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What digital games and literacy have in common: a heuristic for understanding pupils' gaming literacy

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Abstract

This article argues that digital games and school-based literacy practices have much more in common than is reported in the research literature. We describe the role digital game paratexts – ancillary print and multimodal texts about digital games – can play in connecting pupils' gaming literacy practices to 'traditional' school-based literacies still needed for academic success. By including the reading, writing and design of digital game paratexts in the literacy curriculum, teachers can actively and legitimately include digital games in their literacy instruction. To help teachers understand pupils' gaming literacy practices in relation to other forms of literacy practices, we present a heuristic for understanding gaming (HUG) literacy. We argue our heuristic can be used for effective teacher professional development because it assists teachers in identifying the elements of gameplay that would be appropriate for the demands of the literacy curriculum. The heuristic traces gaming literacy across the quadrants of actions, designs, situations and systems to provide teachers and practitioners with a knowledge of gameplay and a metalanguage for talking about digital games. We argue this knowledge will assist them in capitalising on pupils' existing gaming literacy by connecting their out-of-school gaming literacy practices to the literacy and English curriculum.

Key words: digital games, gaming literacy, paratexts, multimodal, heuristic, professional development

Introduction

How do we prepare literacy teachers to acknowledge pupils' gaming literacy in ways that help them acquire the traditional print-based literacies still needed for academic success? We will address this question by looking at what digital games and literacy have in common, particularly the complementary print-based and multimodal literacy practices required by both. Examining this intersection establishes what teachers and practitioners need to know about children and young people's gaming literacy to effectively incorporate digital games into classroom literacy activities.

Recent research that connects digital games with literacy argues that when children and young people play digital games, they participate in a complex "constellation of literacy practices" (Steinkuehler, 2007, pp. 299–300), which are not generally acknowledged within classrooms. This research, which examines a narrow set of digital games, pinpoints that a connection between playing digital games and reading print-based and multimodal texts (frequently asked questions (FAQs), walkthroughs; cheats and codes) – often at grade levels well beyond pupils' acknowledged proficiency as measured by standardised tests – is an important component of playing digital games of which many teachers are unaware (Steinkuehler, 2010; Steinkuehler et al., 2009). These researchers also argue that these print-based and multimodal reading practices are an essential component of pupils' participation in digital gaming culture that often remains 'hidden' from teachers and practitioners (Steinkuehler, 2007, 2010; Steinkuehler et al., 2009). Our discussion builds on this position by examining the connection between pupils' out-of-school literacies developed through playing digital games (and their reading, writing and design practices on and about games) and more traditional school-based literacies.

This article introduces a new heuristic or model for understanding pupils' gaming literacy that we argue can be used for effective teacher professional development. The heuristic offers a new representation of a gaming literacy that will assist practitioners in acknowledging different aspects of pupils' gaming literacy and select games that support activities that are appropriate to their curriculum. Using the heuristic as a guide, they will be able to successfully introduce diverse aspects of gameplay and game cultures into their literacy teaching, learning and assessment practices. It explicates the knowledge about digital games and the metalanguage that is needed to connect pupils' out-of-school digital gameplay practices with school-based literacy practices, and charts the dynamic complementary intersections between unofficial, informal, out-of-school gaming literacies and formal school-based literacies across four quadrants: actions, designs, situations and systems. The aim of the heuristic is to raise awareness among teachers and practitioners of the complexity of

the literacy practices that pupils use during gameplay and consequently alter them to the unique opportunities that digital games provide for connecting the literacy curriculum to texts and practices significant to pupils' lifeworlds.

In this article, we examine what digital games and literacy have in common by first outlining the key role that digital game 'paratexts' (Consalvo, 2007) play in connecting digital gameplay and game cultures to tangible literacy outcomes. The term paratext is mobilised to describe the print and multimodal texts used and often developed by game players that circulate in the complex nexus of literacy practices that make up digital gaming cultures. We argue digital game paratexts can work as a useful segue – because they conform most closely to the textual requirements of the 'official curriculum' – to introduce digital games into literacy and English curricula. Second, we discuss gaming literacy, arguing that when teachers acknowledge pupils' gaming literacy through the consumption and design of digital game paratexts, it provides pupils with increased opportunities to acquire traditional school-based print and multimodal literacies. Finally, we introduce a heuristic for understanding gaming (HUG). We maintain that the HUG presents teachers and practitioners with the essential knowledge and metalanguage about digital games and pupils' gaming literacy practices that will assist them to connect pupils' out-of-school consumption and design of digital game paratexts with school-based literacy practices in ways that are authentic and not ad hoc.

Digital game paratexts

The term 'paratext' is useful for helping teachers and practitioners familiarise themselves with the wide-ranging print and multimodal texts that circulate in digital gaming cultures. Digital game paratexts represent print and multimodal texts (walkthroughs, video tutorials, fan fiction, fan art, for example) that are easily accessible to teachers and practitioners, when digital games themselves are not. *GameSpot* (http://www.gamespot.com.au) has over 40,000 digital game FAQs, guides and walkthroughs, over 250,000 cheat codes and 100,000 reviews contributed by the community of game players.

Many paratexts are not only relevant to pupils' out-of-school lives but are often difficult expository and procedural texts, above pupils' grade level, that they are willing to engage with and work to decode and understand. A study of pupils in Years 6–9 who struggled with literacy or do not experience success in school showed that those that played digital games tackled (e.g. decode, understand and apply to their gameplay practices) texts written at Year 12 or a high school graduate level (Steinkuehler et al., 2009). A pressing issue remains as to why so many teachers continue to fall short of helping pupils who struggle

with reading, writing and design inside schools, when clearly many of these same pupils experience 'literacy success' outside school with texts related to digital games.

Through their out-of-school consumption and design of paratexts pupils are engaging in many difficult print-based (as well as multimodal) literacy practices directly related to school-based literacy practices. Apperley and Beavis (2011, p. 133), describe paratexts succinctly in relation to literacy. Paratexts "refers to both the texts and the surrounding material that frame their consumption, shape the readers' experience of the text and give meaning to the act of reading". It is:

> *"an umbrella concept that connects the familiar notion of intertextuality – the processes of reading texts as linked and 'always already' known and the need for a diversity of texts to be part of any literacy/English programme – to explicit industry-based practices, participation in global culture and existing practices of digital gameplay"* (Apperley and Beavis, 2011, p. 133).

Digital game paratexts aptly demonstrate where and how digital game cultures and literacy are related. If the writing, reading and design (as well as speaking about and listening to pupils' and peers gameplay talk) of digital game paratexts can be viewed as a legitimate medium of expression in the literacy classroom, then the possibility of digital games becoming worthy of academic inquiry in schools might become acceptable. It would also shift the field of literacy in a direction that does not view gaming as something distinct (negative, violent, sexist and an activity that takes away from reading) and in direct competition with school-based literacy practices.

The challenge for teachers and practitioners is in how to include digital game paratexts in the literacy curriculum and make strong conceptual links between them and the kinds of print-based literacy practices that are assessed through standardised tests and aligned with local, state and national standards. We are not advocates of preparing pupils to simply do well on standardised assessments; rather we are hoping teachers can leverage pupils' interest and affinity with digital games and their paratexts to provide opportunities for them to experience success with school sanctioned literacy practices.

Gaming literacy

Gaming literacy suggests a changing stake in what it means to be literate in the era of ubiquitous computer and Internet access and increasingly 'natural' user/player–machine interfaces (Beavis et al., 2009;

Zimmerman, 2009). During gameplay, pupils draw on their gaming literacies to accomplish difficult but motivating tasks and develop new knowledge by navigating the complex, changing virtual environment. Buckingham and Burn further this notion:

> *"game literacy also implies that there is something specific about this medium that distinguishes it from others – that we positively need game literacy as distinct from print literacy or television literacy, or even a broader notion like media literacy"* (2007, p. 325).

For us, gaming literacy includes and extends the definition of complementary literacy fields because it specifically emphasises the elements of gameplay and a complex understanding of computer systems.

As noted earlier, elements of paratextual consumption and design inherent in digital gameplay practices that constitute pupils' gaming literacy are complementary to many school-based literacy practices, but they are also different and often more complex. We argue that paratexts are equally important for understanding gaming literacies. When children and young people read, research and design paratexts they are engaged in relevant print-based and multimodal literacy practices, making these activities a fluid example of situated learning (Gee, 2003; Stevens et al., 2008). Acquiring gaming literacy does not just involve learning how to play digital games, but also the intertextual navigation, comparison and reading of the 'official' and 'unofficial' paratexts, and contextualising the information contained in light of the credibility of the particular sources.

Paratexts are often descriptions, guidelines, instructions and strategies for digital games. However, they should not be regarded as merely practical, but also as imaginative and creative outputs that include writing, digital artwork, visual and audio design and new game designs (Newman, 2008). Paratextual production is grounded in complementary proficiencies that draw on children's and young people's traditional and multimodal literacy practices that are important to literacy pedagogy. While the pedagogical value of reading, writing and designing paratexts is clear, we argue that further work is necessary to re-situate these activities and practices in the literacy classroom. In what follows, we present a model for professional development that familiarises teachers and practitioners with a metalanguage and knowledge about digital games that are needed to connect pupils' out-of-school digital gameplay practices with school-based literacy practices. By exploring four quadrants around gameplay and paratexts: action, design, situation and systems, the model charts the dynamic complementary intersections between unofficial, informal, out-of-school gaming literacies and formal school-based literacies.

A heuristic for understanding gaming (HUG)

We conceptualised the HUG in order to demonstrate to teachers and practitioners an in-depth understanding of digital games. The HUG evolved from our experiences with high school teachers' action research projects on playing, researching and designing digital games in their literacy classroom. The project was funded by the Australia Research Council and ran from 2007 to 2011 with the Australian Centre for the Moving Image, the Department of Education and Early Childhood Development and the Victorian Association for the Teaching of English (see Beavis et al., 2009; project website: http://www.learningfromcomputergames.com/). The heuristic provides a substantiated metalanguage for connecting out-of-school digital gameplay with school-based literacy practices. The heuristic offers an informed explication of digital games on their own merit that provides teachers and practitioners with a coherent and legitimate way of talking about digital games with pupils. This allows them to validly acknowledge children and young people's gaming literacy and proficiencies with confidence. Additionally, the HUG assists educators in conceptualising, developing and providing informed feedback on classroom tasks and assessments when researching digital games or incorporating the consumption and design of digital game paratexts into the literacy curriculum.

The HUG acknowledges first and foremost that digital games are *played* as well as 'read'. This debate has been central to the discipline of game studies. This debate often centres on the difference between narrative understandings of games and how they might otherwise be understood in terms of actions, algorithms, coded rules, designs and systems. The narrative of a digital game (what is happening when one looks at the screen) is the result of a process of playing the game, which involves actions both from the player (by pressing buttons, for example) and the hardware/software of the game system. In response to this debate the HUG acknowledges both the 'narrative' and the 'play' of digital games and demonstrates to practitioners how their interplay produces gameplay experiences (Figure 1).

Take reading a book: you have to turn the pages and you move your eyes across the page; your body is physically engaged. Reading a book is not just 'active' in terms of interpretation, it is also physically active. With digital games, the physical role of the player (reader) has more importance. While digital games have narratives that can be read actively, the physical process of playing the game is also crucial, and to make progress through the game it is essential to master the particular physical responses that are required to succeed. This is challenging, even frustrating, but the engagement of the body and the importance of the
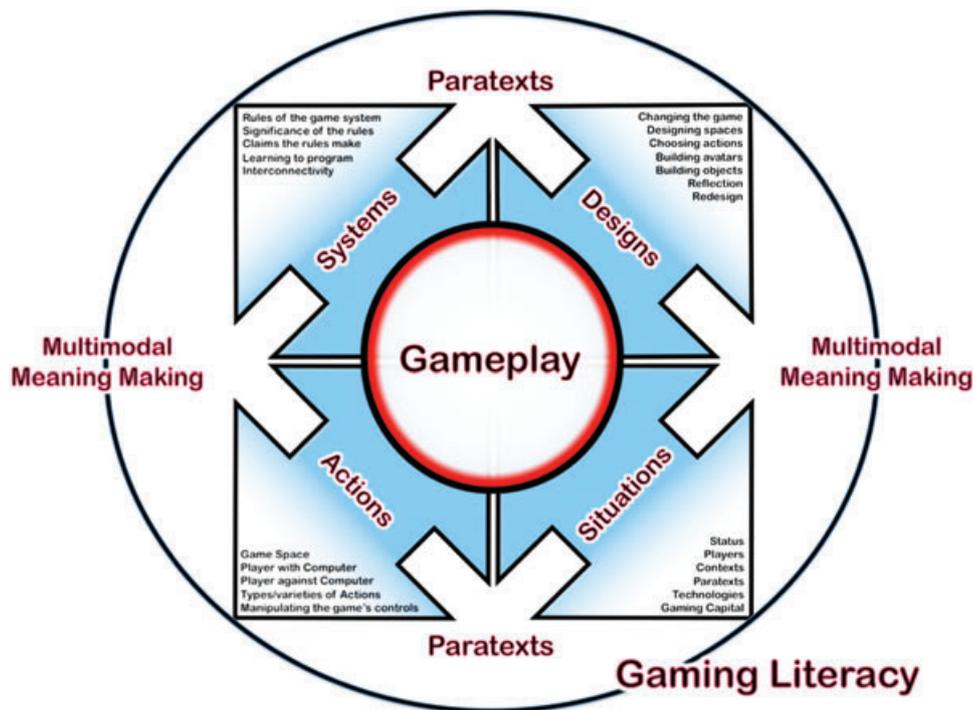
Figure 1: HUG: a heuristic for understanding gaming

performance of the player take on a significance in digital games that is qualitatively different from the effort required when reading (see Aarseth, 1997).

The crucial issue is that *actions* taken by players in the process of playing a digital game have consequences that impact on the final narrative. While a book is subject to multiple possible interpretations, a digital game is an algorithmic encoding of a set of rules that structures the many possibilities (which are also open to interpretation) that gameplay may enact. With books, readers create imaginary worlds, yet the book remains unchanged. Each game – as played – is different. While readers and gamers alike may participate in on- and offline communities of interest where paratexts are shared, consumed and designed, digital games are qualitatively different because they provide the opportunity for – and encourage – players to *design* and re-design digital games on a number of levels.

Digital gaming has its own changing contexts and *situations* that are equally important for practitioners to understand. Like books, games have a *system* that needs to be understood in order to make sense of the content. Books are a medium that follows a specific format; if you do not understand the conventions of the system you will be unable to recognise if those conventions are being followed or inverted, or appreciate how these conventions may change (with the introduction of the e-book for example). We believe this approach to understanding games, illustrated by the HUG, will allow practitioners to apprehend the complexity and skills that underlie gameplay and gaming literacy. In

what follows, we map gaming literacy across these quadrants: actions, designs, situations and systems.

Actions

Digital games require that teachers and practitioners get pupils to consider what physical actions they perform when they are playing digital games. Action marks a key difference between digital games and other media. Actions define both the characters – in terms of the type and variety of actions that the avatar can perform – and the virtual spaces of the digital games. Actions define *how* the space(s), and the objects in it, will be used by the players. The concept of digital games as actions (Galloway, 2006) supports the argument that avatars in digital games were selected in a manner that "disregards representational traits in favour of the constitution of character as sets of capabilities, potentials and techniques offered to the player" (Newman, 2002). In short, the HUG helps practitioners understand how in digital games action informs choices as much as visual or narrative preferences.

Digital games are enacted in multiple ways. Galloway (2006, pp. 5–8) introduces two key distinctions: (a) actions are performed either by the hardware and software, or by the player; and (b) actions can take place either within or outside the virtual world of the game. Action extends this distinction to examine the dynamics of inter*action* between the player and the computer. This concept is extremely useful for practitioners

because it draws out critical distinctions in what might be otherwise understood as amorphous, homogeneous and unspecific reflections on playing digital games. Furthermore, the notion of action highlights how different games require specific approaches that incorporate particular knowledge and gaming literacies. For example, players must recognise how their avatars move, and the actions they can perform (e.g. kick, jump, shoot).

Understanding the distinction between the actions that players may take in the game and actions that are made by players that configure the game is important for understanding the different forms of literacy that are integrated in digital games. For example, jumping in *Super Paper Mario* (Intelligent Systems, 2007) is an action that clearly takes place in the game, while cycling through the Pixls to chose the best special ability takes place outside of the game – as events in the game are suspended while the player makes this strategically important decision. The distinction between player and software/hardware actions is also important for practitioners. This knowledge allows them to focus on which parts of the game are controlled or influenced by player actions and which parts the game software enacts. This illustrates how the relationship between player and the game may be adversarial or cooperative. Sometimes the game hardware will animate and perform both opponents and allies in a game, for example, *Call of Duty: Modern Warfare 2* (Infinity Ward, 2009). In other games, the game hardware's role is primarily environmental. For example, the Nintendo DS provides the 'physics' of the game world (the world presented by the digital game) in *N+* (SilverBirch Studios, 2008). But the hardware may have a more cooperative role by providing strong managerial or administrative support, like in the *SimCity* series (Maxis, 1989) where it enacts and monitors the decisions that players take.

Understanding these nuances in action is paramount to the professional development model we present. This is because action is much more than simply playing a digital game. It illustrates how the player must negotiate their ambiguous relation to digital games – which provides both support and challenge – this can be usefully used by teachers and practitioners to encourage the development of a critical approach to think through how they are positioned within the game. The notion of action also extends to the way players input information. While highly generic in some respects, increasingly how information is inputted into digital games has changed. This is apparent with the touch screen on the Nintendo DS, tablets, smart phones and introduction of motion sensors to gaming consoles. Recently, also several popular digital games series have been released for consoles that have specialised controllers, for example, *Guitar Hero* (Harmonix, 2005). By understanding the actions taking place in digital gameplay as outputs read from, and inputted into the game by the players, practitioners can provide activities and assessments that extend pupils' often taken-for-granted gaming knowledge and literacies.

Designs

Design embraces several crucial related meanings: the process of multimodal meaning-making and design that is involved in re-presenting and recontextualising game information through paratexts; the elements of production within digital games that players encounter and interact with during the course of play; and the process of redesigning games. For practitioners the concept of design links digital game paratexts with both playing and designing games. To understand the significance of design it is necessary to consider how through play a virtual game world is produced in a continuous, iterative reciprocal process of interaction between player and hardware.

A common feature among contemporary digital games is to allow players limited control over the game's design elements. Design in this context is about players making decisions that change how the game is played. This means they design the game to fit their preferences. Many design choices are aesthetic, focusing on the appearance of the players' avatar or the game world (see Kafai et al., 2010). The customisation of avatars is common and varies in detail from the cartoonish appearance of a Mii on the Wii, to the detailed choices permitted in avatar design in *Mass Effect 2* (BioWare, 2010). In some popular games – such as *The Sims* (Maxis, 2000) – players design parts of the game world. Design impacts on the actions possible in the game world and consequently how the game is played. For example, in *Banjo-Kazooie: Nuts and Bolts* (Rare, 2008) players design vehicles with different abilities that provide distinct affordances when navigating the game. In such cases, design involves shifting into a different mode of play that is outside the narrative time and space of the game world. But design may also be included within the process of play. For example in *LittleBigPlanet* (Media Molecule, 2008) the design and redesign of each level is a core part of the game.

Aside from how design may be included as a part of the game, many digital games are now sold with software development kits that include features allowing players to redesign, share and distribute their designs (levels, objects, avatars, etc.). Through the popularity of these features, design has become the basis for many robust game cultures. Other design oriented activities include: making digital games, with software like *Game Maker* (YoYo Games, 1999); and making mods – defined as "amateur modifications of commercial games" (Jenkins, 2006, p. 289) – for example, *Counter-Strike* (Valve Corporation, 2000).

Design is important for practitioners because it offers an authentic connection with out-of-school literacy practices that may not be found in design

opportunities found in more conventional classrooms. Design and redesigning are tangible examples of gaming literacies that illustrate how practitioners can design activities, assignments and debates around digital games and their paratexts. By producing new designs and representations using the game, pupils engage in transformed practice (New London Group, 1996) where they redesign existing meanings to create new designs, which in turn transform game systems. Design also allows players to experiment with the knowledge of the conventions of gaming that they have acquired. This provides practitioners scope to develop activities where pupils reflect on how systems of rules, behaviours and relationships guide interactive gameplay and design.

Situations

The situations of gameplay are about understanding the locations and/or contexts where digital games are enacted. When anyone plays a digital game, it happens in a situated context that is integral to understanding the learning and sociality that occurs during the experience of gaming (Gee, 2003). For example, a practitioner may play a digital game and not be fully able to ascertain its possible relevance to literacy education without questioning where, with and by whom the game is usually played. The significance of the actions in gameplay cannot be fully understood if the context or situation has been ignored. Gameplay is not just an event on a screen, it is enacted in a specific location by a person (or people) using specific technologies. The concept of situations is important because it articulates the overlapping connection between digital gaming and offline activities, and how gameplay experiences are shaped by everyday life (Apperley, 2010). These understandings help practitioners to focus on the uncertain and variable environment where, through gaming, pupils' out-of-school, digital and/or gaming literacies are developed. Having knowledge of how situations shape pupils' various literacy proficiencies helps practitioners connect school curricula, teaching, learning and assessment to pupils' experiences with digital games, paratexts and other popular culture texts.

When digital games are played, people and technologies are being aggregated. There may be one or many individuals playing; they could be playing from different locations over a network, or from the same room. Often a group will play, taking turns to play and watch others play. When people play games together, they are learning from each other; even in the situation of a competitive multiplayer game there is substantial cooperation and learning from each other before, during and after gameplay. Knowledge and information about the skills and techniques required to succeed in (or otherwise enjoy) the game are often shared and players learn from one another, directly and indirectly, through the exchange of 'gaming capital' in different situations

(Apperley, 2010; Consalvo, 2007; Walsh and Apperley, 2009). The accumulation of gaming capital is a key factor that determines players' status in relation to other players within the context of gameplay. It is important for practitioners to be aware of these relations because they are complicated and contentious; different groups consider particular games more or less important. For example, *Warcraft III: Reign of Chaos* (Blizzard Entertainment, 2002) may be rejected in favour of *Team Fortress 2* (Valve Corporation, 2007) because the latter game is newer, or the fantasy elements in *Warcraft III* are considered to be childish or clichéd. However, within the situation of playing a particular game, gaming capital represents skill and experience. It does not necessarily stem from a total command of the game because expertise and skill in each part or element of the game are often acknowledged. For example, in *Grand Theft Auto IV* (Rockstar North, 2008), a player may be recognised for their skill at driving, their accuracy at shooting, or because they have a great recollection of the locations of the stunt jumps. Through gameplay, pupils demonstrate their gaming capital, but importantly often exchange it with others in different situations to enrich their own experiences or accumulate other forms of cultural, symbolic, economic and social capital (Bourdieu, 1984).

Digital games and paratexts are situated in and produced through social and technological networks. Thus, some situated knowledge of how such technologies work is ultimately required. This may not be highly technical knowledge, but players develop skills that allow the necessary objects to be connected (the Xbox 360 to the modem, network, stereo and television). This is important for practitioners as it illustrates how gameplay and gaming cultures are imbricated in a general technological knowledge involving downloading and uploading data, and managing technological interfaces to produce, and switching between varieties of actions. When practitioners consider this situational knowledge of pupils then they can craft classroom activities (print and multimodal literacy practices) that allow pupils to demonstrate their technological knowledge and also valorises their gaming capital by intentionally creating new situations where their out-of-school literacies are acknowledged and put to use to engage in print-based activities. This is crucial, because children and young people that play games, but are excluded from gaming cultures, are unable to capitalise on the skills they develop because they may lack a way of articulating their knowledge in relation to existing literacy practices or skills.

Systems

Digital games are systems that engage players through rules and delineate particular actions, designs and situations. These systems are dynamic, recognising the actions of the player(s) and responding to accommodate those actions. If players both 'read' and play games,

then what they have learned through gameplay and the use of digital game paratexts is how the system or set of rules within the game operates. Systems-based understandings allow practitioners to recognise the significance of the rules, and the kinds of claims those rules make (Walsh, 2010).

Players learn the rules of the system through gameplay, accepting them as absolute. Usually Niko cannot go inside most buildings in *Grand Theft Auto IV*; Mario can only use one Pixl at a time in *Super Paper Mario*; and gravity causes Ezio to fall from rooftops in *Assassin's Creed 2* (Ubisoft Montreal, 2009). A particular challenge for practitioners is to separate the inflexibility of rules as an essential aspect of gameplay and success in the game from the claims those rules make about the world. Take the colonial-era historical nation simulator *Europa Universalis II* (Paradox Interactive, 2001). What kind of claims is it making about the world, when a player of a fledgling European nation enters an army into a newly discovered area of the map like New South Wales and the software politely asks if they wish to 'Attack Natives'? Such issues are worth opening for discussion, particularly when actions that might otherwise be questionable are contextualised as logical within the competitive dynamics and systems of the game world.

When practitioners – particularly literacy teachers – understand that digital games are systems it allows them to be discussed as something other than narratives. This underscores how curriculum design, teaching, learning and assessment using digital games can acknowledge pupils' gaming and out-of-school literacies in a manner that does not simply re-appropriate them as yet another curricular 'text'. Equally important is understanding that pupils can break or alter the rules of the game through 'modding' or modifying the system. When pupils use or design 'mods' they are not just changing the physical appearance of the game, but also the digital game's system of rules (e.g. the algorithmic codes). Practitioners could encourage pupils to demonstrate their understanding of how that system works on multiple levels. When pupils engage in design and redesign of digital games and paratexts, practitioners have the opportunity to initiate classroom activities that segue knowledge of digital games into learning how to programme through reworking a narrative or redesigning audio and visual features of a digital game that they can then write about or present to their peers. This is a critical aspect of the pupils' gaming or procedural literacy (Bogost, 2007); an increasingly valuable set of literacy practices necessary "to understand the interplay between the culturally-embedded practice of human meaning-making and technically-mediated processes" (Mateas, 2005, pp. 101–102).

An understanding of systems, which incorporates the notion of procedural literacy, assists practitioners in understanding how digital games allow players to see the world through a particular paradigm that is understood through actions, designs, situations and systems. This then allows them to design school-based literacy activities that encourage and promote an approach to 'reading' digital games' claims about issues in the material world. We argue that practitioners can encourage this approach by discussing the rules of the game, the significance of the rules (over other rules), the claims about the world the rules make, and pupils' individual responses/nonresponses to those claims (Bogost, 2007).

Practitioners can draw on the HUG to discuss the real or imagined actions presented through gameplay. This engages pupils on a level where they can approach the relationship between the rules of the game and their gameplay actions through a critically engaged mode of play. With this kind of metalanguage about gameplay, practitioners can "surpass institutional understandings of literacy centred on an autonomous neutral set of reading and writing skills or competencies" (Walsh, 2010, p. 37). This creates space within the curriculum in which pupils can design paratexts where they use their gaming literacy to engage in print-based literacy activities and multimodal design.

Conclusion

A great deal of scholarly work indicates that digital games have significant educational value, particularly in the area of literacy. Furthermore, they have an important role to play in classroom activities. This article provides a framework and heuristic for teachers and practitioners who are interested in including digital games in the classroom.

The HUG is a work in progress, and it is intended as a starting point for projects that practitioners can develop according to their own contexts and circumstances. A timely next step would be to use the heuristic for understanding gaming (HUG) to develop both pre-service and in-service teacher professional development courses and programmes to further connect pupils' gaming literacies to literacy teaching and curriculum. Understanding pupils' gameplay on its own is important, but understanding how the actions, designs, situations and systems affect gameplay and contribute to individuals' gaming literacy is entirely more complex. While the heuristic illustrates the strong connection between the educational value of paratexts and gameplay itself, it remains important that teachers and practitioners continue to explore the dynamic segues between digital games and paratexts that will be useful in their own teaching and learning.

We have argued that digital game paratexts are a practical starting point for introducing digital games and gaming literacies into the literacy curriculum for two reasons. First, they require less experiential and

technical knowledge of digital games to teach and they are easier for practitioners, unfamiliar or distanced from the cultures of digital gaming, to integrate into their teaching and learning activities. Second, for children and young people who are already familiar with paratexts, both as users and designers, the paratext provides an authentic segue between their immersion in gaming cultures and gameplay practices and school-based literacy outcomes. By drawing on the knowledge presented in the HUG, teachers and practitioners have considerable scope to focus not only on paratexts, but also on the elements of gameplay and gaming cultures that are appropriate for the demands of their particular institutional affordances and their literacy curriculum and assessment activities.

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