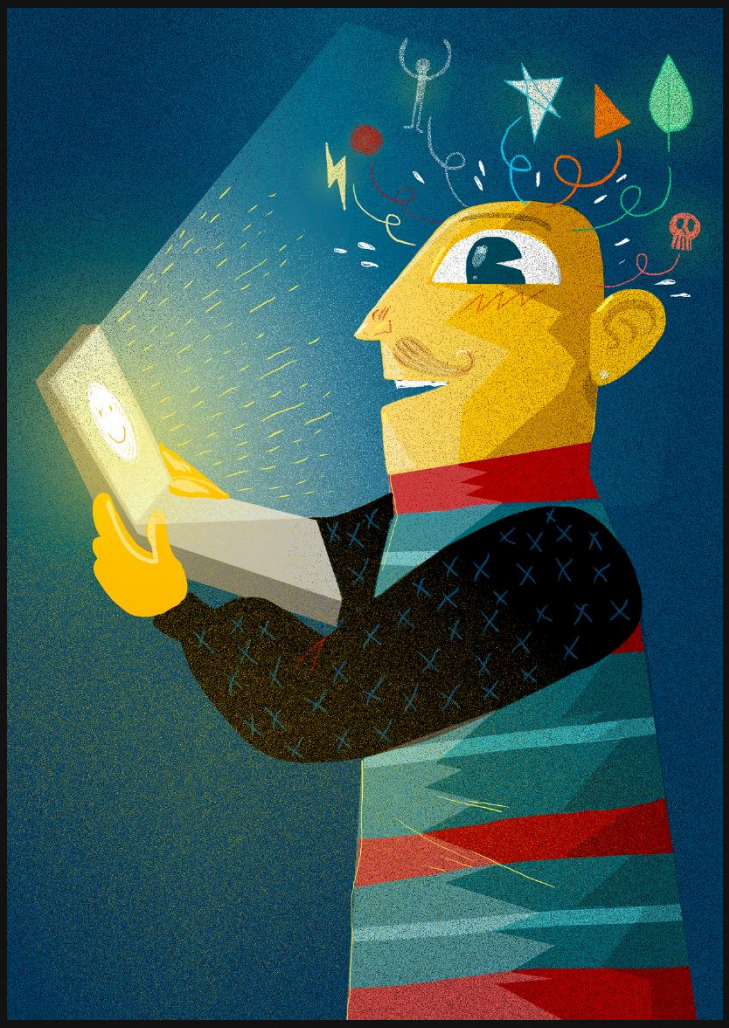
Game Environments



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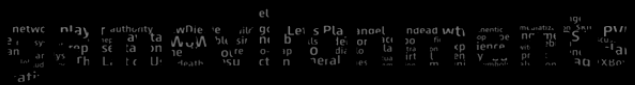

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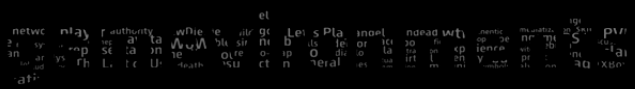

Report

Teaching People What They Already Know. Designing Game Design Courses

Thais Arrias Weiller

Abstract
Game Design is one of those skillsets that are difficult to clearly define, and it can feel like – and is often described as – an inherent part of human nature. We all play games in one form or another, and even when we play *universally recognizable* games we often make rule changes to said games to fit the type of experience we want to have. Local variations of playground games, and house-rules to popular board games, bear witness to the fact that game design is a practice that people participate in, without necessarily thinking of it as *game design*. Even though design is something natural, it still needs to be honed and developed further for those who would like to pursue game design as a more formal profession. This presents a challenge for game education: how do we identify and describe the knowledge and skills that many people already use inadvertently as amateurs, in order to help students see what they need to hone and practice to become expert game designers? This report will describe how we created a framework to create a new Game Design course in the Videogame Development undergraduate program at Pontifícia Universidade Católica do Paraná (PUCPR) in Brazil. Our approach to this challenge was to divide Game Design into four distinct areas: mechanics, systems, contexts, and progression.

Keywords: Teaching, Learning, Pedagogy, Game Design Course, Game Design, gamevironments

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Pontifícia Universidade Católica do Paraná's video game development undergraduate program started in 2009 and has, since its creation, cycled through three different

course curricula. The current one, in effect since 2018, has two semesters of general courses before branching into two different five semester specialization paths; one focused in programming and the other on arts. Since game design is yet not a full major in itself, its presence in the program serves specially as a generalist standpoint and consists of two mandatory semester-long courses and an elective one. With the length of these courses, professors had more freedom and time to test different approaches to the necessary and yet elusive game design education, but could also use the first semester to introduce the basics of the subject matter while diving into specifics in the subsequent semester. This report aims to document our own approach in teaching the first required game design class to two different groups of students and discuss its results.

To summarize it briefly, our new approach to teaching game design is a reaction to issues we've observed over time in our courses, as well as our own experiences of learning game design. The main challenge of game design as a subject matter is that the word *game design* means something entirely different depending on who you're talking to. Some people associate it with game mechanics, or level design, or game balancing. Others might associate it with storytelling in games, and character designs. Compounding the issue is that design can relate to different things in different game genres. As game design teachers, this has presented us with several challenges. Simply telling students that *this course is about game design* makes for a messy classroom. Students don't know what literature is relevant, what kind of challenges they should tackle, or what expertise they should be developing. With our newer approach, we hoped to give students clearer guidelines for learning what game design *can* be by establishing a four core categories of game design: *mechanics*, *systems*, *contexts*, and *progression*.

While we turned to practitioner literature for inspiration for these categories, a more foundational step was to look at contemporary job listings for game design. In essence: what challenges will game designers face in contemporary game development? With these categories, we could have a more clearly defined course structure, and students would have an easier time discussing game design with one another (and, of course, the teachers) since they had a shared understanding of the topic at hand. Another significant benefit of the categorization was that it provided a clear structure for us, as teachers, to identify relevant reading materials, and how different texts could support students' learning at different stages of the course.

This report presents the game design course we've built on these principles. We will share some information about student attendance and the make-up of the class itself. Then, we will provide a description of the four categories we established. We will also describe the ways in which our categories helped us define reading materials for the course, and we will present a simple matrix that can be used to examine whether a course's literature covers essential design topics.

Course Placement and Class Demographics

Game Design is a course attended by both first and second semester students attending the Videogame Development program at PUCPR. We hosted the course for the first time in 2018, with a relatively small number of students. For this first year, our plans were not as clearly structured as they became in later years – it was rather a year that showed us the necessity of finding a better way of structuring our teaching. In 2019 the class was slightly bigger than the first one, and that's where we started fine-tuning our implementation of the categorization-guided course structure. And, more recently, the class of 2020 could take proper advantage of tweaks of the

previous years. However, this was of course disrupted as it had to be hosted online (through a *Discord* [2015] channel) due to the Covid-19 pandemic. During this year, the process would prove its usefulness as the format change would make it extra challenging to give students guidance, and to support a coherent dialogue about design. See table 1 for some further information in of the demographics of each class.

	Male	Female	Non-binary	Total
2018	17	1	1	19
2019	22	4	1	27
2020	34	5	1	40

Table 1. The class demographics.

Problems

A significant portion of the students that join our Videogames Development program have previously created games by themselves, or with friends. Some had created videogames using introductory game engines such as *Scratch* (2007) or *Construct 2* (2011), and some had created board or card games. Most of the students had also played in, or game mastered, table-top role-playing game campaigns, which requires active writing, role-playing, and character design skills. Although many of these activities alone doesn't make a person a *game designer*, it still meant that the student cohort had developed a personal connection with game creation. Some students come to the program with some previous formal training, but most students had a perceived innate understanding of the inner workings of games. With this wide variety of game creation backgrounds, creating a well-defined notion of game design, which could unify students with such different previous experiences with games, was (and remains) our biggest challenge in this course.

The second biggest challenge is not unique to game design, but rather shared by many subjects in higher education: how to communicate to students how much they have achieved during the course and to make them sense their own progression. Differently from coding or visual arts, skills in which students can more easily comprise how their understanding on the subject evolved during the semester by comparing earlier works to current ones, better game design or a broader game design understating is not readily perceived. A student that does not see how all their work translates to identifiable results is often a student that becomes less motivated to participate in the course activities.

These two problems are, ironically, very similar to the challenges a game designer has when creating a game; how to make your player understand their place in the world and how to interact with it, and how to keep your player engaged during the whole game duration. Since this is a game design course, it was only fitting to use game design strategies to overcome the problems.

Strategies

As previously mentioned, the first challenge we faced was finding a way to formalize the terminology we used to discuss games in the classroom. But a course can't just be driven by clear terminologies, it also needs a strategy that takes advantage of them. Our course was heavily Project Based Learning (PBL) oriented, but we aimed to take a *micro PBL*-approach where students were presented with many small design projects. The students went through four different steps of in their exercises.

1. Divide game design in smaller, approachable, *levels* – each with specific concepts and theories rather than broader design discussions;
2. Small, short exercises that bring fast feedback – the students created two

small prototypes, focusing on a specific design category;

3. Playtest their own prototypes in the classroom, so their peers can play and give their feedback while everybody can learn from the experience;
4. Freedom to suggest extra content from the professor in particular areas of interest.

As we had our four categories to guide the course, the students would go through this cycle four times, focusing on one category at a time.

Categorizing Game Design Knowledge

When it came to establishing our categorization of design knowledge, we started by consulting three different game design books that have sections covering game design education: *Game Design workshop: a playcentric approach to creating innovative games* (Fullerton 2008), *The Art of Game Design: A book of Lenses* (Schell 2019), and *Challenges for Game Designers* (Brathwaite and Schreiber 2009). Fullerton's work favours a process-oriented division, first explaining and exemplifying concepts and words of the field and then proceeding into the traditional developing cycle of concept, prototype, testing, polishing and finishing. As a result, readers of her book are first invited to step into the lay of the land, word by word, jargon by jargon, as a settling period for a new job, to then ensuing into the development of a project, start to finish, each of these steps sprinkled with game design challenges based on the topic at hand. A similar route is taken by Schell (2019), who delimits some key concept on his view of the area, which he names lenses, and then follows this with a detailed account on his process for creating a game, from brainstorming to shipping. Brathwaite and Schreiber (2009) emphasis, on the other hand, is on the challenges themselves while approaching each main type of mechanics they see fit to only then deal with the development cycle.

So, while there are many overlaps between the authors' views on game design, and game design skill development, there does not appear to be much consensus – or significant discussion – regarding how game design can actually be *described* for the purpose of teaching.

Trying to find a way to provide this description, we instead turned to how contemporary game developers describe a game designer's different skillsets. Any videogame development undergraduate who wants to specifically pursue work as a *game designer* in any capacity more senior than *junior* will find four types of job listings: mechanics/gameplay designer, system designer, narrative designer/writer, and level/progress designer. These category repeat in job listings for *game designer* positions in studios of different sizes all over the world.

Mechanics/gameplay designers focus on how the game works. When the player picks up the controller, what can they do? And how? What are the consequences? What can they not do? The main rules and dynamics are established by these professionals. *System designers* are the ones who assign value to these actions or items or pieces in the game and balance them in a way that makes sense with what is expected to be the game's experience. A *context/narrative designer* is the one who applies meaning to all things in the game. The why of what the protagonist is doing what they are doing or what are the themes and feels of this game are their main responsibility. Finally, the *level/progress designer* is the curator of the players' interactions with everybody else's work. This designer envisions how the player progresses in the game, and when and where new mechanics and functions can be introduced. The level designer paints an interactable picture, by using the game's mechanics and narrative elements to introduce concepts pertinent to the player at different

moments in their journey. This also entails guiding players along certain paths of game sections and deciding the ebb and flow of gameplay and systems in the game.

While these categories helped us shape the overall structure of our course, they also helped us examine whether our course literature covered the entire spectrum of game design. We made a simple matrix of our four categories and mapped out chapters from all the aforementioned literature to see what types of knowledge they'd be able to contribute to the course (see figure 1).

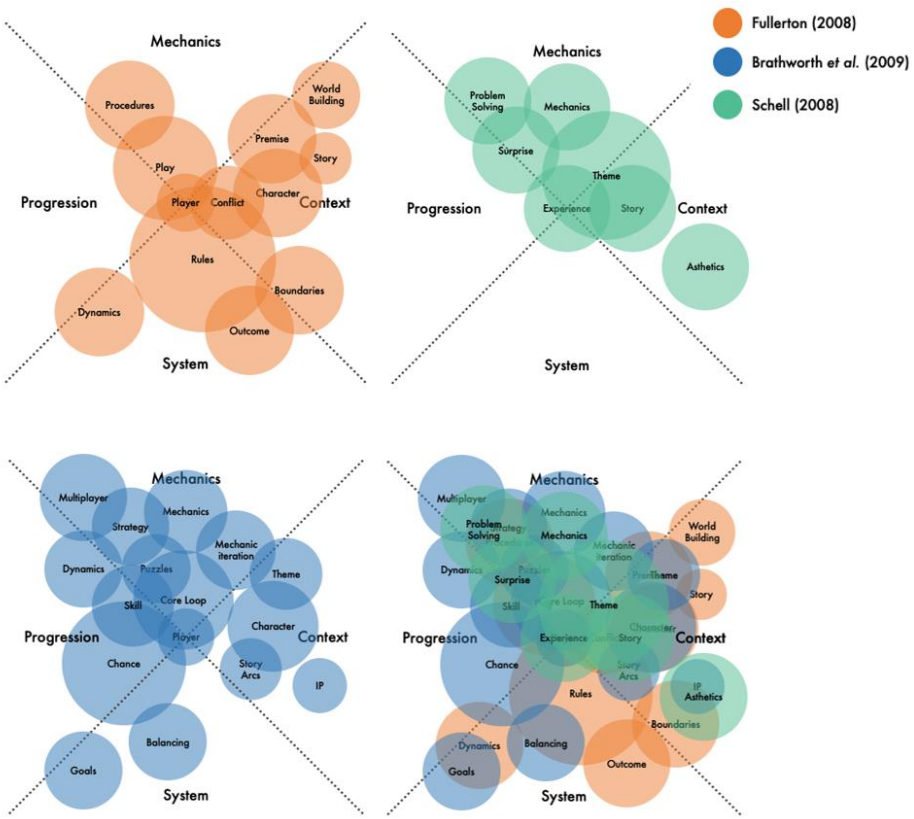
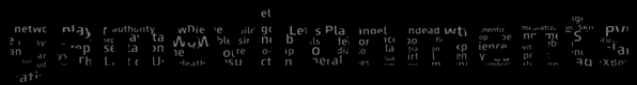


Figure 1. Mental map of main game design concepts present in the main course literature.

Fullerton (2008) discusses several categories, but has an extra emphasis on context. Schell (2019) primarily focuses on mechanics. Brathwaite and Schreiber (2009) focus on mechanics and progression. The bottom left image shows the overlap between texts.



As you can see, the different works certainly have a lot of overlap with one another. But each work tends to be weighted towards a particular part of the design conversation. Knowing about each author's main focus, we also knew when and how to include them in the course structure. One thing that is immediately apparent from this model was, for us, the relative lack of course material on *progression*. So, this mapping was immediately helpful to us in identifying a gap that we needed to fill with additional literature.

By using these books in the course, the students could analyse each and every aspect of a game from these four distinct perspectives, which allow them to be constantly reminded how all parts of a game contribute to the final product. Every mechanic needs to have a meaning in the context of the game, as it needs to be balanced and used in a certain or many parts of the player's journey. A particular item has its systematic status, but also a mechanic use, a narrative function and is present (or has a random and designed chance to be present) somewhere carefully planned in a game. Another positive point about this division is that it allows the students to identify which area of game design they have a particular interest as for means of further researching, practicing and even job applying.

We should note that there is one component of game design that we have deliberately left out from the course curricula, is the examination of design *processes*. That is, the craft of *building* a game, and the various steps a designer can take to make an idea into a full product. Although the practical process of creating a game is, of course, a very important aspect of game development, this particular course focuses on understanding what game design *is*. Process is something that we do not want to try to formalize too early in the program, before the students have developed

their own designer *voice*. By more freely experimenting with pure design concepts early on their journey, they will have a good creative foundation for exploring design from a more pragmatic, processes-oriented, perspective.

Project Based Learning (PBL) and Prototyping

The semester was then mapped to have two introductory classes in the beginning on game design history and current state, and three open classes at the end for students' requested themes. All remainder classes (between eleven and 13, depending on how many holidays the semester had) were divided into four main moments, each one focusing on one of the four areas of game design previously explained. Starting a new area, we would have a presentation lecture and a playtest with pre-selected games in which the whole classroom would watch one of the students play and analyse what was happening in the screen through the lens of the area in consideration. The lecture functions as an introduction to the theme while the play test and analysis works as a familiarizing activity for students to exercise critical thinking and the jargon without the pressure of individual performance as the analysis is conducted with the whole classroom.

We decided to use PBL to encourage our students' autonomy and creativity, so we gave them a problem and a guide of suggested approaches to solve the said problem. They did not have to follow the guide if they thought it was not pertinent to their solution but they had to justify their reasoning behind it. In order to also encourage them to try as many solutions and situations possible, we used a very different flavour of PBL then described in previous studies (such as Reng and Schoenau-Fog 2011) by making the problems small and the projects short (between

one and two weeks maximum). It was thought that the fast pacing of projects would keep them engaged and yet not too attached to a given solution or approach to a problem.

By the end of the introductory class, students received a briefing of a problem and a guide of how to approach it, to be presented on the next class. The objective of this project varied on how early in the semester it was; in the beginning of it being a simple concept of a game or feature, evolving to a report prototype and modifying mechanics in an existing game. The importance of this first Project Based Learning (PBL) exercise was to improve the students' acquaintance with the element and to get more confidence using it. In the next class students had to present in front of the whole classroom if the project was a concept or a pitch, or to offer the playable prototype of modified game to playtest in the classroom while also playtesting their colleagues projects.

By the end of the second-class presentation, students gave a second briefing and guide to another project. This project could be something entirely new or an improvement or change on their first project and would be more robust and challenging as well. For this project, students would have the remainder of the second class, if any time was left, and the third class to work on the project, get feedback from peers and professor, before presenting their results in the fourth class on the element. The objective of this activity was to increase students' familiarity with the element and make them as comfortable in using it as they could be.

Student's Assessment

Students rated their experience with the Game Design course positively, and the course evaluation questionnaires resulted in a median score of nine out of ten. But the course evaluations, of course, was not without pertinent critique. Many of the students (more than five) from the 2018-2019 iterations of the course stated that they were confused by the sheer number of activities, and the rapid pace the course would change design topic. In particular, they referenced making two game prototypes per category, which made us tweaking our *micro PBL* approach. On the 2020 syllabus we adapted to the criticisms by doing only one, slightly more substantial, game project per category, which was well received and obtained no negative remarks in the subsequent course evaluation.

Conclusion

Teaching something that has always been present in culture and individual peoples' lives, but *updating* it and matching it to a recent technical and academic field of study - game design - is a daunting challenge. A challenge, however, that can be best tackled using the game design knowledge we have so far, but presenting it in a specific and more granular fashion. From our own perspective as educators, these types of changes proved to be beneficial to the students' learning journey. The choice of dividing game design in mechanics, progression, context and system proved to be, at least in the short run, straight-forward and motivating. The use of problem-based learning and in-class play-testing was also generally positive. Having several short and small projects, however, were not as well received as we had hoped. Next semester, we will be experimenting with having one larger project for each design category, rather than a few rapid projects. While the current form might be useful in

teaching students about rapid prototyping in game ideation and production, it might be difficult for students to truly experiment with complex design ideas if they don't have time to properly go *beyond* the initial prototype.

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