [33]. Fullerton stipulates that games can be better understood by structurally addressing their formal and dramatic elements as separated but interdependent systems. The formal elements set includes players, rules, resources, or objectives. Dramatic elements include premise, story, characters, and settings. For example, “*Monopoly*” is a game of multilateral competition between two to eight players whose objective is to bankrupt opponents to win. Player relationships, in-game currency, and title deeds are resources. Story-wise, in the original game players take the role of early 20th century US landowners who attempt to buy land and build a real estate empire in a rapidly growing metropolis.

The interplay of formal and dramatic elements is what allows players to experience the strife for the emancipation from slavery in 19th century North America (in *Freedom: The Underground Railway*), group survival on a deserted island after an airplane crash (in *Ravine*), or the fragility of democratic processes (in *Secret Hitler*) through, in accordance with Crawford, representation (games as self-sufficient subsets of reality); interaction (games as exploratory systems); conflict (games as the pursuit of competing goals); and safety (games as artifices that simulate but do not concretize danger).

Building on Fullerton [33], Crawford [29], and Schell [34], two of the authors of this paper have consolidated an extended framework for approaching the analysis and design of games that has also been applied to the analysis and design of services and experiences. Retaining the distinction between formal and dramatic elements formalized by Fullerton, the extended framework introduces a third set, that of spatial elements, to account for “*the most fundamental human experience of apprehending oneself as a body located in space*” [35, 36] and to acknowledge the reinforcing role played by material anchors [37] in stabilizing conceptual blends [38] such as those happening in design activities. These spatial elements bridge between game-centered heuristics, and spatial and architectural primitives such as proximity, separation, sequence, and nesting [39].

The idea of a space as an important element of games harkens back to the seminal work of Huizinga [40], who characterized ludic activities as “*standing quite consciously outside ‘ordinary’ life*” and having their “*own proper boundaries of time and space according to fixed rules and in an orderly manner*” (p. 13). The commingling of digital and physical in our daily lives is also increasingly “*tak(ing) players away from the ‘gaze’ cultures of film and the ‘glance regime’ of TV and into the space of the haptic (touch) dimension of gameplay*” [26, p. 5] and digital games have been designed that directly interact with a person's embodied self in physical space [41].

Fullerton's framework does not conceptually identify spatial components as different: they are generically grouped under the label of “*boundaries*” and considered part of the formal elements set [33, p. 78]. Schell, while stating that “*every game takes place in some kind of space*” and investigating a number of structural spatial patterns [34, p. 130–134], considers space a game mechanic, and thus just an individual element part of his

foundational structure of games built on an “*elemental tetrad*” comprising mechanics, story, aesthetics, and technology [34, p. 41].

The introduction of a set of spatial elements provides a more granular way to analyze and discuss games, and gives the design process a way to influence how embodiment comes into play in the context of the game. For example, how the experience of a game of chess changes greatly if we play with a regular board, on a mobile phone, or as part of a live chess extravaganza. Size, positioning, textures, haptic feedback, one’s proprioception in respect to the game, aural and visual cues or commands are all significantly different and produce different effects, even if the architecture of chess, its rules, is the same.

1.3 The “Gamify Ethics” Design Experience

The DSI program is a two-year master’s program: the initial three semesters consist of eight courses focusing on different aspects of Digital Service Innovation, such as Intelligent services and Design Research Methods, Academic communication and Emergent Themes in Digital Service Innovation Research; the final fourth semester has the students working on their master’s theses. While the course plans all include ethical considerations to some degree, the program manager decided that ethics and the role it plays in digital service innovation should be emphasized even more by implementing a “*core theme*” running throughout the entirety of the program.

The implementation of this core theme consists in a number of activities that can be structurally divided in four stages. The first stage includes an introduction to different games and gameplay. Board games and card games as well as digital games are played, analyzed, and discussed, in order for the students to be acquainted with the idea of playful reflectivity that will carry through all of the four stages. This introductory part is also meant to inspire, illustrate the possibilities of addressing problems by means of a game, and have fun. The second stage focuses on the extended game design framework discussed above: students are introduced to the *Formal*, *Dramatic*, and *Spatial* elements in detail and apply these to analyze and then remix existing games. In the third stage, the students plan, design, and prototype a game focusing on an ethical issue they have encountered in the program courses. The goal is to learn as much as possible about such issues through game-design-centered experiential learning, and to create a tool, the game prototype, that allows others to safely and playfully experience that same problematic situation. Teaching staff provides continuous support in the form of lectures, supervision, collaborative work, and game workshops. In the fourth and final stage, the various game prototypes are brought in to be played by the upcoming student cohort to provide a tangible demonstration of what their two-year involvement in the core theme initiative intends to achieve. It will be a good introduction to different ethical issues connected to the program (Fig. 1).

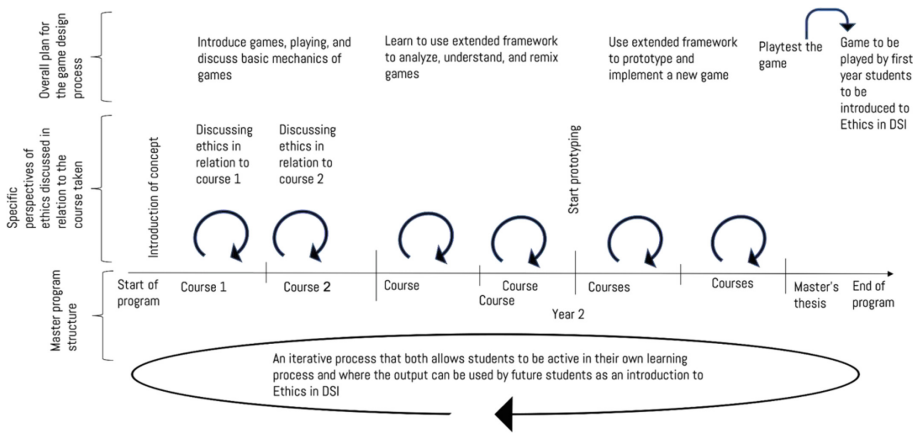


Fig. 1. A diagrammatic view of the core theme process across the two years of the master’s program

Students and teaching staff meet regularly every other week to keep the process going. Since the meet-ups are not compulsory, practical activities and theoretical moments have to be finely balanced so that students remain interested and engaged. Game playing and post-game reflections play an important role in this respect, as does allowing the students to bring in their favorite, or least favorite, games for analysis and debate.

It is important to note that while the extended framework used can be applied to the analysis and design of video games as well as board and card games, the current core theme implementation strongly encourages students to primarily consider the design of board and card games. This is a consequence of both pedagogical and design process-related reasons. The pedagogical reasons include the need to embody and directly manipulate abstract concepts through material anchors that facilitate the learning process [37]. For example, manipulate the idea of “contingency”, a game mechanic that requires players to complete their goals before a future event occurring in-game after an unpredictable amount of time [42], through movable or eliminable tokens; and a lowering of the barriers to entry for students, since no specific programming skills are necessary. The design-related reasons include the need to focus on the structural and experiential aspects of the process and how they allow one to untangle ethical questions, rather than on the coding, hand-eye coordination issues, game engine expertise, or visual design expertise that would be necessary to implement a digital game. Card and board games can be easily prototyped with pens and paper and no graphics.

A number of intrinsic and extrinsic organizational constraints have also influenced the process, including the current impossibility to assign credits to core theme activities, the diverse background expertise of students in terms of their undergraduate studies, and the restrictions imposed by the ongoing pandemic.

2 Methodology and Empirical Process

This research uses an action design approach [43] where the problem is grounded in the challenge of engaging students in learning opportunities that have no curriculum credits assigned to them. Students will follow an applied design methodology in their own design process. The setting is a master's program where a core theme is being implemented. The core theme runs throughout the two-year program and connects with each and every course included in the program. The core theme of the program is ethics and ethics in design.

This process started with a brainstorming session during which author #1 of this paper was tasked with implementing a “*core theme*” for the DSI program at Halmstad University. The intention of the core theme was to infuse ethics in all the different courses throughout the program to continuously enable opportunities for students to learn about, and engage with, ethics. A list of all the different courses was created and ethical questions that could be linked to each course were added. For example, the course on Academic Communication was connected to issues of plagiarism, and the course on Intelligent Systems to the handling, storing, and use of personal data.

As the core theme project would have no curricular credits connected to its completion, innovative ways of getting the students to get engaged were to be considered. Author #1 then contacted the other authors of this paper at different stages to collaborate on the development of the concept.

A second list was created containing a number of board and card games that could be used to illustrate the relationships between game choices and goals and the ethical questions from the previous list. This proved to be an ill-fitting process, with a very uneven distribution of games across the different questions and at times a rather thin relationship between the games themselves and the actual questions. The authors entertained the idea of creating an entirely new narrative game that could include the different relevant perspectives of ethics and ethics in design that the students should come in contact with. A narrative skeleton was created by means of a commercial card-based *story engine* built around “agents”, “anchors”, “conflicts” and “aspects” so that a basic storyline could be outlined to work with. A number of alternatives were generated. For example, “*A bossy designer wants to solve the problem of a device. But they will have to act against the community they belong to and protect a hated rival*” or “*An organisation is harming their local community with bad working conditions but protects the rest of the world*”. A prototype was also quickly produced using Twine (twinery.org), an open source tool for creating online interactive, non-linear narratives. The idea was discarded in the end since it either took away the students’ design agency entirely, if they were simply given a complete narrative to explore, or introduced a rather steep programming learning curve, if they were to be directly involved in the design of the game.

A decision was taken to have the students design, prototype, and playtest their own game as part of their learning process. Such a set up would satisfy a number of pedagogical goals the team wanted to achieve: in accordance with experience learning principles, having to set their own goals would improve the learning outcomes for students [44]; it would engage students in a way that simply playing through a game presenting them with ethical choices would not; the game design process itself would place them in a position where discussions on ethics as they relate to the content of the game would become a

constant occurrence. Additionally, the finished games at the end of the two-year cycle could be used to introduce future students to the core theme and to the design process, and could be listed in the students' portfolios when applying for jobs.

Consequently, the core theme project will see students design and prototype a game artefact addressing ethical challenges in the context of design and digital service innovation. During the design process, teaching staff will meet students regularly to offer help with the framing of ethical questions and for game design supervision. The various scheduled meet-ups, one every other week, will include game workshops, playing sessions, storyline development, workshops focusing on game design theory, and critique sessions. Meeting every second week will allow for continuous contact between students and teaching staff and a regular progression in their investigation of the core theme through the game design process. It will also allow students to discuss questions and concerns that might arise with specific points of the process as they emerge. Given the current pandemic situation, some of these meet-ups will take place on campus while others will be remote.

3 Conclusions and Further Work

This paper presents an ongoing project using games and game design as a way to guide the students through a two-year experiential learning process. This process runs in parallel to their master's studies and focuses on infusing a core theme, ethics in this case, all throughout the curriculum. Students are immersed in a social and cultural environment in which games occupy a relevant role, and research shows that games are a successful learning tool for tangling with complex problems as they provide immersion and agency while preserving safety [29]. This makes them an interesting conceptual tool to introduce the students to the analysis and simulation of design solutions that respond to ethical problems, an important concern for all processes concerned with the digital transformation process [45].

During the course we have adopted a modified and extended version of Fullerton's [33] framework where dramatic, formal and spatial elements are connected to ethical explorations. These three sets allow game designers, and in this case students, to precisely identify which elements of a game are embodying ethical aspects connected to the specific problem space. For example, how dramatic elements such as "premise" or "character" can make an entire game offensive to play through simple linguistic substitutions, say by changing "werewolves" to "immigrants" in a game of "*Werewolf*". Reflective moments to discuss and add perspectives on ethical decisions that arise as they conceptualize, design, prototype, and playtest their games are part of the design process.

Although the project is ongoing, the team has gained a number of preliminary insights. First, much planning is required to simply be able to start the pedagogical process. For the students to benefit from the parallel core theme process, both content (literature, examples) related to the core theme itself, ethics in this case, as well as the necessary theoretical and practical notions related to designing games, have to be in place. Yet, as the process adapts constantly to the opportunities and constraints offered by what the students are doing and the way they are advancing, planning happens primarily ad hoc via what are agile-like maneuvers of constant adjustments to keep the

pedagogical method of experiential learning via game design and the core theme in focus. A secondary element is the necessity to keep students involved and engaged. Finally, as DSI expresses a students' cohort of different social, cultural, religious, and political backgrounds, an additional dimension was added to the way the entire process is handled to treat ethics as culturally bounded. Possibilities for open and interesting discussions in safe and comfortable settings were enabled through this process, something the teaching staff also profits from.

Although this specific project focused on how to infuse ethics and ethics in design throughout a master's program, the authors believe that the pedagogical method, once stabilized, could be generalizable and used in different organizational settings, not necessarily connected to formal education, and for different core themes.

Reflections on the different parts of the core theme process, for example whether and how the setup described in this paper solved, and to what degree, the initial problem of engaging students and infusing ethical themes throughout the length of a master's program, are expected as the project progresses. Evaluation of the whole experience from a student's perspective is also planned at the end of the initial run, together with an assessment of the learning outcomes of the process.

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