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Introduction

Clara Fernández-Vara

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This Special Issue of ToDiGRA comprises works that were presented at the workshop "Teaching Games: Pedagogical Approaches", which took place at DiGRA 2019 in Tokyo. The papers presented were elaborated into articles for this issue. The blind peer reviews, along with the revisions of the articles, took place during the 2020 pandemic lockdown. The workshop organizing committee, along with the editor of this volume, would like to express their thanks and appreciation to all the authors and reviewers for their work and effort during these troublesome times.

This volume is dedicated to Jeff Watson, who passed away before we could release it.

1.

Infrastructures of Play

Labor, Materiality, and Videogame Education

Jeff Watson

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ABSTRACT

Preparing students for the job market is not the limit of our responsibilities as videogame educators. We must also prepare them to be ethical actors within the industries they may join. This paper argues for augmenting player-centric videogame design education and game studies pedagogies with approaches that situate videogames in context as operational components of extractivist business models and the political and financial economies that support them. This approach entails teaching videogames as technical systems with complex and expansive

upstream and downstream supports and impacts. These supports and impacts have real and frequently detrimental effects on the environment, communities, and individual human lives, and yet are relatively rarely discussed in the literature, especially in comparison to discussions that focus on representation and rhetoric. By looking beyond the frame of the individual videogame as an expressive artifact, educators can help learners to apprehend issues such as the growing material and environmental costs of computer-based entertainment and the many tiers of labor exploitation involved in producing videogames and the computing machinery that makes them possible, among other concerns. The paper concludes by suggesting that students equipped with these kinds of understandings will be able to make more informed ethical assessments, and thus wiser choices, as they percolate into the videogames industries and, in some cases, into positions of leadership.

Keywords

Environmentalism, ethics, labor, materiality, platforms, videogames

INTRODUCTION

How should videogames educators respond to the growing crises in the environment and in democracy? Is it enough to simply advocate to students that they consider developing or studying videogame content that addresses these issues? Or are there other responsibilities we bear?

It is true that videogames educators, particularly in design domains, have a responsibility to help their students prepare for employment. After all, our students have entrusted us with their post-secondary education, at least in part, on the premise that the learning experiences we provide them with will lead to sustainable career outcomes. This is especially important in the United States,

where many post-secondary students will accumulate massive debt in the course of attaining a degree. But the economy is tight everywhere. Graduates need jobs.

Still, our responsibilities clearly do not end there. It is also our responsibility to ensure that students have an understanding of what the videogames industries do *as industries*, alongside what videogames themselves can say or do as interactive cultural artifacts, so that they can make more informed ethical assessments and choices, both as citizens and as workers. This means helping students to understand—through reading, reflection, and even critical videogame design itself—the reach and scale of these industries, their imbrication in some of the most extractive of sectors of the 21st century global economy, and the many ways that the infrastructures they co-construct impact human life and the biosphere.

Illusions of Immateriality

One reason why this is an important pedagogical aim is that the material and human costs of all things digital are largely hidden behind an illusion of immateriality put forth by the computing machinery industries and encoded in the norms that govern how we talk about our experiences with computers, especially in the English-speaking world (Carruth 2014; Chang and Parham 2017; Ensmenger 2013, 2018). The virtual can feel otherworldly and mystical—indeed, this is sometimes a key aspect of its appeal. Steve Jobs famously described the iPad as a "magical device" (Arthur 2010). But the fact is, the iPad is not magical, and neither are the PlayStation nor the latest graphics cards from nVidia or AMD. The "cloud" is not a cloud, but rather a resource- and energy-intensive network of data centers, undersea cables, satellites, water suppliers, and power plants. The technical infrastructure that makes possible the videogame is composed of physical machines—and every part of those machines, from housings to microprocessors to cooling systems, are the result of

decidedly “unmagical” processes, such as mining and refining, international shipping logistics, trade pacts, assembly line labor, the burning of coal and other fossil fuels, and so on.

In developing new curriculum materials for the University of Southern California to address these issues, I have identified several pathways to help students to understand the industrial and human supports that underwrite 21st century videogaming. These pathways are worthy of both their own courses and of further integration into existing theory, history, and production offerings—not only here, but at all institutions seeking to provide students with ways to critically design and assess videogames. In this paper, I will discuss two of these pathways: *Materiality and the Environment* and *Labor*.

In the sections below, I will outline some of the reasons why I think traversing these pathways is so essential to videogame pedagogy in 2019 and beyond. In so doing I will identify selected research, reporting, and critical writing on each topic, with an eye toward providing educators with trailheads for developing or augmenting syllabi. Finally, I will conclude by gesturing first at the urgency of this kind of intervention given the present global political and environmental situation, and second, at the importance of recognizing videogames and associated technologies not only as contributors to, and enablers of, some of the thorniest problems of our time, but also as necessary vectors for their amelioration.

MATERIALITY AND THE ENVIRONMENT

While the material underpinnings of an individual videogame or videogame console may not be apparent to the end users of such products (or to their creators), their impacts on human beings and the physical environment are profoundly real, even if one completely sets aside the play experiences they facilitate and the psychosocial transformations those experiences can usher into

being. As videogames educators, it is our responsibility to bring students into contact with these impacts.

In a reflection on computer science pedagogies, sociologist and technology scholar, Nathan Ensmenger, argues that greater attention should be paid to the "real world" impacts of computation. To this end, Ensmenger proposes that educators move beyond the traditionally "conceptual" introductions to computing topics that characterize many post-secondary courses in computer science—introductions that tend to concentrate on things like abstract descriptions of Turing machines, depoliticized histories of storage media, and so on. Instead, by treating the computer as a "physical artifact, rather than as an ideal," Ensmenger argues that we can put students in contact with the lived and material realities of computation and its industrial supports, and in so doing "avoid the kinds of one-sided utopianism that dominates much of the conversation about computers and society" (Ensmenger 2013, 81).

Likewise, videogames educators could improve how they serve their students by moving beyond idealizations that can elide the significant and growing material impacts of the medium. As Alenda Chang and John Parham put it in their introduction to *Green Computer Games* (2017), such idealizations can "fetishize the player and the act of play" (11) in ways that can drastically limit students' understandings of the broader industrial contexts of videogames and the platforms that support them. By leavening our discussions of the formal properties, psychosocial impacts, and emancipatory powers of games and play, with a recognition that 21st century computer-organized play is in fact an extremely resource- and labor-intensive proposition, videogames educators can disclose to students a fuller picture of what the object of their study does in (and to) this world.

One entry-point to this discussion is the relationship of videogames to time—in this case, to *geological* time. Consumer electronics—the substrate of all videogames—can seem

ephemeral and entirely of-the-moment, but are in fact intimately connected to geological processes that extend into the deep past. As Kate Crawford and Vladan Joler note, home computing devices such as iPads, gaming consoles, and smart speakers involve the extraction and refining of materials that took the earth billions of years to produce, only to "serve a split second of technological time" before they become obsolete and are thrown away (Crawford and Joler 2018, 5). Further, these resources are finite, and recycling them is a dangerous and expensive process that many jurisdictions simply do not support. How does this reality interface with the economic imperatives of the videogames industries, which demand constant growth and "innovation?" How does this fold into discussions of immersion, verisimilitude, and virtual reality, especially as they map to the development of ever more powerful graphics processing units and new classes of devices, such as VR headsets and motion capture volumes? Most importantly, how might a contemplation of the radical extractivism (Mezzadra and Neilson 2017) entailed in the videogames and computing machinery industries change how students conceive of their futures? Asking such questions can help educators to challenge students to "[engage] candidly with how games and gamers may be complicit in, or at least uncomfortably close to, legitimating unsustainable practices" (Chang and Parham, 1). In the absence of such challenges, students could find themselves entering into industry only to participate unawares in the reproduction of harmful practices they may otherwise oppose.

LABOR

Another important aspect of the videogames industries hidden behind the veils of inconsequentiality and immateriality is the labor that goes into creating the devices, applications, and platforms that characterize play after the internet. Hidden here, too, are the fraught histories of the computing machinery industries, and of the often-exploited workers who have made

their long booms possible (Hicks 2013; Lécuyer 2017; Nakamura 2014).

In "Indigenous Circuits" (2014), Lisa Nakamura traces some of this history, and begins by pointing out how Donna Haraway's 1985 essay, "A Cyborg Manifesto," amid its many insights, "draws our attention to the irony that some must labor invisibly for others of us to feel, if not actually be free and empowered through technology use" (Nakamura 2014, 920). Pointing to the example set by a variety of critics, organizations, and artists working in the fields of technoscience and entertainment, Nakamura invites us to "question and challenge the human cost of computing and mobile telephony" (921). She illustrates this human cost by showing how the labor of women of color was both fundamental to the birth of Silicon Valley, and a preview of the exploitative outsourced labor practices that keep game consoles and laptops alike both accessible and disposable today. What becomes clear from this example is that the development of such labor practices is as much a part of the technology business as is the development of ever smaller and more powerful computers, or ever more compelling entertainment and applications. Indeed, as Nakamura shows, one of the industry's most storied corporations, Fairchild Semiconductor, pioneered not only microprocessor engineering, but also the methods and supply chains by which such complex products could be cheaply manufactured (923). Industrial labor downstream from the consumer can be equally exploitative—and equally invisible. For example, the over 80,000 people living in the Agbogbloshie slum in Ghana's capital city, Accra, subsist by scavenging copper and other metals from the massive e-waste dumps located on the outskirts of the city. The concentration of toxic dioxins and PCBs at these dumps can cause serious health problems, including nervous and immune system disorders. These problems afflict not only the dump workers, but also their families, as the toxins seep into the groundwater and thereafter the food chain. According to research conducted by the International Persistent Organic Pollutants Elimination Network (IPEN), a single egg laid by a chicken raised in Agbogbloshie "[exceeds] the

European Food Safety Authority limits on chlorinated dioxins 220 times over" (Beaumont 2019).

In addition to these "offshore" labor implications, videogame design students outside the developing world also ought to be made aware of how they, too, can face exploitative and even dangerous conditions should they end up working in the videogames industries. Game developer "crunch" is one of the few areas where some public awareness of the labor practices of these industries exists (Fenlon and Chalk 2019; Glasner 2019). However, despite nascent efforts to unionize game workers ("Game Workers Unite!" n.d.), professional game development remains a life-consuming grind for many. Those fortunate enough to land jobs in the videogames industries can quickly discover that the work demands placed upon them, buttressed by their implied near-instant replaceability, can be extreme. As Marcin Iwinski, a Polish game developer, told the New York Times, making games is "hard-core work. It can destroy your life" (Schreier 2018).

Finally, other forms of labor associated with videogames, from the "free" labor (or "playbor") of live streamers and the players of online multiplayer games (Walker 2014), to the ever-expanding demand for content moderation on para-gaming social media platforms (Noble and Roberts 2017), deserve disclosure as a part of any complete videogames education. Simply put, educators do students a disservice if they deprive them of the opportunity to understand not only the risks they may incur personally, but also those that the industries to which they intend to devote their lives can inflict on other workers up and down the supply chain.

CONCLUSION

As with all things educational, disclosing difficult truths about our field of research and practice is not exclusively about our students and their moral and economic well-being. It is also about the society they belong to and the ecosystem we all depend upon—and how our students, insofar as they aspire to become involved with

an increasingly powerful and transformative set of industries, will impact the world as they graduate our programs and take on positions of responsibility.

Only from a position of understanding can our students become the agents of change that our troubled world urgently needs them to be. Rather than understanding games as something separate—an escape, a distraction, a sealed-off "magic circle"—we must enable our students to see that no such separation is possible, or even desirable (Consalvo 2009). We must inspire our students to ask difficult questions about where videogames and interactive entertainment fit into the epochal struggle for the survival of our ecosystems and the democratic way of life. We must face, with our learners, the very real roles that videogames and the computing machinery industries have played in exacerbating the environmental and social problems that now threaten to bring ruin to the world; and so too must we recognize that play remains the *sine qua non* of transformation and discovery in human affairs, and that games can order and direct play's energies in many directions other than the pursuit of endless growth and profit.

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2.

TOG

A Model for Innovation-Centric Design in Games and Expressive Interactive Media

Mirjam Palosaari Eladhari & Hartmut Koenitz

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ABSTRACT

This paper describes an approach to facilitate innovation in game design by increasing the designers' palette of playable and participatory computational expressions. The TOG model (Technology, Ontology, and Game Genre) can be used in teaching game design and related practices, but is also applicable to prototyping in professional settings. TOG is inspired by the processes of AI-based game design, and introduces the concept of the techno-artistic minimum. It was conceptualized when teaching

a course on computational expression at Malta University. The main aim for teaching with the TOG model was to facilitate innovation by challenging aspiring game designers to think ‘outside the box’ and come up with unusual and innovate creative solutions. In addition, TOG can complement existing design methods such as MDA and DDT in the practice of professional game designers.

Keywords

pedagogy, game design, teaching, AI-based game design, case study, computational expression, TOG model, expressive effect, intentionality, mental model

INTRODUCTION

With a professional practice extending back to the 1970s and an educational practice in higher education going back to the first game design program at Abertay University in 1996, we need to face the fact that “routine game design” becomes an issue for both the professional practice and education. It is therefore timely to consider planned interruptions using methods designed to disrupt the well-trodden paths (or rather, multi-lane boulevards by now) of game design and challenge designers to consider problems they would not otherwise have engaged with. In this paper, we are introducing a model designed to facilitate such creative interruptions: TOG (Technology, Ontology, and Game Genre). We describe the model’s foundations, components, and concrete application in game education. More concretely, TOG uses unexpected ontologies, technological approaches and applications not yet commonly used in games (for example, because the technological advances are so new that they pose a risk to stability in a shipped game) and settings/environment outside of classic (worn out) fictional universes of medieval fantasy, steam punk or space travel. Furthermore, the TOG model assumes an understanding of the minimal requirements for coherent games

systems (which we will describe as the ‘techno-artistic minimum’). The main aim of the TOG approach is to facilitate innovation by means of out-of-the-box design thinking. The TOG triad engenders new ideas and approaches growing on the fertile creative ground of unexpected combinations of technology, ontology, and game genre that serve as starting points for a given design.

We also discuss concrete results as examples of what this approach can accomplish. In order to illustrate how the TOG model can be used in teaching, we present a case study from a course of five ETCS credits, which was taught at masters’ level. Our example is of particular interest to educators who are teaching students from mixed educational backgrounds. In such settings, a TOG-based approach can help student groups to work in ways that enable them to harness their existing knowledge, and gain new means of expression in collaboration with their peers. Students participating in the course have described it as positively challenging, stating that it helped to expand their horizon, and that they were inspired to make things they did not expect to make. In addition, many of the students participating in the course later based their dissertation work on the design experiments and prototypes they made using the TOG model.

The TOG approach is informed by work reflecting on processes in AI-based game design (AIGD) (Eladhari et al. 2011). In this context, it is crucial to recognize that game creation is, fundamentally a liberal art, even when taught within the engineering disciplines. Game creators build worlds and formulate ontologies, and as a foundation for their work, often read up on a plethora of subjects for inspiration – biology, art, music, psychology, economics, politics, learning sciences, architecture, and more. It is in this particular sense that we use the term ‘computational expression’ to denote computational methods as a means for artistic expression. Given the particular nature of video games as expressive works made for the active exploration and co-development by audiences – we need to consider the need for

evaluation criteria different from those of traditional engineering disciplines. In this regard, Horswill et al. argue:

> […] the evaluation criteria of computational media are ultimately aesthetic: the value of a piece lies in its ability to engage its audience, and the value of a technology lies in its ability to allow artists and designers to develop engaging pieces. (Horswill et al. 2019)

This perspective continues Janet Murray's line of thought in her distinction between the affordances and aesthetic qualities of the digital medium (Murray 1997). The broadness and openness of systematic perspectives and combinatorics at the heart of game design give rise to a rich design space, full of unmapped terrain and novel opportunities. The TOG approach is intended to prepare and enable students to realize the expressive potential of computational expressions, to make creative use of the "digital plenitude", as Bolter (2019) recently put it.

In summary, the aim of this article is multi-fold: to a) offer an approach for overcoming what we call the 'techno-artistic minimum', the threshold of successful game design, b) introduce the TOG model as a means to facilitate innovation and exploration in computational expression, and c) demonstrate how the TOG model can be used in teaching.

BACKGROUND

In this section, we will describe the conceptual background of the TOG model and its triad of *technology*, *ontology*, and *game genre*, as well as the *techno-artistic minimum*. TOG model draws on work on AI-Based Game Design (AIGD). In short, AI-based game design is the creation of games where the game mechanics are intertwined with the AI systems used to realize the game. Examining design process in making AI-based games, Eladhari et al. (2011) identified distinct processes in that approach by means of case studies. The authors also found that a common

denominator in the practice was to consider the respective knowledge domains in triplets, e.g.

1. a main subject area, theme or theory,
2. an AI method, and
3. game genre convention(s).

For example, a game whose **main theme** is musical theory invites different types of play activities in comparison to a game based on collaborative storytelling. Often-used **AI methods** can both constrain and open up a design space. For example, adopting a belief-desire-intention architectural approach (Rao and Georgeff 1995) for autonomous entities in a game would imply that autonomous entities should be able to perceive a world, believe something about it, desire something, and have means to satisfy that desire. **Game genre** conventions, such as the typical challenges that players face in real-time strategy games, computer role-playing games, or first-person shooters shape the affordances designers create for players within the systems. The overall tripartite segmentation provides the inspiration for the TOG triad.

Techno-Artistic minimum

A basic goal of game design pedagogy is to reach the *techno-artistic minimum,* by which we mean that technology and artistry need to form a minimal ‘happy alliance’. Both the technological and the artistic sides need to come together sufficiently well in a design to enable experiences that can be compared to the original vision. Thus, the *techno-artistic minimum* describes the threshold that an artifact needs to reach in order to be a viable video game prototype, understood as a playable experience. In terms of skillsets, this means that a) students and designers with engineering backgrounds need to have sufficient consideration for aesthetic and experiential aspects in order to create a satisfying player experience, and b) that those with an artistic background

need to acquire sufficient proficiency to have a technological palette of options to work with.

The challenge for educators here is to develop both sides of the techno-artistic spectrum and build a conceptual-aesthetic understanding, along with the technical skillset of their students so that they can reach the *techno-artistic minimum* in their own work. This also means that any educator originating in the humanistic or social sciences would be severely handicapped by not understanding the technologies underlying computational expression, while computer scientists and engineers would be hampered without an appreciation of expressive categories. It is a fundamental challenge of game design teaching to develop an understanding of the expressive opportunities afforded by the combination of technology and art, and how to reach the *techno-artistic minimum* as a foundation for more advanced skills.

THE TOG MODEL

Before describing the TOG model in detail, we want to be clear about our aims with it. The focus here is *not* on making artifacts ready for public consumption, but rather to create experimental works that demonstrate a concept, allow for play testing, and enable critical reflection on its underlying ontologies, systems, processes, and genre conventions. Consequently, the TOG model is not meant as a model for understanding how to develop a 'good' game, or to provide a mapping or framework for analyzing existing games. Instead, it is a tool to spur innovation in game design and thus enhance an individual learner's palette of computational expressions. As such, the focus is on the artistic process, the journey to innovation, and the expansion of artistic registers and design approaches.

The TOG Model (Figure 1), abbreviated from *technology*, *ontology*, and *genre*, aims to facilitate two important goals in teaching game design: to spur conceptual innovation by breaking out from conventional game theme/fictions and genres, and to

encourage experimentation with technology, both in terms of using existing computational processes and by developing new ones, as well as using non-conventional technologies for player input. As the authors found the triadic approach of AIGD useful for explorative research in AI-based games, a tripartite approach offers a promising foundation for a model used on teaching methods for computational expression in connection with game design.

The **technology** category covers both computational processes and the use of different types of hardware. Technology is thus used in very broad terms. When it comes to computational process, this aspect is cutting across different categories from the foundational architectural layer of a given game design, up to the representational level where the player interfaces with the game – what Walk et al. (2017) call the "experience layer" in the DDT framework (which in turn is an improvement of the MDA model for game design by Hunicke et al. from 2004). This aspect of the TOG model is similar to the concept of "operational logics" as defined by Mateas and Wardrip-Fruin (2009), and further refined by Osborn et al. (2017), in that the technology, or processes an operational logic can consist of, is neither beneath nor above mechanics, but represents a different slice through a game, cutting from system architecture to what effect it may have on the player experience.

We specify **technology** in this loose way to invite experimentation. For example, in the first iteration of the course (presented as a case study below), the original project description mandated the use of a small section of specific technological approaches such as procedural generation or machine learning. However, some students were keen to experiment with new hardware, and there was nothing in the learning goals of the course that would motivate curtailing this enhancement. On the contrary, it opened up a space for further and broader experimentation and a reflection on how expansive the notion of computational expression can be.

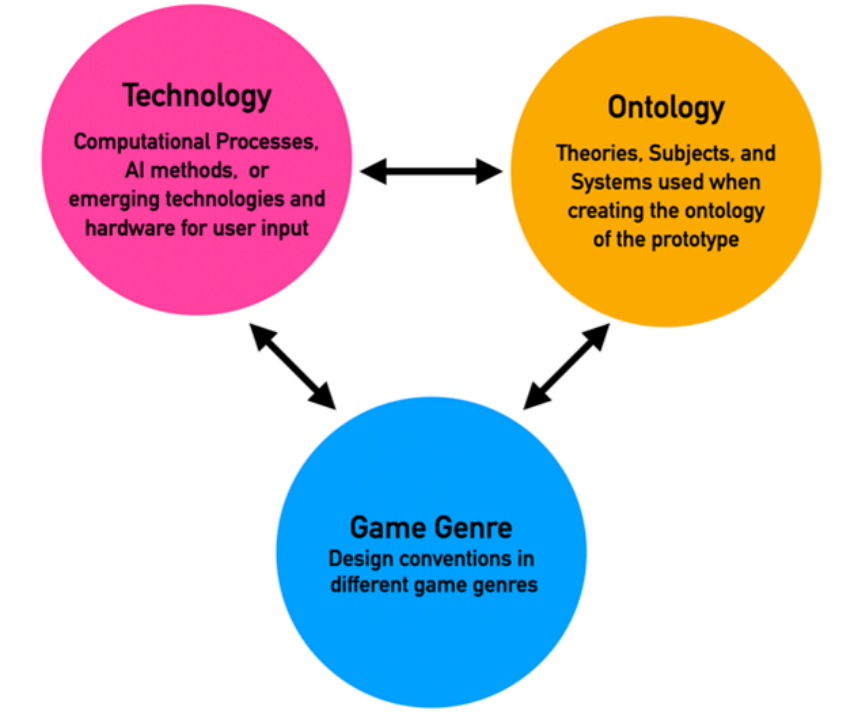

Figure 1: The TOG model

An **ontology**, in its lexical definition, has two meanings: "the branch of metaphysics dealing with the nature of being", and "a set of concepts and categories in a subject area or domain that shows their properties and the relations between them." In the context of TOG, we understand ontology in the latter sense. Creating ontologies is what game system designers do. It is important to reflect that an ontology is more than just a theme. Any game system has an ontology created by someone, since the virtual world must be defined in its entirety; which things exist in the world, what the things consist of, and how they relate to each other. Conversely, ontologies determine a user's perception of, and interaction with, a game. In the TOG model, we pick ontologies not commonly used in game design (for some examples, see the section describing prototypes in this paper), as a targeted intervention, as a layer of both creative constraint and inspiration, to facilitate problem solving in novel and potentially unexpected

ways. The selected ontology is used as a starting point for the construction of an ontology specific to the prototype, that informs the overall system design.

Game genre is the third component of the TOG model. Game genre conventions impact both the design process/choices and players' expectations. For example, in the genre of role-playing games (RPGs) we would expect to find a facility for skill selection and a way of levelling up skill values. As designers, we bring past play and development experiences to our projects, often unconsciously. As Bartle (2003) noted, we have a tendency to want to re-create our first deeply meaningful game experience. Furthermore, as designers, we are often asked to create a work of a certain genre – consequently thinking in terms of genre is widespread in game development.

In the TOG model, we use game genre in two ways: first, as a starting point for the design, an established set of conventions for game rules and game mechanics, and secondly, to instill the awareness that the choice of game genre is an *active*, conscious one, with considerable consequences. Making the choice of game genre an explicit decision in the design process helps to raise awareness of its benefits, but also potential pitfalls. Specifically, there is a danger that genre conventions are taken for granted and thus become a foregone conclusion, unnecessarily limiting the design space. An explicit consideration of game genre enables productive engagement with the concept, and can help foster novel computational expressions. Games genre also serve as an indicator of difference from established genres, since the use of unconventional ontologies is designed to create a productive tension with the concept of game genre.

At this point, some readers may wonder where in the TOG model they can find an equivalent to Hunicke's (2004) and Schell's (2008) layer of "aesthetics", or – as Walk (2017) and Winn (2009) in their models call it – the experience (of the player) layer. In the TOG model, this aspect is not specifically spelled out, as our

focus is on experimentation and a focus on the designer and their learning process, and not on creating products for the end-user. However, the player experience is central to the reflection phase in an implementation of the TOG model.

Implementing TOG: Concept and Realization Phases

In a concrete application of the TOG model, we differentiate the three phases of *concept*, *realization*, and *reflection* (Figure 2). In the concept phase, students develop a concept taking into account the three given elements of a TOG challenge. In the realization phase they develop a project, with the aim to reach the techno-artistic minimum necessary for a playable prototype and as a prerequisite for the reflection phase.

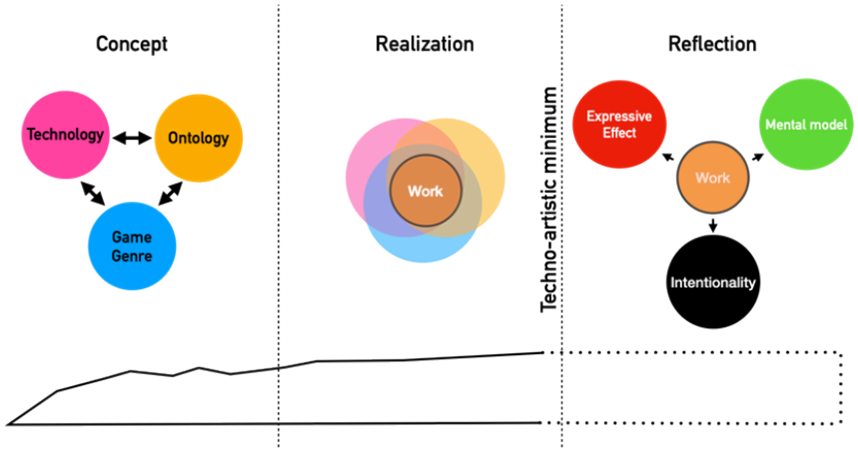

Figure 2: TOG model and implementation phases

It is important to point out that the TOG triad is only the starting point of the design process: once the work begins, the different parts of the triads feed into and affect each other. Through these interactions, seams, ruptures, and undefined spaces appear at multiple levels, fostering innovation. For example, a technology may not be able to cater to the design – hence an existing computational method needs to be improved, modified or invented. In another instance, a particular design may not fall into

any existing category, or established game design conventions may not cater to them, and consequently, a novel game category, design approach or type of game play is created. In these ways, the TOG approach is of particular use to facilitate innovation,

Reflection Phase

In the reflection phase, designers consider the work from three different perspectives: mental model, expressive effect, and intentionality.

We routinely form **mental models** of phenomena we encounter, starting in childhood, e.g., when we first try to understand what a cat is. Such models are changed and reinforced through learning, and inform our actions in daily life. In particular, they enable us to perform both routine and new tasks (by contrasting to existing knowledge and adjusting to new circumstances) and thus also inform players' conception about how something should work in a game. For the purposes of game design, it is important to take these models into account and make productive use of them (Puerta-Melguizo et al. 2002). In the reflection phase, we identify the mental models that players have formed and whether these reflect the original design intention reflected in the constructed ontology.

The reflection on the **expressive effect,** here understood as the process-experience ratio, is concerned with the workings of the underlying computational system and how a player perceives that aspect. This category is inspired by Noah Wardrip-Fruin (2009), who in *Expressive Processing*, describes three different effects of authored computational processing. The first is the ELIZA effect, where the user ascribes more computational capability to a system than there actually is. Joseph Weizenbaum's original ELIZA program (1966) was an AI experiment simulating a Rogerian therapist (a style of therapy where therapists ask questions based on patients' remarks). ELIZA was able to sustain shorter "therapy sessions" based on a clever combination of computationally simple methods such as keyword identification and repetition of the users'

utterances. In game AI programming the ELIZA effect is often seen as a form of cheating, as 'smoke and mirrors.' Yet, if a given design creates an enjoyable experience for the player, then there may not be a need for more complex computation in the first place.

The second is the Tale-Spin effect (Wardrip-Fruin 2009). It happens when an elaborate and ambitious system does not result in a level of player experience quality that matches the effort of creating it. The TaleSpin system (Meehan 1977) was a masterpiece of system engineering that could generate stories, but it was more appreciated by fellow system designers than by the users. Thirdly, there is the SimCity effect (Wardrip-Fruin 2009), and this is where the computer processing made for the system creates an immersive, complex, and dynamic experience for the player. SimCity (Wright 1989) is a simulation game where players define cities. As the cities grow, areas respond differently, and players learn to understand the system's operation as a process of play. The SimCity effect occurs when players' understanding of a system matches its actual operation.

Thus, we can see expressive effect as a scale reaching from the overestimation of the capabilities of a computational system to a match between perception and actual abilities (we might call this the 'techno-experiential balance') to an underestimation of the computational system on the other end, where there is a lack of transparency of its capabilities.

When the notion of effect is considered in the reflection phase it is from this backdrop: where does the prototype fall on this 'techno-experiential scale'? This also means that individual works can be evaluated along the scale – they do not have to be placed at the extremes or at the perfect center – resulting in a more granular instrument of reflection.

Intentionality is described by Dennet (1987) as the player's observation that an agent in a system is acting rationally, towards internally held goals. When players encounter an AI system in

a game, they assign intentionality to that system, “using words whose meanings go beyond the mathematical structures” (Agre 1997). They create narratives that rationalize the AI’s actions and reason about the AI’s goals (Sengers 2000). Hence, it is an indication of a successful design, if a player can read intentionality into a system or into components or agents in a system.

When a system does not have sufficient reactive-expressive capability to support the intentionality players read into it, or when a system fails to communicate its technical capabilities, when it strays too far from the balance of the center at the techno-experiential scale, this means that the believable (in Loyall and Bates’s sense, 1997) immersion of the SimCity effect is lost. Therefore, reflecting upon how players perceive the intentionality of a system and its acting component is a crucial part of using the TOG approach. If players assigned intentionality, this is positive because it means that players are actively creating belief (Murray 1997) (in contrast to Coleridge’s suspension of disbelief (1894)). In particular, it is useful to reflect on what entities, or parts of a system, users assign intentionality to, and how. The following table contains a matrix of how to categorize and evaluate intentionality (Table 1). In concrete usage, not all columns need to be filled, e.g., a given process might not be perceived as breaking.

Perceived intentional process	**What is the perceived intention?**	**Is the perceived intention sustained? How?**	**Does the perceived intention break? Why?**
Encountered NPC (agent, human)	Independent life	Dialog in line with overarching narrative and NPCs personality	Repetitive actions, out of character utterances
Weather (in-game system)	Weather phenomena governed by gods	Weather is changing according to gods’ moods	No weather effect, even when the gods are angry.
Political society (in-game system)	Dynamic politics with competing factions	Political events happen (e.g., mayor is elected, new laws are enacted)	Player character not affected by changes in society. Faction representatives act out of line with their ethos

Table 1. Intentionality

The categories of *mental model*, *expressive effect* and *intentionality* provide a rich toolbox for reflection on a prototype designed with the TOG model approach. As such, these criteria may be seen as aspects of the type of aesthetic evaluation Horswill et al. (2019) called for (and before them, Murray (1997) described as foundational to the digital medium). The development of a full set of aesthetic criteria for the evaluation of AI-based games, as well as other designed digital interactive experiences is outside the scope of this article and remains a task for the future.

In the following section we will report on the course where the TOG model was conceptualized.

Development of the TOG model and use as a method in education

The course "Computational Expression" was designed by the first author at the University of Malta and was offered for two consecutive years (after which the first author moved to a different institution). In the first year, the course was focused entirely on AIGD. In the second year, the approach was broadened, allowing students to base their designs on any significant technology of their choosing – the technology did not have to be an AI approach, but instead could apply new tools for interaction, for example bio-feedback sensors or virtual reality headsets.

The courses were taught at masters' level. The majority of students had their main educational background in computing, which helped lower the threshold for using the technological approaches involved. However, students with other backgrounds were accommodated with development tools that did not require prior programming knowledge, but still provided hands-on experience in using AI approaches, authoring systems and different types of input and display systems. The initial course had five students, the second iteration eleven. The course was structured into the following work phases. The first phase in the course, *knowledge*

gathering, is not represented in the TOG model proper, but part of its implementation was used as a method of education and a prerequisite for the subsequent phases.

1. Knowledge gathering,
2. Conceptualization,
3. Development and play testing,
4. Reflection: Presentation, feedback, and write-up.

In the following sections, the work conducted in these phases is described.

Knowledge Gathering Phase

The *knowledge gathering phase* was dedicated to giving students an introduction to the possibilities of AI techniques commonly used in games. This part was structured as in-class discussion seminars followed by hands-on practice in workshops, allowing students to expand their creative palette as designers. The discussion seminars were focused on different themes, including AI-Based Games, Software Studies, Interactive Narrative, Characterization and Agents, Procedurally Generated Content, Computational Creativity, and Artificial Life.

In the first seminar, students chose themes, texts and tools, which they later presented to their peers. Doing so, they became the group's experts on different approaches, the 'experts in resident' for their chosen themes.

In the workshops, students explored a range of topics and technologies related to the seminar themes, including Oculus Rift and various bio data gathering devices. The emphasis of the workshops was to provide hands-on experience that would be meaningful for both students proficient in programming, and those who were not. For example, in a workshop on interactive

narratives, all students participated in playing the card game, *Harold in Trouble* (Hoffman, Spierling and Struck 2011), which demonstrates how planning (as a computational approach) can be used for creating narratives. Then, students could choose between systems of different difficulty levels to implement a short story themselves (from paper prototyping with cards or TWINE[1] to Inform 7[2] or TADS[3]).

Figure 3. Workshops. Left: Play of card game Harold in Trouble as a way to introduce STRIPS planning in interactive story worlds. Top right: MindWave device, Bottom right: Interacting with ELIZA.

Learning was also accomplished through reading and by hands-on experimentation with technologies. In addition, subject experts were invited to give guest lectures via teleconferencing. The motivation was to give the students a range of examples illustrating what can be accomplished with different approaches. For the initial course, four guests were invited. Brian Magerko described ongoing work with Viewpoints AI (Jacob and Magerko 2015), Gillian Smith presented her work on Tanagra (Smith et al. 2010), and Richard Evans expanded upon his work on building a

1. http://twinery.org
2. http://inform7.com
3. http://www.tads.org

world of rules via the Praxis language he designed for the Versu engine. Evans also answered students' questions about the development of the AI for the creatures in the game, *Black and White* (Electronic Arts 2001), the behavior of which is determined by the players' actions, and about the AI for *The Sims 3* (The Sims Studio 2009) for which he was part of the engineering team. A central text in the course literature was *Expressive Processing* (Wardrip-Fruin 2009), as the volume describes the experiential and aesthetic effects of computational expressions, and in one of the seminars, Noah Wardrip-Fruin gave a lecture and discussed the topic (especially the SimCity effect) with the group.

Concept Phase

In the *concept phase*, students worked in groups, brainstorming and creating game prototypes. Their first task was to narrow down what they wanted to make; what type of game, what type of technology to have at its core, and what subject area or theory to use as the main ontology in the design. Early on, group members needed to agree on design goals in terms of player experience. The following questions were used as guidance:

1. What are the underlying theories or subject areas used as metaphors for the design of the game?
2. What, if any, game genre conventions are used?
3. What technologies, AI systems, or tools are used, and how could they affect the design of the game world and the game mechanics?

Development and Play Testing Phase

In the *development phase* students created digital playable games. For this they used commonly established workflows, including iterative design as described by Fullerton (2004). For play testing, students were asked to consider whether the impact of certain

domains, or ontologies, affected the game in a way that was appropriate according to the design goals. Results of play testing sessions fed into the next iteration of the prototypes.

Figure 4. Students play test each other's prototypes in the workshop.

In the following section, we describe prototypes made in the course. For each prototype, we state the starting technology, ontology and game genre used at the outset of the design process.

Examples of Prototypes made

Haiwaicode (see Figure 5) was made by Vincent Farrugia and Alan Pirotta. As starting points, they used machine learning as technology, "car traffic" as ontology, with racing as game genre. In the prototype, the cars' acceleration and deceleration was AI controlled. The player's role was to observe the car's behaviors, and inform the game if the cars were over- or underspeeding (top left corner buttons), and how severely (top right slider). Each new car that is spawned has a modified behavior depending on what the user did and other things the car observes by itself (collisions and such). The idea is that the player manages to get the cars to behave "decently" – to not collide and to not move too slow or too fast. The slider at the bottom was a rough indicator of how good / bad

the cars were doing. The play objective was to get the slider to the extreme right, which would open up new levels.

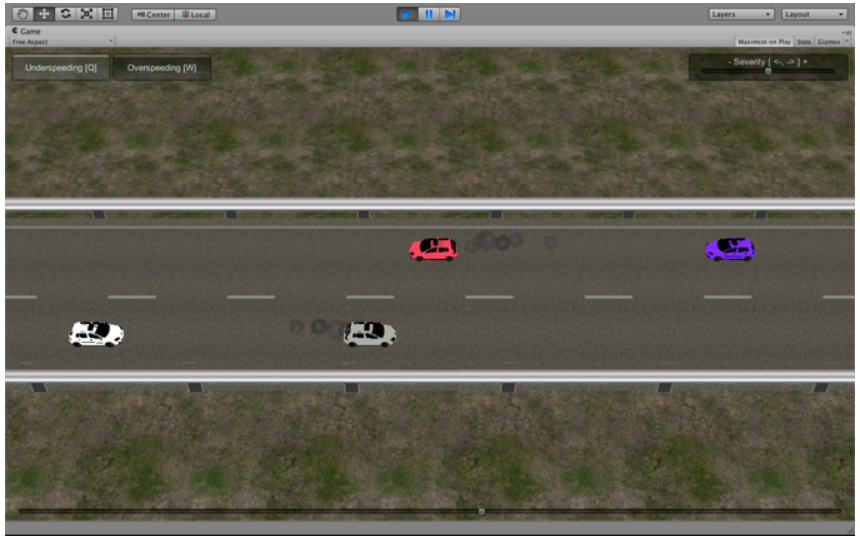

Figure 5. Haiwaicode prototype.

Compoblocks was made by Luke Aquilina and Karl Grech. The main computational approach was procedural generation, the ontology was musical composition, and the genre adopted was platformer. At the starting screen, players chose one of four moods; normal, stressed, relaxing or sad. The player controlled a ball, and the music changed depending on how the player moved the ball up or down the screen. The game experience was intended to be meditative, so there were no losing criteria. Normally, players lose when falling from a platform, but in Compoblocks, new platforms spawned under the player-controlled ball in concert with the music.

Organatron (see Figure 6) was made by Noel Cuschieri and Matthew Agius. For computational approaches they used procedural generation and genetic algorithms. Their ontology was robot wars and the game genre was strategy. In Organatron, two players could experiment with evolving dueling hybrid creatures, playing together on the same keyboard using different keys. In

the beginning, each player received five creatures that have one weakness and one strength each, represented by dots in different colors. Each turn consisted of a battle and a mutation phase, and it was in the latter that the strategy element came in, and where players picked the strengths to evolve.

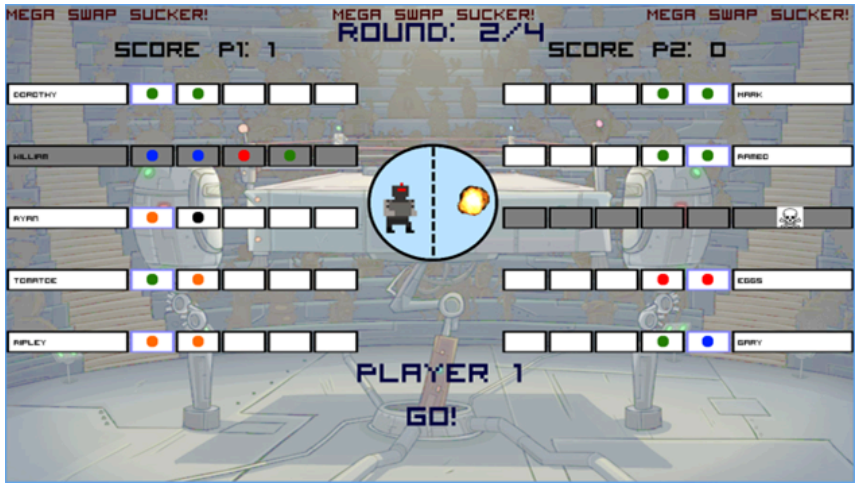

Figure 6. Organatron prototype

Dungeons & Maybe Dragons (see Figure 7) was built by Jean-Luc Portelli and Andrea Piano. As technology, they used procedural generation in combination with quest flags, adopted the common RPG ontology of dungeon crawlers, having the game genre in game mastering of RPGs. They created a hybrid digital/analog system where game masters could use mobile devices in order to author dungeons for table-top RPGs.

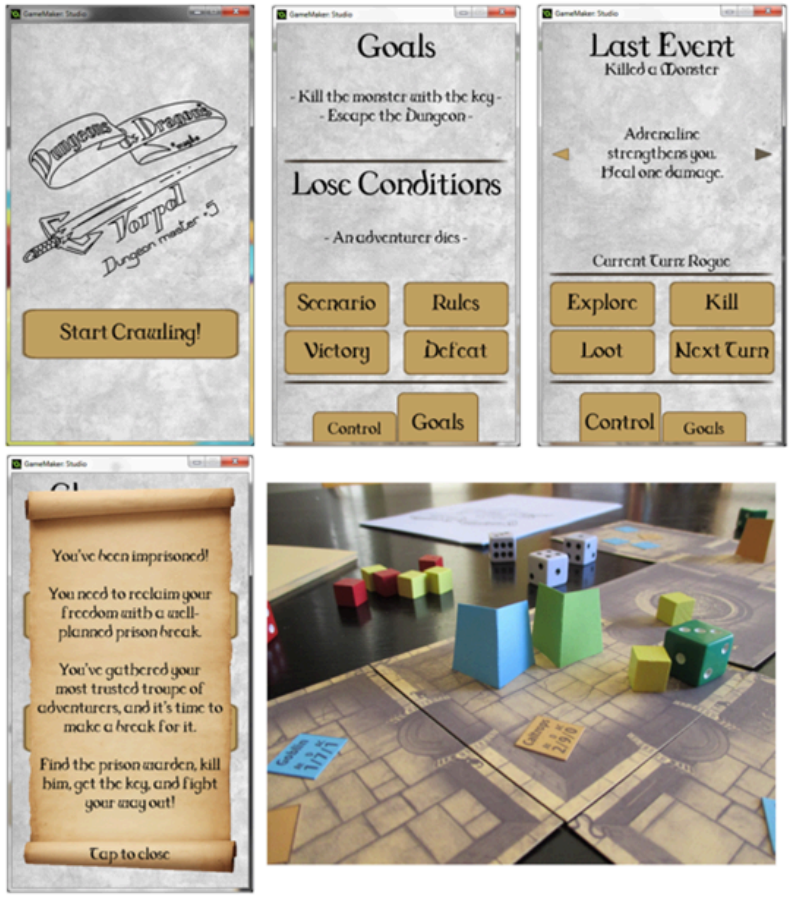

Figure 7: Dungeons and Maybe Dragons prototype

Heracles (see Figure 8) was built by Stelios Avramidis, Joseph Darmanin and Michael Camilleri. They used the functionalities of the gyro as their main technical approach, their ontological realm of choice was Greek mythology, and the game genre was shooter games. In this project, the notion of technology shifted from using computational approaches – instead it led to an exploration of the affordances of gyro functionalities. The group built a custom device (see to the left of Figure 8), a bow that was used in connection with a mobile device. The goal for the player was to shoot birds, aiming with the bow. In addition to seeing the birds on the screen, players where given audio cues to help find the birds.

Figure 8: Heracles prototype. Left: bow with gyro. Right: screen view on mobile device.

Line (see Figure 9) was built by David Chircop and Gary Hili. This was another prototype that focused on a non-standard input method: drawing on a tablet. For the ontological inspiration they used the concept of minimal art (line), and for the game genre they used the convention from *Yellowtail* (Levin 1998). *Yellowtail* repeats a user's strokes, which are received as gestures, and produce a dynamic display of textures. In Line, Chircop and Hili introduced simultaneous, competitive line input that resulted in minimalist artwork, both as a result of the interaction, and as an evolving art piece for players and spectators of the game play.

Reflection Phase: Presentation, Feedback and Write-up

In the reflection phase, students finalized their games and presented them in the seminar. We reflected on the design process, and discussed promising aspects. Students were given a date by which to halt all further development of their prototypes, in order to ensure that they had enough time to reflect on what they had achieved with their work. Finally, students authored their reports, reasoning about how the TOG triad affected their design processes and the created prototypes (see Figure 2). More concretely, students considered the following:

1. Do players' mental models reflect the designers' (your) intentions? (Mental Models)
2. Are the workings of the underlying computational systems transparent to the players? (Expressive Effect)

3. Do players assign intentionality to computational processes in the game world? (Intentionality)

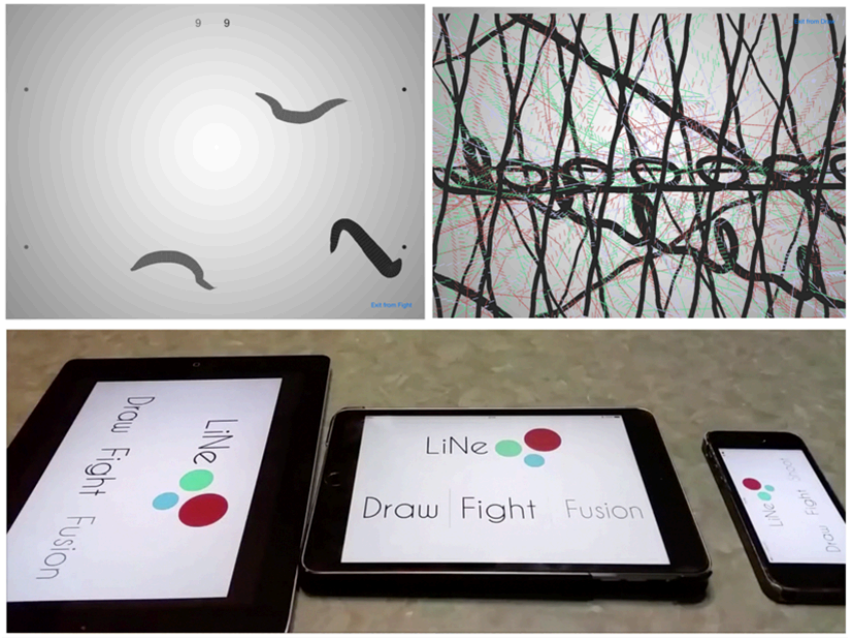

Figure 9 Line prototype.

Post Mortem

Student's reflections

After the course, students reflected on their learning process. They each answered a survey, wrote an individual piece as part of their assignments, and participated in a discussion in the last seminar. A common element in students' reflections after the course was that they found the approach useful for ideation. They also appreciated the resulting non-standard and innovative projects. Regarding learning new technological approaches, students appreciated the structure where they each were able to champion one or several approaches in seminars, and thus became the resident experts for

each other, increasing the shared knowledge of the course as a "hive-mind".

Often, students individually focused on those approaches they wanted to use or develop in their future careers. Hands-on experience in using different tools and technological approaches in the workshops was mentioned as another positive aspect, and it was also described as improving confidence in their future use. For the development process, many noted that the focus on one specific technology or AI method, along with their game design, helped to make it feasible to produce a playable prototype within the given time frame.

Output

Evaluation of the materials produced during the course shows that the student groups who had put a strong effort into studying and integrating their ontology into the game and technology design, produced the most interesting projects. This assessment is based on the play-test evaluation conducted by the students during the course. Another indication of the success of the overall approach is in the level of participation and engagement in the course, which was exceptional: In both iterations of the course all the students returned all deliverables on time, and according to instruction. Two years after the first course on computational expression, almost half of the students based their exam projects on ideas developed during this particular course.

CONCLUSION: TOG IN GAMES EDUCATION

In summary, the TOG (Technology, Ontology, and Game Genre) model is designed as an intervention that enables innovation through the challenge of unconventional combinations of technology, ontology and game genre. The use of the TOG approach in teaching game creation enables students to reflect on genre conventions and learn about particular technologies. In

addition, it facilitates the adaptation of ontologies outside the realm of established approaches for game design, and increases their productivity of concrete game designs, leading to the creation of non-standard prototypes. The concept of the techno-artistic minimum is used to emphasize the dual nature of video games as both a technological artifact and an artistic one. Both of these aspects need to come together sufficiently well in a given video game in order for it to be considered playable, and thus at least a viable prototype. Reaching the techno-artistic minimum is also a prerequisite for the reflection phase of the TOG model as a method in games education. In this final phase, students reflect on the artifacts in terms of mental models, intentionality, and expressive effect.

The TOG approach was developed during a two-year period of teaching a course on computational expression of five ETCS at the University of Malta. Course evaluation and direct feedback showed the approach to be successful. In addition, many of the students' final masters' projects were based on this course. For implementation in different educational settings, the TOG approach can be modified according to the needs and technological proficiency of the students, and to the learning goals set by the educators. Students with computer science backgrounds can reflect more deeply on aesthetic aspects in the use of technology. Students with artistic, humanistic or social science background can apply prior critical perspectives while getting hands-on experience in using various computational methods. Hence, the TOG approach can be used to increase the common understanding of the expressive opportunities afforded by the combination of technology and game design. The seminar topics mentioned in the case study serve as examples, to be adjusted by educators in accordance with their specific learning goals and available resources. The aim in implementing the TOG model as a method in games education is not to produce the perfect game for the player, but to facilitate a process in which students improve their skills as developers, find their favorite tools of trade, learn to use them with confidence, and spawn ideas that can be prototyped within the safe

space of the course. The TOG approach invites game designers to see themselves also as artists in computational expression and ideally, this experience will lead to further experimentation and innovation in their future academic work and industrial careers.

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3.

Towards a "Filipino" Video Game

Teaching Filipino Culture and Identity for Video Game Development

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ABSTRACT

This paper uses the author's experiences of teaching the Filipino module of a multidisciplinary video game development class as a case study in teaching Filipino culture and identity as an element of video game development. A preliminary definition of "Filipino video game" as having Filipino narratives and subject matter, made by Filipino video game developers, and catering to a Filipino audience, is proposed. The realities and limitations of video game development and the video game market in the Philippines is also

discussed to show how the dominance of Western video game industry, in terms of the dominance of outsource work for Filipino video game developers and the dominance of non-Filipino video games played by Filipino players, has hindered the development of original Filipino video games. Using four Filipino video games as primary texts discussed in class, students were exposed to Filipino-made video games, and shown how these games use Filipino history, culture, and politics as source material for their narrative and design. Issues of how video games can be used to self-exoticization, and the use of propaganda is discussed, and also how video games can be used to confront and reimagine Filipinoness. The paper ends with a discussion of a student-made game titled *Alibatas*, a game that aims to teach *baybayin*, a neglected native writing system in the Philippines as a demonstration of how students can make a Filipino video game. The paper then shows the importance of student-made games, and the role that the academe plays in the critical understanding of Filipino video games, and in defining Filipino culture and identity.

Keywords:

Philippines, Filipino video games, Filipino culture and identity, teaching video games

"INTRODUCTION TO GAMES AND GAME DESIGN I"

My university offers an interdisciplinary game design course with the course catalogue number CS179.15A and titled *Introduction to Games and Game Design I*. Though it is a course housed by the Department of Information Systems & Computer Science (DISCS) for computer science students, the aim of the class is to introduce to the students the basics of designing a video game with a more literary and philosophical focus, and it is taught by an instructor from the English, Filipino, and Philosophy Departments, along with one from DISCS. I was assigned to teach the Filipino module for this course twice in the first semester of academic year AY

2015-2016, and in the first semester of AY 2017-2018. The final group project was a game pitch by a group of five or more students of their video game idea that they developed during the semester. The aim of the course was to teach the basics of video game design by not just copying Western or Japanese video game ideas and design. The aim of the Filipino module of the course was to encourage and inspire the students to use their Filipino culture and identity as part of their final project.

But what makes a game "Filipino" as opposed to an American or Japanese video game? This is a difficult question to formulate for the course because of the dangers of essentialism and nativism. But in a world of multinational video game development where homogeneity and Western narratives dominate, it is important for creating a space—especially in the academe—for students and future game developers to imagine video games as a means of expression that is closer to their own experiences.

What came next in the course was my attempt to define "Filipino culture" or "Filipinoness", and then determine how this can be used in video games by Filipino video games developers. Throughout the module, existing Filipino video games were used as case studies on how this "Filipinoness" was defined, and what students can learn from these Filipino video games. But this essay is also a reflection on how video games studies and the teaching of video game design can be used for critical discourse of national cultures and identities. Though most video game theory and criticism has focused on the postmodern and posthuman tendencies of video game culture, the theories related to national cultures and discourse must not be forgotten, as most video game audiences are still constrained by national boundaries and policies.

Lesson 1: A Working Definition of "Filipino Video Games"

To teach the use of "Filipino culture" and "Filipinoness" in making video games, one must pose the question: what is a Filipino video game? And connected to this is another: what is Filipino culture

and identity? These questions were asked to the students in the very first lesson of the Filipino module. The second question, "What is Filipino culture and identity" would be the most difficult to answer. In his book, *Keywords: A Vocabulary of Culture and Society*, Raymond Williams makes a concise history of the word "culture". Williams notes that "culture" has two different senses. On the one hand, "culture" is used in the similar way to "civilization" to connote a universal development of human history. On the other hand, there is a sense of "culture" that is particular to a nation or people, hence different nations and peoples have different cultures (Williams 2015, 49-54).

For a formerly colonized country like the Philippines, these two competing senses of "culture" remains relevant. As a former colony of Spain and the United States, most of what is now considered mainstream "Filipino culture" is a product of nearly 400 years of Western colonization. The majority of Filipinos are Roman Catholic, a result of nearly three centuries Spanish colonization. English remains an official language of the state, and is a medium of instruction in schools and universities, a result of American imperialism from 1899-1946. On the surface, the Philippines seems to have embraced Western culture, which is pervasive around the world. On the other hand, there is also a recognition that Philippine culture, though heavily Westernized, is also unique and different as a consequence of this particular history of colonization. And even within this entity that is the "Republic of the Philippines" there exists a multiethnic, multilingual, and multicultural population that is competing with the "official nationalism" espoused by the state. Although Roman Catholicism is the major religion, different Christian sects prosper while Islam is dominant in some parts of the Philippines, especially on Mindanao Island. Dozens of ethnic groups that for centuries have resisted Spanish and American colonization are slowly being integrated into the world economic system by means of the Philippine state bureaucracy and global capitalism. There are at least a dozen languages that are spoken and printed outside

the dominant English language, including the Tagalog language, which is the basis of the Filipino national language.

But going into such theoretical questions immediately might have hindered the students' creative ideas. So, for the first lesson, I focused on the question: what is a Filipino video game? Ideally, a Filipino video game that 1) is a video game made by Filipino video game developers; Filipino by heritage or citizenship; 2) uses Filipino characters, settings, visual design, sound, and narratives that are Filipino and portray experiences from a Filipino perspective, and 3) is made to be played by Filipinos. This is my appropriation of M.H. Abrams' formulation of the differing aspects of interpreting a literary work by focusing on 1) the social and political milieu of the literary work, 2) the author or creator of the literary work, and 3) the audience of a literary work (Abrams 1953, 6-7). I would like to use this framework from Abrams as a way to think about Filipino video games as creative works that, though it can be played and appreciated without any prior knowledge about the Philippines, acknowledges being culturally-rooted to the Philippines and centered on Filipino experience and point of view. But this definition of Filipino video games immediately highlights the difficult reality of video game development in the Philippines, and the consumption and habits of Filipino players.

Firstly, are there Filipino video game developers and companies? Alvin Juban, president of the Game Developers Association of the Philippines (GDAP), notes that the majority of video game developers in the Philippines do outsource work for major video game development companies that are outside the Philippines (Gawad Alternatibo). Some major international video game companies have even opened their own studios in the Philippines. For example, Ubisoft has recently opened a studio in the Philippines as a supplementary studio that contributes to the development of Ubisoft's main franchises, such as *Assassin's Creed* (Ubisoft 2019). *Assassin's Creed: Origin* can't be defined as a Filipino video game just because a studio in the Philippines with

Filipino workers worked on part of the game. There are Filipino video game developers, but they are not making video games for a Filipino audience about Filipino culture and identity. The realities of the video game industry in the Philippines hampers the creation of original Filipino video games, as most of the expertise and labor in the Philippines caters for a market and an industry that is outside the Philippines.

Secondly, are there video games that use Filipino identity and culture as source material? Some video games made outside of the Philippines do have characters, settings, visual and audio designs, and narratives from and about the Philippines. For example, *Front Mission 3* has a story arc with Filipino characters, and has missions set in the Philippines. Also, various fighting games such as the *Soulcalibur* and the *Tekken* series have some Filipino or Philippine-inspired characters (Barreiro Jr. 2015). These video games can't be defined as Filipino video games because of issues of cultural appropriation, as these games were made by Japanese video game developers. More precisely, the use of these video games that feature multinational and multiethnic characters, settings, and narratives reflect the multinational and transnational nature of video game production and consumption. To appeal to a wider international audience, video games designers need to appropriate non-Western cultures within their games. This attempt at appropriating Filipino cultural material in a video game is commendable for giving Filipino culture a space in their games. However, I would like to believe that a Filipino video game developer would approach and handle the topic of Filipino identity, culture, and history in a video game with greater sensitivity, as this is closer to his/her experience.

Lastly, what are the video games played by Filipinos? Ideally, Filipinos should play video games that are made by Filipinos and that have Filipino characters, stories, and settings. However, just as films shown in the Philippines are dominated by Hollywood films, video games played by Filipinos are also dominated by foreign-made video games. This can be explained by the limited

market for video games in the Philippines, as video games remain expensive and are accessible only by the middle and upper classes. According to the Philippine Statistics Authority, a family of five in the Philippines needs P10,481 (around US$205) to live decently (Jaymalin 2019). For context, a new video game disc costs at least P1,000 (roughly US$20) and a 500 gigabyte PlayStation 4 has a suggested price of P17,700 (around US$347) (Sony PlayStation 2019). Recently, mobile games, which are mostly free-to-play with in-app purchases, have grown in popularity in the Philippines because of the low cost for the Filipino gamer. Filipinos reportedly spent $572 million on video games in 2019 (Elliott 2020).

To summarize, Filipino video game developers are not focused on making video games about Filipino culture and identity for a Filipino audience, and Filipino players are not predominantly playing Filipino-made video games. This situation has created a precarious situation for Filipino video game developers. However, there have been attempts to create video games about the Philippines, made by Filipinos, aimed at a Filipino audience. An early attempt at making a Filipino video game was made by Anino Entertainment when they developed and published the isometric role-playing game, *Anito: Defend a Land Enraged* (Anino Entertainment 2003). Though the game won some awards and is credited as being the first mainstream Filipino video game, it wasn't enough to sustain Anino Entertainment to continue creating Filipino video games for Filipinos. Anino would eventually be merged with a Thai video game studio in 2014 and is now focused on creating free-to-play mobile games for the international market (Anino 2019).

Recently, more Filipino studios and developers have started to develop video games that are about the Philippines and have Filipino characters and stories. Filipino video game developers can now use Steam for personal computers, and Google Play and Apple Appstore for mobile, as platforms to quickly and easily release their games inside and outside the Philippines without the need for a publisher in each territory. Other platforms, such as

itch.io, have also been useful for independent developers to upload and share their work. Crowdfunding platforms have also been used to appeal directly to fans and audiences for support and as an alternative source of funding to supplement traditional sources of investment capital for video game studios. Most Filipino video game developers, therefore, are making video games outside of the mainstream of big video game companies. And it is this context—video game development outside the mainstream—that the module that I developed in AY 2017-2018 aimed to develop with the students.

Lesson 2: Four Filipino Video Games

To help students reflect on video games in the context of the Philippines, I discussed four Filipino video games developed in the Philippines by Filipino video game developers. This is similar to the approach I use for my literature and creative writing classes. In creative writing, the discussion of classical or canonical literary works is used to create a baseline knowledge for the students on literary technique and themes that can be models for their own literary works. In CS179.15A, the four example Filipino video games were used as primary texts or case studies for discussion to give the students: 1) a sense of history of Filipino video games and what has already been done, 2) an idea of how "Filipino culture" or "Filipinoness" was used in games in terms of narrative and design, and 3) to learn from the successes and failures of these games in using Filipino culture and identity. Lessons learned from the discussion should be reflected in the game designs and narratives in their final project.

The four Filipino video games that were discussed in four weeks were the already mentioned *Anito: Defend a Land Enraged*, *Nightfall: Escape* (Zeenoh Games 2016), *Political Animals* (Squeaky Wheel 2016), and *Duterte: Fighting Crime 2* (Tatay Games 2016). These games all have different genres, and deal with different aspects of Philippine culture and identity.

Discussions of the games began, firstly, with a playthrough of a portion of the game and a formalistic analysis of the game was be made. The genres, game designs and mechanics, narratives, characters, settings, and themes that the games use were discussed. From these preliminary details of the games, discussion of Philippine culture, identity, and politics can be expanded depending on the issues and themes related to the game.

The first two games use Philippine mythology, folklore, and history as the basis for their design and narrative. The first game discussed was *Anito: Defend a Land Enraged*, a 3D point-and-click isometric role-playing game (RPG). It is set in Maroka, a fictional island in Asia, after the arrival of the Senastille in the 16th century (Figure 1). Players can choose between the siblings Agila and Maya, the children of Datu Maktan, a chieftain of the Mangatiwala tribe. The story of the game revolves around the mystery of Datu Maktan's disappearance and other fantastical occurrences happening all over the island. To progress through the story, players also have to fight Philippine mythological creatures, such as the *tikbalang*, a creature with the head of a horse and a body of a human. Maroka can be read as an allegory for the Philippines, and the Senastille are the fictionalized version of the Spanish who arrived and colonized the Philippines. Although *Anito* uses mechanics of Western RPGs, it was able to adapt a Filipino narrative into a Western video game genre.

Figure 1: Agila, one of two playable characters, encounters a non-player character inside a house in Anito: Defend a Land Enraged (GameSpot n.d.).

The second game discussed in class also dealt with Philippine history and mythology. *Nightfall: Escape* is a first-person survival horror game set in the province of Ilocos, Philippines. The player takes on the role of Ara Cruz, a journalist who is investigating disappearances in an abandoned mansion. The game uses environmental puzzles to convey its nationalist imagery and historical references. Like *Anito*, players also encounter creatures inspired by Philippine mythology—the *aswang*, a man-eating creature; the *manananggal*, a woman who can transform into a winged creature during the night; the *batibat*, a creature that can cause sleep paralysis to its victims, and others. The player would have to unravel a mystery that dates back to 1896 during the time of the Philippine Revolution against Spain.

Figure 2: Bestiary entry for the paring pugot in Nightfall: Escape explaining the historical roots of the monster (screenshot by author).

Issues of creative license and the importance of accuracy and faithfulness of these games in the use of Philippine mythology and history is highlighted during the discussion of *Anito* and *Nightfall: Escape*. Jema Pamintuan, in her essay, "Anito: Paglalaro sa Lunan ng mga Arketipo at Laylayan [Anito: Playing with Space of Archetypes and the Periphery]," commends the use in *Anito* as the archetype of Philippine epic heroes, and indigenous material culture in creating its gamescape. However, Pamintuan has also noted that the game's use of its Philippine influences can also lead to self-exoticization because, although it was made for a Filipino audience, its success hinged on its commercial success in the international market, and an exotic setting and non-Western characters helped differentiate it from the competition (Pamintuan 2009, 94).

On the other hand, *Nightfall: Escape* had more problems in capturing Philippine history and mythology. An example is the game's use of the *paring pugot* (headless priest) to refer to the three Filipino priests collectively known as Gomburza (Figure 2). The Gomburza is a portmanteau of the names of Fathers Gomez, Burgos, and Zamora, Filipino priests who were executed in 1872 after being falsely accused of conspiracy against the Spanish colonial government, and are considered by Filipinos as national heroes. The mention of the Gomburza in the *paring pugot* can be confusing or ambiguous, depending on the audience. A Filipino player can understand, depending on his/her understanding of Philippine history, that the *paring pugot* does not represent the Gomburza, but rather represents the enemies of the Gomburza, the Spanish friars. However, a non-Filipino player may be confused, and conclude that the *paring pugot* represents the Gomburza. The non-Filipino player may think: the *paring pugot* is an enemy in the game, therefore the Gomburza are bad.

Through the discussions and lectures, students were made aware of the possibilities and the limits of how *Anito* and *Nightfall: Escape* handled the themes of Philippine history and mythology. Both *Anito* and *Nightfall: Escape* are successful examples of Filipino video games that followed and replicated well-established genres, such as the RPG and survival horror. But translating the context of the culture that inspired a video game is the most difficult aspect in creating a game, next to actually coding and designing the game. The students' final projects were then put to the test concerning the use of Philippine culture and history. Were the projects faithful, if not earnest, in representing Philippine culture and identity? Were they able to balance being creative in the narrative and game design of their proposal, with being faithful to, and respectful of, their source material? Did they avoid the pitfalls of self-exoticization?

The next two games discussed in the module directly dealt with Philippine politics as topics and themes. The third game is *Political Animals*, a turn-based strategy game that uses

anthropomorphic animals campaigning to become the president of a country. As noted by Ian Bogost in *Persuasive Games*, strategy games like *Political Animals* aren't really about democracy, but about electioneering and the use of abstract systems to capture and quantify the inner workings of political electioneering (Bogost 2007, 91). In the case of *Political Animals*, the game captures the political culture of democracy in the Philippines through its mechanics. For example, the game highlights the personality-based politics of the Philippines when the player chooses a character at the beginning of a game. The player needs to consider the kind of personality and abilities that the character has, and plan a strategy to win based on these abilities. The game also emphasizes the importance of money in launching and maintaining an election campaign. Nearly all actions need money, and the player must acquire money by any means possible, either by honestly earning the trust of people or by accepting bribes and strengthening the patronage of criminals and other powerful figures (Figure 3).

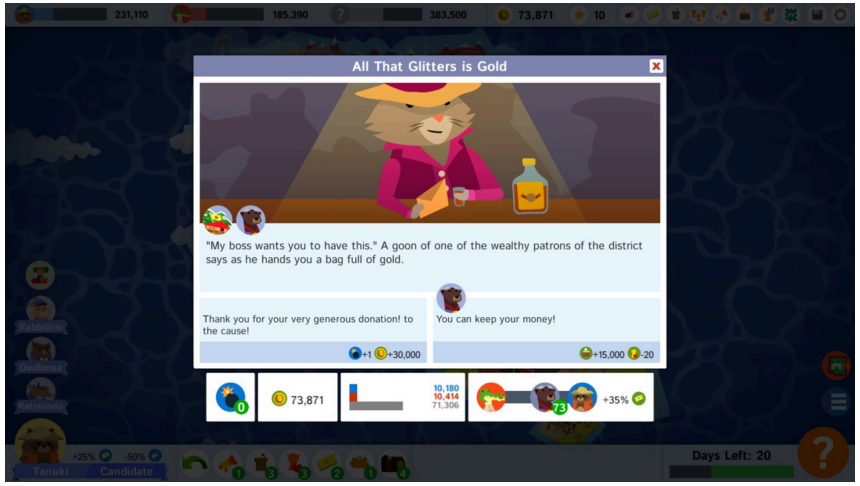

Figure 3: The player in Political Animals must decide whether to accept a bribe and win the favor of a patron, or reject it and win the trust of voters (screenshot by author).

The last game discussed in the module, *Duterte: Fighting Crime 2* is a free-to-play arcade-style shooter for Android and iOS. The

player takes the role of President Rodrigo Duterte as he prowls the streets at night to fight criminals (Figure 4). Released during the Philippine presidential elections in 2016, the game is an endorsement of Duterte and his campaign against drugs and crime. The game depicts Duterte as a hero/vigilante who uses violence to quell crime. But in the context of rampant human rights violations and extrajudicial killings, the game becomes a propaganda tool to spread the violent ideology of the Philippine drug war (Cerda 2021).

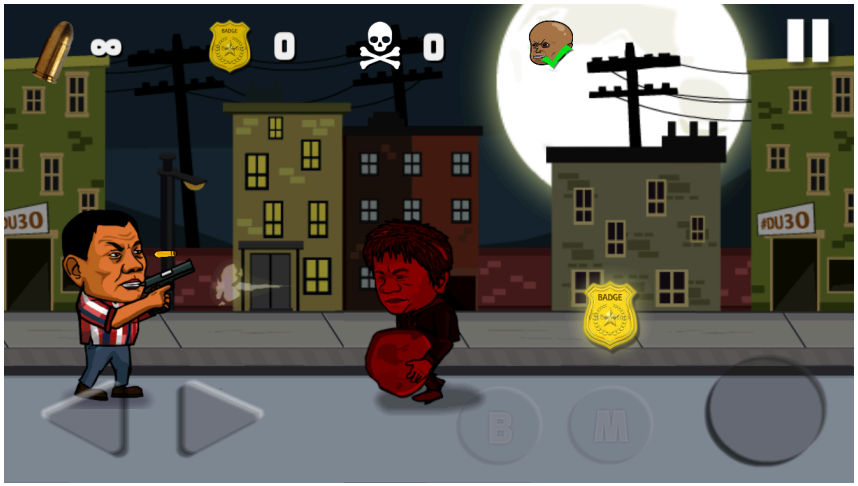

Figure 4: President Duterte shooting a criminal in Duterte: Fighting Crime 2 (screenshot by author).

Each of these last two games tackle politics very differently through their game design. *Political Animals* attempts to earnestly and honestly capture an aspect of Philippine politics through its game design without directly supporting or criticizing any politician or political party. On the other hand, the simple design of *Duterte: Fighting Crime 2*, where the player cannot but kill the criminals that he encounters captures the "kill or be killed" logic of the Philippine drug war and clearly supports the violent government campaign against crime and drugs. With these two games, the students were exposed to concepts like "patronage politics" and "extrajudicial killings" as part of Philippine political reality, and both games offer questions to students about the role

of politics in video games, and the role of video games in politics. The political message of the games that the students pitched for their final project was therefore also scrutinized. What kinds of narratives did the proposed games employ? How did the proposed games portray and represent minorities and marginalized people? Did the proposed game's design and mechanics give the players freedom and agency to act freely? Are players forced to follow a certain way of thinking?

Game Pitch: Student-made Video Games and the Role of the Academe

By the end of the module, students were expected to incorporate the ideas and problems learned from these four Filipino video games, and how Philippine culture and identity can be incorporated into their own final project. The document for the final project incorporated the following parts: 1) a premise that contains the main narrative, setting, and characters of the game, 2) a game design description that details the genre and game mechanics that the video game would use, and 3) preliminary art work for the characters, and a visual mock-up of how the game would look on screen.

Most of the video games proposed by students for their final projects still reflected the Western and Japanese influence that they had as avid players. They used visual art, music, and narratives that represented Philippine culture and identity, but problems of exoticization were still common in the final projects, especially when the students saw Philippine culture and identity as just window dressing to market a game that was essentially a copy of dominant genres or trends. This was expected, as a four-week module can hardly affect the influence of games that they grew up with. But there were some projects that were able to balance creative concepts and premises with dominant and prevalent ideas of video game design like a puzzle-platformer with characters and

settings based on Filipino food or a fantasy first-person shooter set in the slum of Manila, Philippines.

In the end, most of the final projects of CS179.5A were just documents that described a game. To better demonstrate how a Filipino video game can be made in an academic setting, I would like to discuss a video game made by Dominic Tristan D. Margarejo, Carlos Enrique P. Nava, and Anton Nikolai R. Tangan for their senior project as BS Computer Science majors. Margarejo, Nava, and Tangan were students enrolled in CS179.5A during the first semester of AY 2017-2018. They asked me to become a Filipino subject matter expert and member of their panel for the thesis that they were writing about the creation and testing of a video game titled *Alibatas* . Although *Alibatas* was not originally a final project proposed in their CS179.5A class, their project still embodied the ideas that they learned on how to make a video game using Filipino culture and identity.

Alibatas is a puzzle adventure game that introduces the player to *baybayin*, a precolonial syllabic writing system common among the Tagalogs of the Philippines, but would become disused after the imposition of Spanish colonialism. Players take the role of Matthew or Matt Talino and Christina or Tina Tamad, two students who need to save their school after a spirit has cursed the school because the students have lost an appreciation of their history and culture. Matt and Tina must learn *baybayin* to solve puzzles that involve writing in *baybayin*. The aim of the game is to teach the players how to write and read *baybayin* by way of these puzzles (Figure 5 and 6).

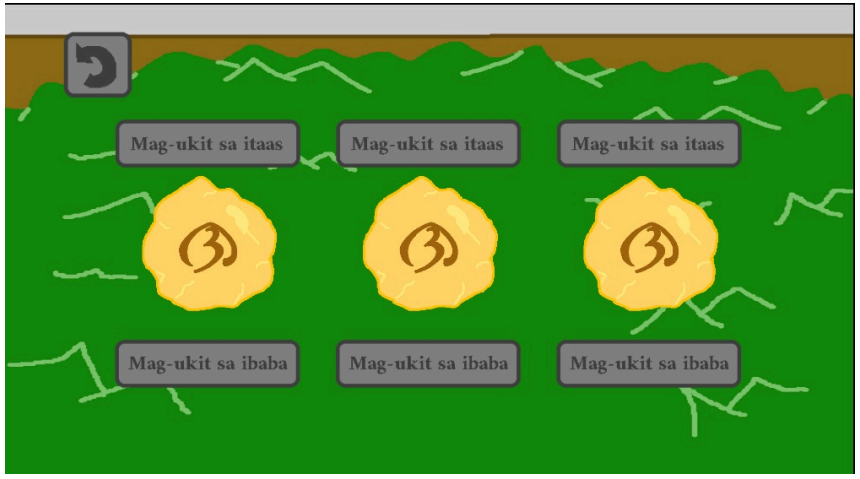

Figure 5: A puzzle in Alibatas how to write a kurlit/kudlit on a baybayin symbol (Margarejo, Nava, and Tangan 2019, 30).

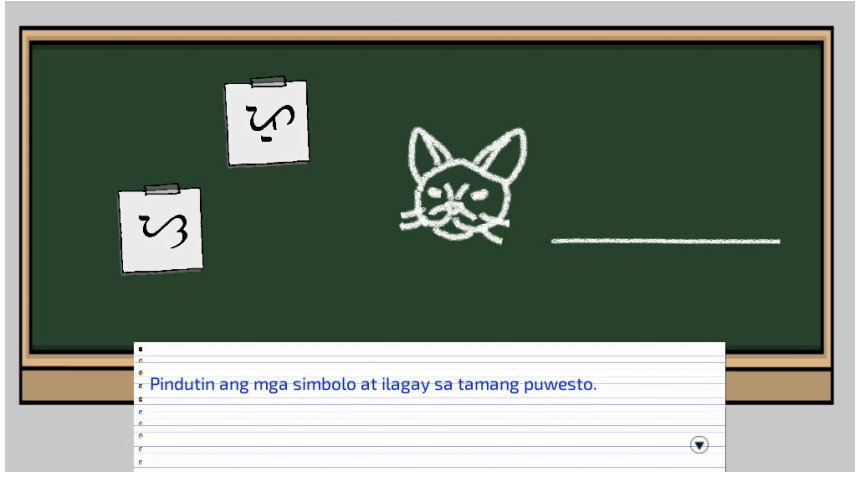

Figure 6: A puzzle in Alibatas on how to write pusa (cat in Tagalog) in baybayin (Margarejo, Nava, and Tangan 2019, 33).

By making *Alibatas*, Margarejo, Nava, and Tangan needed to research the history of *baybayin* and the problems that it faced through its history. The use of baybayin was discontinued during the Spanish colonial era, not just for political but also for practical

reasons. Being more familiar to a phonetic system like the Latin alphabet, early Spanish missionaries found it difficult to write and read *baybayin* because it is an abugida or syllabic system of writing, which means a symbol in *baybayin* connotes a combination of consonant-vowel sounds. Using Figure 5 as an example, the symbol is read as "na." To change the vowel sound attached to this symbol, a mark called a *kurlit* or *kudlit* is placed above or below the symbol. A mark above would turn the "na" into "ne/ni," and a mark below would turn it into "no/nu". In Figure 6, the symbol represents the sound "pa" and by putting a *kudlit* below the "pa" symbol, it can now be read as "pu/po." If this symbol is followed by the or "sa," these symbols can now be read as "pusa," which is the Tagalog word for "cat."

Using puzzles in the game, players learn to understand the basic rules of writing and reading *baybayin*, as well as being introduced to some symbols. To test if the game can be used as a tool for teaching *baybayin*, Margarejo, Nava, and Tangan conducted a playtest of a prototype of the game with five 9th grade students. They conducted a written pretest and posttest to confirm the baseline knowledge that students had of *baybayin*, and whether the game helped them to learn to read and write *baybayin*. Most of the students were familiar with *baybayin*, as this was discussed in their class, but they were never taught how to read or write it. Four of the five playtested students achieved a perfect score in the test after playing the game. Only one of the students did not achieve a perfect score, but received a higher score compared to a pretest score of 0. This student also experienced a glitch in the game, which hampered his/her experience of the game (Margarejo, Nava, and Tangan 2019, 15-17). Admittedly, the sample size of the playtest was small, but it showed the potential of using video games for educational purposes.

By making *Alibatas*, Margarejo, Nava, and Tangan showed that a video game can be used to teach *baybayin*. But other than that, games like *Alibatas* can help players reflect and engage the history of the colonialization of the Philippines, and be more aware of

what has been lost or changed in Filipino culture by this historical process, and be aware of the subsequent national awakening. With *Alibatas*, *baybayin* is given a new (virtual) space to exert its discursive power. *Baybayin* no longer exists only in old documents, but in digital media such as video games, and this expansion will help *baybayin* reach newer audiences. With *Alibatas*, new research can be done on how to better educate students about *baybayin*, Filipino history, culture, and identity.

With student-made games like *Alibatas*, Filipino video games can forge a different path from mainstream video game development. It is in the academe that ideas about Filipino culture or "Filipinoness" can be transformed into a game that Filipinos and even non-Filipinos can experience. The creation of video games in universities would give students an opportunity to experiment and make games that advocate for a deeper understanding and dissemination of knowledge about the Philippines, and be a testing ground for what a Filipino video game can be without the pressures of market demands. Students don't need to think about what sells, but rather what needs to be done, what works, and ultimately, why and for whom these video games are made? Again, Filipino culture is a contested idea, however, it is through cultural and creative works like video games that this fluid idea is fleshed out and can help Filipino players think and reflect on what being "Filipino" is, or what "Filipinoness" means for them. Distributing these games outside the academe will be the next challenge. However, it is my hope that, like the academe contribution to the nurturing of Philippine literature, theater, and film, student-made video games will help in the creation of video games that can contribute in the redefining of Filipino culture and identity.

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4.

The Paradigm of Game System Building

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ABSTRACT

In this article, we posit ‘game system building’ as a paradigm for game design. Inspired by earlier perspectives on cybernetic art, and current practices in game development and education, we consider the creation of dynamic game systems as a creative-artistic practice where the consideration of complex and often unpredictable behavior and effects are as foundational as the individual elements (rules, graphics, characters, UI etc.) of a game. The paradigm of ‘game system building’ has important implications for the education of designers and games scholars. In this article, we introduce the paradigm and its lineage, and propose an educational approach that reflects ‘game system building’.

Keywords

game systems, game system building, artistic practice, pedagogy, education, cybernetics, complex systems

INTRODUCTION: CREATING VIDEO GAMES

Building games is an artistic creative practice that requires designers, artists and developers to acknowledge, accommodate and even embrace unpredictability that stems from a complex interplay of system and user actions. In games education, it is tempting to adopt a mechanistic view where we teach that making a game system is mainly about rules and causality, e.g., "if you do A, then B happens". However, this is an undue simplification, which does not fully reflect the actual practice in handling unpredictability. In this paper, we posit that it is critical to trust – from the very outset – that we and our students are capable of embracing the complexity of the game design space. We introduce *game system building* as a paradigm to express this aspect and help educators and students to fully make use of the unique and rich possibilities that are at our fingertips as creators and thinkers in the field of games.

Let us start by asking: What is the activity of creating video games? "Game design" might be our first answer. While this reply is correct, it is also incomplete. Do we design video games the same way we design a piece of furniture or a coffee maker? Intuitively, we might say 'no', as neither of these products are dynamic artifacts. With video games, a central concern is the creation of reactive artifacts that enable continuous engagement and feedback – what the game designer builds can best be described as a dynamic, reactive system. It is not a static artifact, a "product" in the sense of a well-made piece of furniture that serves its purpose without modification as long as it is used. Yet, it is also not simply a machine in the same way a coffee maker or a bicycle are functioning machines as a result of the combination of

their parts. Instead, the totality of a game is more than the sum of its parts (rules, graphics, characters, UI etc.), and therefore, game design is concerned with how the elements interact and how players can use the resulting system. Game design might be best understood as 'game system building', a creative-artistic practice which foregrounds the consideration of complex and often unpredictable behavior that emerges out of the intricate combinatorics of dynamic systems with players' interactions. Indeed, many game designers and educators are keenly aware of this fact and certainly reflect it in their practice and teaching. However, published analytical and educational perspectives so far have not fully embraced this notion or put it in words. What we introduce here is a conceptual framing for a phenomenon that has been recognized for a while in the practice of game design and education.

In this article, we consider the status quo in game design and education from a conceptual perspective, develop the paradigm of game system building, outline its lineage from cybernetics, and discuss its implication for education in games programs.

GAME STUDIES, GAME DESIGN AND EDUCATION

Conceptually, game design exists in a space influenced by the interplay of theoretical frameworks developed in games studies, approaches that emerged in games education, and the pragmatics of game design practice. Early game studies focused on distinguishing the new discipline from the study of earlier mediated forms. During this period, ludology scholars frequently discussed the dynamic nature of games, and the empowered role of the player vs. reader. A common pattern in defining games and game design ever since has been to place a central emphasis on rules. For example, Markku Eskelinen defines the "gaming situation" as a "combination of ends, means, rules, equipment and manipulative action." (Eskelinen 2001) Conversely, Espen Aarseth describes games as "simulations" based on "logical rules":

> Games, however, are often simulations; they are not static labyrinths like hypertexts or literary fictions. The simulation aspect is crucial: it is a radically different alternative to narratives as a cognitive and communicative structure. Simulations are bottom up; they are complex systems based on logical rules. (Aarseth 2001)

Equally, Jesper Juul takes the rule aspect as central:

> "A game is a (1) rule-based formal system with a (2) variable and quantifiable outcome, where (3) different outcomes are assigned different values, (4) the player exerts effort in order to influence the outcome, (5) the player feels attached to the outcome, and (6) the consequences of the activity are optional and negotiable. (Juul, 2003)

While the definitions of games in the texts mentioned above differ in many aspects, rules are a shared feature and there is no doubt regarding their importance for games. Even more recently, the notion of rules was still taken as representational of the overall design intention of a game: "The goal of a game—for example 'supporting environmentalism'—can be found in its formal system, more specifically in the properties of the rules." (Raessens 2019)

Yet, the question remains whether rules provide a paradigm that holds as an overarching conceptual perspective on games. Game systems contain many additional elements – graphics, characters, narrative structures (for narrative-focused games), UI and procedural generation. Consequently, it might be better to understand rules as an essential ingredient, for example, as Jesse Schell does in *The Art of Game Design: A Book of Lenses* (2008), a book widely used in games teaching.

Rules, by themselves, are too limited as a paradigm for game creation and analysis. An insightful perspective in this regard comes from Michael Mateas and Andrew Stern (2005), who describe game design as an instance of "wicked problems" (cf. Rittel & Weber 1973), where every attempt at solving a problem changes the very understanding of the problem. Mateas and Stern

draw parallels to architecture, where the understanding of dependencies and affordances of various elements are a necessary ingredient for the creation of a building (building materials, statics, load on floors, the properties of the ground the building will stand on, energy requirements etc.). Transferring this understanding to game design means to take a wider view than commonly used, one that includes a consideration of the affordances of authoring tools like Unity and Unreal, but also the complex interplay of system and user actions and reactions in games (cf. discussions on "emergent gameplay" (Spector 2007, Lundgren et al. 2009, Fizek 2014)).

The limiting focus on rules might also be a factor that contributed to what can be understood as a rift between game theoreticians and game design educators. Many educators saw the ludology/narratology debate as nothing more than an amusing storm in a teacup and considered the efforts at definitions at the dawn of games studies to have little relevance for practical education. Instead, many of them, especially in the late 1990s and early 2000s, focused on teaching students how to make games. Concretely, game education included aspects such as:

- Learn to make clean assets (2D, 3D, audio, dialog text).
- Write an if-clause.
- Learn to brainstorm and work together nicely and efficiently.
- Learn versioning.

The focus on basic and necessary aspects meant that students learned the craft because they wanted to create games. That is not a small feat, especially since familiarity with games through playing only goes so far. The shift from consumer to producer is radical, even more so as making games is a considerable challenge, requiring the combination of creative vision, technical knowledge, UI considerations, team management and marketing aspects – a truly multi-disciplinary effort. Specialized roles, similar to the

many different crafts in the film industry, took years to develop and in some are areas that are still forming, e.g., the responsibilities of narrative designer vs. game writer, or the role of team members concerned with procedural content creation.

Yet, a purely practical perspective is limited in its ability to provide the reflection necessary to move beyond the replication and refinement of existing games, and lay the foundations for sustainable development and continued innovation in game design. Our conceptualization can serve as a basis for both the practice and an education that eclipses the merely technical and craft aspects. To demonstrate the shift in perspective, we will now consider Jose Zagal's education-focused framework in his book on Ludoliteracy (2010). Zagal here develops Gee's perspective on semiotic domains further in the context of games. Zagal starts with Gee's hierarchy of literacy:

1. Ability to decode.
2. Ability to understand meanings with respect to a semiotic domain.
3. Ability to produce meanings with respect to a semiotic domain.

He then re-interprets these categories for games literacy:

> For games, being able to decode is thus analogous to being able to play. Gee's second element, understanding meanings with respect to a semiotic domain, becomes understanding meanings with respect to games, and the third, produce meanings with respect to a semiotic domain, can be expressed as the ability to make games. Thus, games literacy can be defined as:
>
> 1. Having the ability to play games.
> 2. Having the ability to understand meanings with respect to games.
> 3. Having the ability to make games. (Zagal 2010)

While this perspective produces a neat segmentation and hierarchy for learning, it does not fully capture the requirement for active meaning-making with interactive forms like games, which produce meaning through playing. To cover this aspect, we posit a fourth category:

1. Ability to decode.
2. Ability to understand meanings with respect to a semiotic domain.
3. Ability to produce meanings with respect to a semiotic domain.
4. Ability to produce artifacts that engender meaning-making by domain-literate others.

Or in more game-specific terms:

1. Having the ability to play games.
2. Having the ability to understand meanings with respect to games.
3. Having the ability to produce meanings while interacting with games.
4. Having the ability to make games as meaning-making devices for others.

Our emphasis on **system building** captures this enhanced understanding, that game making is the production of **meaning-making devices for others**, the creation of artifacts whose meanings are never fully determined a priori by their creators.

What we are describing here is a shift from static objects to dynamic systems that constitute a challenge to many existing analytical frameworks (e.g., Lankoski & Björk 2015a, Järvinen 2008). This challenge has been detected before (e.g., by Mateas and Stern, referenced above) and yet is still in need of continued attention. Put simply, frameworks originating in the analysis of

static objects are limited in their ability to capture dynamic, systemic behavior. For example, in a book chapter on the formal analysis of games, Petri Lankoski and Staffan Björk discuss the scope of existing analytical frameworks and point out that these traditional frameworks cannot entirely describe complex game systems. Instead, formal analysis has to concentrate only on parts of games, essentially a vertical slice:

> Many contemporary games are *too big to be described as whole.* For many purposes, first one needs to find a part of the game or parts of games that are analyzed. This requires building a rough understanding of the game by playing it and distinguishing the parts that are good candidates for analysis in terms of one's research questions. [our emphasis] (Lankoski & Björk 2015b)

A variety of the same issue also exists in several practice-oriented books frequently used in games education, in that they do not fully embrace a systemic approach towards game design. While the term *system* is frequently mentioned, many books on the subject do not treat the problem of video game design as anything more than the sum of its mechanical parts, as exemplified by Salen and Zimmerman: "When understood in this way—as a set of parts that together form a complex whole—it is clear that games are systems." (2003, p. 50) The same publication even mentions uncertainty and cybernetics, but stops short of considering a systemic understanding. A chapter on *Games as Systems of Uncertainty* is concerned with randomness, exemplified by dice throwing and the uncertainty of play outcomes, not system behaviors. Conversely, another chapter on *Games as Cybernetic Systems* does portray cybernetics as yet another element in a mechanistic world. Additional examples in this regard include Koster's book, *A Theory of Fun for Game Design* (2004), Braithwaite and Schreiber's *Challenges for Game Designers* (2008) and Tracy Fullerton et al.'s *Game Design Workshop* (2004) as well as Schell's *The Art of Game Design: A book of lenses* (2008) and *Andrew Rollings and Ernest Adams on Game Design* (2003). Certainly, these books provide many important insights

and valuable advice for practical development. Yet, a common trend emerges from these books – that game design is stuck in a mechanistic world view. In the next section we will discuss the limitations of mechanical thinking, and start to develop a model that is rooted in a systemic understanding.

THE LIMITATIONS OF MECHANICAL THINKING

In the practice of game design, we are used to thinking in terms of mechanics. Indeed, Brenda Romero (2009) proclaimed mechanics to be the message as the design intentions behind an influential series of games. Yet, the very idea of mechanics assumes a Newtonian world model in which all parts combine to form a whole as the sum of its parts. When in this mindset, we have to imagine that dynamics and aesthetics can be achieved as a function of the mechanics, exactly as Hunicke et al. have described it in their MDA model (2004), a conceptual framework influential in games education that considers game design as composed of *mechanics, dynamics*, and *aesthetics*. However, we know that the Newtonian way of considering the universe is not sufficient to explain the complex world around us – an insight reflected in the natural sciences at least since Einstein's Relativity theory (1916), further developed in quantum physics (maybe most famously in Schrödingers 'cat' thought experiment (1935)), and more generally applied in cybernetics (Wiener 1948) system theory (Bertalanffy 1969) as well as complexity theory (for an overview see Turner & Baker 2019). The same is true for procedural and participatory game systems. Given the unpredictability that is introduced by unexpected combinatorics, co-creation by players and procedural content generation, we need to embrace more advanced models such as chaos theory (Alligood et al. 1997). Yet, to implement such a perspective in actual development is a considerable challenge. The standard way to think in mechanics is convenient and well established, yet the limitations of Newtonian thinking drives designers to assume a parallel mindset, a kind

of ‘doublethink’ to accommodate the unpredictability of complex systems (Cummins 1999, Bossomaier & Green 2000).

More concretely, MDA embeds the limitations of a Newtonian world view, in that a *dynamic* resulting from a *mechanic* is always predictable. Even when the combination space is vast, it would be predictable with enough computational brute force – analogous to Isaac Asimov’s concept of psychohistory in the Foundation series (1951), a fictional work that was written pre-chaos theory. “Psychohistory” postulates that history is predictable in its entirety, provided enough computational capacity is available for the necessary calculations.

Indeed, if the game in question is a zero-sum game (e.g., a constant sum game, in which one person’s gain is equivalent to another’s loss, so the net change in benefit is zero), such as chess, then it *is* possible to calculate all possible outcomes of the movement of the pieces, if the search algorithm and the processing power allows it. However, when we consider the design of systems that include unpredictable elements, the concept of predictable dynamics as an effect of designed mechanics no longer holds (as, for example, has been observed in the real-world context of accident investigations (Dekker et al. 2011)). An example in this regard are systems that allow for user-created content that become part of the fictional world, especially if users are allowed to add their own executable code and macros. Even more complexity enters the picture when groups of players or users create and adapt their own (‘house’) rules for how the game can be played, something that is happening in most MMORPGs where player communities thrive, for example, in the ways groups of players act together in WoW (Blizzard Entertainment 2004). Different cultures develop on different servers, and cannot be predicted in a computational way, no matter how much computational power is thrown at it. Games with large numbers of players, and games where players are allowed to co-create, are subject to the effects of chaos theory, just as the real world. Yet, many games exhibit behavior that is unexpected and difficult to predict as the result of complex

combinatorics and/or procedural generation – even without large player populations and user generated content. Consequently, mechanical thinking becomes an impediment for developers in their design work, since this paradigm assumes that the worlds they build will behave according to Newtonian law.

Mateas and Stern (2005) even argue that in order to fully understand a complex game-like system, it is necessary to build it, and furthermore, the act of building can facilitate the analysis of existing games. Their stance is one that resonates with much of the practice in current games education, where prototyping and game making is central. The act of building allows exploration of game design spaces. However, this perspective might also be unrealistic, as the time and effort for building is not always available, especially during the course of an educational program. Therefore, Mateas and Stern's method does not mitigate the need for a conceptual understanding of game systems and a paradigm of game system building.

Fundamentally, the game system builder designs for unpredictability. In order to capture this aspect of game design, we propose to shift the perspective, and talk about *Architecture*, *Generation* and *Participation* as foundational concepts in development. In the next section we will discuss the lineage of the system building paradigm from cybernetic art theory.

GAME SYSTEM BUILDING AS A CREATIVE-ARTISTIC PRACTICE

Our outset is that games are an art form, following Smuts (2005). While not all games can be considered 'art', some can be, just as in other forms, e.g., movies, pictures, and novels. As soon as we see games as art, the act of building them is an artistic practice. The term *artistic practice* refers to the ways in which an artist goes about their work.

At this point, some remarks about the artistic status of games and game making as an artistic practice are in order. We are fully aware that talking about art in this context can be a double-edged sword. On the one hand, this is a strategic move that opens up a potentially productive connection to the discourse on artistic practice and computation (e.g., Penny 2000, Fleischmann & Strauss 2006, Brinck 2007). On the other hand, there is the danger of getting bogged down in a distracting discussion on whether games can be art in principle and whether all games production can be understood as an artistic practice. Therefore, for the purpose of this paper, we want to clarify that our focus is on using the concept of "art practice" as a productive analogy for "game making". Conversely, while we take the production of a game as an art practice on a more abstract level, we understand that not every role in the game production process can properly be called "artistic", since many sub-tasks might be better categorized as "creative". This aspect is similar to film and theatre productions, where the overarching artistic process requires the output of creative work as building blocks. Therefore, in this paper, we regard game system building, the creation of an architecture containing rules and dynamic elements as a *creative-artistic practice*.

The notion of system building as the activity of artists can already be found in conceptualizations of cybernetic art practices during the latter half of the 20th century. Roy Ascott, a pioneer of cybernetic art, described it as follows:

> A shift of human interest […] from the thing, the object, the product to the process, the system, the event […] (Ascott 1968)

What Ascott points out here is the difference to earlier forms of art like painting and sculpting, which are complete and determinate. We can understand these earlier forms as 'object art' in contrast to the "system art" Ascott is concerned with. He further explains:

> I make structures in which the relationships of parts are not fixed and may be changed by the intervention of a spectator. […] To project my ideas I set limits within which he may behave. […] the participant

> becomes responsible for the extension of the artwork's meaning. (Ascott 1964)

The salient features of system art – the co-creative role of participants/players, and the dynamic and procedural nature of systems – have become even more accentuated by the development of video games in the decades that have passed. Consider, for example, *No Mans Sky* (Hello Games 2016), where players act in a procedurally generated universe that includes over 18 quintillion planets. Or, consider a social game world such as *Second Life* (Linden Lab 2003), which allows players to create their own environments in the world, and to write code that governs the behaviors of the objects players make.

Unpredictability of Systems

Ascott's change in perspective from object art to system art reflects the reality of game design work. Game designers cannot know with certainty how something they build, or create affordances for, will be used by players, and what results will come out of the combination of procedural elements and player interaction. Consequently, *unpredictability is a fundamental element of the practice of building non-zero-sum game systems.*

A pivotal question is therefore: How do we deal with this uncertainty as system building designers and game design educators? In the games industry, much effort is spent to accommodate the inherent uncertainty during the development of games. A common practice is to model system behavior around specific use cases. A more elaborate approach is to work with imagined users, or personas (Cooper 2004) who might want to play in a particular manner. The ultimate test of a game system is always with actual players – yet when we are still in the design phase of game production it is not possible to test with actual players, as the system is not realized yet. Common work-arounds are to use either paper mock-ups or simple digital prototypes. While these can demonstrate certain aspects of games, more

complex game systems cannot be represented fully in such a way. Yet, even user testing with a feature-complete prototype cannot do much more than reduce the degree of uncertainty in game systems. This is the reason larger games require continued attention and software patches for a long time after initial release, even if best practices in software engineering and game design have been followed. A telling example is that of Microsoft's infamous twitter bot. Tay, which was intended to impersonate a nineteen-year-old American woman engaging in light conversation. The bot's utterances were, however, based on its 'learning' from the corpus of words that users were putting into the conversations with the chatbot. The result was that the chatbot was posting offensive and inflammatory text messages on Twitter (Wakefield 2016). Microsoft removed the bot within a matter of hours, not having been able to predict such an outcome.

In game education, while the importance of best practices and user testing has certainly been emphasized, there has not been an explicit concern with uncertainty. These challenges will not simply disappear when we move to a new paradigm of system building, but the changed perspective will enable us to understand uncertainty as an inherent aspect of system design, to plan for it in game design practice and to prepare students for this reality in game education. We will now introduce a model for creative system design, before discussing concrete approaches in education.

A TRIPARTITE MODEL OF CREATIVE SYSTEM DESIGN

As a starting point for a model of creative system design, we like to offer some conceptual framing. An important key to the artistic practice of game system building is to accept the fact that game systems will always entail unpredictability, even when sophisticated user testing methods or extensive run-time simulations are applied. It is helpful here to consider Cook's distinction between the generative space and the possibility space

of systems (Cook 2019). The generative space of a procedurally created environment can be enormous: for example, there can be 64921,600,000,000,000,000 different virtual landscapes instantiated in MineCraft (ibid). This number, albeit large, is finite and determined. In contrast, the possibility space of this system is even bigger, as it describes everything that players can create with MineCraft – and for this space there are no practical restrictions. On this basis, we propose a conceptual solution – to understand a game system as three connected layers, all of which need to be considered by the game system builder:

1. Architecture; creating the elements and relationships of a system (rules, characters, landscapes, objects, objectives, trajectories, etc.). The dynamic artifacts that serve as raw material for further processing.
2. Generation: computational co-creation – the systems when they are running, including procedural generation, and generative spaces.
3. Participation, performance, and co-creation of players in the possibility space – recognizing that play can also be considered as acts of artistic performance

This perspective demonstrates the challenge and pleasure of the practice of game system building – the challenge is in the fact that the output is an architecture, followed first by a layer of generation before the actual participatory engagement of the players happens. The pleasure is in the unfolding possibilities – a never ending number of ‘what-ifs’ being realized. Game design, as an artistic-creative practice, means to understand both the challenge to design for potentialities, and the pleasure of seeing them realized by players – even if these are engaged in activities that are not in line with the original intent (“transgressive play” (Aarseth 2007, Jorgensen & Karlsen 2019)).

AN EDUCATION IN GAME SYSTEM BUILDING

The move to the perspective of "system building" as a foundational post-Newtonian paradigm for game design (and related disciplines) has important implications for the education of designers and games scholars. We are proposing to make the understanding of game systems building a necessary element of game education.

Here, too, we can learn from Ascott. In the 1960s, he was faced with the educational challenge of teaching cybernetic art, essentially to train art students in systemic thinking and design, and to raise their awareness of the opportunities and limitations of technological developments. Ascott's response to this challenge was the development of a *groundcourse* at the Ealing College of Art, a two-year training program with a focus on challenging students' established perceptions of object art, and transform them into cybernetic artists with a systemic approach. A cornerstone of the educational program was the collaboration between artists and scientists. Through an ongoing series of challenges, students had to create solutions using artistic means (e.g., "Create a world on paper with major and minor structural systems. Show a fault occurring in the minor one; design a repair centre to put it right" (Ascott 1964)). They also collaborated with other students:

> [The students] form groups of six. These sexagonal organisms, whose members are of necessity interdependent and highly conscious of each other's capabilities and limitations, are set the goal of producing out of substances and space in their environment, an ordered entity.
>
> [….]
>
> The subsequent "ordered entities" are as diverse as the composite personalities of the organisms they reflect. Totems, time machines, sense boxes, films, sexagonal cabinets, cages have been produced out of the flux of discussion and activity. (Ascott 1964)

Ascott took inspiration for the groundcourse concept from the educational approach of the Bauhaus, arguably the most influential design school of the 20th century. Bauhaus founding director, Walter Gropius, saw the separation of specialized knowledge as a fundamental flaw of contemporary education in the early 20th century – for example that architects did not understand furniture making (the term "design" would become popular only later), or that the makers of daily use products, such as silverware and crockery, were separated from architecture. Conversely, he saw many traditional professional crafts such as carpentry as disconnected from developments in industrial manufacturing. Gropius' solution was the introduction of an integrated curriculum which started with the "Vorlehre" – a 'preliminary course' mandatory for all students, in which they acquired a shared foundation of basic knowledge in materials, color and form (Figure 1).

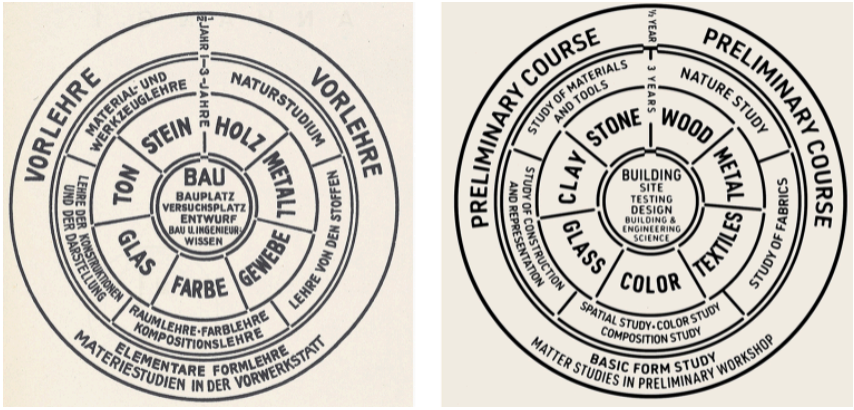

Figure 1: Diagram of initial Bauhaus curriculum (German original on the left, English translation on the right). "Vorlehre" (preliminary course) is the outer ring, followed by more specialized training in the inner rings that eventually come together in different aspects of building ("Bau") Source: The Getty Research Institute

In games education, the idea of the groundcourse is practiced. There is a common awareness that people working in different roles on a game project must have fundamental knowledge about each other's expertise. A programmer cannot be effective without

understanding computer graphics, a game artist needs to have basic programming and technical knowledge in order to create usable assets, and both need to understand the technical limitations and the opportunities of the technology in order to create fulfilling user experiences. Thus, in games education it is a common approach to start a longer education with courses that teach students fundamental concepts and skills together.

Yet, current approaches foreground a mechanistic perspective (the result is the sum of its parts) and not one that emphasizes systemic thinking (the elements together form a system with complex and often unpredictable behavior). The conceptual shift we propose would reorient existing groundcourses towards systemic understanding and the design of systems. This represents a particular challenge, as we have no existing metaphor for it. Everyday metaphors like “construction of a house” or “cooking” fail in communicating the meaning of complexity and unpredictability inherent in system building. This aspect is the pedagogical backdrop and reasoning for Ascott’s seemingly ‘wild’ collaboration exercises, and why they still provide inspiration for a reorientation of games education towards system building.

In games education, such exercises could include observations of complex systems outside of games (e.g., factories and ecosystems), studies of games’ systemic behavior, and the modification of an existing game (e.g., add a new feature and report on the unintended consequences you observe). To make this shift more concrete, in the following section, we propose a range of example projects for different educational setups.

GAME SYSTEM BUILDING EXAMPLE PROJECTS

An Afternoon Workshop

Design a paper-based game in which (un)happiness is spread like an infection, similar to the way coronavirus is spread. What unintended consequences could occur?

Design a prototype in which there is a disconnect between the objective and your abilities. For instance, you need to pick something up, but your tool is too unwieldy and powerful for the fragile object you are required to pick up. Or the other way around; you are very weak and have to move a heavy object. What are the effects of this disconnect? What strategies can players use to succeed, regardless?

Students Working for a Week

What would robots cook for robots (or aliens or bats)? Design a supply system for this kind of food, and consider the occurrence of a supply scarcity (similar to a drought that causes a shortage in human food) and how the system would deal with it.

You wake up one morning to find that you are a sponge. How is your life now: what do you need, what is meaningful to you, and what does your new everyday life look like? What can you do, and what can be done to you? Design a world for yourself, your fellow sponges, and the other beings in the new environment.

Students Working for Five Weeks

Design a game that loses a feature (e.g., ability to zoom in or out, ability to carry supplies) every ten minutes, yet the objectives stay the same. Invite test players, and observe their reaction.

Design and explore the effects of an unreliable facial recognition system. Use it to keep a virtual machinery running by requiring verification at regular intervals. Consider what a failure to verify would mean to the machinery. Use a ready-made image recognition API, such as Amazon Rekognition or Google Cloud Vision, but randomly feed deteriorated images to it and observe the effects.

Create a prototype game in which the player character encounters regular personality changes, and observe how players react.

Students working over the course of a multi-year program

Iterative system re-design

Each year, over the course of the educational program, have students revisit game systems they have designed. For example, in the first year of a three-year program, work with one of the suggested projects, as described above. In the second year, instruct the students to go back to the game from the first year to either add an additional system and integrate it with the existing one(s), or to completely exchange one system for a different one. Preserve the design intentions for the play experience. Have the students conduct and document play tests. In the third year, instruct the students to radically change the play experience of the game, while maintaining the system aspects of the game version they built in the second year. Have the students conduct, document and analyze data from their play tests, and have them compare the results with the results they gathered in the second year.

Longitudinal multi-player world

Design a multiplayer game world that explores the interaction between two or more different systems, for example, two different alien populations on a planet with conditions different from earth. Start with one population and then introduce the other one at a later stage. Have the two populations influence each other through their actions. The students should play each other's games over the whole length of the educational program to facilitate longitudinal studies of multiplayer game systems and the effect of design changes on them. Regularly perform user studies, and also evaluate technical aspects, such as code quality and sustainability. This setup would have the additional desired effect of solving the recruiting problem for the study of multiplayer games by enlisting students.

CONCLUSION

In this paper, we have introduced ‘game system building’ as a paradigm for game design. We motivate this perspective through a discussion of the limitations of Newtonian mechanistic thinking, and argue for the need to embrace the systemic nature of games, which means to acknowledge complex behavior and often unpredictable effects. In addition, our perspective creates an opportunity for a productive dialog with system-related art practices, such as cybernetic art.

As a first step towards a more developed perspective of this paradigm, we propose a conceptual understanding of game system building as three connected layers of co-creation, all of which need to be considered by the game system designer: the architecture, the generation, and the participation.

Finally, we consider implications for education and suggest a change in focus for the common groundcourses in game design programs; a shift from a mechanistic perspective, where the result is the sum of its parts, towards an approach that considers systemic thinking and designing. To facilitate this change, we discuss a range of example projects for different educational setups.

Our future work will be the further development of the ‘game system building’ paradigm in concert with the game design community and games educators.

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5.

A Research-Based Approach to Game Writing Pedagogy

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ABSTRACT

This paper discusses the importance of, and presents a possible framework for, phenomenological research of game industry practice to enhance pedagogy in computer game design (CGD) education. Built around examples from one such study on the practices of game industry writers, the author provides background for the study in question, outlines the theoretical framework of the research design, and presents an overview of the findings. A discussion of possible impacts and further applications in other subdisciplines of game development follows.

Keywords

game writing, rhetorical genre studies, activity theory, phenomenology, pedagogy, writing studies

INTRODUCTION

Collaboration between the game industry and CGD programs in the past has focused on workforce development (Ashton 2010). It can be difficult to develop pedagogies in creative fields, but, as Mayers (2005) suggests, engaging existing frameworks to theorize practice can help fields learn from each other. CGD programs' faculty, as educator-researchers investigating the phenomenon of game development in context, can leverage the lived experiences of practitioners to construct more effective course design and instruction. In doing so, researchers can build rich data that may be applied to future work, thus driving further sophistication of CGD as a field of study in higher education.

This paper addresses the potential of this approach to research-enhanced pedagogy by outlining and discussing one such study focused on the pedagogy of game writing. The paper starts by providing background on the research problem, outlining the issues with developing a pedagogy of game writing. Next, the author presents an overview of a two-year phenomenological study of industry game writers to identify possible applications of this pedagogy-focused research approach. The discussion that follows highlights important questions and opportunities resulting from the study data and other scholarship.

Problem Statement / Background

The primacy of industry skills in CGD programs should be reconsidered, recognizing a need for entry-level skills to enhance student employability, while also acknowledging the faculty's desire to enhance their students' capacity for creativity and

innovation later in their careers (Ashton 2010). In the subdiscipline of game writing, this reconsideration is fraught with complications.

Harry Brown stated, "Game development studios still struggle to define the role of the videogame writer and, more broadly, to reconcile the tasks of game design and storytelling" (2008 3). While the roles and tasks of game writing and game writers are poorly defined, hundreds of established professionals thrive as game writers and narrative designers in the field. A common sentiment surfaces throughout the literature and pervades the industry: there is nothing else like game writing (Bateman 2007; Chandler 2007; Dansky 2007; DeMarle 2007; Heussner et al. 2015; Sheldon 2013). In terms of scholarship, the game writing community's attempts to define their own practices is somewhat limited.

Experimenting with Conceptual Frameworks from Other Disciplines

Remaining open to scholarship and methods in other established disciplines that may not seem relevant at first glance, offers a vital opportunity to explore more effective pedagogies of game design in higher education. Educator-researchers in CGD pedagogy would benefit from adopting Maxwell's (2013) interactive approach to qualitative research design, one that remains flexible in methods and data collection, to test ideas and develop theory rather than draw conclusions.

Calling on my experience and training as an English composition instructor, my first inclination was to seek out resources to serve as exemplars and inform my approach to course design. However, I soon found that extant texts meant for instructive use (Bateman 2007; Chandler 2007; Despain 2009; Dille & Zuur Platten 2008; Heussner et al. 2015; Lebowitz & Klug 2012; Sheldon 2013; Skolnick 2014) are based primarily on professional anecdotes. Traditional writing genres, ranging from composition to poetry, can be found in game writing, but rather than communicating

a single author's vision to the audience, game writing serves to enhance the other elements of the player's experience (DeMarle 2007; Sheldon 2013). Lacking relevant theoretical underpinnings in pedagogy or writing research, these texts are of limited use to researchers or educators looking to develop and enhance pedagogy.

"There is nothing like game writing" captures the common sentiment of these texts. Wendy Despain (2009) frames her edited collection on writing for video game genres as an industry-veteran authors' alternative to "drowning our sorrows and crying in our beer" (p. xiv). Statements like this signify the limitations of relying on these trade press publications as a scholarly assessment of the field.

Starting an inquiry with an exploration of these industry-borne texts may seem overly simplistic to some researchers, but "any meaningful inquiry into games must take the realities of the industry into account" (Egenfeldt-Nielsen et al. 2015). The distance between understandings in these two spheres does not indicate a lack of sophistication on the part of the industry or of game writers. Rather, it is indicative of an opportunity for educator-researchers to engage with the field directly (Hudson 2018).

The search for a more effective pedagogy for game writing courses in higher education became the focus of my doctoral thesis, *Approaching a Pedagogy of Game Writing* (Hudson 2018), collecting data via semi-structured interviews with AAA game developers over the course of two years. What follows is a brief discussion of two such theories, prefaced with my bias stemming from a background of teaching composition. With such a vast corpus of scholarship, interested readers should seek out more from the sources referenced.

We do indeed stand at a frontier of interactive digital media, of games as a storytelling tool; fortunately for educators, colleagues

in other fields have investigated how humans interact with one another in collaborative pursuits. Some of the theories that informed my research design, such as those first presented by Vygotsky (1978) and Miller (1984), may seem quite dated; many of the methods of data collection and analysis are well worn territory for researchers in other fields. The goal here is to expose readers to potential lines of inquiry, offering just one example of how common theories and methods from other disciplinary traditions can be repurposed to shed light on a relatively new field of study.

CONCEPTUAL FRAMEWORK AND RESEARCH DESIGN

While basic, the strongest advice for students wishing to pursue game writing is to demonstrate "not only that they can write, but they can write for games" (Dansky 2007). The goal of this study is to approach what it means to write for games, with the eventual goal of incorporating that knowledge into game writing pedagogy. According to DeVoss, Eidman-Aadahl, and Hicks (2010), pedagogical practices to support writers' development fall into three strands:

- Supporting students in the process of writing and working in a community of writers,
- Studying the craft of writing and how it functions across genres, and
- Helping students analyze the rhetorical situations where writing takes place to instill flexibility and strategic thinking when addressing new contexts.

The purpose of this study is to support these goals by exploring the game writing practitioners' lived experiences in terms of writing scholarship and research, and effectively apply these findings to pedagogy.

Given the role of game writing within AAA game production, constantly changing from one project to the next and working under constraints dictated by technology and organizational structure (Bateman 2007; Chandler 2007; Dansky 2007; Despain 2009; Dille & Zuur Platten 2008; Heussner et al. 2015; Sheldon 2013; Skolnick 2014), the game writers' experiences are most effectively analyzed as part of the complex system of game development. A synthesis of rhetorical genre studies (RGS) and cultural-historical activity theory (CHAT) ultimately drove my research design, as both approaches look at writing in the context of production.

Rhetorical genre studies (RGS)

Genre, as defined below, is inescapable in writing instruction, as it is part of the cultural context writers work within (Devitt 2000). Russell (2001) holds that effective writing instruction should focus on what instructors want students to do, rather than what they want them to know.

RGS approaches to writing embrace the dynamic nature of any working situation. The game writing literature presents the lack of standard formatting as a limitation to learning the practices of game writing, but rhetorical genre researchers understand that all writing is situational. This means that the common notion of, "there is nothing like game writing" found in the literature is a null point. Were the same logic informing this sentiment applied to writing in other professional situations, it would be true to say, "there is nothing like any writing" in specific professional settings.

Relying on John Swales (1990) for a working definition, this study categorized genre in the following ways:

- Genre is a class of communicative events playing a vital role in game writing that encompasses both written and oral communication;
- The principal feature of the communicative events from

which genre evolves is a shared set of purposes among individuals within a particular professional setting;

- Exemplars of a particular genre vary in their prototypicality.

To this last point, Swales identified a definitional approach and a family-resemblance approach. The latter focuses on loosely shared interrelationships rather than a list of defining features. Swales' family resemblance approach to genre is useful in the context of the game industry, not only for writing but for analyzing the relationships between all the moving parts required in game production (Hudson 2018).

The industry-borne game writing literature presents the lack of standard formatting—lack of prototypicality—as a limitation to learning the practices of game writing, but RGS researchers understand that all writing is situational. Exploring the processes of game writing in context serves the scholarly purposes of this study, while also presenting useful information for the field of computer game design. Applying RGS as a frame to analyze the practices of game writers, and game developers in general, is a key tool in challenging the current assumptions in and about the field.

Phenomenological approaches can provide rich descriptions of the social contexts surrounding writing, but defining a genre also requires the textual inputs and outputs of the activity (Bazerman, 1997). Luckily, CGD students are likely very familiar with the outputs, games in this case. What they do not have access to are the inputs, the actual work performed by game writers in context. Analyzing genre should go beyond the features we are already aware of to identify the implicit practices—the functional interactions of writing and its creators—of those in the field (Bazerman & Prior 2009).

Borrowing concepts from RGS—focused on the real-world contexts where texts are created (Bazerman & Prior 2009; Devitt 2000; Miller 1984; Russell 2010; Swales 1990)—this research

design allowed for meaningful investigation of game writers in their respective professional settings.

Cultural historical activity theory (CHAT)

CHAT, for instance, is conducive to defining the processes and the conditions for attaining concrete goals in a complex system, while also factoring in the ever-present dynamics of power, money, culture, and history (Foot 2014). Despite romantic notions of video games being developed in basements by small groups of talented, enthusiastic friends, "[i]t is important to consider the mass production of games and the industrial process that makes their production possible, since both their aesthetic form and their consumption are influenced by this overarching structure" (Egenfeldt-Nielsen et al. 2015).

Scholars and researchers continue to extend Vygotsky's (1978) model of activity theory —notably Engeström (1999), Foot (2014), and Nardi (1995)—but three central ideas remain at the core of what is now more commonly known as cultural historical activity theory:

- Humans act collectively and learn by doing, communicating in and through activities;
- Humans make, use, and adapt tools—literal and conceptual—to learn and communicate; and
- The community is central to making and interpreting meaning in all forms of learning, communicating, and acting.

Given the complexity of game development, complicated by poorly-defined roles and a lack of standard practices (Newman 2013), CHAT provides a valuable framework for meaningful understanding of any role in game production. CHAT's attention to constraints within a system is also uniquely valuable for analyzing

the work of game writers who are often tasked with executing others' concepts while accounting for interactivity (Hudson 2018).

It is important to note that this study's eventual focus on game writers in the AAA space was driven by the conceptual framework; CHAT, in particular. Many of the games that are leading the way for the medium's maturation via more sophisticated approaches to narrative have come from the indie games space; given the creative constraints present within any profit-driven industry, that trend will likely continue. Focusing on AAA game production and framing it as an activity system can follow the footsteps of other CHAT studies that seek to understand large, complex systems. There are a growing number of spaces where games and other interactive experiences flourish, but considering CHAT in research design illuminated other interesting lines of inquiry to explore tensions within the game industry.

In addition to insights that help inform pedagogy aimed at professional development, the CHAT framework often serves to highlight contradictions and tensions within the systems they investigate; those same tensions and contradictions indicate space for innovation across the entire system (Engeström 1999). Aside from my goal of developing more effective pedagogy, the incorporation of CHAT methods of data collection and analysis offers a unique chance to overcome what O'Donnell (2014) calls the "industry's pervasive secrecy" and attempts by the game industry and its developers to hold themselves "as distinct from other industries." One phenomenological study seeking to learn from the experience of industry practitioners is not likely to unveil this secrecy, but an accretion of research focused on the experiences of individuals within the system might do so over time.

CHAT studies often employ phenomenological interview methods, as these allow practitioners to make tacit knowledge explicit while affording the interviewer the new insights regarding their own role in the system. Educator-researchers engaging industry actors

through research come away with unique insights as the observed phenomenon is seen through the lens of an educator. Used to better understand fields ranging from public healthcare systems to theater production, CHAT research aims to advance ways of thinking about professional practices, shaping or reshaping them in context, and often with the goal of developing related teaching strategies and curricula (Foot, 2014).

According to Bazerman and Prior (2009, 2), to view writing through the lens of RGS, "we need to explore the practices that people engage in to produce texts as well as the ways that writing practices gain their meanings and functions as dynamic elements of specific cultural settings." CHAT is equally useful when considering writing in game industry contexts, as it incorporates the complex relationships of power, money, culture, and technology (Foot 2014). By making these connections explicit, this study provides a clearer analysis of the game writing process and formulates pedagogical recommendations that can help students prepare to perform in that specific genre.

CHAT and RGS demonstrate the complexities in writing in various settings, so the thinking of these scholars allowed me to limit my scope and refine my methods to add something to the larger conversation about writing instruction and the game industry. Namely, I hope to provide a model for game writing that accounts for the realities of production, and develop an effective pedagogy for game writing—one that incorporates the realities of higher education and best practices in instruction.

Research Design

After reviewing relevant literature and settling on a conceptual framework combining RGS, CHAT, and my personal experiences as an educator, the ultimate design of the study was built on two deceptively simple research questions:

- What functional competencies are required of

professional game writers?

- To what educational experiences do game writers attribute the development of these competencies?

Throughout the course of the study, I allowed my knowledge and experience as an educator to inform my efforts. While open to any theoretical direction the data suggests, my approach was pragmatic, seeking results conducive to applicability and action (Brinkmann & Kvale 2014), rather than a purely phenomenological approach solely focused on representing experience. An approach of this kind attempts a deeper understanding of the meanings behind everyday experiences, while also offering plausible insights that allow others to understand those experiences more completely (van Manen 1990).

Following Prior's (2009) suggestion, these semi-structured interviews shifted between questions grounded in specific knowledge and scholarship, and questions that surfaced naturally during the conversation. Direct questions regarding the knowledge, skills, abilities, and characteristics of game writers fell into this category (e.g., "Tell me about your favorite writer to work with."). I also asked more open-ended questions regarding the day-to-day activities of game writers (e.g., "Describe what it looks like when you sit down to write," eventually followed by, "How is your writing process different in the studio?").

The steps taken to ensure anonymity—giving pseudonyms to participants, removing references to specific studios and game titles, and limiting specifics in demographic reporting given the close relationships within the game writing community—allowed participants to be honest and open in their responses. In cases where the interviewee responses began with, "Since this is off the record," it was apparent that providing participants anonymity allowed them to be more forthcoming, likely offering richer data. Note: All recruitment materials and informed consent documents were reviewed and approved by my institution.

Data Collection and Analysis

Recruiting participants at industry events and through relevant email lists, one-on-one interviews were scheduled for mutual convenience. While I created a guide that outlined particular questions that were meant to assist me as an interviewer and give uniformity to in situ notes and coding, the interviews were conversational. This semi-structured approach to interviewing allows for co-creation of knowledge (Wengraf 2001) and provided space for me to interpret via my conceptual lens.

Honoring these interviews as conversations, rather than a collection of data to be scrutinized once transcribed, I was able to interact with participants in the process. Assisted by the interview guide, I coded responses in situ, both during and immediately after interviews. This allowed me to be present in the conversations without losing focus on the intention of the interview.

Working with the transcriptions after the fact, I performed open coding to identify emergent themes—sentiments that surfaced across interviews or seemed pertinent to my purpose. Another round of coding followed, reviewing the transcripts with audio to verify the appearance of those emergent themes while identifying any pointed responses from participants. Pointed responses were those sentiments imbued with emotional intensity, given importunate explicitly, or repeated multiple times throughout the interview. Interviews are conversations, not transcripts (Brinkmann & Kvale 2014); making an effort to be present in the interviews and spending time with the audio after transcription was the key to collecting meaningful data in this study.

Now coded, I adopted aspects from Brinkmann and Kvale's (2014) framework for interview analysis focused on adopting their use of meaning condensation tables to process the data. These condensation tables were produced after the first two rounds of coding by revisiting the interview transcripts and audio, and extracting the natural units that accurately portrayed the context of

specific responses. In practice, this meant returning to the coded transcripts and audio with a focus on isolating the humanity around a particular statement.

The process of generating these natural units, repeated multiple times, looks like this: choose a specific instance coded in the transcript, find that portion of the interview in the audio recording, then rewind and playback the recording as needed to identify and capture the whole sentiment that produced the coded utterance in this question. Finally, the text from that natural unit is captured via the transcript and set aside. This curated sampling of natural units was the final data set used in analysis.

This engagement with the data was of particular use as an educator. Though it required many hours, weeks, and months to process and analyze, the time spent working with the data yielded immediate insights for my practice in the classroom. Even if I had failed to complete and publish the work, my students would benefit.

While this may seem daunting, this approach to data analysis deepened my understanding of the participants, the people, who kindly offered their time to assist me with my work. Given the purpose of enhancing game writing pedagogy, this phenomenological research approach was effective.

Limitations

This approach to data analysis did limit the sample size, curating a data set based on multiple interviews with seven different individuals. Each of the seven met the criteria developed in the first round of coding—I will not share it here to respect anonymity. Setting this limitation was indeed intentional, based on Moustakas' (1994) thinking that a purposeful sample can maximize the richness of the data. As Creswell (2006) advised, "An individual writing a phenomenology would be remiss to not include some discussion about the philosophical presuppositions of phenomenology along with the methods in this form of inquiry"

(59). Basic philosophical stances on phenomenology hold that it describes the essence of the lived experience, rather than draw conclusions based on the data collected.

Outside of questioning the reliability of any particular accounts, each participant offered reflection. The reporting of each interviewee's lived experiences is specific to his or her career path, beliefs, biases, and a host of other factors informing who they are as people, in addition to their professional selves. Shared in the form of reflection, and sometimes relying on a participant's perception of others, at a minimum, the responses are filtered through hindsight. As opposed to ethnographic approaches that may provide more accurate data on day-to-day work through observation, this study relies solely on what the participants said about their work hindsight.

OVERVIEW OF SIGNIFICANT FINDINGS

Rather than identifying finite abilities, skills, and knowledge, data analysis revealed more malleable categories, termed 'areas of competence' necessary for game writing; these included: writing and storytelling, communication and collaboration, understanding systems and dynamics, tool proficiency, and understanding play. Beyond these areas of competence, the study also identified three essential roles of the game writer—*wordsmith*, *sensemaker*, and *advocate*—that may serve as a structure for examining how various areas of competence are engaged, alone or in combination, across the array of tasks performed by industry game writers.

Areas of Competence

Listed below, each area of competence encompasses a group of competencies required to support a productive career in game writing:

- Writing and storytelling—required to produce written text and generate engaging story content efficiently;

- Communication and collaboration—required to work effectively with other individuals in a studio environment;
- Understanding systems and dynamics—required to perform functions at a high level within the limitations of production and technology;
- Tool proficiency—required to demonstrate the transfer of writing and storytelling skills to the tools, both technological and conceptual, of the industry; and
- Understanding play—required to create content for games by producing writing conducive to interactivity and allowing for player freedom.

Learning outcomes that promote the areas of competence outlined in this study are enhanced when framed in the three essential roles of wordsmith, sensemaker, and advocate.

Essential Roles of the Game Writer

This study identified three essential roles that game writers play, in some capacity, across contexts. Although little uniformity exists across titles and roles in the industry (Bates 2004; Newman 2013), these roles encompass the array of tasks the game writer may perform in any given setting. Summarized, they include:

- Wordsmith—the game writer's focus is on execution rather than creativity. Completing the assigned tasks of game writing requires flexibility when crafting with text.
- Sensemaker—the game writer seeks to understand the creative views of individuals in other subdisciplines to build a sense of ownership for the game's story from all those involved in the production.
- Advocate—the game writer champions the story vertically to the decisionmakers and horizontally across

> the subdiscipline teams, relying on emotional intelligence and careful observation.

Students can conceive of any given task in terms of hypothetical industry contexts—the rhetorical situation and its context within the activity system—while relating them to a combination of these essential roles.

Application to Pedagogy

My experience conducting this research has directly affected my pedagogy, but also offered a basis for designing curriculum. I present a small sample of these pedagogical applications and/or considerations regarding the areas of competence below.

Game Discipline Knowledge (writing and storytelling): while this study focused on game writing, the specific subdiscipline of game design I sought to better understand, this particular area of competence is interchangeable. Art, animation, audio, programming, etc. could easily stand in. In some cases, this knowledge can be attained from other disciplines at university. In the instance of game writing, a few courses on creative writing, regardless of genre. In the classroom, this means borrowing from my background as a student taking playwriting, screenwriting, and poetry courses.

Communication and collaboration: the prevalence toward collaborative team projects in CGD is valuable indeed, but maximizing the pedagogical value of these group interactions requires reflection. By giving students a task and letting them develop mediating tools as they see fit, or alternatively demanding strict adherence to a particular approach that reinforces attention to detail and accountability, a balance can be struck by introducing thoughtful reflection on the process of creation.

Understanding systems and dynamics: giving students an understanding of the hierarchical structures within game

development offers a lens for situating even the smallest group project in the larger system of game development. Even on an indie team consisting of a handful of individuals, the relation of one task to another, while factoring in the technological challenges that accompany each task, is vital to success. This also factors in the hierarchical structure present in larger-scale production. In the classroom, roleplaying—and often times, playing with roles mid-project—affords students this understanding. Low stakes collaborative activities suit this purpose, making outrageous demands for writers to produce X in the next 45 minutes then letting them know it needs to be X+Y about 25 minutes into their work.

Tool proficiency: reinforcing that writing is about more than generating ideas; incorporating technological challenges alongside narrative content creation allows for greater creative growth. In the classroom, students can create content using Twine or Inklewriter. Often times I combine the creation of a user guide with these assignments, asking the students to consider how they might explain the use of these tools to others. If the availability of game-specific software is not an option, giving students tasks with common tools such as Microsoft Word can have equal benefits. Challenging students to use these tools as more than word processors, engaging their creativity to use seemingly mundane software, and enhance the visual impact of a project, allows them to inject identity into documents. Also, in the case of game writing, teaching students to work within spreadsheets is a must.

Understanding play: a thorough understanding of play and players is an obvious requisite for anyone aspiring to make games. In my courses, which often include students outside the CGD major, this means finding a way to present player interaction that is valuable to the experienced and novice alike. Readings from game studies, recordings of post mortems, and actual play in the classroom offer a chance to examine prior experience with play and give it meaning.

Due to the necessary collaboration between game writers, other subdisciplines (e.g., art, audio, programming), and player expectations of interactivity, the essential roles and areas of competence that emerged represent the differences between writing for games and writing in other mediums. The essential roles of wordsmith, sensemaker, and advocate are the frame for the course. I introduce this concept early and reinforce it throughout the course with explicit reminders—often times, students are asked to reflect on particular experiences in writing—so that students understand which roles they are playing in given situations. This deepens their understanding of the rhetorical situation in the context of larger, though sometimes hypothetical given our classroom setting, systems at work.

Researcher Reflections

The data collected in this study, much like extant texts on the subject, still focused on debunking the perceived myths about a writer's work in preparation for the practical realities of the field. According to Peery (2016), if there are rules for writing in the industry, they are largely developed in-house for specific projects. In university composition programs, however, the concept of writing as a loosely-defined set of interrelated tasks and processes is now common. Teaching writing with a focus on process, rather than product, is so widely accepted that "it may be difficult to imagine alternative instructional approaches" (De La Paz & McCutchen 2011, 32).

Making tacit professional knowledge explicit is valuable to advancing any field (Schön 1983), but is particularly useful when exploring new fields with few standard practices. The real value comes in the educator-researcher's interpretation and eventual implementation into pedagogy. Capturing the game industry professionals' perceptions is a first step in challenging the assumption that "there is nothing like game writing."

CGD instructors that conceive of game writing, or any subdiscipline, as a mere synthesis of relevant tasks common in the industry are not likely to produce anything more than a list of possible classroom activities. Those who are willing to experiment in the classroom and attempt new methods of instruction that challenge traditional notions of higher education can truly empower students (Hudson & Willis 2019). Instructors who frame pedagogy in more abstract ways, such as these essential roles, are better able to develop effective methods of instruction regardless of perceived constraints of time or resources.

DISCUSSION

While a great number of words are devoted to my journey of approaching a more effective pedagogy of game writing, I hope educator-researchers in the field of CGD take away something more. The study presented above highlights the potential for collaboration between industry and academia that is driven by instructors—experienced professionals with a wealth of knowledge—and grounded in research. Rather than simply amending coursework per the views of the practitioners in the field, faculty that engage in research on the industry in concert with academic disciplinary knowledge and teaching expertise, develop more effective instruction and approaches to curriculum design.

Individual studios and professional organizations such as the International Game Developers Association have demonstrated a willingness to work with CGD programs, but "collaboration, dialog and attempts to bridge industry and higher education gaps seem to be focused principally around workforce development" (Ashton 2010, 44). While logical, that goal is more elusive than it may seem. Preparing students with industry-specific skills is difficult given the lack of uniform practices in the industry and the rapid pace of change driving the industry's evolution.

Just as the medium "must move beyond computer science and art to simply code games and make them look good" (Salmond 2016, 24), CGD educators must seek more innovative approaches to training students—a greater focus on game storytelling is one way forward. Greater focus on narrative has the potential to speed the sophistication of the medium (Jacobs 2004; Norman 1999). Games with engaging stories and clever writing increase emotional impact (Isbister 2016) and players' sense of immersion during gameplay (Bissell 2010; Ermi & Mäyrä 2005). Game studios that "have indulged the writing process," have created some of the most innovative and socially- engaged work to date (Bissell 2010). Creating inclusive content should be a consideration for all CGD educators.

The authors of trade press books on game writing define their field by juxtaposing it with common ideas about creative writing, likely driving the sentiment that "there is nothing like game writing." This sentiment is shared by some who teach creative writing in university. Kenneth Goldsmith (2011) asserted that the field of creative writing is stuck on perpetuating the incorrect notion of the original artist in writing. Goldsmith indicated that this attitude limits the potential of creative writing in the digital age. Others, like Mayers (2005), highlighted university creative writing programs' common refusal to theorize about the ways creative work operates. As a result, potentially valuable qualitative studies of these practices remain non-existent.

CONCLUSION

Basing curriculum design and instruction on research, rather than on generalized assumptions regarding industry trends and practitioners' anecdotes, adds value to the students' CGD education, which is vital to programs competing with the unbundled alternatives of online self-instruction in the

technological tools of the trade (Selingo 2013). We have to teach students more than just technology; we have to ask ourselves, "What can we give students that the internet cannot?" Engaging our expertise as educators, amplified by research on practitioners in the field, will certainly present answers to this question.

Given the complexity of game development, complicated by poorly-defined roles and a lack of standard practices (Newman 2013), innovative research on industry practices, with the ultimate purpose of pedagogical application, is the key to advancing computer game design as a field of study. Any existing gaps in communication between the game industry and higher education should not serve as an excuse to retreat to our respective bases of understanding. Rather, those gaps are indicative of an opportunity for researchers to engage with a new field that represents a convergence of technology, art, storytelling, and interactivity in the digital age. Deployed in pedagogy, those efforts will certainly benefit the students we seek to serve and our field of study; they may also innovate the medium itself.

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6.

Educating Interactive Narrative Designers

Cornerstones of a Program

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ABSTRACT

In recent years, games with a focus on narrative have been a growing area. However, so far, interactive narrative aspects have not been the focus of video game education (with the noted exception of a small number of programs in game writing), which indicates that many narrative designers are self-trained. The insular status means that many designers use private vocabulary and conceptualizations that are not directly transferable. This state of affairs is an obstacle to productive discourse and has negative consequences for the further development of the professional field.

By starting an educational program, we aim to address this problem using the opportunity to also include perspectives outside of games. We report on the first iteration of a minor in interactive narrative design, and reflect on lessons learned, while considering future trajectories for this and similar programs.

Keywords

Ludonarrative pedagogy, game design education, interactive digital narrative (IDN), interactive narrative design, interactive narrative pedagogy

INTRODUCTION

Interactive narrative aspects, sometimes referred to as ludonarrative, have not been the focus of video game studies and education. During the foundational phase of the discipline, the focus was placed on game mechanics and on understanding what distinguishes games from earlier forms, such as movies and novels. In addition, some scholars presented narratives as oppositional to the very idea of games. In recent years, however, the growing field of high-profile narrative-focused games (e.g., Dear Esther (The Chinese Room 2008), Gone Home (The Fullbright Company 2013), Telltale Games' productions like The Walking Dead (Telltale Games 2012), The Wolf Amongst Us (2013), Firewatch (Campo Santo 2016)) and Detroit: Become Human (Quantic Dream 2018), Mutazione (Die Gute Fabrik 2019) and more recently the release of The Last of Us 2 (Naughty Dog 2020) have alerted a wider audience to the possibilities of narrative expressions that embrace the affordances and unique possibilities of digital interactivity (Laurel 1986; Murray 1997; Rieser 1997; Jenkins 2004a; Murray 2011; Calleja 2013; Koenitz et al. 2015). In other words – these games do not attempt to 'interactivize' print literature or the movie, but instead explore a different and, so far, less explored space of interactive digital narration. This development needs to be reflected in video game teaching. Yet, so

far, narrative has been a stepchild in games education. Most game design degree programs feature only a single course on the topic, and specific programs in game writing are scarce[1]. Our approach, instead, is to offer a minor concentration within a game design program, which also integrates perspectives outside of games, for example interactive documentaries and installation pieces. and thus offers a wider view on interactive digital narratives (IDN). First, we will discuss the concrete motivation and professional context of the minor interactive narrative design. Next, we will explain our overall pedagogical approach, followed by a report on the first full iteration of the course. Finally, we will reflect on the lessons learned and consider future trajectories for this and other programs.

MINOR INTERACTIVE NARRATIVE DESIGN

One reason for the development of the minor Interactive Narrative Design has been the expressed need of the game industry in the Netherlands for skilled interactive narrative designers. When developing narrative content for games, such as dialogues or storylines, game studios often rely on scriptwriters. These are trained in the art of creating traditional, fixed forms of storytelling, and understand the appeal of narrative experiences. However, this skillset is not directly applicable in an interactive context. In contrast, game designers understand the art of interaction design, and see the appeal of interactive experiences, but often lack a deep understanding of interactive narrative. Consequently, some game studies have resorted to in-house training in order to transform game designers into narrative designers. This practice has economic implications (training costs for companies, lost projects due to lack of expertise and/or capacity), but more significantly, this condition creates vocabularies and practices specific to a particular employer – knowledge that is scattered, siloed and not easily transferable to other contexts (cf. Koenitz and Eladhari's "Babylonian Confusion" (2019)). For the individual narrative

1. The authors are aware of less than ten specific programs worldwide.

designer this means re-learning becomes necessary when switching companies. In addition, for the field of narrative design as a whole, this state of affairs is a significant obstacle to further development, since incompatible vocabulary results in a vicious circle of 'forget and reinvent' and endlessly repeating "groundhog day" (ibid) of interactive narrative design. This is the other motivation for the minor – to break the vicious circle of company-specific silos and offer an education that is oriented on furthering the creation of interactive digital narratives as a design discipline beyond immediate economic interests. On this backdrop, the minor targets game design students with an interest in designing interactive narrative experiences.

As Koenitz et al. (2016) have pointed out earlier, the interactive narrative designer finds their craftsmanship in the ability to express narrative through interaction. In other words, an interactive narrative designer understands the appeal of characters, or the importance of conflict and then must be able to apply this narrative sensibility when designing engaging interactions for its audiences. The question thus is how to turn this sensibility into concrete designs?

Two Approaches: Unlearn and Reuse

The challenge for us as educators in the minor is to first help game design students "unlearn" linear and static ways of storytelling, which still dominate school education and public discourse about narrative. We do this by expanding students' understanding of narrative and raising awareness of alternatives to the dominant euro-centric forms (e.g., multi-climactic and cyclical Africa oral storytelling forms or the 'conflict-less' Asian form of Kishotenketsu) and thus counter the myth of "universal" narrative models (Koenitz et al. 2018).

Secondly, we train students to "reuse" their game design skills for narrative purposes. Students first need to develop a new understanding of narrative; one that is not based on established

notions of storytelling, but that understands narrative as a cognitive meaning-making process, a "mental frame for cognitively projected worlds" (Herman 2002). We explain to the students how this 'cognitive turn' in narratology facilitates novel forms of narration and thus provides a solid foundation for interactive narrative design (Ryan 2006; Koenitz 2015a; Roth, van Nuenen, and Koenitz 2018). When they have acquired this alternative understanding of narrative, they can start using their skillset in a new way by applying specific design principles (Koenitz 2015b). For example, we ask students to design interesting narrative game mechanics (Dubbelman 2016) that invite the player to perform actions that support the construction of engaging stories and fictional worlds in the mind of the player.

In this two-step process, we turn game designers into narrative game designers; students with the ability to design game systems in such a way that meaningful narratives emerge in the imagination of players when they interact with the designed interactive systems.

The Multiple Roles of the Designer

We train the students to be narrative artists, interactive system designers and vision holders (Figure 1). The skillset that interactive narrative designers need to master, is derived from these three essential components. First, we consider them to be artists (Knoller 2012), working with interactive technologies as their medium of (self-) expression. The skills pertaining to this narrative sensibility are, amongst others, the ability to imagine and express engaging and believable characters, worlds, events and conflicts. Although they do not necessarily have to been trained scriptwriters or visual artists, they do need to be able to understand and apply the basic principles of writing and visualizing for an interactive context. Secondly, they are system designers who need to be deeply aware that their creation is a dynamic artefact that already by itself at runtime can show intricate and even unintended behaviors, an aspect already described for cybernetic art by Roy

Ascott in 1964 (Ascott 1964). Once players/interactors enter the picture, the complexity only grows. The role of the designer is to plan for these effects and embrace the role of "narrative architect" (Jenkins 2004) who sets boundaries, and offers opportunities for meaningful interaction – the quality Janet Murray has deemed agency (Murray 1997). Third, as vision holder, it is the responsibility of the interactive narrative designer to facilitate the vision of an interactive narrative project and communicate about it internally and with clients. This is a considerable responsibility due to the lack of standardized procedures in the production of narrative-focused games and other forms of interactive digital narratives. Equally, clients often have little understanding of interactive narrative, and the lack of an established lingo means that a considerable effort is needed to prevent misunderstandings, and ensure successful communication.

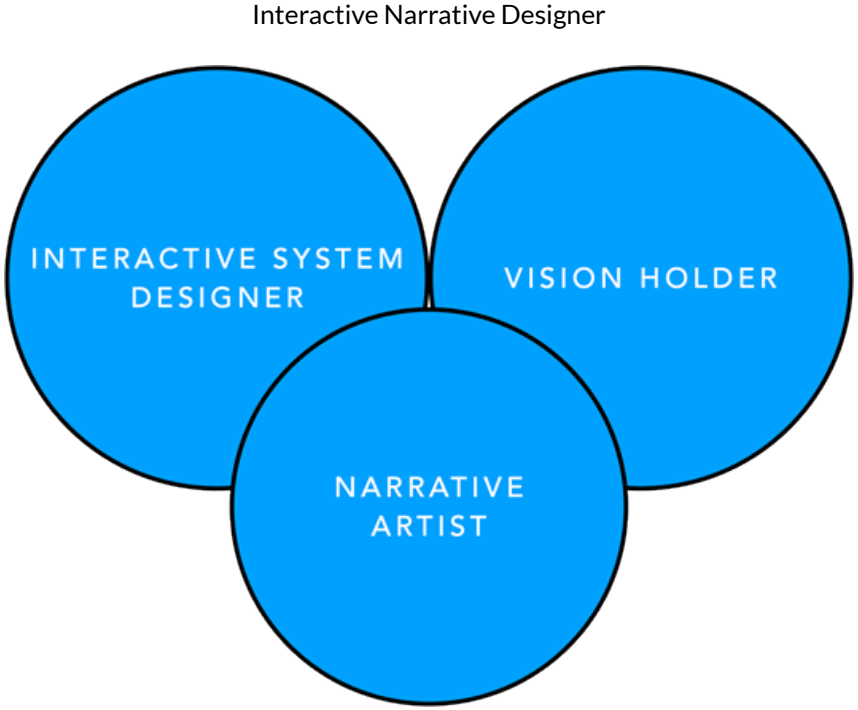

Figure 1: Triadic perspective of the interactive narrative designer

The multiple roles of the designer translate to an expanded skillset (Table 1) in nine areas: interactive narrative design principles and conventions, narrative sensibility, ideation and conception, testing, prototyping, writing (for interaction), audio-visualizing (for interaction), communication, and dramaturgy. In each area, we define three different skill levels with expected knowledge/abilities at that level. In this way both educators and students have a clear understanding of where they stand and what they need to accomplish to reach the next level.

A Multidisciplinary Perspective

While our minor is located in a game design program, we do understand interactive narrative design as a cross-cutting perspective of which ludonarrative design is one variety (cf. Koenitz et al. 2015). Consequently, we acknowledge additional forms, for instance, interactive documentaries (Aston et al. 2017), interactive film (Hales 2015), non-game forms of VR and AR experiences (Bucher 2017, Fisher 2021), interactive art and museum installations (Oh & Shi 2012, Vayanou et al. 2014), educational approaches (Dubbelman et al. 2018, Sylla & Gil 2020), as well as journalistic interactives (Usher 2016; Jones 2017). Our curriculum reflects this view by also bringing students in contact with these additional varieties and their design practice. For their projects, students can choose to also work on these forms, and thus use an extended design space. This multidisciplinary perspective also distinguishes our program from existing ones focused exclusively on game writing.

Skills	Basic	Advanced	Expert
1) IDN design conventions	Student is able to recognize IDN design conventions in existing interactive narratives	Student is able to apply existing IDN design conventions in their own work	Student is able to develop new (potential) IDN design conventions
2) Narrative sensibility	Student understands the appeal of (interactive) narrative experiences and the basic components of (interactive) narrative	Student is able to apply their insight in the appeal of (interactive) narrative experiences in their own work	Student is able to apply their insight in the appeal of (interactive) narrative experiences in their own work, creating works with emotional impact
3) Ideation and concepting	Student has worked incidentally with existing tools and methods for ideation and concepting (e.g., IDN design canvas / IDN design lenses / IDN design branching cards)	Student has worked regularly with existing methods for ideation and concepting (e.g., IDN design canvas / IDN design lenses / IDN design branching cards)	Student develops new tools and methods for ideation and concepting Student develops unexpected ideas and concepts
4) Testing	Student is able to conduct existing user experience tests	Student is able to combine existing user experience tests	Student is able to develop new user experience tests
5) Prototyping	Student masters three methods for physical prototyping (e.g., paper prototyping, play prototyping, preja vu prototyping)	Student masters three tools for simple digital prototyping (e.g., Twine, Construct 3, Ren'Py)	Student masters three tools for complex digital prototyping (e.g., Unity, Unreal, Godot)
6) Writing (for interaction)	Student is able to recognize 'writing for interaction' techniques	Student is able to apply 'writing for interaction' techniques in her own work	Student is able to develop new 'writing for interaction' techniques
7) Audio-visualizing (for interaction)	Student is able to recognize the power of audiovisual (and haptic) stimulus for narrative expression	Student is able to design the audiovisual (and haptic) stimulus for narrative expression (in concept)	Student is able to develop the audiovisual (and haptic) stimulus (e.g., illustration, modelling, animation, UI, etc.)
8) Communication	Student is able to share ideas internally, supported by basic communication tools (e.g., pitch, slides)	Student is able to share ideas internally, supported by advanced communication tools (e.g., video, prototypes)	Student is able to share ideas externally (offline/online), supported by advanced communication tools (e.g., video, prototypes)
9) Creative leadership	Student is able to integrate the various elements of her own work, supporting an overall vision	Student is able to integrate the various elements of a small team production, supporting an overall vision	Student is able to integrate the various elements of a large team production, supporting an overall vision

Table 1: Skillset on the interactive narrative designer

IMPLEMENTATION

Our approach became a concrete educational program in the form of a minor in interactive narrative design at the University of the Arts Utrecht. The minor had its first run in the fall term 2019. It was in high demand, and therefore, participation became competitive. After a selection process, 20 students were accepted. In this section, we describe the structure and content of the program, and give examples of student projects. We close this section with a reflection of our approach, consider lessons learned, and point out topics for future improvement.

Structure

The minor is scheduled as a 20-week program starting in the fall and extending into spring. The full syllabus is available online[2]. As shown in Figure 2, the overall course is divided into two periods, each lasting ten weeks and ending with a project presentation. In the first project ("Express yourself"), the students work in pairs to create a simple interactive digital narrative. The main learning goal for the students is to acquire the basic skills of interactive digital narrative design (see Table 1). In the second project, the students work in teams to create a pitch to an external committee, which includes the creation of a digital prototype. The main learning goal here is for the students to apply the skills they have acquired thus far, in a context relevant to their future professional ambitions. For example, students wanting to pursue a career in the arts, work on a proposition for an art grants committee. Students who would want to start their own company, prepare a proposition for a publisher or investor. Students who would want to work in a company, do not have to prepare a pitch, but instead make a portfolio and participate in a mock job interview.

2. https://ardin.online/resources/syllabi/

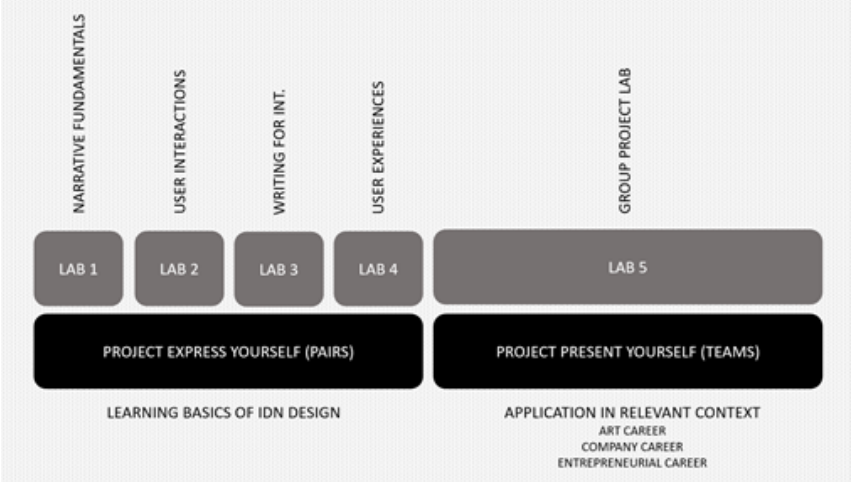

Figure 2: Program overview of the minor IND

In parallel with the projects, the students participate in labs. These are learning units in which students explore one particular topic in detail. Each lab is given by a topic expert. These topics are closely connected to the basic interactive narrative design skills the students have to master (cf. Table 1) and are relevant to the respective phase of the project. The first lab focuses on narrative fundamentals. In the following sections we describe the structure and content in sequential order.

Kick-off: Play and discuss

In the first week of the minor, we introduced a wide variety of interactive narrative works, and taught and discussed the basic terminology, including Murray's affordances and aesthetic qualities (Murray 1997) and Koenitz's SPP model (Koenitz 2015a). Together with students, we played games, VR/AR apps, interactive documentaries, and more. By reflecting on our play experiences, we tried to answer questions such as: What is special about an interactive narrative experience? How does it differ from other narrative experiences, like watching a TV show or reading a book? Can we already recognize certain design principles or conventions? And how do we talk about these products? What

kind of terminology should we use? At this stage, students were encouraged to start thinking about their own upcoming projects, and to develop some initial ideas.

LAB #1: Narrative fundamentals

This lab provided a framework for discussing and designing interactive digital narratives. We started by tackling the big elephant in the room: what is narrative and how can it be designed to be interactive? To answer that question, students have to unlearn much of what they have been told about narrative so far to be able to look at the topic with fresh eyes, connecting age-old traditions of oral storytelling with modern insights from cybernetic arts (Ascott 1964) and brain sciences (Herman 2002). Students learned that narrative can be many things beyond the novel and the movie, and that the notion of a universal story structure is only a myth (Koenitz et al. 2018). Building on this expanded understanding of the narrative space, we taught basic vocabulary and a model (Koenitz 2015) for analysis and critique of existing interactive narrative works and for presenting sample analyses. We explained to the students that we intend to continually evolve these foundations to reflect on our own design practice, and communicate it to others.

LAB #2: User interactions

This lab focused on the design of the interactions that users have at their disposal to influence the narrative. These actions can differ between different interactive digital narratives. Some provide the user with explicit choices, for example: “Do you want to go right or left?” Others create an exciting environment for users to experience and explore. And yet others give the user a set of tasks to perform, like running, jumping and picking up items. In this lab, we looked at different interactive narratives and discussed their differences in terms of user interactions. Students explored the types of user interaction suited their own projects, trying to find answers to questions such as: “What kind of user interactions

are inspired by the story you have chosen as a starting point?" and "How can you create narrative meaning or arouse emotions through user interactions?" Students worked with a set of concrete tools to communicate, discuss and test their ideas, such as the IDN Design Canvas (Dubbelman 2021) and a specific framework for evaluation (Roth 2016), With the help of these tools, students created their first digital (or physical) prototype during this lab.

LAB #3: Writing for interaction

In this lab, students focused on the topic of writing for interaction in different media. Students acquired tools and techniques for layered and impactful storytelling. Throughout the lab, we drew inspiration from a wide variety of source material, from cutting-edge interactive narrative projects to examples from the world of cinema, theatre and literature, and even traditional ways of storytelling. In this lab, we focused on different aspects of 'writing': from creating convincing characters and scenes, to playing with the structure and possibilities of language itself. There was also an emphasis on how to structure the writing process, and students learned to not only write, but also to re-write their texts throughout different iterations. Finally, we focused on how students can reach out to target groups (audience members, peers, investors, etc.) through the writing of treatments, synopses, and marketing texts.

LAB #4: User experiences

Meaning-making, understood as the process by which we create, construe, and interpret meaning, is an essential part of how we experience different forms of creative expressions. In this lab, participants learned how the design, delivery, and reception of meaning contribute to the interactive narrative experience. We investigated how designers create meaningful, potentially transformative, experiences, and how to evaluate the resulting user experience (Roth and Koenitz 2016). This lab applied cognitive psychology to facilitate insights into the interactors' perspective

and interactive narrative meaning-making processes, which is crucial when designing with a goal in mind. In this context, we analyzed and utilized the concepts of ludonarrative harmony – the successful combination of ludic and other narrative elements – and ludonarrative dissonance – the clash between ludic and other narrative elements. In the second part of the lab, the aspiring interactive narrative designers learned how to efficiently playtest and evaluate their prototypes. Participants applied Roth's Measurement Toolbox (Roth 2016) to evaluate their works both qualitatively and quantitatively as part of an iterative design process. The Measurement Toolbox consists of 12 user experience research dimensions (usability, effectance, autonomy, flow, presence, role-identification, curiosity, suspense, believability, eudaimonic appreciation, affect positive/negative, enjoyment) that can be used in experimental setups to identify effective design principles and potential for improvement. A concrete application of this set of measurements is asking users to fill in questionnaires immediately after an experience. Since interactive narratives can take many forms, and this robust measurement toolset is able to compare user experiences across different technological and design approaches. For example, evaluating an interactive theatre experience with VR elements (Roth 2019) or the interactive movie, Bandersnatch (Roth and Koenitz 2019).

Kick-off project – Present yourself

The second half of the minor was concerned with the "Present yourself" project. During the kick-off, the project details were shared and project teams were formed.

LAB #5: Group project lab

This lab supported the group project by having students focus on creating documentation, portfolio items, or presentation material for both their internal communication needs as well as the final assessment. In contrast to the previous two-week intensive labs, contact hours in this part were spread over the whole second block

and consisted of a bi-weekly mentoring session with each group, ongoing peer-review and structured meetings with other teachers, as well as the final judges, which included potential employers, investors, clients, curators, or representatives from art funding bodies, depending on each project's focus. The students' projects were discussed from the perspective of real-world orientation.

PROJECTS

Project 1: Express yourself

In the first project, students worked in pairs. The task was to create a simple, personal interactive narrative with the skills acquired in the first half of the course. The starting point of the project was an existing story of the student's choosing. This could be a movie, TV show, book, or a play, but also a news item, documentary, historical event, or something that happened in real-life. The students were told to choose a narrative that was particularly relevant to them. For the project, they had to turn this existing narrative into a personal interactive narrative experience. The project was assessed by a committee of teachers and industry professionals. The learning goals were to understand core elements of an IDN design process, and apply these in a concrete project, more specifically:

- Use of a set of IDN design tools (IDN Design Canvas (Dubbelman 2021), IDN Design principles (Koenitz 2015b)), and a specific framework for evaluation (Roth 2016).
- Learn a set of IDN design conventions (e.g., delayed consequences, foldback structures and scripting the interactor), and apply them.
- Create a project with the following requirements:
    - The project must be inspired by an existing story, chosen by the students.

- The project contains a clear analysis of the basic elements of (a part of) the story (characters, setting, conflict, events) as well as the story's appeal, according to you (topic, message, affect).
- The project must be small in scope (preferably one scene with a limited playtime).
- The project includes:
    1. Multiple characters.
    2. Some form of interactive written text.
    3. A limited set of clearly defined user interactions (i.e., narrative game mechanics).
- The project must be tested with the intended target audience.

The projects in this category took a wide range of different forms, including an interactive documentary about nuclear energy and its potential benefits in reducing CO2 output, an interactive movie about a child having to cope with a serious illness, another interactive movie about addiction, a game where the interactor became a censor in an Orwellian world, an AR-based science fiction code puzzle, and a VR experience where the interactor is trapped and needs to free themselves. In the following section we describe two projects in more detail.

VR experience

In this project, the students[3] used an interesting design solution to heighten the sense of immersion. The starting point of the

3. Ramon Hoffman and Jessica Krediet

experience is that the interactor is an agent tasked with retrieving data from a computer for their remote instructor. However, upon entering the building, an earthquake happens, burying the interactor under debris. To convey this situation, students fixed the interactor's right foot to the ground to create an experience congruent with the player character being physically restricted (Figure 3), thus also limiting the range of interaction. Only after solving a series of puzzles, for instance by combining objects to reach a switch, is the interactor set free. Play testers and evaluators were impressed with the resulting embodied experience. This project showcased how a seemingly simple design choice can have a strong impact on the user experience.

Figure 3: VR experience with right leg fixed to the floor.

Redemption Project

Originally, the two students[4] working on this project had a plan to create a technically sophisticated mask that would emit visual impulses through the closed eyelids of the interactor to trigger afterimages, accompanied by synchronized audio effects. The first

4. Nicky Maatman and Luke Verhagen

prototype of the mask revealed too many design challenges, and the team deemed the project to be too ambitious. Instead, the advisor to the project suggested the use of simpler technology, and to focus on self-expression and interaction. The resulting project was a powerful interactive narrative of addiction and failure, realized as an artistically filmed interactive movie, using an almost invisible interface with hotspots to trigger different metaphorical video clips that provided a fuller picture of the protagonist's personal narrative (Figure 4). The project showed that a focus on interactive narrative first and technological sophistication second can pay off. Play testers and evaluators were impressed by the project and surprised to learn that Microsoft's PowerPoint presentation software was used as the authoring system.

Figure 4: Interactive movie experience realized with PowerPoint

Project 2: Present yourself

The second course project, "Present yourself", was about the students' position as an interactive narrative designer in the

creative industry and in society at large. What is their role, and what kind of opportunities exist to work in this profession? If they want to succeed as an interactive narrative designer, they have to be good designers first. In addition, they also have to learn how to create their own opportunities for a profession that is still not widely known, or understood. In this project, students explored the kind of opportunities that exist by reflecting on the value of interactive narrative designers for society. Conversely, they needed to consider the different application areas of interactive narrative design. They also learned how to seize these opportunities by practicing the "selling" of their capabilities, skillsets, and concept ideas. For this project, students worked in teams to create and pitch a promising ("saleable") interactive narrative concept (supported by a convincing, playable prototype), targeted at a relevant application area and audience.

Students were reminded that interactive narratives come in all shapes and sizes. They can offer engaging artistic experiences, they can be used in a museum to shed light on a historical event, they can be used in an advertisement to sell a particular product or brand, they can be used by journalists to share insights on a news topic, they can be used by politicians in their campaigns, and so on. It was up to them and their team to decide what kind of interactive narrative concept they wanted to pitch, as long as it catered to a clearly defined and existing societal (social, economic, political, artistic) need or opportunity. Mentors from the industry were attached to the projects and a committee of teachers and industry professionals assessed the students' projects.

In this project, there were three main learning goals:

- How to work in a team.
- How to develop and pitch a promising, purposeful IDN concept (supported by a prototype), targeted at the "right" audience and application area.
- How to present themselves as professional interactive

narrative designers.

The project itself had the following basic requirements:

- The project must address an existing societal need or opportunity.
- The project must contain a clear exploration and analysis of this need or opportunity (research).
- The project's aims and targets must be realistic – workable in scope (considering team size, skills, and available time).
- The project team must deliver a pitch presentation, supported by a tested and playable prototype.

"Present yourself" projects again took a range of different forms, including an interactive movie about stress, a VR experience about hacking computers, a VR experience about the fabrication of beauty, and an interactive narrative experience about teenagers' online experiences, including the consequences of online fame and harassment.

Example project: Antidotum

A team of six students[5] worked on the project, *Antidotum*, a short interactive movie demonstrating that ignoring stress can lead to unforeseen consequences and panic attacks. The team's goal was to give interactors a warning about what can happen when body and mind can no longer cope with stress and panic.

In their narrative, Theo, a businessman in decline, retires after experiencing a violent panic attack in an empty country house, in the hope of learning to prevent this in the future. His expectation of this rest period is disturbed by his own twists and fears. By making choices about Theo's life, interactors get involved in his

5. Dwayne Rufai, Nicky Maatman, Peter-Jan Wittebol, Sam Vette, Thom de Bie, Wim Brouwer

inner struggle. In this interactive film, interactors select options similar to Netflix's Bandersnatch. The team wanted to include interaction to immerse players in Theo's role and to create a bond. For this, they introduced breathing and heart rate mechanics. By simultaneously pressing L2 and R2 on a gamepad, interactors regulate Theo's breathing. Pressing the "X" button regulates Theo's heartbeat. These controls serve to involve interactors in more than just visual and auditory areas, and to bind them emotionally to the story, striving for ludonarrative harmony, where all facets of the interaction play a role in connecting the interactor with the narrative experience.

For the realized project (Figure 5), the introduction part was text-based with choices inspired by the introduction part of the narrative game, Firewatch. Three crucial scenes were filmed and aforementioned mechanics were fully implemented: 1) the isolation of Theo, 2) Theo's moment of insight, and 3) the confrontation of the problem. Playtesting revealed that while controls were clear and easy to remember, players needed better feedback on how well they were performing regarding the breathing and heartrate mechanics, e.g., by using certain controller vibrations when performing in the right or wrong rhythm.

Figure 5: Project Antidotum – Interactive movie

Reflection

Overall, the first iteration of the minor was a considerable success. The program attracted more applicants than available spaces, and the cross-cutting perspective that addressed different forms of interactive digital narratives not only worked well, but also resulted in interesting cross-fertilization, e.g., students from game design backgrounds remarked how they were enriched by the contact with students from film backgrounds. Student evaluations were also positive.

In terms of lessons learned, we found that unlearning ingrained explicit and implicit knowledge on linear storytelling can be challenging, especially when students have already worked for years in a professional capacity following design conventions and paradigms from linear media, such as film and books. Students with such backgrounds have a tendency to initially create linear narrative, that they interactivize in the second step, usually resulting in limited agency and a lack of meaningful interaction. During our supervision of the group projects, we learned that it helped to play to the strengths of a particular group. A group with experience in writing film scripts had to learn to plan their scripts by working from a perspective of interaction, while integrating their knowledge of filmmaking.

The separation into two projects worked well, for two reasons. First, it enabled students to express themselves freely via a first project before tackling an applied project in connection with the industry. Secondly, the initial project allowed for failure and faster iteration, and thus was focused on the learning experience. On that basis, the second project, "Present yourself", needs professional planning. Through industry involvement, the stakes are much higher.

The role of mentors in the second project proved to be a bit of a double-edged sword. On the one hand, it was beneficial for the students to have industry insiders attached to the projects, and they profited from their experience. On the other hand, mentors were at times also the source of confusion, as the boundary between the mentoring role and teaching roles were not clear enough – in some instances, mentors became teachers without fully understanding our educational concept. A more clear-cut definition of the mentor's role is necessary here.

CONCLUSION

In this paper, we have described the context of our educational efforts in educating interactive narrative designers, outlined our

approach in creating a minor in interactive narrative design, and described its first implementation. We see this effort as a step in the direction of establishing interactive narrative design as a discipline. We will use the lessons learned from this milestone to further develop this approach.

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7.

‘Thinking Through’ Games in the Classroom

Using Discursive Game Design to Play and Engage with Historical Datasets

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ABSTRACT

In this contribution, we outline Discursive Game Design (DGD) as a practice-based educational framework, explain how to use this design framework to teach game historiography, and report on findings from a series of in-class experiments. Using *Nandeck*, a freely available software tool for card game prototyping, we created sets of playing cards based on two game-historical datasets. Students were then asked to prototype simple games with these card decks; both playtesting and co-creating each other’s

games in an ongoing quasi-conversational process between different student groups fostered discussions on, and produced alternative insights into, the complex notion of (Dutch) game history, canonization/selection and games as national cultural heritage. The article shows how DGD can be implemented to allow for students with little or no design background to actively 'think through' games about the subject matter at hand.

Keywords

Discursive game design, game history, historiography, practice-based game education, playing cards

INTRODUCTION

This article outlines Discursive Game Design (DGD) as a critical practice-based game research and teaching framework, and demonstrates its practical applicability in academic education, specifically in the context of working and 'playing' with historical data and cultural histories. Existing approaches that employ game co-creation, such as "constructionist gaming" (Kafai & Burke 2015) or "game-media literacy" (Caperton 2012), which compares playing and making games to reading and writing respectively, have mostly been discussed in the context of younger learners, e.g., empowering children to express themselves through the 'language' of games. In comparison, DGD tailors game co-creation to higher education scenarios, but also has a distinctly procedural focus. The framework, which is based on earlier work on game-making as civic engagement (Werning 2019), conceptualizes Discursive Game Design as an ongoing critical conversation conducted through procedural rhetoric, which – as will be elaborated below – differentiates it from other epistemologies of practice-based game research that result in making one final game as a fixed 'text' an outcome of the actual research process. With this article we aim to a) outline a methodological framework that is replicable in the classroom, b)

demonstrate the benefits of such a procedural approach using the specific subject of game historiography – including contentious related issues like national gaming cultures, the "politics" of canonization (Staiger 1985), and the epistemic implications of game archiving – and c) explore how DGD can be employed to facilitate exploratory and "playful learning" (according to Mitch Resnick, quoted after Kangas 2010) about cultural data in humanities classroom contexts.

We report on educational experiments with two datasets on national videogame history; the Dutch Games Canon (Nederlandse Gamescanon) represents a curated selection of 65 influential Dutch video games[1], while the second dataset, scraped from the openly accessible database, Gamebase64[2], includes over 300 games published in Dutch for the Commodore 64 home computer during the 1980s and early 1990s. We reflect on how our in-class exercises using the DGD framework stimulated discussion about the data sets themselves, the 'stories they tell', and about the underlying notions of historiography and game culture 'built into' the different prototypes. Compared to game history and game preservation, game historiography – i.e., the modalities of writing different histories of games as cultural phenomena – has received less scholarly attention. For instance, Carl Therrien (2015) proposed an etymological approach to re-trace the convergent histories of the "first-person shooter" genre. We will elaborate below on the historiographical terminology supporting the method presented in this article. Most importantly, we argue that game-making as a more activating approach implements the claim for more "performativity in historiography" (Kuukkanen 2015), which holds that we need to move beyond "truth-functional evaluations" of historical accounts that epistemically reduce history to the level of 'text'. We will show how different game prototypes designed by the students highlighted different games, connections, game characteristics, and trends in the available data. While the notion

1. The Dutch Games Canon was created by the Netherlands Institute for Sound and Vision in 2018, see: https://gamescanon.beeldengeluid.nl/
2. Cf. http://www.gamebase64.com/.

of "data games" (Erickson 2013) has so far primarily been used to 'gamify' traditional data analysis (using game mechanics as motivational affordances), we focus on game co-creation to develop exploratory techniques for 'small data' analysis, i.e., to discover new 'stories' in the datasets, complementary to those identified using more established (e.g., visualization) techniques.

BRINGING DISCURSIVE GAME DESIGN TO THE CLASSROOM

The use of game-making and, to a lesser degree, game modification as research and teaching heuristics in academic contexts is not new, but has become more prominent in media studies discourse since around 2015. For instance, (digital) games have been defined as "executable thought experiments" (Schulzke 2014) – placing them into a long-standing tradition of humanistic inquiry – or as "philosophical artifacts" (Gualeni 2016) that facilitate critical engagement primarily by de-familiarizing established aesthetic categories. For instance, Stefano Gualeni demonstrated this claim by creating a small game defying the habitual player-centric orientation of most virtual game worlds (2016).

All of these approaches inherently focus on the creation of one game as the 'result' of the research process, but do not outline a methodological framework that could be used in classroom contexts. For instance, Zavala & Odendaal (2018) advocate "codifying theory into game mechanics", i.e., 'translating' concepts – in this case the role of interfaces and algorithms in app design – into corresponding game rules. To illustrate the approach, the authors create one 'finished' prototype, which "would hopefully result in a publishable critical board game for algorithmic literacy". Even Greg Loring-Albright, whose notion of "critical modification" (2015) constitutes an important reference point for our methodology, essentially creates one new 'version' of the *Settler of Catan* board game, which exposes (and 'corrects')

the alleged colonialist bias in the original game's procedural rhetoric, to demonstrate his approach.

This 'product-oriented' approach emphasizes the game as a "knowledge object" (e.g., Kalthoff & Roehl 2011) rather than the process itself, a problem that also characterizes e.g., audiovisual essays as outcomes of practice-based film studies, which Grant (2016) describes as "performative research", but which in the end often follow the logic of arthouse films (e.g., being tailored to festival exhibition) than the requirements of education. Zavala & Odendaal (2018) themselves concede that "the emergence of critical play [as defined by Mary Flanagan] did not seem to occur naturally" as players struggled with the randomness of in-game events; yet, committing to one final game prevents both the authors and players (as potential co-designers) from exploring what constrains the potential for critical play, and how it could be unlocked differently.

Our own approach differs in several key areas, which we briefly outline below; as most aforementioned practice-based game research introduces its own labels, e.g., "critical board game design" (Zavala & Odendaal 2018) or "experimental game design" (Waern & Back 2015) to provide orientation, we use the term 'Discursive Game Design' (DGD) to make these distinctions explicit.

First, rather than making a game as 'product', we conceptualize **game-making as an ongoing critical conversation** conducted through the 'language' of game design, in which each prototype merely constitutes an 'utterance' that can and should be continually referenced, quoted, challenged and rephrased (i.e., modified). From that angle, insights do not primarily 'reside' in any one version, but emerge from 'between' the different prototypes. This premise builds on Gerald Voorhees' (2012) notion of "discursive games", which acknowledges the communicative dimension of games as cultural expressions. On the other hand, it draws on Bruce and Stephanie Tharp's (2018) "discursive design"

framework, which reflects how socially relevant design need not, and often should not, be "unobtrusive, intuitive, invisible, and undemanding", but instead may "offer social criticism" more effectively by disregarding norms and usability concerns or even embracing unfinishedness as a productive form itself. It should be noted here that the critical conversation Discursive Game Design aims to start can be both self-reflective (i.e., a critical conversation on game design) and focus on the topic of choice of the exercise (i.e., a critical conversation about game historiography through game design, as our example below will show).

Second, we more explicitly reflect on the role of **game prototypes as socio-technical actors** in research or – as in the case at hand – education scenarios. To acknowledge what we call 'socio-technical' implications, i.e., to understand how the prototypes shape social interactions between and among groups of students as well as lecturers, Susan Leigh Star's "boundary objects" is a key concept. Accordingly, due to their "interpretive flexibility", "material/organizational structure" and "scale/granularity" (2010 602), the prototypes allow for learners with different disciplinary backgrounds, levels of knowledge and types of game experiences to "cooperate" on a complex issue such as game historiography without an agreed-upon "consensus" (both 604). For example, having to abide by the rules a team formulated for their games created material constraints, within which discussions about the data or the rhetoric of the prototype became more productive. Within the epistemic frame of game design as 'conversation', the prototypes can be defined using Mieke Bal's (2013) notion of "theoretical objects". Bal refers to her experience with filmmaking as a modality of theorization, and attributes discursive qualities to images, which allegedly can perform "an equivalent of speech acts" (2013 51), "speak back, resist (parts of) my interpretation of them, and make me think" or even "entice viewers to theorize" (2013 52). Similarly, game design can entice theorization, sometimes even more so if they produce unexpected dynamics or do not 'work' at all.

Third, we acknowledge and aim to leverage the **playful characteristics of the game co-creation process**. For instance, one co-creation heuristic we utilize is "playgiarism", a technique which literary author Raymond Federman described as "remix[ing] the different sources and versions of his own personal narrative to form [w]hat he terms a playful self-appropriation" (Amerika 2007). Adapting this literary technique to applied game research helps prevent researchers from becoming too enamored with any particular model they devised, and to hone their self-reflexive capacities. Moreover, bricolage plays an important role, as the unfinishedness of the prototypes prevents the player from adopting an immersive disposition. Instead, considering the mechanics and available metrics as recombinable 'building blocks' encouraged students to adopt the co-creative perspective of a "researcher as bricoleur" (Antionijevic and Cahoy 2018).

Fourth and finally, as the goal of DGD is not the creation of one prototype as a seemingly stable knowledge object, but to actively 'think through' games and procedural rhetoric about the subject matter at hand, we reflect on the process itself by adopting an **autoethnographic perspective.** Specifically, we derive introspective techniques to reflect on the role of game-making in research processes after the design phase from organizational autoethnography (e.g., Doloriert 2012). Compared to documentation techniques in design research (e.g., Pedgley 2007), we do not differentiate between more and less 'successful' designs to infer 'best practices' but, most importantly, aim to understand the interplay of theoretical and practical rationales throughout the process (i.e., thinking and making mutually influence each other), not unlike how we routinely test, challenge and rework concepts in conversation with others. Within the context of DGD, the primary autoethnographic goal is to retrace the flow of the 'game-design-as-conversation' between different participant groups and lecturers involved. For that purpose, we pay attention to how specific designs strategically expand the discourse in different directions or re-frame (in the sense of Lakoff) key issues – in our case, for example, the agency of curators or different forms of

"emplotment" (cf. e.g., Iggers 2000, 377) in game histories – by modifying related rules.

WRITING GAME HISTORIES WITH CARD GAMES

The trigger for changing the setup of our game history classes and moving towards a DGD approach was the recently published canon of Dutch games, which had caused quite a bit of controversy on the selection of games, a process we were invited to be part of by the Netherlands Institute for Sound and Vision. It led us to explore the politics of canonization as part of game historiographies (cf. Glas and van Vught 2019) which we then wanted to make a key part of our teaching as well.

One important thing we wanted our students to become aware of when studying game histories (like the canon) is that game histories are always written from a specific perspective, and to that extent is selective, ideologically charged, and politically motivated. Suominen (2017), for example, recognizes four historiographical meta-models in the different digital game histories written in our field, with all four having widely different foci and widely different stakes. Enthusiast histories, for example, tend to focus on the game "highlights", often presenting history as a "master narrative of innovative game development and developers, cultural consequences, and, sometimes, progress" (Suominen 2017, 551). On the other hand, emancipatory histories tend to expose these master narratives as exclusionary to certain groups of games and developers, and instead, present counternarratives in which history is written from these often more marginal positions (Suominen 2017, 551-553). In line with this idea that the histories of games we read about in textbooks are not neutral perspectives, Staiger's notion that the politics of canonization extend to the academy, is important here. In fact, Staiger argues, in order to become a 'proper' game studies student, "one must master not only the canon of films on a filmography list, but a canon of articles and books, so that one can supersede that

work and be admitted into the group of professional canon-makers and canon-analyzers" (1985 18). This is not problematic per se but can be if these "networks of taste-makers" (1985 19) make it more difficult to focus on more marginal or alternative approaches to thinking about the history of digital games.

In order to confront students with the selectiveness of game histories, we wanted them to play around with, and interpret, the datasets that underlie game databases, which are often the foundation of game canonization, as they allow for easier selection of what is deemed important and what is not, i.e., "putting some order into the apparent chaos" (Staiger 1985 9). By designing small prototypes on the basis of these datasets, students can get first-hand experience of how the design of the playing platform itself and the different game mechanics that students experimented with, lay bare different selections of games, and highlight different patterns in the data. As such, students would also reflect on the role of tools in contemporary humanities educational practice itself through defamiliarization and co-creation, thereby promoting "creative data literacy" (D'Ignazio 2017) and "tool criticism" (van Es, Wieringa, and Schäfer 2018). This means that, similar to an awareness of how visualization, sonification (Hermann and Ritter 1999), and even haptification (Paneëls, Roberts, and Rodgers 2010) impact insight into the datasets, our aim was to have students reflect on the impact of the modality of play (and platform that is played on).

To tackle these aims, we decided on a set of in-class DGD experiments, which took place in undergraduate and postgraduate game studies-related courses in 2018 and 2019. The sociocultural history of games had been part of one of the course weeks for years, but the topic had, for a long time, been taught using a more traditional setup of a lecture first and then a seminar session to discuss relevant literature on the topic, as well as discussing some historically relevant games students had to play. The four DGD characteristics translated into these sessions as follows.

First, we decided upon playing cards as a familiar starting point, drawing on Nathan Altice's framing of playing cards as "platform" (2014). This allowed for 1) easy collaboration between students from different backgrounds and with different levels of knowledge of games, and 2) reflection on the way the platform itself (the design of the card) already steered the conversation as a socio-technical actor. Choosing cards, allowed us to translate game-historical data, because the 'hardware', i.e., the material affordances, of playing cards afford many familiar game mechanics. Students could then quickly try out different prototypes with the dataset. Furthermore, students could then elaborate on how playing cards, due to their distinct material-semiotic properties, store data as well as structure access to, and interpretation of, these data in a similar way as Nathan Altice (2014) does, citing examples like the *Iraqi Most Wanted* (U.S. Defense Intelligence Agency 2003) or the *Archaeology Awareness* (United States Department of Defense 2007) sets of playing cards.

However, contrary to these more well-known institutional uses of card games to teach data, we are more interested in bottom-up processes, e.g., the widespread creation of custom *Magic: The Gathering* (Garfield & Rosewater 1993) cards on websites like MTG Cardsmith[3] to 'parse' popular culture and discourse, or the grassroots design of *Wikipedia* games[4] to play with the ordering of encyclopedic knowledge. Turkay et al. (2012) conducted a study among players of *Vampire: The Eternal Struggle*, to identify motivational factors that might facilitate using CCGs "as learning tools" (3701), including "deck building and community aspects" (3705). Yet, the authors only briefly hint at potential applications, e.g., incorporating educational material into the "'flavor text'" (3705) and illustrations, towards the end of the article. Instead, following up on the examples above, we focus instead on co-creating simple CCG-style prototypes to enable students to 'think through' the genre's mechanic about the subject matter at hand.

3. Cf. https://mtgcardsmith.com/.
4. Cf. https://en.wikipedia.org/wiki/Wikipedia:Wikipedia_games.

Second, in our aim to implement game-making as an ongoing critical conversation on the topic of game historiography, we asked students to create rough, unfinished prototypes using game historical datasets. This kept students from investing effort into the promise of a finished product, and instead, had them share and compare their different prototypes in class. As noted above, this unfinishedness is key in adopting a more reflexive stance on the role the game model plays in writing a specific game history, positioning the game first and foremost as an "object to think with" (Papert 1980) rather than a model to strive for.

Third, to emphasize the playful characteristics of the game co-creation process, we encouraged students to work from a list of known card game mechanics (and sometimes use additional tokens or other material) and modify and mix them in a variety of ways, which again kept students from pursuing a finished product. This mixing up of known mechanics also allowed students to reflect on the procedural rhetoric of these different mechanics in writing game histories, and to switch or change them if a certain mechanics was found to be problematic (e.g., too exclusionary for certain games).

Fourth, to encourage active reflection on the rules of their games in relationship to the lessons learned about the topic at hand, we had students document their design process according to a given template. That template not only forced them to provide detailed descriptions of the setup phase, the playing phase and the wrap-up phase of their games, but also asked them to reflect on these phases in relationship to the type of histories that were being written from the datasets at hand. Consequently, these familiar card game genres should be interpreted more broadly as a "symbolic form" (Manovich 1999; Paul 2007), i.e., as increasingly internalized 'ways of seeing' and interpreting the world, rather than simply as teaching tools.

IMPLEMENTATION AND FINDINGS

Below, the implementation of the method will be briefly outlined; we provide the two datasets online so that the co-creation exercises can be replicated and further developed in class.

For the Dutch Games Canon, a basic dataset including name, year of publication and developer already existed, which we manually extended by adding the columns 'platform', 'genre(s)', 'theme(s)' and 'audience(s)' as well as URLs to the screenshots provided by the Netherlands Institute for Sound and Vision. In Gamebase64, we first limited the selection of games via 'Advanced Search' to those with a 'Dutch' language setting, then scraped all URLs to the individual games into a list[5], and applied a screen scrape to that list to collect corresponding metadata, including publication date, publisher, music and graphic artist(s) as well as coder(s), genre and size. The spreadsheets were processed and published as Google Sheets.[6] These datasets were then transcoded into customizable decks of playing cards via the freely available (albeit closed source) software tool, *Nandeck*, developed by Andrea Nini to facilitate paper prototyping of board and card games.[7] *Nandeck* uses a simple markup language similar to HTML to display the content of the columns on playing cards, including conditional formatting and unique fronts and backs via duplex printing. The immediate modifiability of the card layouts, e.g., using ready-made templates for common games like *Top Trumps* or *Magic: The Gathering* as a basis enables a bricolage approach, which we aimed to facilitate not only with reference to the card design but the student games' mechanics as well.[8]

5. The format used was "www.gamebase64.com/game.php?id=xxxxx".
6. The full Google Sheets datasets are available at http://tiny.cc/dgcanon and http://tiny.cc/gb64-dutch. Cf. http://www.nand.it/nandeck/.
7. Cf. http://www.nand.it/nandeck/.
8. A ZIP archive of the sample card layouts and related materials for use in Nandeck is available at http://tiny.cc/DGD-nandeck. While explaining the syntax of Nandeck is beyond the scope of this article, the samples should be straightforward to adapt and tailor to different learning goals and class contexts.

After printing the card decks on thick paper, we distributed random stacks to smaller groups in class. After a brief introduction of the theme and goals of the exercise, students were free to explore any type of game with the decks that they could think of. In some cases, especially when we had more in-class time, we first presented them with a simple card game setup which they could then appropriate and remix into a new game. In other cases, we also made additional game components like dice, cubes, meeples and so on available for them to include in their prototyping. The playing cards and their content should always be the primary component of their games. The aim was that the constraining principles of our predefined card design, which in itself was of course constrained by the information available in the database, should lead to new perspectives on the selectiveness of game histories and the politics of game canonization. Out of these affordances and constraints, many familiar and some new types of card games emerged, a few of which are discussed below based on their specific framing of game historiography and related issues.

A History of Winners or a Focus on Outliers

One of the first things that most, if not all, student groups did was to go through the cards given to them, looking for commonalities and differences to work with. Here, students immediately discovered some key information about the datasets. While, for instance, the Gamebase64 database itself uses a total of 177 genre categories, students soon noticed that this wide range was based on 13 main genres, which allowed them to see prominent trends and also outliers in Dutch game history on the basis of these 13 predefined genres. Some genres, like "adventure" or "arcade", where noticeably dominant, while others like "simulation" or "sports" were rare. While the Dutch games canon featured a more coherent take on genres created by Sound and Vision, the Gamebase64 database was the product of bottom-up contributions by fans. Genre labels were thus assigned by those who uploaded the games into the database, making the data fuzzy at best. Similar looking games might have different main and/or subgenres, and

in some cases genre information was simply missing (which cards would display as “Uncategorized” or “Unknown”). The same goes for game creators, where the database showed a few highly prolific game makers from the 80s, like John Vanderaart and Cees Kramer, while other games were one-offs or had unknown creators. Hence, going through the cards showed how easy it is for games to get ‘lost’ if they, for instance, do not fit in the most dominant genres of a certain time period, or if the database contained the wrong or even missing data for particular obscure titles.

As working with sets is a well-known way to use playing cards, many prototypes used some kind of matching mechanic on the basis of one or more of the data points on the cards, which resulted in variants of games like *Memory*, *Dominos* or *Halli Galli*. Such games almost always foregrounded games with shared common parameters, with games that had no obvious connection becoming worthless for scoring points. Therefore, not just the underlying data but also the subsequent gameplay mechanics inherently favor histories of ‘winners’, e.g., of genre trends or dominant game creators. In the discussion during the design process, as well as in the class discussion afterwards, this came up in a critical fashion. Since we expect games to be fair and properly balanced rule systems, and when trying to apply these criteria to their own designs, students questioned the very ‘fairness’ of the game histories represented by the datasets. Some groups had already worked this critique into their designs. Rather than seeing outlier cards as worthless, they implemented them as especially worthwhile cards to have. For instance, a variant of the classic card game, *Crazy Eights,* used outlier cards as cards which, when drawn, could lead to receiving a bonus or punishment. Another prototype game revolved entirely around a particularly obscure game called *Nijmeegs Avontuur*, a title with no information on its individual creators or even a year of release, which was such an outlier in their deck that the entire prototype was named after it. To show the differences between the two datasets used: while the Gamebase64 entry for *Nijmeegs Avontuur* had no data entries for the creator or year of release, the Dutch games canon actually

did feature the game with all its data in full.[9] These approaches encouraged more awareness of different data points in relationship to one another in one card, and helped students identify the obscure over the dominant entries within the databases.

From Power Struggle to Cooperative Histories

Most, if not all of the games mentioned above, using either matching mechanics or focusing on outliers as game makers/breakers had, at their starting point, a competitive angle. These games pitted players against players, resulting in winners and losers. This design choice likely reflects the students' own game experiences, but – given the subject matter at hand – arguably also substantiated the dominant 'antagonistic' interpretations of canonization and historiography as a power struggle between different groups and institutions. Instead, some groups opted for a cooperative game, thereby, for instance, interpreting the creation of a Dutch games canon as a shared project with a common goal or goals, and re-framing the canon itself not primarily as a 'tool' for selection and therefore potential exclusion and marginalization, but rather as a site for collective cultural identity formation.

The semi-cooperative *Nijmeegs Avontuur* game mentioned above fits this description of working towards a canon as a collaborative effort between different groups (see Figure 1). Two players receive a random selection of five cards that need to be played in chronological order (so if player A plays a game from 1983, player B needs to play a game in a later year), as well as a few pawns representing game developers. Cards played are "in development", and a pawn can be added to the card at the next turn. When the number of pawns matches the number of developers mentioned on the card, it is "published" and becomes part of the canon. When five cards are part of the canon, the game ends and the player with the most games in it wins. Here, the *Nijmeegs Avontuur* card, having no year and no named developers, inherently becomes the trump card, as it can be played anytime and without the cost of a

9. Cf. https://gamescanon.beeldengeluid.nl/#event-nijmeegs-avontuur.

pawn. While one player wins the game, together they have created a new historical timeline, one which also favors cards with fewer – or less known – developers, as these cards can be played quicker. In a prototype of another game loosely based on *Scrabble*, built by crossing chronological timelines of cards instead or words, whether or not a game would fit a particular timeline would be based on the best argument. Here, players could even score points by removing a game from a timeline already on the board if players agree that their argument for inclusion was convincing.

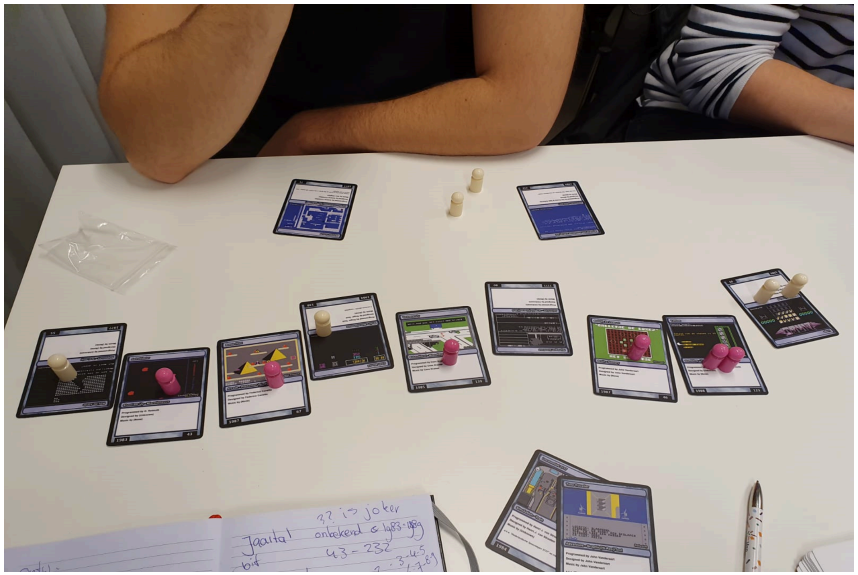

Figure 1: The creation of the Nijmeegs Avontuur game in action.

Data with Stories to Tell

The *Scrabble*-like game above is also a good example of the next type of game prototypes, which did not so much focus on connections between data points, but rather on the content of actual cards – or the creative interpretation thereof. While still focusing on the main dominant genres, a variant of *Memory* asked players to recall properties of the dataset to make sets of two. This could be as easy as two matching years of release, but could also refer to two games with text-based, narrative-driven gameplay, or two

games featuring geographical maps to play on/with. While the first is all about remembering basic factual information about two games, the latter already facilitates a more complex understanding of the games and possible historical connections as students had to look carefully at the screenshots in relation to genre data in order to interpret the games. Other teams went even further into design strategies which could be called "narrative sense-making" (Cunliffe & Coupland 2012) or "narrative inquiry" (Kim 2015). A team devised a game about interpreting and comparing stories that emerge from playing with the data as the main goal, like a variation of *The Metagame* (Zimmerman 2012) where players had to argue why their games were a better or more logical historical match than those of other players. This allowed players to make unsuspected matches, like linking themes or colors visible in the screenshots of the game to other data, or creatively 'filling in the blanks' when faced with missing or "messy" data (for a discussion of "messy" and other forms of "data in the humanities" cf. Schöch 2013).

CONCLUSION AND OUTLOOK

In this paper we have introduced the notion of Discursive Game Design and aimed to showcase its implementation within a class setting using an example of game historiography. Below, we briefly contemplate on our findings and outline some potential directions for follow-up research, including methodological advancements we are currently experimenting with.

By discussing our experiences in applying the DGD framework, we wanted to highlight the potential of 'thinking through' games and game design within a classroom setting. This potential is even greater within educational programs, which do not have design as part of the curriculum. Our students, by and large all media and culture studies students with little to no design experience, indicated that the act of game co-creation itself – rather than playing a game 'by the rules' – already helped them understand

how playing with the rules can lead to different forms of meaning making. Focusing on these processes rather than on working towards a contingent final 'product' kept them in a more critical discursive mode. More in-class applications and experiments will undoubtedly help to fine-tune and further formalize Discursive Game Design as a practice-based methodology – both within game studies on topics like the one chosen for this article, and beyond. Nonetheless, in our experience and based on class discussions and evaluation after the classroom design sessions, our students did pick up on the goals we set ourselves with this specific assignment.

Taking DGD as a starting point allowed us to rethink our approach to teaching game history, from a situation where the teacher disseminates information one-way to students, to a far more discursive mode where students understand game history through experimentation, creation and co-operation. Using playing cards as a platform to experiment with prototyping games using existing datasets of games, students were engaged with the topic at hand in a playful and, we argue, critical discursive manner. Co-creatively experimenting with game mechanics that were tied to data from historical games, and discussing and comparing the various prototypes and iterations thereof, showed game history not as a given singular and linear process, but as the result of multiplicitous processes with various identifiable trends and potential cross references, moving from a teleological to a more genealogical understanding of (game) history. More so, the use of different datasets with their own particularities, in terms of their origin and purpose, allowed for a better understanding that a canon is not a model of 'reality', but rather a sequence of potentially arbitrary and highly political choices. Discursive game design then allowed for reflection on data and rules, and how manipulating them allows for new insights. With its procedural focus, we found that DGD as a practice-based research method helped to make student's discovery, creativity, and subjectivity accessible to critical inquiry, allowing for (self)reflexivity and acknowledging one's own situatedness within and knowledge of game culture.

We see several future directions for Discursive Game Design exercises. First and foremost, while the current work on games to interpret datasets focuses on card games, the framework can be similarly applied to board games, as well as simple digital prototypes, as long as the quasi-conversational approach and the focus on multiplicity can be feasibly implemented. Second, it will be relevant to assess more systematically how DGD can be used, in conjunction with earlier work, on scholarly game design (e.g., Waern & Back 2015; Gualeni 2016), and the educational potential of game-making in specific non-digital contexts discussed, e.g., within the context of "Critical Board Game Design" (Odendaal & Zavala 2018) or "Indigenous Board Game Design" (LaPensée 2016).

As for the experiments outlined above, they characteristically did not include modifying the actual cards, in the sense of playing with their "planar, uniform, ordinal, spatial, and textural" (Altice 2014) properties (e.g., their material affordances). While this is easily possible in *Nandeck*, it requires more time, being better suited to, for example, course components that include more than one session. The existing co-creation endeavors already demonstrated a surprising range of 'expressivity'; yet, they arguably also demonstrate the importance for continuous modification on all layers, ranging from hardware to interface design or from game goals to manipulation rules. After all, an important implication of continually modifying the games used to 'analyze' the data is that it minimizes the risk of "simulation resignation" (as defined by Sherry Turkle, quoted after Bogost 2006, 106), i.e., the unreflected belief in a game as a model of 'reality'. As explained, students became sensitized to the fact that the data presented in card decks did not present a 'neutral' take on history, but the data *categories* nonetheless remained fixed throughout.

Figure 2: The Dutch games canon cards recreated in Tabletop Simulator.

Changing the card layouts themselves by, for instance, adding new/alternative data points (like units sold, or primary audience), changing the screenshot into box art, or adding game descriptions, will lay bare yet more perspectives on how politics of selection are influenced by earlier and potentially arbitrary choices.

To overcome the constraints of the physical classroom, we are currently experimenting with using *Tabletop Simulator* (Berserk Games 2015), a proprietary software tool to prototype and play turn-based games online, in combination with *Nandeck* to facilitate mock playtesting and even afford synchronized prototyping sessions between multiple groups across different locations (see Figure 2). Moreover, documenting and preserving the network of interrelated prototypes in a standardized format is vital to reconstruct the 'conversation' within a particular DGD session and establish connections between different 'conversations' over time. Currently, we are exploring how game designs can be stored as small documents via Github Gists[10], which has the benefit that users can easily document and 'fork' them (i.e., create alternative

10. Cf. https://gist.github.com/discover.

versions that can be traced back to the original designs later on). In combination with referencing the datasets as Google Sheets and the Nandeck code as associated Gist files will be important next steps in creating a platform for persistent game-based 'conversations' following the DGD framework.

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media with fluid versions of publications as well as enabling the creative blurring of what constitutes reading and writing.

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