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Game Literacy in Theory and Practice

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This article addresses the notion of teaching about games as a cultural medium in their own right. This includes critical analyses of existing texts but also involves enabling students to create their own. Implications of this approach are discussed and concrete, research-based examples are provided. A more theoretical discussion of the notion of *game literacy* and the principles on which this approach is based is also included. The article concludes with implications for policy and practice. [abstract ends]

"If you want to use television to teach somebody, you must first teach them how to use television" (Umberto Eco, 1979). Umberto Eco's argument about the educational use of television can equally be applied to newer media. As he implies, media should not be regarded merely as teaching aids or tools for learning. Education about the media should be seen as an indispensable prerequisite for education with or through the media. Likewise, if we want to use computer games or the internet or other digital media to teach, we need to equip students to understand and to critique these media: we cannot regard them simply as neutral means of delivering information, and we should not use them in a merely functional or instrumental way.

In this article, we consider the implications of this approach specifically for computer games. Our interest here is not in using games as a means of delivering a particular curriculum or of re-engaging disaffected learners – a role in which games are often cast (cf. Kirriemuir & McFarlane, 2004). Nor

are we concerned with the learning principles that might be derived from analysing play with computer games, and then perhaps applied to the learning of traditional subjects in schools (cf. Gee, 2003). On the contrary, our primary focus is on how we might teach *about* games as a cultural medium in their own right, just as we teach about film or television or literature. As in those other areas, we believe that this should not be confined to the critical analysis of existing texts but should also involve enabling students to create their own. In later sections of the article, we provide some concrete instances of the approach, drawn from our own research in UK schools. We begin, however, with a more theoretical discussion of the notion of game literacy and the principles on which our approach is based.

Defining Game Literacy

Over the past twenty years, there have been many attempts to extend the notion of literacy beyond its original application to the medium of writing. As long ago as 1986, one of the leading British researchers in the field, Margaret Spencer, introduced the notion of 'emergent literacies' in describing young children's media-related play (Spencer, 1986); and the call for attention to new or multiple literacies has been made by many authors over subsequent years (Bazalgette, 1988; Buckingham, 1993a; Cope & Kalantzis, 2000; Tyner, 1998; and many others). We have seen extended discussions of visual literacy (e.g. Moore & Dwyer, 1994), television literacy (Buckingham, 1993b), cine-literacy (British Film Institute, 2000), moving image literacy (Burn, 2007a), information literacy (Bruce, 1997) and digital literacy (Gilster, 1997). Proponents of the so-called New Literacy Studies have developed the notion of multiliteracies, referring both to the social diversity of contemporary forms of literacy, and to the fact that new media of communication require new forms of cultural and communicative competence (Cope & Kalantzis, 2000).

This proliferation of literacies may be fashionable, but it raises some significant questions. Popular discussions of economic literacy, emotional literacy and even spiritual literacy seem to extend the application of the term to the point where any analogy to its original meaning (that is, in relation to written language) has been lost. Literacy comes to be used merely as a vague synonym for competence or skill. The term *literacy* clearly carries a degree of social status; and to use it in connection with other, lower status, forms such as television or computer games is thus to make an implicit claim for the latter's validity as objects of study. Yet as uses of the term

multiply, the polemical value of such a claim – and its power to convince - is bound to decline. Thus, while recognising the significance of visual and audio-visual media, some scholars challenge this extension of the term, arguing that literacy should continue to be confined to the realm of writing (Barton, 1994; Kress, 1997); while others effectively dispute the idea that visual media require a process of learning analogous to the learning of print (Messaris, 1994). Furthermore, while the analogy between writing and visual or audio-visual media such as television or film may be useful at a general level, it often falls down when we look more closely: it is possible to analyse broad categories such as narrative and representation across all these media, but it is much harder to sustain more specific analogies, for example between the film shot and the word or the film sequence and the sentence (Buckingham, 1989).

So what are the possibilities and limitations of the notion of game literacy? Is it just an elaborate way of talking about how people learn to play games, or is it something broader than that? Indeed, do we really need another literacy? In exploring this issue in this article, we will inevitably have to address some fundamental questions. To make the analogy between games and writing presumes that there are some significant elements that are shared between those media (and, by extension, by a range of other media as well). It implies that games can be analysed in terms of a kind of language – that they make meanings in ways that are similar, at least in some respects, to written language. It also implies that there is a competency in using that language which is gradually acquired – a competency that can, perhaps, be explicitly taught, and that can be transferred across to other media or forms of communication. Yet the notion of 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. Pursuing the analogy, therefore, requires us to address some difficult questions about how we define the characteristics of games as a cultural form, about how we differentiate them from other media, about how they create (or make possible) meaning and pleasure, about how users (players) make sense of them and learn about them, and so on. We do not intend to answer all of these questions in this article, but we do intend to pursue some of the issues, not least in the hope of achieving a greater degree of precision in the use of this term.

Games as Representations - and Games as Games

There are clearly many elements that games share with other representational or signifying systems. On one level, this is a well-known symptom of the convergence that increasingly characterises contemporary media: games draw upon books and movies, and vice-versa, to the point where the identity of the original text is often obscure. Users (players, readers, viewers) must transfer some of their understandings across and between these media, and to this extent it makes obvious sense to talk about literacies that operate – and are developed – across media (Mackey, 2002; Burn, 2004).

More fundamentally, computer games are almost invariably multimodal texts (Kress and van Leewen, 2001) – which is to say that they often combine different communicative modes, such as still and moving images, sounds and music, speech and writing, and so on. Different games (or genres of games) will use and combine these modes to different degrees and in different ways; and this will vary according to the functions the different modes perform (or, in multimodal parlance, the functional load the modes will carry). These elements can be, and are, studied at a micro level, in ways that are at least analogous to the study of written language. Zach Whalen's (2004) analysis of music in computer games is a recent case in point; another example would be Diane Carr's (2003) account of space in the games *Silent Hill* and *Planescape Torment*. We would argue that there is scope here for much more detailed analysis of the visual style of games and the ways in which different representational conventions make different claims about their relation to reality (or what semioticians would call their modality claims).

More broadly – and controversially, at least for some games scholars – there is the fact that games also employ broader elements that are similar to, or analogous with, other media. Thus, many games have characters; and it is possible to analyse these characters, for example in terms of fairly conventional literary criteria (such as the distinction between *flat* and *rounded* characters that derives from E.M. Forster, 1927; cf. Ryan, 2001) or in terms of structuralist paradigms such as the functions of hero, donor, helper and so on identified by Vladimir Propp (1928/1968), which we employ below in relation to children's game designs. The narrative functions of such characters suggest that many games also have, or use, narratives; and it is possible to analyse these narratives, for example in terms of semiotic distinctions between hypotactic and paratactic narrative (drawn from Hodge & Tripp, 1986) or in terms of notions such as the implied reader, the implied author, the addressee, and so on (drawn from the work of Gerard Genette, 1980).

We apply several of these approaches elsewhere in our analysis of role-playing and action-adventure games (Carr, Buckingham, Burn, & Schott, 2006).

Nevertheless, these kinds of parallels are anathema to many game theorists. Many academics in game studies, and indeed some game designers, have effectively dismissed such elements as merely trivial or peripheral. Markku Eskelinen (2001), for instance, dismisses stories within games as uninteresting ornaments or gift-wrapping and argues that paying them any attention is just a waste of time and energy; while the designer Chris Crawford (2002) sweeps aside elements such as characterisation and narrative as merely cosmetic. Yet while some theorists might seek to marginalize such elements, even a cursory look at the fan culture surrounding games would suggest that they are absolutely crucial to their appeal.

Thankfully, the debate on games and narrative has generally drawn back from these rather absolutist positions (see, for instance, Frasca, 2003); but the point remains that analysing games simply in terms of their representational dimensions produces at best a partial account. For example, characters in games function both in the traditional way as representations of human (or indeed non-human) types and as points of access to the action; but the crucial difference is that they can be manipulated, and in some instances positively changed, by the player (Burn & Schott, 2004). Likewise, many games contain and depend upon narratives to provide motivation and engagement; and yet narratives can also be developed by players, albeit in different ways in different circumstances. Even a more specific semiotic analysis would suggest that games function in linguistic terms both through the indicative mood (that is, showing us the world) but also in the imperative mood (that is, urging us to take action upon that world).

In other words, we need to account for the fact that games are *played*; and any analysis of game literacy also needs to address the *ludic* (or playable) dimensions of games. There is a growing literature, both in the field of game design and in academic Game Studies, that seeks to identify basic generative and classificatory principles in this respect. For example, Aki Jarvinen (2003) provides a systematic taxonomy of different types of game rules; Markku Eskelinen and Ragnhild Tronstad (2003) describe the different types of gaps that provoke ergodic work on the part of the player; while Wolf (2002) distinguishes between different types of objects or assets in games. The most extended example of this kind of analysis to date – and one that looks well beyond computer games – is Katie Salen and Eric Zimmerman's *Rules of Play* (2004), which considers (among other things) the logical or mathematical principles on which games design is based.

Even so, it does not make sense to see the ludic and representational elements of games as necessarily separate or opposed; and we will see later

how they can be connected both through explicit teaching and in children's design practices. The distinction may reflect a certain division of labour within the games industry (between programmers on the one hand and artists/designers on the other). But in the analysis of games themselves, and of players' engagements with them, it makes very little sense to see this issue in either/or terms (see Carr et al., 2006). Similarly, we would argue that any account of game literacy needs to address both the elements that games have in common with other media and the elements that are specific to games (whether or not they are played on a computer). These might to some extent be identified with the representational and the ludic dimensions of games respectively; although we need to recognise that games also have specific representational conventions that may not in fact be shared with other media.

Literacy as Critical Social Practice

Research on print literacy clearly shows that literacy should not be seen as a set of disembodied cognitive skills, but as a set of social practices (e.g. Heath, 1983; Street, 1995). Literacy practices are embedded in social contexts and social relationships; and they involve forms of social action that have social purposes and consequences. This view of literacy thus implies that individuals do not create meanings in isolation, but through their involvement in social networks, or interpretive communities, which promote and value particular forms of literacy. It also means recognising how different social groups have different kinds of access to literacy, and how access and distribution are related to broader inequalities within society (Luke, 2000).

Likewise, any analysis of game literacy needs to take account of the social dimensions of gaming and not merely the textual or formal aspects of games per se. This involves understanding how the social activity of play is defined and carried out, and how players are socially located; and this then leads into broader questions about how social relations and identities themselves are constructed. It also entails an understanding of the institutional and economic factors that shape the production, distribution and circulation of games. In the case of game literacy, therefore, this approach suggests that we cannot regard – or indeed, teach – this literacy as a set of cognitive abilities that individuals somehow come to possess once and for all. We would need to begin by acknowledging the ways in which the activity of gaming is part of the texture of people's daily lives and social relationships; and we would also need to address the broader social, economic and even political

forces that constitute the wider game culture. In our view, these questions are not peripheral to the analysis of literacy, but central.

In the context of education, discussions of print literacy typically distinguish between *functional* literacy and *critical* literacy (Cope & Kalantzis, 2000). This is a distinction that we believe can also be applied to the medium of games. Functional literacy in relation to games might include such basic hardware skills as the ability to operate the relevant technology, to load and save a game, and to use the controls efficiently; but it might also include software-related skills such as the ability to navigate around the game space, to utilise menus and options, to customise assets to one's requirements, and so on. To say this much is to imply that game literacy is essentially about playing well: the more literate you are, the higher your score will be. Of course, this is a reductive definition; although it is hard to see how these aspects of game-play could be completely dispensed with. Can somebody who is simply hopeless at game-playing be considered game literate?

Nevertheless, the notion of literacy – particularly in an educational context - generally implies a more reflexive approach. Literacy in this sense involves analysis, evaluation and critical reflection. It entails the acquisition of a meta-language – that is, a means of describing the forms and structures of a particular mode of communication; and it involves a broader understanding of the social, economic and institutional contexts of communication, and how these affect people's experiences and practices (Luke, 2000). According to advocates of the multiliteracies approach (Cope & Kalantzis, 2000), literacy education cannot be confined simply to the acquisition of skills, or the mastery of particular practices; it must also entail a form of critical framing that enables learners to distance themselves from what they have learned, to account for its social and cultural location, and to critique and extend it.

This notion of critical literacy is by no means unproblematic, as the ongoing debates about so-called critical pedagogy clearly show (Buckingham, 1998). There seems to be little place in some conceptions of critical literacy for aspects of pleasure, sensuality and irrationality that are arguably central to most people's experience of media and of culture more broadly. An emphasis on critical distance fits awkwardly with the emphasis on immersion and spontaneous flow – and even the pleasure of addiction - that is frequently seen as fundamental to the experience of gaming. As such, we would wish to caution against a narrowly rationalistic conception of critical literacy – a conception that is arguably quite at odds with how the majority of players behave or might wish to behave.

In this respect, it is also important to emphasise that literacy is not merely critical but also creative – it is a matter of writing as well as read-

ing. Accounts of media literacy have only recently turned their attention to the question of how people learn to produce – or otherwise actively engage with – media (Buckingham, 2003). Yet to some extent, games problematize any straightforward distinction between consumption and production. There is clearly a continuum within game play between genres that are primarily about reaction (first person shooters, or *Tetris*, for that matter) and those that allow space for strategising and reflection. There are also some genres (most obviously Role Playing Games (RPGs), and especially Massive Multiplayer Online Role Playing Games (MMORPGs)) that permit the player a greater degree of choice, for example in the customising of game characters or aspects of the game world, and even defining the overall objectives of the game, than others. From there we can move on to consider "modding" and level editing, some of which may be explicitly made possible by the inclusion of facilities within the game package itself (as in the case of *Timesplitters 2*). Then there are game design tools, which vary from the relatively constrained packages designed for home use (such as *Stagecast Creator* or *3D Gamemaker*) to the modification of open source game engines and the use of professional software used within the games industry. Finally, the 'fan cultures' that surround gaming may be characterised by quite complex levels of creative participation, as well as critical engagement and debate (Jenkins, 2006). Machinima, for example, is an emergent media form in which game players render, record and edit sequences from games as short animated films (see www.machinima.com).

In the discussion that follows, we consider these cultural, critical and creative dimensions of game literacy in the context of games designed by school students. We draw on a recently completed research project, *Making Games*, in which we worked with an educational software company, Immersive Education Ltd., to create a software tool that would enable children to make their own 3D computer games. While there has been some previous research in this area, it has mostly focused on the potential of game-making in terms of developing logical or mathematical thinking (e.g., Kafai, 1996). Many of the games that have been produced in these studies bear little relationship to the kinds of games that students are likely to be playing outside the classroom. By contrast, our interest here is in the potential of game-making both as a form of creative cultural expression in its own right and as a means of developing students' critical understanding of the medium. The project ran from 2003 to 2006, and involved partnerships with two secondary schools, one mixed comprehensive in Cambridge (with a largely middle-class white intake) and one girls' comprehensive in Lambeth, South London (with a largely black African-Caribbean intake). We researched the work of

approximately 100 young people, 14 of whom stayed with the project over the three years. The ages of the students ranged from 12 to 15, though those referred to in this article are 12-13, Year 8 in the UK school system. In the account that follows, we focus particularly on the work undertaken in the Cambridge school.

Making Games

In recent years, media education has placed a growing emphasis on the importance of student production (Buckingham, 2003). This builds upon a longstanding set of rationales for the value of production work, both as a creative and as a critical practice (Buckingham, Grahame, & Sefton-Green, 1995). However, it also reflects the rapid growth of accessible digital authoring tools for use in schools. These software packages have allowed for the widespread exploration of digital video editing (Burn, 2007a), while digital music editing, website authoring, desktop publishing and graphic design have also begun to appear in media education programmes. However, the creative production of games has proven more problematic. No commercial software yet exists which will allow students detailed control over the design process, while also enabling them to produce a complete, satisfying game.

The students we describe in this article participated in a media education course in which they made their own games using prototype versions of the authoring tool developed by the *Making Games* project, currently named *Missionmaker*. The research involved the development of the software through a process of iterative design, informed by interviews and activities with the students, and a study of game design processes in media lessons, after-school clubs, and homes. The methods used included semi-structured interviews, videotaped observation, and analysis of the students' games, drawings and writings. The analysis of these data employed theoretical frameworks derived from earlier models of media literacy, as outlined above, as well as social semiotic and multimodal theories of textual design, and play, game and narrative theory.

One research objective, which will be the focus here, was to develop a model of game literacy based on researching the students' existing experience of games and their creative authoring practices. The following account, accordingly, will consider the cultural experiences students brought to their game designs, the forms of critical awareness they already possessed as well as those developed through the design process and other aspects of the programme, and the nature of the creative production process itself.

The Cultural Experience of Games

The children we worked with had varying experience of games. A minority did not play games or particularly like them; although some who claimed they did not play (especially girls) later revealed more knowledge and experience than they at first implied. There were widely varying tastes and loyalties to specific genres: some liked first-person shooters, some liked *The Sims*, some enjoyed strategy games, and so on. There were some patterns here which, although we cannot claim that they are in any way representative, are worth noting.

To begin with, there were predictable gender differences. At first glance, it seemed that boys preferred action games, including shoot-em-ups, while girls preferred peaceful constructive games. However, it later transpired that these claims may have had as much to do with children's own construction of themselves through stereotypical images and expectations of gender as with any real preferences (Pelletier, 2005). In fact, some girls did want to play and make "violent" games, while some boys did play and make "peaceful" games. This is in accordance with other research into gendered gaming. For example, a study of an Australian High School found that girls enjoyed a much wider variety of game genres than they at first admitted (Mackereth & Anderson, 2000); while advocates of "grrl gaming" have proposed that girls can gain pleasure from fantasy roles in games which allow some escape from stereotypical expectations of gendered roles in everyday life (Cassell & Jenkins, 1998). Nevertheless, this aspect of game-play and design also provided valuable opportunities to open up discussion of gender representation with students.

In addition, there were widely varying experiences of games that can be related, on the one hand, to age or maturity, and on the other hand to regulation and censorship. Some children's experience was of games often associated with their age group or even with younger children: *The Sims*, *Crash Bandicoot*, and *Harry Potter*. However, a minority had played games more often associated with adult audiences, such as the horror games *Silent Hill* and *Resident Evil*, or the controversial *Manhunt*, mentioned by one boy. Two implications follow from this. Firstly, it seems important to recognise that some children have more adult tastes than others: in a discussion with one group of 12/13-year-olds about the pleasure of games, for instance, two boys made a series of sophisticated points about the nature of suspense in *Silent Hill*, during a discussion that had begun with Harry Potter. Secondly, controversies about violent content and regulation (for instance, *Manhunt* is rated by the British Board of Film Classification as only suitable for view-

ers aged over 18), are clearly productive topics for discussion or simulation work as part of a consideration of media institutions and audiences. Age is of course a concern here; but as with other forms of violent content, the pedagogic stance here is to recognise that young people have interests in such content before regulatory authorities permit them to view it legally (and indeed, sometimes precisely because of such regulation). The logic is to prepare them for such experiences, rather than somehow to pretend they do not exist.

Many children had experience of games which had been developed as part of cross-media franchises, such as *James Bond, Lord of the Rings, Harry Potter, Spiderman* and *Star Wars*. One girl played game spin-offs of film and TV with her father:

> When I'm with my dad I play like…usually *Lord of the Rings* and *Harry Potter* and sort of known games, like, not sort of…games that have like got books as well or films or TV programmes that I sort of know.

In some cases, children played the game because of a passionate commitment to the overarching idea, character or narrative, as in the case of a group of five ardent Harry Potter fans. There are interesting implications here for how narratives are experienced across literature, film and game, and how they are differently constructed across these media; and this can be exploited in the context of literacy work in English or media studies, as the work of Catherine Beavis (2001) has shown. There are also many questions about the nature of the media industries, and how they organise such franchises, that can be posed in the context of media education. Finally, this kind of cross-media loyalty among fans raises questions about the nature of fandom as an intense form of audience behaviour, again a topic of particular interest to media education.

Finally, various forms of critical engagement with games were demonstrated in the interviews. In some cases, these were forms of appreciation, and expressions of individual taste: there were children who particularly liked the Harry Potter games, or enjoyed skateboarding games because of the excitement and satisfaction they provided, or enjoyed social aspects of gaming (there were examples of children playing with friends, brothers and sisters, fathers and mothers, and even a grandfather in one case). In other cases, there were very specific kinds of critical comment: on the differences between PC-based and console-based games; on boring aspects of games which were too slow or repetitious; and in one case, a series of critical remarks specifically about the second Harry Potter game. In some respects,

then, children and young people can be seen to develop quite sophisticated forms of critical discourse through their everyday engagements with games, which can be further explored in the classroom.

Critical Literacy

However, one key dimension of critical awareness is to do with the conceptual grasp of the semiotic structures of the text. As we have indicated above, these can be seen in terms of the representational and the ludic aspects of games. While the former was a very common dimension of the students' understandings, the latter was more strongly developed among those who were already game enthusiasts. For example, a very small proportion of our participants (four boys) had some experience of what might be called proto-design, through using the level editor in the commercial game *Timesplitters 2*. Briefly, this provides an editing interface in which players can create their own level of the game, building their own 3-D space and locating objects, assets and characters. More crucially, they have the ability to construct the conditionality of the game: they can, for instance, determine that when the player enters a designated space, an enemy character will begin shooting at them. These boys had a conception, then, of what they called game logic, since this was the name of the relevant menu in the level editor.

For most students, however, this kind of concept was completely new. They generally had a good informal grasp of the more obvious components of games which are visible to the player: missions, end-of-level bosses, obstacles, rewards, challenges, and combat. But the notion of games as rule-based systems (see Juul, 2003; Frasca, 1999; Salen & Zimmerman, 2003) was not something they had learned from their experience of play. As well as this concept of rules, our teaching also focused on the idea of economies – the quantified resources determined by the designer, for strategic use by the player (such as health, hunger, point scores, weight, time, vulnerability, ammunition). The course we developed with the teachers who were partners in the project set out to develop a critical understanding of such concepts in two ways – by exploring how they related to games in general in the students' own experience; and by focusing explicitly on such concepts in the process of game design with the software.

The general exploration of the concepts in class discussion produced thoughtful results from many students, although at this stage their grasp of the ideas was not always completely secure. Students were encouraged to think of examples of rules across many kinds of game. One student, Jack, came up with this list:

> Call of duty – you mustn't shoot your ally
> Tennis – the ball mustn't leave the court
> Pool – the white ball must not go down any of the pockets
> Cards (pontoon) – you must not score more than 21 to win
> Cricket – you can't touch the wickets with your bat

Like many other students, Jack used examples both from computer games (*Call of Duty* is a first-person action game based in a World War II narrative) as well as from other kinds of game. He also wrote at length about why rules were important, for a homework following a class discussion:

> The reason games have to have rules is because if there wasn't rules in a game you couldn't have challenges and boundries (sic), limits too, and that would spoil the fun and cause you not to have anything to complete. Rules are needed for objectives because they are almost the same thing because they are both telling you to do or not to do something.

This account recognises that rules make a game a specific kind of text, one largely constructed in the imperative mood - which, rather than simply presenting you with a story, continuously demands that you act within that story.

The discussion also considered the paradox of why we enjoy following rules, which in contexts other than games and play can be oppressive. Again, Jack continues this discussion with himself:

> People enjoy following rules because it creates suspense of trying not to lose the game by breaking the rule, and a lot of people like difficult challenges. For example, on a computer game, trying not to be seen and to sneak somewhere where you are rewarded with a prize.

Jack's recognition that game rules are related to affective qualities such as suspense, and also to the challenge and level of difficulty posed by the game, is a sophisticated insight that prepares the way for his own game design. The notion that constraint is related to the pleasures of play can be understood in terms of theories of rule-governed, structured play, such as Frasca's (1999) use of Caillois' notion of *ludus* (1979), where a strict rule-system is structurally associated with victory or defeat - as it is in Jack's definition. This is distinct from Caillois' *paidea*, in which less defined rules generate pleasurable play that is not necessarily oriented towards an outcome of quantified gain or loss. The distinction between game and play is

an important debate in play and game theory, and one which students in schools can usefully pick up. For example, football is obviously a game with clearly-defined rules. What about paintballing? What about young children's clapping and skipping games? What about "I'm the King of the Castle?" Clearly, some kinds of play are also games with firm rule-systems, while others are less well-defined, more open, more improvisatory.

The other key concept related to the ludic structures of games that we introduced was the idea of *economies*: that is, quantifiable resources within games, such as health, hunger, power, currency, ammunition, food, healing potions. We began by discussing the common sense notion of economy as a monetary resource. In their written homework, students again developed this idea for themselves, rooting it in their own knowledge of the world, and their experience of games. Fiona used the examples of Ibiza's tourist industry and *The Sims*:

> Ideas of economy in a game (e.g., The Sims) is money as without it your 'sim' will not have a good life and you will find the gameplay much harder and less enjoyable as the sims get mad as they can't have many possessions and sometimes they don't have any food so they are really depressed.

This work shows that children are often familiar with ludic aspects of the text which are explicitly discussed in popular discourses (in game manuals, magazines, websites, fan sites, or within the games themselves), such as non-player character (NPC), or end-of-level boss, or first person shooter. However, they do not generally know unfamiliar terms and concepts which may underlie the ludic structure. The concepts of rule and economy, then, amplify their existing understanding of how games work, make explicit what was previously implicit knowledge, and prepare the way for the use of the tools in the authoring software which allow for the construction of rules and economies. However, this also shows that these concepts are by no means purely abstract: they need to be related back to students' wider cultural knowledge both of games and of other relevant experiences which serve as examples and analogies.

In terms of narrative, two approaches were used. One involved discussion of how stories and games had features in common, asking, for instance, if students could think of stories which had rules or economies. One girl produced the example of *Hansel and Gretel*, arguing that the breadcrumbs left as a trail by the children through the forest were an economy, since they could run out, and also a rule: if the trail is visible, you can find your way home.

Our other strategy here involved introducing Propp's character functions (1928/1968), commonly employed in teaching about narrative in media edu-

cation, and asking students to design a selection of these into their games. Within the software, the protagonist is also the player character, with specific properties which can be managed and designed by the students, such as levels of health, hunger, and so on. All the other characters are NPCs who have to be designed and programmed to behave or speak in particular ways. Enemies may be inflected as game-characters such as end-of-level bosses - especially powerful NPCs who have to be defeated to complete a level (in much the same way as Shelob the spider or Grendel are defeated by Sam Gamgee or Beowulf, respectively). Figure 1 shows an end-of-level boss being attacked by the player in one student's level design. The use of ammunition as an economy has been designed here in relation to the vulnerability of the boss character, which has been set high for difficulty. In terms of Propp's narrative theory, this is the antagonist, of course.

Figure 1. Boss character in level 6 of *Jimmy DeMora and the Dying World.*

As we have argued above, critical game literacy does not only involve a conceptual grasp of the languages or semiotic properties of games. It also entails some understanding of the wider cultural and social meanings sur-

rounding them and the circumstances of their production and consumption. In the case of this project, these aspects were addressed by simulating the work of a game development company and the processes of review and evaluation in games magazines accompanying the release of a new title. The following example of a press release written by students gives some idea of this kind of work:

> *Saturday 25th March, 2006.*
> *Kids Make Their Own Game!*
>
> *Students in Year 8 at Parkside Community College in Cambridge have formed a games company named PIG productions, in order to create a spectacular adventure game with an impeccable plot.*
>
> *PIG is an acronym for Parkside Interactive Games, and PIG's first game is currently in the making, by the name of Jimmy DeMora and the Dying World. Using Mission-Maker and just under 30 creative minds, students work in one of the English rooms at their school to design and make the game. …*
>
> *The game is scheduled for release at all good game stores from May 2006, as the final touches are currently being made to the game. Lucky people who have had the opportunity to preview the game have never given it less than 4 stars, mainly for the plot.*
>
> *The game follows secret agent Jimmy DeMora, who is living in a world that is deteriorating thanks to global warming, and is suddenly faced with the kidnapping of his daughter and sister. He has to rescue many prisoners, including much of his family, and seek a holy artefact for renewable energy. Some say the game is a cry for attention to the melting polar ice-caps, some say it's an exaggerated joke.*
>
> *Whatever is said, we can't wait to see how the final release is seen by the gaming world!*

While there is no space here to develop a detailed analysis of this area of the project, we can remark in passing that the writing reveals an emerging consciousness of the work of games developers, of specific practices such as genre-labelling, and of conventions of game evaluations such as star-ratings. In addition, we can see that the development of this kind of aware-

ness is easily related to the meanings the children invested in their game, in its treatment of the theme of global warming, but also to the pleasure of production, suggested in the final sentence and in the brief reference to the humour which offsets the serious message of the game.

Creative Production: Ludic and Narrative Design

To begin planning their class game, students were asked to write individual proposals for homework: short pitches for a game, which had to include Proppian character types and examples of the rules and economies explored in class. The teacher then synthesised as many of these ideas as possible into a single plan. Thus, one girl had suggested a game based on the melting of the polar icecaps due to global warming, as a result of which the protagonist lost his family and had to find and save them. Several others had thriller, assassin or secret agent themes. One girl had subverted the stereotypically feminine activity of shopping that features in many games by proposing a shoplifting game; and so on.

These ideas all became part of the final game, *Jimmy DeMora and the Dying World* (a title proposed by one of the students). In the game, secret agent Jimmy DeMora has to find the evil corporation that is causing global flooding through its unscrupulous production of environmentally unfriendly fuels, stopping off for some shopping and saving members of his family along the way. A crucial part of the teacher's role here was mediating the students' proposals, partly through class discussion which opened up contradictions, differences, advantages and disadvantages; and partly by encouraging a consensus which would produce a whole-class design which would be coherent, and to which, as far as possible, everyone in the class had contributed.

Clearly, this game has a central narrative. It also has game structures: levels, obstacles, rewards, and clearly-defined win-lose states. The player character was named Jimmy DeMora after a proposal by one of the class, who had suggested a gangster-themed game with an assassin as the central character (possibly influenced by games such as *Hitman 2: Silent Assassin*). However, as the class game design amalgamated elements from proposals by many members of the class, the character was modified in terms of his mission and narrative background. He was equipped with a gun, albeit not to assassinate anyone but to rescue members of his family and to save the world which was threatened by global warming and evil corporations. If Jimmy was the Proppian hero, other characters proposed by students ful-

filled other functions: his kidnapped daughter was the princess; the evil corporation was the villain; various other characters in other levels helped, donated, misled, and so on.

The overall game design was then divided up by the teacher into 15 levels, one for each pair of students in the class. This allowed each pair to work on their own small game, with its own structure and sense of beginning and end. However, each pair had to constantly negotiate with its adjacent pairs to see how the levels would connect with each other and with other pairs to achieve other kinds of coherence; for instance, to make sure that NPCs appearing in their level would look, behave and speak in the same way as the same character appearing in another level later or earlier in the game.

A closer look at one of the levels will give some idea of the design processes involved, and how the two students who made this level have considered ludic and representational elements in their section of the game.

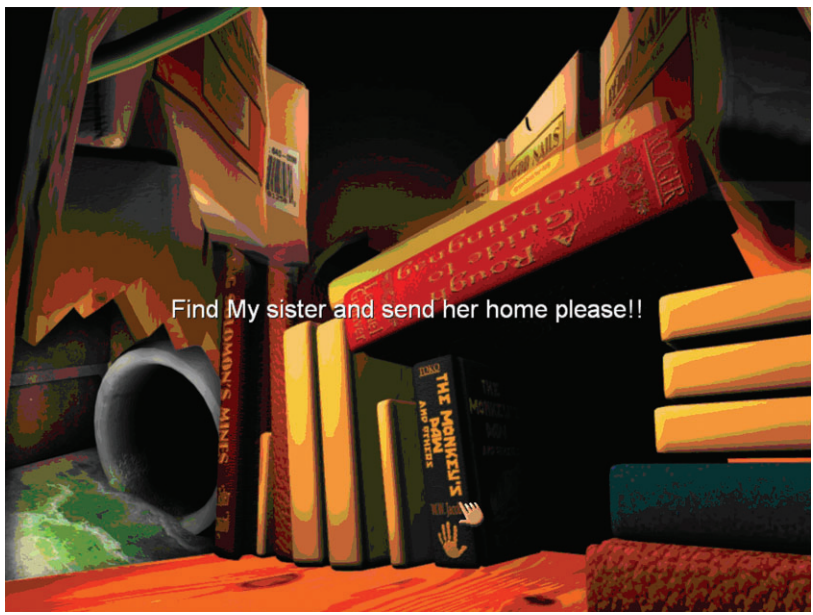

Figure 2. *The mission pop-up in Sara and Louise's level of Jimmy DeMora.*

Figure 2 is taken from level 8, which was made by two girls, Sara and Louise. Here the player, as Jimmy DeMora, has to rescue his sister who is held captive by the evil corporation. The image shows a pop-up inserted by the girls at the beginning of the level: to specify the mission for the level,

they instruct the player to "Find my sister and send her home please!" This simple instruction embodies both representational and ludic design: it continues the narrative events, characters, unresolved conflicts and episodic trajectory, while also issuing a ludic imperative which provides the challenge for the level. Interestingly, there is an error of person: the structure of the whole class plan would produce "Find *your* sister." Sara and Louise seem to be imagining that the protagonist is an invisible presence in the game; while the player, by implication, becomes something more like the helper character of Propp's typology. These distinctions, however, are obviously not clear to the girls – this is an aspect of narrative they are addressing through production but not yet conceptualising clearly.

Figure 3 shows the design of their gameworld. This is the designer interface of the software, in which the large panel with the grid is the *tile editor*, a generic feature of game design software (the *Timesplitters 2* level editor has a similar feature, as does the inexpensive commercial package *3-D Gamemaker*).

Figure 3. Sara and Louise's gameworld design.

On the tile editor can be seen a large area of rock and two lakes, which is the chamber where the game starts. From this leads a corridor below, end-

ing in a chamber where various resources can be found, but which is otherwise a dead-end. Above, another two corridors join up to form a simple maze which eventually leads to a large sci-fi styled chamber, where the player meets various enemies, and from there to another corridor ending in a prison cell where the sister is found, ending the level.

The parallel and connected trajectories of game and narrative are very clear here. The player has to find the sister, and she appears as a character in the narrative world, appropriately imprisoned in a small cell. The journey to find her involves repeated combat with enemy stormtroopers and the exploration of confusing, alien spaces such as sewage conduits, alien laboratories and cells. This sequence has all the elements we could reasonably expect of a brief narrative sequence: conflict, resolution, and three Proppian character types – protagonist (and possibly helper), antagonist and princess.

Meanwhile, the ludic elements include mission, challenge, reward, and clearly-defined win-lose states. There are three of these: the player can lose by not finding the sister (one door is programmed to close irretrievably if the player makes the wrong move); by being killed by an enemy stormtrooper; or by running out of time. Economies are clearly designed into the game. The player can find enough ammunition at the beginning of the game to kill two or three stormtroopers, but then needs to find the various refills distributed through the gameworld, which are guarded by more stormtroopers. The time is set at five minutes, and is therefore very tight - although this can be boosted by successful entry to one of the chambers.

To examine how the girls managed the idea of rule, we will look more closely at one rule they have constructed. Figure 4 shows the designer's perspective on the start chamber.

At the bottom of the screen can be seen the *rule editor*. This is a function the research and design team built into the software to make the process of rule design explicit and transparent. It involves creating the conditions for events in the game by selecting an event, the action that will trigger it, and the activator that will set off the trigger. In terms of game literacy, this involves learning how to create a *rule*, a fundamental component of the principle of conditionality in game design, and also a basic element of high-level programming.

Here, Sara and Louise want to provide the player with ammunition for the gun which is lying elsewhere in the chamber (concealed behind a treasure chest). However, they want to make it difficult for the player to get the ammo, so they have placed it in the lake (it can just be seen below the foliage). In order to obtain it, the player has to manoeuvre themselves to the edge of the rock without falling over – once in the lake, it is impossible to

climb out. This is difficult, but achievable with practice. However, the girls have made life even more difficult. To the left of the image can be seen a transparent shape, in front of a barred door, behind which is an enemy stormtrooper. The shape is a trigger volume – a defined space which is invisible to the player, but which will trigger events if entered. The rule the girls have created, which is in the rule editor at the bottom of the screen, is: *If Player / enters Cylinder Trigger 11 / Female Stormtrooper seeks and destroys Player.*

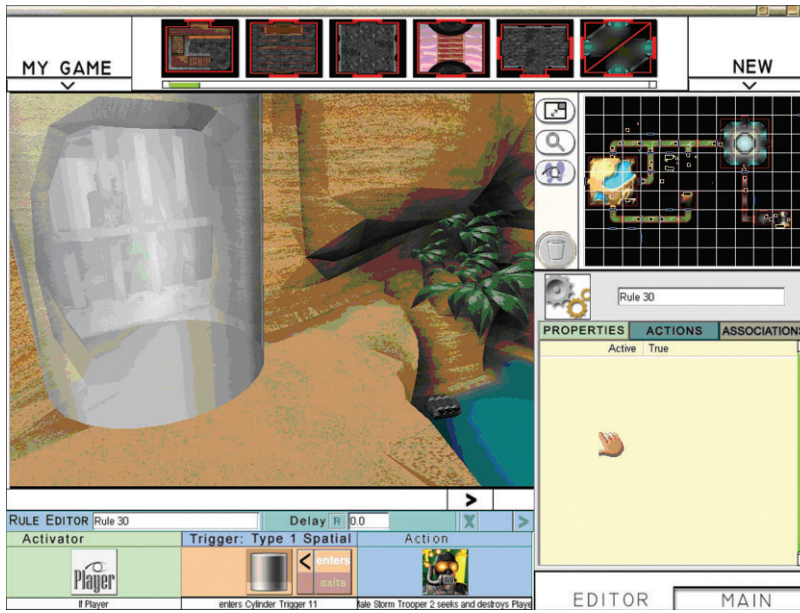

Figure 4. Sara and Louise's rule design.

This example shows that rules have two dimensions: a programmed rule, aspects of which the player will be ignorant (in this case, the trigger volume), but which operate the machinery, so to speak; and a rule determining conditional action on the game from the player's point of view. In this case, this is realised by the player as something like, "If I get too close to the stormtrooper, she will shoot me." This functions as a ludic rule, in the same kind of way as placing a pawn in the wrong square will result in it being taken by a knight in chess. However, it also makes narrative sense – if the protagonist arouses the suspicions of the enemy guards, they will open fire.

The design of this small sequence gives a good idea of at least part of what we mean by the creative aspect of game literacy. In one sense, this

level is entirely original – it is a new creation. In another sense, however, it involves the use of what Vygotsky (1978) calls semiotic tools and cultural resources. Here, these can be seen in three ways: the assets provided by the software (the game-world, characters and rule-editor); the resources devised by the class (another student had invented the Jimmy DeMora character); and the concepts applied in the design, in this case narrative functions and rule, learned in earlier lessons.

However, there is more going on here. The design reveals a sophisticated sense of how a challenge can be constructed in a game – how a careful articulation of the 3-D environment, the pick-up object and the programmed trigger creates a difficult and interesting ludic experience for the player. This can involve cautiously approaching the verge, the experience of teetering dangerously on the edge, the shock of coming under fire by accidentally triggering the stormtrooper, and the need to rehearse and repeat the manoeuvres several times in order to succeed. In short, this sequence has all the elements of a miniature game within it: a mission, obstacles, a reward and a defined win-lose state. However, it also creates, within the orderly deployment of rule-systems and programmed logic, an affective experience for the player which is fundamental to the complexity of play. In Caillois' schema, the rule-governed nature of *ludus* can be used to describe some aspects of Sara and Louise's level; but the more fluid, chaotic nature of his *paidea* is also appropriate for the complex set of events they have designed. Even more specifically, the dangerous vertiginous experience of play he called *Ilinx* is created by the juxtaposition of the enemy and the cliff-edge. In short, they have designed not only an effective game, but a wider experience of play.

Thus, creativity here means more than using received templates, procedures and resources. It involves the critical feature of transformation, which for Vygotsky (1931/1998) is a defining element of creativity. It involves the memory of earlier experiences of games and the creative combination of different resources to provide a rich realisation of the principle of ludic conditionality on the one hand, and narrative suspense on the other. According to Vygotsky, the imaginative activity of young children can transform physical resources into fictional entities through acts of symbolic substitution; but creativity is only fully realised when children combine such imaginative acts with conceptual thinking. In the case of Sara and Louise's level, we can argue that concepts of narrative and game, and specifically of rule and economy, have combined with the imaginative transformation of space and dramatic movement to create a new player experience in their game. In addition, we can see how such work is informed by their own experiences of games and gaming cultures.

CONCLUSION: GAME LITERACY AND EDUCATIONAL PRACTICE

Our aim in this article has not been to offer a definitive theory of game literacy: to do so would be, to say the least, premature. However, we have tried to offer some account of what we believe a theory of game literacy might entail, and the kinds of functions it might be expected to serve. To sum up: we have argued for a theory that addresses both the representational and the ludic dimensions of games; that incorporates a critical as well as a functional dimension; that addresses the textual dimensions of games, while also recognising the social contexts and social processes through which literacy is manifested and developed; and that entails a focus on the creative writing dimensions as well as on reading or consumption.

But do we really need such a theory – and if so, why? Our answer is a tentative "yes." As we hope to have shown, game literacy has some potential, not simply as a fashionable metaphor but also as a means of provoking a more sustained discussion of games and gaming culture, and how they are to be studied. Polemically, it might help to draw attention to aspects of games that need to be addressed more carefully. In this respect, it is worth noting specific implications of our project for the policy domain, and for research practices. In respect of the first, some of the project dissemination has targeted key players in UK educational policy, and the government's Department for Education and Skills (DfES), the Qualifications and Curriculum Agency, and the British Educational Communications Technology Agency have been represented on the advisory committee. The DfES has been strongly supportive, funding a stand at the Los Angeles E3 exhibition. In respect of the second, our research suggests the value of combining social semiotic approaches to how young people make meaning with media authoring tools with cultural studies perspectives exploring the cultural experiences and practices which inform such creative work. The methodological questions raised here are presented in a forthcoming handbook of research in new literacies (Burn, 2007b).

Practically, game-literacy might also provide a useful basis for educational initiatives in this field. For example, the software produced by the project, and, importantly, the accompanying pedagogic framework based on the notion of game-literacy presented in this article, is being used by over 100 early-adopter educational sites, even before the full commercial release of the software. The variety of curriculum contexts – media, English, art, ICT – suggests how such subjects might expand their notions of creative work, cultural context, and methods of assessment to accommodate game-literacy. Apart from anything else, it demonstrates that games are a signifi-

cant part of children's cultural capital, and a potential expressive form which they can develop in the classroom. For many schools, however, this remains invisible, in Bourdieu's sense that to see (voir) one has to know (savoir): "a work of art has meaning only for someone who possesses the cultural competence, that is, the code into which it is encoded" (1984, p. 2). By contrast, we would argue that the forms of expertise and critical understanding displayed by many of these young game designers represent exactly the kind of cultural competence that should be more extensively valued and developed within education.

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Notes

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