

'WRITING' COMPUTER GAMES: GAME LITERACY AND NEW-OLD NARRATIVES

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Abstract. This article presents a case study of the authoring of computer games by two secondary school pupils (a girl and a boy) in an English comprehensive school. The students' work is analysed as examples of multimodal literacy, in which both narrative and ludic aspects of their games are taken into account. The analysis is set in the context of recent debates about media literacy, proposing that game-literacy can be seen as a subset of media literacy; and that full realisation of it will involve game design as well as game-play. The final section of the article considers a written proposal by a 12 year-old boy for a game based on *The Odyssey*, concluding that the conceptual apparatus of game-design offers new ways to approach narrative in schools.

Keywords: Computer Games, Digital Authoring, Literacy, Media, Multimodality.

Chinese

[Translated by Shek Kam Tse]

題目:「寫作」電腦遊戲:遊戲中的讀寫能力與新舊敘說體裁

摘要: 這篇文章闡述由兩間(女生和男生)的綜合英語學校,所編寫的電腦遊戲作為案例。學生在家課裏,遊戲中的敘說和一些有趣的部份,也會被視為多媒體中的讀寫能力中的分析的一部份。這分析是基於近期廣為討論的媒體讀寫能力,遊戲的讀寫能力則只視為傳媒讀寫能力的一小部份。若要完全實現這方面,則需要包含遊戲設計與遊戲玩法。文末提到,一名十二歲男孩取材自「長期飄泊之旅」(*The Odyssey*)的建議書為遊戲的文本,總結出具體的遊戲設計概念,為新的敘說提供新的方向。

關鍵詞: 電腦遊戲、電子編寫、讀寫能力、媒體、多媒體語言

Dutch

Samenvatting [Translated by Tanja Janssen]

In dit artikel wordt een case studie gepresenteerd over twee leerlingen uit het voortgezet onderwijs (een meisje en een jongen) die computergames ontwerpen. Het werk van deze leerlingen wordt geanalyseerd als voorbeelden van multimodale geletterdheid, waarbij aandacht wordt besteed aan zowel de narratieve als de spelaspecten van hun games. De analyse vindt plaats tegen de achtergrond van recente discussies over mediageletterdheid, waarin gesteld is dat gamegeletterdheid een vorm van mediageletterdheid is, en dat deze zowel het ontwerpen als het spelen van games omvat. In het laatste deel van het artikel wordt een voorstel van een 12-jarige jongen gepresenteerd voor een game gebaseerd op de Odysseus. Geconcludeerd wordt dat het conceptuele medium van gamedesign nieuwe wegen biedt om verhalen op school te benaderen.

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Burn, A. (2007). 'Writing' computer games: Game literacy and new-old narratives.

L1 – Educational Studies in Language and Literature, 7(4), p. 45-67.

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French

Résumé [Translated by Laurence Pasa]

Cet article présente une étude de cas de deux collégiens (une fille et un garçon) dans un établissement secondaire polyvalent anglais, devant créer des jeux vidéo. Le travail des élèves est considéré comme un exemple d'une pratique de littéracie multimodale, dans laquelle des aspects à la fois narratifs et ludiques sont analysés. L'étude prend place dans le contexte des récents débats sur la littéracie numérique, dont les jeux seraient un sous-ensemble, impliquant la science (ou l'art) de la création et de l'interaction. La section finale de l'article examine une proposition de jeu basé sur l'Odyssee écrite par un garçon de 12 ans et conclue que les instruments conceptuels à l'œuvre dans la conception des jeux offrent de nouvelles manières d'aborder le récit à l'école.

Mots-clés : Jeux vidéo, Auteur de supports numériques, Littéracie, Multimodalité.

German

Zusammenfassung [Translated by Irene Pieper]

Dieser Artikel stellt eine Fallstudie dar: Eine Schülerin und ein Schüler in der Secondary einer English comprehensive school haben Computerspiele geschrieben. Die Arbeiten der Schüler werden als Beispiel multimodaler Literalität untersucht. Sowohl narrative als auch spielbezogene Aspekte werden berücksichtigt. Die Analyse steht in Beziehung zu Debatten im Bereich der Medien-Literalität und argumentiert, dass die Spiel-Literalität als ein Subset der Medien-Literalität betrachtet werden kann. Volle Realisation schließt Spiel-Design und Spiel ein. Im letzten Teil wird ein Exposé des 12-jährigen Jungen für ein Spiel, basierend auf *Die Odyssee*, betrachtet. Es wird argumentiert, dass die Konzeptualisierung von Spiel-Design neue Wege für die schulische Arbeit im Bereich des Narrativen eröffnet.

Greek

Metafrase [Translated by Panatoya Papoulia Tzelepi]

Το άρθρο αυτό παρουσιάζει μια μελέτη περίπτωσης συγγραφής παιχνιδιού για ηλεκτρονικό υπολογιστή από δύο μαθητές μέσης εκπαίδευσης (ένα αγόρι και ένα κορίτσι) ενός Αγγλικού σχολείου. Η εργασία των μαθητών αναλύεται ως παράδειγμα πολυτροπικού γραμματισμού, εις το οποίο και η αφήγηση και η «παιγνιώδης» όψη του παιχνιδιού τους λαμβάνονται υπόψη. Η ανάλυση τοποθετείται στο πλαίσιο της πρόσφατης διαμάχης σχετικά με το γραμματισμό για τα ΜΜΕ, προτείνοντας ότι ο γραμματισμός για τα παιχνίδια με τον υπολογιστή (game literacy) μπορεί να θεωρηθεί ως υποσύνολο του γραμματισμού με τα ΜΜΕ, και ότι η πλήρης υλοποίησή του θα συμπεριλάβει σχεδιασμό παιχνιδιού τόσο όσο και το παίξιμο των παιχνιδιών. Το τελικό μέρος του άρθρου παρουσιάζει μια γραπτή πρόταση ενός δωδεκάχρονου αγοριού για ένα παιχνίδι βασισμένο στην Οδύσσεια, συμπεριλαμβάνοντας ότι η γνωσιακή σκευή του σχεδιασμού παιχνιδιού για ηλ. υπολογιστή προσφέρει νέους τρόπους προσέγγισης της αφήγησης στο σχολείο.

Polish

Streszczenie Translated by Elżbieta Awramiuk]

Niniejszy artykuł przedstawia studium przypadku autorskiego opracowania gier komputerowych przez dwoje uczniów (dziewczynkę i chłopca) w angielskiej państwowej szkole średniej. Praca uczniów jest analizowana jako przykład multimodalnej umiejętności czytania i pisania, w której pod uwagę brane są zarówno narracyjne, jak i ludyczne aspekty gier. Analiza prowadzona jest w kontekście ostatnich debat nad medialną piśmiennością, proponujących spojrzenie na umiejętności dotyczące gier (obejmujące nie tylko granie w gry, ale i ich projektowanie) jako na podzbiór umiejętności dotyczących mediów. W końcowej części artykułu omawiamy pisemną propozycję dwunastoletniego chłopca gry opartej na *Odyssei*, podsumowując, że aparat pojęciowy projektowania gier oferuje nowe drogi podejścia do narracji w szkołach.

Słowa-klucze: gry komputerowe, cyfrowe opracowanie autorskie, umiejętność czytania i pisania, media, multimodalność

Portuguese

Resumo [Translated by Paulo Feytor Pinto]

Este artigo apresenta um estudo de caso sobre a produção de jogos de computador por dois alunos do ensino secundário (uma rapariga e um rapaz) de uma escola inglesa. O trabalho dos alunos é analisado como exemplos de literacia multimodal em que foram tidos em conta aspectos lúdicos e narrativos dos

seus jogos. A análise enquadra-se nos recentes debates sobre literacia multimédia, propondo que a “literacia dos jogos” pode ser encarada como um subsector da literacia multimédia e que o seu desenvolvimento implica tanto a concepção do jogo como a sua utilização. A parte final do artigo refere-se à proposta, escrita por um rapaz de 12 anos, de um jogo baseado n’ *A Odisseia*, concluindo que o aparato conceptual de produção de um jogo possibilita novas abordagens da narrativa na escola.

Palavras-chave: jogos de computador, autoria digital, literacia, multimédia, multimodalidade.

1. INTRODUCTION

The idea of writing is taken for granted as one side of the literacy coin in English and literacy curricula, classrooms and research, of which the obverse, inseparable, complementary, somehow made of the same metal, is reading. In the world of media education, things are not so simple. For historical reasons, ‘media literacy’ has been heavily weighted towards ‘reading’, variously constructed as practices of consumption, interpretation, analysis, critique and (more rarely) appreciation. The first influential motive for ‘reading’ the media in these senses in classrooms came from Leavis and Thompson’s (1933) proposal to English teachers that they should arm children against the depredations of the mass media with the weapons of critical analysis.

The development of media education since those days of ‘inoculation’ against ill effects has seen the growth of a consensus, albeit unevenly distributed across the Anglophone world (and differently again across Europe), around a more positive model, which recognises, especially in the wake of the Cultural Studies tradition, the value of popular media, and the need to explore them both critically and appreciatively (Buckingham & Domaille, 2003). Along with this has come the development of a critical apparatus of conceptual tools on which learners can hang understandings of media institutions, texts and audiences.

However, to return to the central focus of this article and special issue of this journal, this growing consensus has also increasingly emphasised the importance of the production of media texts by young people. In a simple sense, this is an obvious logical step towards a complete idea of media literacy: ‘reading’ media texts needs to be complemented by ‘writing’ media texts. Needless to say, in practice and in research, things have been a bit more complicated. The rationales for media production have certainly included the idea that production is another way for learners to grasp the key concepts; but there have also been other rationales: media production as expressive, aesthetic work; as identity work; as a challenge to dominant ideologies; and as a form of pre-vocational training (Buckingham, Grahame & Sefton-Green, 1995). At the same time, the nature of the key concepts changes or becomes differently specific when children make their own media texts: do they learn about media industries by simulating studio production? What do they learn about the ‘grammars’ of comicstrip, film or computer game by making their own? How do they understand ‘audience’ differently by addressing real or imagined audiences? The other important element in this growing and complex field is, of course, the arrival of new media. The long debate about media literacy has, in this context, become implicated in the debates about multiliteracies, multimodal literacies, and digital literacies.

This article will explore three texts by secondary school students in the UK in order to steer a way through some of these complexities. However, it will also add its own questions. One question that dogs the media literacy debate is to what extent it is useful to construct ‘sub’ literacies related to specific media: television literacy (Buckingham, 1993); cine-literacy (FEWG, 1999); moving image literacy (Burn & Leach, 2003). Such sub-divisions, while running the risk of clouding the picture, do at least allow more specific notions of the formal properties, signifying structures, semiotic affordances and cultural milieux of specific media; though it is necessary also to pay attention to cross-media practices, understandings, and technologies (Mackey, 2002; Burn, 2005).

In this spirit, then, this article will propose a notion of ‘game-literacy’, involving both the ‘reading’ and the ‘writing’ of computer games by school students; though the emphasis, for the purpose of this special issue, will be on the latter.

2. STUDENTS’ GAMES

The analysis here derives from a three-year research project, ‘Making Games’ (2002-6), funded by the PACCIT-Link programme in the UK. PACCIT (people at the centre of computers and information technology) brings together researchers and IT industries to develop prototypes of products built around the needs of specified user-groups. ‘Making Games’ is a partnership between the Centre for the Study of Children, Youth & Media at the Institute of Education, London University, and Immersive Education Ltd, an educational software developer in Oxford. The research is funded by the Economic and Social Research Council; the development is funded by the Department of Trade and Industry.

The aim of the project was to develop a games authoring software for use in education. The rationale was based in the premise and practice in media education referred to above: media literacy needs to be defined as the ability to both ‘read’ and ‘write’ media texts. While such combinations of analysis and production are now relatively easy to achieve in digital video editing, web-authoring, radio production of music composition and editing, games have remained elusive, and at the time the project began, there were no examples that we knew of which showed students actually making computer games within a model of media education.

The project has largely consisted of development work by Immersive Education, related theoretical work by the researchers, and fieldwork based on the use of successive iterations of the software. These have mainly been in two secondary schools: one in Lambeth, London; and one in Cambridge. Altogether, approximately 100 students were involved, from two different contexts: the one in Lambeth, an economically-deprived area, and a school with an all-girl intake, mostly Black African-Caribbean; the one in London, mostly white middle-class. Samples of students were interviewed in both schools in focus groups of between 4 and 6, using semi-structured approaches with questions derived from previous research in games, gaming cultures and game design. Other data included observation of children playing and designing, videoed observation of lessons and game design sessions, students’ writing for homework, and the games themselves.

This article will analyse two games made by students at the Cambridge school, along with a written proposal for a game by another student from the same school.

The analysis of these texts will be based in a model of media literacy (Buckingham, 2003), in a social semiotic theory of multimodality (Kress & van Leeuwen, 2001), and in models of literacy and new technologies applied in previous research to children, games and literacy classrooms (Beavis, 2001). It will also draw on recent developments in game studies. Because many computer game genres are narrative-based, a debate which has been vigorously exercised (but never quite resolved) is the ‘narratology-ludology’ debate, between approaches which adapt narrative theories to analyse games, and others which argue that narrative is incidental and dispensable, and that ludic structures are the criterial elements of games.

Our argument has been, at least in the many game genres which are narrative-based, including our own authoring software, that we need to theorise game and narrative together, attendant to their separate properties, but also to how they fuse and integrate (Carr, Buckingham, Burn, & Schott, 2006). In this respect, we are close to specialists in the field of game-studies like Gonzalo Frasca (1999), who argues that the structures of game and narrative have many similarities, and are often closely implicated, but are absolutely not identical. This leads us to explore how the students in our project designed games using this software, but also designed narratives. Both game and narrative elements can be seen in terms of the metafunctions of systemic-functional linguistics (Halliday, 1985), variously adapted in social semiotic theory by Kress & van Leeuwen (1996), Lemke (2002) and Burn & Parker (2005). I will mix between these versions, adopting the categories of a representational function, an interpersonal function, and an organisational function. The first represents the world or an idea of it; the second constructs relations between participants in the act of communication; the third constructs texts out of these representations and communications, by organising them into coherent wholes. The students’ games, then, will be considered in terms of their constructions of game and narrative; and the social semiotic metafunctions will be referred to where they are relevant.

The purpose of the analysis, in this case, is to work towards a detailed notion of some aspects of game-literacy, seen as a subset of media literacy. These aspects will include the cultural provenance of the students’ game designs in their own experiences of the media; the semiotic and specifically grammatical features of the designs; the conceptual frameworks within which their explicit understandings of their designs develop; and the multimodal work, including writing, which surrounds the process of making games.

In the context of the present journal, it will be important to think of how game-literacy relates to print literacy, and specifically how game design relates to writing. These relations will be raised throughout the article, but may be briefly anticipated here. The argument will be that game design:

- has a grammar, which can usefully be seen in relation to the grammars of other semiotic systems, including both language and visual design; and these systems can all be approached through general semiotic principles of the kind derived by social semiotics from systemic-functional linguistics;

- develops conceptual awareness of narrative, as well as providing new opportunities for the production of narrative; and such processes will both consolidate old understandings of narrative encountered by children (and teachers), and challenge them;
- involves writing in a literal sense, as part of the design process, as an integral element of games, and as forms of interpretive writing of the kind performed by game fans.

3. ELEANOR'S GAME

The context in which Eleanor's game was made is a series of media studies lessons over six weeks in the summer of 2005, with a Year 8 mixed ability group (12-13 years of age). The class teacher was James Durran, an Advanced Skills Teacher in the Cambridge school, Parkside Community College, and a partner in the project. The lessons were co-taught by James and myself. The research was conducted by the project manager, Caroline Pelletier, myself, and David Buckingham.

Eleanor's game is a simple two-chamber game (the software allows the construction of gameworlds of as many chambers as will fit into the tile-editor, which can be seen at the top right of the screen in Figure 1). The two-chamber game was intended as an introduction to the software and to principles of game design: while constraining the length and complexity of the game, it allowed the students to build an environment, set a mission for the player, program rules which would determine events, and produce a simple narrative.

Her game is based around a simple narrative, which she was asked to produce as a written proposal:

The story in our game is that Rose Tyler has landed inside a spaceship. She is in a room containing a still robot, a blue gem, and three identical levers. The one door out of the room is closed, and when she tries to open it it stays closed. Rose goes to the gem, it says 'one of these levers will open the door, the others will give you a little extra time before your oxygen runs out.' She tries each lever in turn opening the door. The robot is still there though. She goes over to it and it speaks. 'You must follow me and save the crew of this ship.' Rose follows as it heads through the door and into another room. The robot stops and the door closes behind them. The robot speaks again. 'I have run out of energy bring me four correct batteries and I can save the crew but beware there are 10 batteries not all are mine. You must be quick oxygen levels are low.' Rose tries every battery and finally, just before the oxygen runs out, she has all four. She has completed her mission and the robot can save the crew.

Rose Tyler is the female companion of Doctor Who in the new BBC series of 2005. The students have been asked to make a Doctor Who story; though Eleanor has made the decision to have Rose as the player-character. At this point, three aspects of our tentative model of game-literacy can be indicated.

Firstly, it concurs with both popular understandings and earlier academic formulations that literacy is a form of *cultural* competence. In media literacy debates, the emphasis here is on how young people draw on their experience of popular culture to make sense of new media texts they encounter or make. In this case, then, Eleanor's experience of Doctor Who provides possible protagonists and story structure.

Secondly, it demands that these thirteen-year-olds find a solution, at their own level, of the academic debate about narrative and game. This will involve *conceptual understandings* of both game (as a rule-based system) and narrative (at least in terms of character and plot); and so this model of game-literacy will integrate with existing conceptual frameworks of media education, under the general expectation that students will learn about the languages, codes and conventions of media texts. However, while understandings of narrative will be a familiar category in media education, understandings of game structures will not be.

Thirdly, as Eleanor translates her proposal into an actual game using the software, she quite quickly begins to develop an *operational* literacy: an ability to manipulate the compositional and editorial features of the authoring package.

The students in this course have explored narrative and game - as well as certain specific features of game design; in particular, rules and economies - which will be discussed in detail later in this article. For the moment, it is worth observing that Eleanor's story, while it is slight and undeveloped, fits both a computer adventure game and Doctor Who extremely well. Games need puzzles to be solved, rules to be followed, interlocking environments to be explored, 'technological' fixes to quantified problems, resources to be managed, missions to be accomplished, lives to be saved. And these are exactly the qualities that also make a good Doctor Who narrative.

There are good reasons for this, which will be developed further below. For the moment, it is enough to say that games enact certain kinds of narratives well, in particular those which feature action, which have quest-like structures, which have their own kind of rule-systems that more or less determine generically what can or cannot happen and how.

So, Eleanor's simple narrative emphasises the principal function of Doctor Who's assistant (to save lives); and the function of the robot, as a helper. These are both basic character functions of the kind specified in Propp's typology of folktale characters (1928/1968). Further, Eleanor's game develops a narrative tension through a time constraint. It specifies particular rules: only one lever will open the door; only the four correct batteries will power the robot. The key thing is that these features are also ludic, or gamelike, features: what makes a good formulaic narrative of this kind also makes a good game.

The narrative in Eleanor's written proposal can be seen in terms mainly of the representational metafunction of language. It represents a series of transitive sequences: a sequence of actions performed by the protagonist in the third person, upon the objects found in the narrative space. When she translates this into her game design, however, she is doing something different. The actions performed by Rose are all allocated to the player, and thus become subject to a degree of player choice, and to player manipulation of the PC keyboard and mouse controls. Actions represented in Eleanor's written proposal as the finite verbs "tries", "goes", and "follows", for instance, become, technically, *clicks* and *presses up arrow*, for the player. In this respect, then, what was part of the representational system of the written narrative has now become part of the interpersonal system: actions offered by the game to the player. This dimension of the game is associated with the interpersonal func-

tion also proposed by Caroline Pelletier (Pelletier, 2005), who uses the term *transactive* of such sequences, to distinguish them from the purely representational function of conventional narrative sequences. This fusion of representational and interpersonal functions can serve as a semiotic definition of interactivity. However, while the player's actions are confined to a finite set of keyboard moves, they are connected with the representational system of the game, in particular its 3-D visual design, so that these actions are experienced by the player as a much wider variety of actions within the narrative.

This game uses the software in its second iteration (it has now reached a third and nearly final version, in which characters can also be created). It can be used to make environments, to place objects, and to program 'rules'. Figure 1 shows the design interface as it appears with Eleanor's game. At the top right, the tile-editor shows how chambers, selected from a large library of different genres (sci-fi, Egyptian, Victorian, Mini-world) can be placed and connected through interlocking doorways. The large panel shows the chamber in which the game-designer is currently working (in this case, the second chamber of Eleanor's game). The three-section panel at the bottom shows the Rule-Editor. This is a unique feature of this software, and represents the level at which, in this project, we decided to construct the ability of the designer to program. The rule-editor determines how events in the game will happen, in a system of conditionality. In this case, the desired event is that the robot moves forward. The trigger for this action is that the player clicks on an object. The object clicked is specified in the Rule as the robot. So the programmed rule reads as an 'if' clause: 'If Robot 1 is clicked Robot 1 [moves] forward'.



Figure 1: Design interface of Eleanor's game.

What the rule-editor is intended to do is, firstly, to give the young designers control over at least some of the programmed elements of the game they are making; and the ability to use it correctly and effectively can be seen as part of the *operational* aspect of literacy (Durrant & Green, 2000), in which the writer is gaining fluency in the use of the design tools. However, the rule-editor is also intended to model an important concept in game design: the notion of rule. Rules were explicitly drawn to the attention of the class in a previous lesson, through a class discussion of what rules meant generally in society, and then what they meant particularly in games. This discussion then led into a demonstration of the rule-editor, followed by the students working in pairs to practise it on desktop computers. Finally, they were asked to produce a piece of writing for homework explaining what they understood by the idea of 'rule'.

In general, the idea of 'rule' was understood by the students in terms of game rules, or rules apparent to the player. So Jack, for instance, listed:

- call of duty: you must not shoot your ally
- tennis: the ball must not 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.

In social semiotic terms, it is clear from the language here that rules operate as part of the interpersonal metafunction, and that they are demand acts, framed as second-person imperatives. They register, in this way, one of the characteristic features of games which distinguishes game narratives from literary or filmic narratives, whose mode is typically (perhaps exclusively) indicative, as the narratologist Gerard Genette argues (1980). Narratives usually make statements; in games, however, they also ask you questions and tell you to do things.

This kind of game-rule is compared by Frasca (1999) with narrative rules. Frasca points out that narrative systems can be seen as offering structured potential sequences which look very similar to those of games. However, he points out that the similarity is at a different level: potential sequences in narrative exist above (or previous to) any actual realized narrative; whereas an actual, realized game preserves the potential sequences for the player to decide upon. So, in Eleanor's game, the narrative choice of characters and setting is already made, whereas the ludic events to do with puzzle-solving are held as potential structures for the player to realise.

Social semiotics would also seek explanations of the social motivation of any semiotic act. In the same piece of writing, Jack addresses this issue:

The reason games have to have rules is because if there wasn't rules in a game, you couldn't have any challenges or boundaries, limits etc, and that would spoil the fun and cause you do not to have anything to complete. ... People enjoy following rules because it creates suspense of trying not to lose the game by breaking the rule, and people like difficult challenges.

The notion of constraint related to pleasures of play here can be related to theories of rule-governed, structured play, such as Frasca's use (1999) of Caillois' notion of *ludus* (1979), where a strict rule-system is structurally associated with victory or defeat, as in Jack's definition; and as distinct from Caillois' *paidea*, in which less defined rules operate to define pleasurable play not necessarily orientated towards an outcome of quantified gain or loss.

The other key concept in game design which the software makes explicit, and which we built into the course, is the idea of economies: quantified resources allocated by the designer, and managed by the player. Again, the idea was introduced through class discussion, modelled in the software, practised by the students, and consolidated in a piece of written homework. Economies the designer can incorporate into the game include time, health, weight, strength and hunger.

Eleanor's homework explains economies like this:

Economies are things such as lives, strength and score in a game. They add to the challenge of a game, for example you might lose a game if you have no lives left so you have to think about how to get more and when to risk them. This shows that they also add to tactics because you need to think about them and what to do with them. Economies could also be to do with the aim of the game for example the aim could be to have most points at the end of the game. Sometimes economies are not connected with winning the game but might just increase the sense of achievement when you win eg you might win a game by reaching the centre of a maze and you don't need points to win but if you won and had a large amount of points it would make you feel even better. Also if you did not win the game, but before losing you had a large number of points it would lessen the disappointment [sic]. So they can be like sub-aims in a game. Economies complicate a game by adding challenges and rewards which make the game more interesting.

She goes on to give an example of a game-economy in a children's game called Skid the Squirrel (an online game in a wildlife-themed website of Children's BBC). The economy here is life and health; as Eleanor explains, "every time your health goes down to zero because you have hit prickly bushes you lose a life and start the level again".

Eleanor's game also contains economies: the levers in the first chamber either give time bonuses or reduce time, so they introduce an element of chance into the game. As she says in her homework, the economy here adds a subordinate challenge, rather than determining the win-lose state at the end of the game.

The understandings of rule and economy in these children's work are evidence of conceptual complexes informed both by their own experiences of games in general and computer games in particular, but also by classroom work which builds these experiences into generalisable abstract concepts at the same time as practising them through concrete game-design activities.

Eleanor's own game, as we have seen, has rules visible to the player: and these are the kinds of rules the children in this project have learned about, and which Frasca describes in relation to *ludus*. However, there is another kind of 'rule'. Figure 1 also shows a circular black shape between the robot and the wooden level. This is a trigger volume, placed there by Eleanor to define an active space, but invisible to the player. The programmed rule in the Rule Editor here is "If anything enters Trigger Volume, lever goes down". This whole rule is invisible to the player, who perceives this action as a consequence of the game rule: "if I click on the robot, it will move forward and press the lever". This game rule, then, is an effect of the two programmed rules: the one which makes the robot move forward, and the one which makes the lever go down. A third programmed rule combines with these two to complete the series of actions which appear to the player all to be effects caused by clicking the robot: "if the lever is in a down state, the sack of coal becomes active". The sack of coal is the final goal of the game: it will re-power the spaceship.

Conceptually, then, the rules of the game are distinct from the programming logic which underlies them. Programming, even at this simple level, is a logical, rule-governed system, here expressed as a conditional proposition. Game rules are also logical and conditional. This difficult relationship between the apparent effect in the game and the logic system performing the magic beneath can be seen as an example of a general meeting of the functions of the computer with older cultural forms. Lev Manovich described these as the 'cultural layer' and the 'computer layer' (2001). His model of the meeting of the two raises the question of how computer scientists need to learn about the representational texts which their machines are now producing; while those of us whose expertise lies in representation and culture need to find new ways to think about how our texts have changed now that they are computable. In the context of the media and literacy classrooms we are describing here, this question becomes, "How do we help children to understand the relationship between a computer and a game (or indeed a digitally-edited video or word-processed essay)?" This is a question which the present research project has yet to address.

In the next example, the analysis will look more closely at aspects of the game and narrative grammars. In the case of the organisational functions of Eleanor's

game, it is worth briefly observing that the ludic aspects of the game display a particular kind of cohesion (in terms of the organisational metafunction): each cluster of ludic events is related to its neighbour either by conjunctive links (if this, then that; this and then that); or by redundancy, as in the repeated levers, which teach the player what consequences to expect, but also conceal the chance element. By contrast, the narrative coherence works by reference: so the mission given to the player at the beginning, to find the fuel for the ship, refers to the sack of coal which appears at the end. However, these references also serve a ludic purpose, in the sense that they present the challenge which motivates the player through the game.

4. OCHIRBAT'S GAME

Ochirbat was in Year 9 when he made this game (14 years old). He has been with the project since its first year, when he participated in a class on computer games co-devised by the project team and his media teacher, James Durran, even before the first iteration of the software was produced.

His game demonstrates that game-literacy is culturally situated: his design draws extensively on his own experience of games. He has told us in interviews of the games he has played, which cover many different game-genres (he refers to adventure games, horror games, online games, strategy games, platform games, first-person shooters); he has shown that he can generalise about game structures across different games (see Burn, 2005, for a discussion of his knowledge of the games of *Harry Potter* and *The Lord of the Rings*); and across different but related media (books, games and films). He has shown expertise as a player, and also as a proto-designer, able, for instance, to use the level editing provision in the game *Timesplitters 2* with fluency.¹

His game, *Maniac Maze*, was made over six weeks, in an after-school club, in the summer term of 2005. It can be seen, then, as a more developed example of game-authoring than Eleanor was able to achieve in just a couple of hours with the two-chamber introductory activity. His game is analysed below in terms of narrative and ludic design.

5. NARRATIVE 'WRITING'

The initial consideration for the students in this project was how to construct their game world, or space of play. However, this is also a narrative space², much as a child writing a story or making a video narrative might be encouraged to construct a

¹ A level editor is a form of authoring software made available within a commercial game. It enables players to design their own section of the game, using the game's own assets; and then to play this section.

² Frasca (*ibid*) makes two points in relation to the settings of games. Firstly, he suggests that settings (and characters) are among the more obvious common features of games and narratives. Secondly, he argues that in the settings of games, the potential for unstructured play (*paidea*) is greater: activities like exploring, for example, are playful and rule-governed, but not necessarily oriented towards obligatory completion and a win-lose state.

setting. The software allows students to choose from and combine chambers and corridors from a library of ‘building blocks’, and assemble them using a tile editor: a 2-D grid on which they design their game-world, which they can then view and enter in 3-D. So Ochirbat’s world on his tile editor, in plan view (Figure 2) shows that it is a complex assemblage, with a maze-like structure on the right. Though not visible in this image, it is also significant that he has chosen from different representational genres available: he built into his game a sci-fi segment, an Egyptian segment, and a Victorian segment. These spaces represent narrative potential: they are designed to be explored by the player (who is also a first person protagonist); they represent a sequence, which implies a narrative journey from a point of outset to a final destination (a mysterious locked room).



Figure 2: Design interface for Ochirbat’s game.

Ochirbat has also designed characters – which was not easy in this iteration of the software, in which visible, animated characters were not yet available.³ He has constructed an idea of a mysterious keeper of the maze, who only appears as a graphic image of a face at the beginning of the game (which Ochirbat has found and imported into the software: Figure 3), and as a voice who instructs the player through the first two levels. Ochirbat takes some care to give this character, though he only

³ The final iteration of the software, which was field-researched in 2006, does have a library of animated characters. The software is now commercially released as Missionmaker.

has rudimentary narrative properties, dramatic and affective power. The image itself is strong and mysterious; and he makes a series of statements as voice files for the character to speak when certain triggers are activated by the player. Though he improvises these himself in one version of his game, he is not satisfied with his own voice or with the hesitant improvised wording; so he scripts the words on a scrap of paper, and asks me to record them in a suitably spooky voice. The first voice file locates both player and the maze keeper: “I am your captor! This is my little maze for you to explore. For the first few rooms I am going to guide you, let you get used to your surroundings. First of all, go to the safe room to get your orders.”



Figure 3: Ochirbat's Maniac Maze-Keeper.

The game has, then, certain narrative properties. It has a protagonist positioned as captive, and an ambiguous magical controller, both antagonistic and mentor-like. It also constructs a space which is in many ways a narrative space, implying a sequence with an Aristotelian beginning, middle and end. The beginning is technically defined: the authoring software allows the designer to determine where the player will start. The end point is defined by the solution of a complex puzzle, by a dead-end in the spatial design, and by a pop-up which announces “Congratulations! You have won!”

At this point, readers might justifiably be asking what kind of narrative this is – it sounds much more like a game than a story. And this is true, in a general sense,

and also in more specific ways. From a general point of view, Ochirbat's 'game-literacy' could be said to be weighted heavily towards the ludic aspects of games rather than the narrative. In previous interviews, he has shown interest in properties of games such as weapons, boss enemies, level structures, and game logic. More specifically, we could look at the coherence of the narrative elements of his game. In certain ways, these could be further developed: the captor character, for instance, is developed through the first two levels by repeated use of voice cues for the player; but is absent from the last level. Similarly, while the player character is introduced as a protagonist with no memory, the implied promise to reveal a hidden backstory or narrative motivation is never fulfilled. This kind of promise is familiar in adventure and role-playing games: in the roleplaying game *Planescape Torment*, for instance, the player assumes the role of a nameless character whose quest is in part a search for identity. Similarly, in the massively popular Japanese roleplaying game *Final Fantasy 7*, the player-character's past history is revealed through a series of flashbacks that appear throughout the game.

Arguably, Ochirbat's interest, then, is less in telling a story than in making a game. However, another point relevant to the literacy and literature curricula is to observe that the ostensibly clear distinction between game and story is by no means as straightforward as it may seem. In particular, some stories are game-like; and as such particularly suitable for adaptation into games. Marie-Laure Ryan makes the point about game-like narratives in the inaugural issue of the academic journal *Game Studies* (Ryan, 2001). She proposes that games are 'a matter of exploring a world, solving problems, performing actions, competing against enemies, and above all dealing with interesting objects in a concrete environment'. The kind of characters she suggests are at home in this kind of narrative are Alice, Sherlock Holmes, Harry Potter and the heroes of fairytale rather than Emma Bovary, Oedipus or Hamlet. Within this kind of emphasis, Ochirbat's game is more narratively rich than might at first appear. While there is no kind of psychological development, there is problem-solving, exploration and competition in a mysterious, fantastic world which mixes familiar narrative genre elements: the kind of experience that Alice or Harry Potter might feel quite at home in. Furthermore, a fundamental and explicit feature of Ochirbat's design is the maze: a figure in which game and narrative often fuse, from Daedalus's Minoan labyrinth to the icy maze at the climax of Kubrick's *The Shining*, in which Shelley Duvall and Jack Nicholson enact their final confrontation.

6. LUDIC 'WRITING'

If the narrative coherence of Ochirbat's game can be said to be relatively weak, its ludic coherence and cohesion is high. The player has to navigate through a training level, learn how to 'kill' white robots with a knife found in a safe, manage health levels by recharging from a health pack picked up in the first level, complete a mission by finding three objects, negotiating a maze, and opening a locked room by placing the three objects in the correct order on a table.

This involves knowledge of a specific kind of grammar, as we have seen, involving programmed rules constructed with the software's rule editor, which underlie

game rules apparent to the player. Unlike the modality of conventional narratives, in which causality follows a pre-determined pattern, causality in games is at least partly determined by player decisions, so that the dominant mood is conditional. These pervasive structures of conditionality are most effectively expressed as ‘if’ clauses. So, in Ochirbat’s game, white robots are surrounded by a ‘trigger volume’ – a defined space which is visible in the editing mode of the game as a transparent balloon, but invisible in the play mode. He has constructed a rule that says “if the dagger enters the trigger volume, the robot becomes inactive” (that is, disappears). He is, then, like Eleanor, constructing two kinds of rule. The one just cited, which appears in the ‘rule-editor’, is a programming rule, and underlying programmed cause-and-effect inaccessible to the player. The other is a game-rule which is accessible to the player, and depends for its realisation on the underlying programming rule: if you stick daggers into robots, they die. At the same time (to further develop the close implication of game and narrative), this is also a narrative rule typical of game-like narratives, such as the one in *Lord of the Rings* which states “if orcs are near, Frodo’s sword Sting will glow blue”.

This is just one rule, in which narrative and ludic effect are created by programmed conditionality. Ochirbat’s game has ninety-three such rules, constructed in the six sessions of the after-school club. On such a basis alone, this is quite a complex and extensive game, which takes some time to play: the Year 10 students in the other partner school, in London, took 45 minutes to play it.

Like Eleanor’s, Ochirbat’s game design also contains economies. Ochirbat has decided that his player will have both health and hunger. These are economies that constitute on the one hand part of the player character, who can be defined as a bundle of such economies (health, strength, hunger, point score); and on the other hand constitute dynamic properties of objects in the game which connect with the player. In Ochirbat’s game, then, there is a vermin-infested area in the second ‘level’ – rats and skulls distributed round an Egyptian corridor. A trigger volume determines that the player’s health points decline dramatically on entry to this area. Here, then, the programmed rule produces an invisible cause and effect (entry into the trigger volume depletes the score by a determined amount); while the ludic rule visibly produced is that the vermin themselves cause the effect. Again, this is also a rule with narrative logic: this space is semiotically produced as dangerous; the rats are deployed as signifiers of danger and disease. If the notion of economies as part of narrative seems odd, we can again think of *Lord of the Rings*, in which, if the Company of the Ring find their energy depleted, they eat elvish lembas cake to restore it.

Finally, we can ask what kinds of cohesion are apparent in the ludic design. It would be entirely possible (indeed, it was true of the games produced by some of the children in this project) for the ludic design to consist of a series of unrelated puzzles laid out in a sequence in no particular order. By contrast, the ludic structure of this game is marked by strong cohesive relations between elements. For instance, the acquisition of the knife is related to the two white robots encountered later; while the acquisition of a ‘sickle sword’ in the Egyptian level is similarly related to the ‘killing’ of two black robots later on. These examples, like the levers in the first chamber of Eleanor’s game, show something like lexical cohesion in language through repetition: they display a form of redundancy by repeating a process several times. In an

oral narrative, redundancy exists partly for the sake of the audience, to give them a chance to grasp important narrative elements. Here, in a similar way, the redundancy is to give the player several chances to do the same thing, and to learn to do it better. Ochirbat has a cultural interest both in making the game challenging, and in inducting his player through procedures he has learnt from other games, in particular the idea of a training level, which is explicitly signalled in his opening voiceover.

A different kind of cohesion exists between elements of the game that refer to each other. Just as reference across different parts of a text ties elements together, so here there is, for example, a bomb, found very near the 'end' of the game (in terms of the spatial design), which disposes of a barrier to an essential room very near the 'beginning' of the game, thus sending the player right back through the maze. This strong cohesion produces an effective and satisfying piece of game-play, as well as contributing to the overall ludic coherence of the whole design. However, an interesting feature of the bomb is that it gives minimal information: it can be inspected by the player after being picked up, and produces a message which reads: 'Bomb: use this to open the secret barrier'. Two features of this are of interest. First, the function of the bomb is signalled, like many elements of games, multimodally. The visual sign operates as a kind of imperative, demanding to be used somewhere; while the verbal sign disambiguates and amplifies the function. This multimodal sign combination coheres, as we have seen, with the invisible rule: 'if bomb enters trigger volume, barrier becomes inactive'. However, the second point of interest is that this event can only be designed as a textual potential. It must be realised by the player. So some elements of the cohesion here are provided by the player, who needs to: read and respond to the verbal instruction; recognise the function of this kind of object both by reading its visual connotation, and by relating it to similar objects in the wider class of 'pickups' familiar to a game-player; connect it with the barrier which must have been encountered earlier for this cohesion to work; carry the bomb back and thrust it into the trigger volume (or 'throw it at the barrier', in narrative-ludic terms).

Cohesion here, then, is designed as a potential by the teenage author; and realised by the player through interpretation, through recognition of external cohesion with similar objects in other games, and through pursuing a particular traversal of the game-space both before and after picking up the object.

In general, then, Ochirbat's game can be seen as a more complex example of the features of game-literacy derived from Eleanor's. It draws heavily on a cultural experience of games; it displays operational fluency in the authoring tool. It produces evidence of both ludic and narrative composition, the former strongly cohesive, the latter weakly cohesive. It is multimodal, and uses the different modes to amplify ludic cues, though also to produce narrative information and the affective element of the game related to his interest in horror texts.

7. PERIPHERAL LITERACIES

In our tentative model of game-literacy, we have adopted the notion of peripheral literacies to describe forms of communication or design which surround the game

proper, but are not directly integrated into it. These can fall either into the processes of design and production, or they can be part of an explicatory post-hoc process. In the former category we could place design drawings and diagrams, backstory writing, script-writing, sound production. In Ochirbat's game, for instance, we have seen that he (reluctantly) scripted the vocal performance of the mysterious captor. In this sense (in relation to the notion of writing literally as print), he has actually written this part of the game; though writing here exists as a design mode only, as in a film script; in the actual text, this has been transformed into speech.

At the end of the project, the students are asked to write walkthroughs for their game. Walkthroughs are a well-established genre of fan work published on the internet and produced by players who are motivated to make step-by-step guides for how to play the game. They represent the cultural interest of fans whose chief preoccupation is the ludic imperatives of the game (rather than its narrative dimensions); and they are invariably literally couched in the imperative mood⁴. Ochirbat wrote a walkthrough for his game, which gives quite detailed instructions about how to play the game. Like all walkthroughs, it elaborates the ludic aspects of the game rather than the narrative aspects (these are more typically addressed in fan work by writing genres such as spoilers, fan fictions and poems). This reflects Ochirbat's cultural interest, in which ludic features are, perhaps, of more interest than narrative features. The walkthrough also reflects some aspects of the game's cohesion: so, for example, the cohesion by reference is dealt with also by reference to other parts of the game, via a prepositional phrase, and to other sections of the walkthrough, in parenthesis:

The upper rooms have the map and the mine switch which give [sic] you the mine which can be used to destroy the barrier in the tube room (I will explain that later in the skeleton key locations page).

Ochirbat's walkthrough provides further evidence of two aspects of the model of game-literacy we are building. Firstly, it provides further evidence of a cultural experience of games, and of this genre of writing associated with them. Secondly, it is evidence of an operational literacy, in two senses. Ochirbat clearly knows how to play games in an operational sense: he is a skilled player in a variety of complex ways. He also knows how to author games in an operational sense, too: he can manipulate the software to construct environments, rules and economies.

His walkthrough, then, provides another example of the range of different kinds of written language which surround and inform the playing and design of games. So far we have given examples of written proposals for games, written explanations of abstract principles of game design, and the walkthrough. The final example of students' work to be discussed in this article is a more developed form of written proposal.

⁴ See Burn (2006) for a fuller explanation of walkthroughs and mood.

8. NEW GAMES, OLD STORIES

Ochirbat's game, then, fuses narrative and ludic elements in its design; and displays a cultural experience of games and game-narratives, as well as an accomplished ability to operate the grammar of the game.

The last selection of student work presented here is a piece of writing produced at the end of the same Year 8 media course in which Eleanor made her game. Students were asked, once they had been through the production experience and learned about the principles of rules and economies, to write a proposal for a game based on an existing story. One boy, David, chose to make a game based on *The Odyssey*. It is apparent from his proposal that the work on game design had given him a very different understanding of narrative from the conventional models often used in English and Media Studies:

The Odyssey

My idea is for a game following the story of Homer's *Odyssey*, in which Odysseus travels back to Greece after a long war to capture Troy. He is blown about in a storm, and must face several challenges to return to Greece. I think that this will work as a game because although it has discrete levels, each consisting of a single challenge, the levels relate to each other somewhat, such as Circe warning Odysseus about the Sirens, and about Scylla and Charybdis.

...

This game will be aimed at boys aged 10-14 who may (or may not) have some interest in the Greek myths. This target audience should be interested in role-playing games, as the player would be expected to negotiate information and assistance out of the other characters, as well as a certain amount of puzzle-solving, as these also will be included to some extent. ...

The player characters are Odysseus and his men, who are desperately trying to get back to their homeland, the difficulty of which is a cruel twist of fate after their glorious victory in Troy. There are various NPCs (non-player characters) who help or hinder the PCs (Player characters) or do both. An example of an ambiguous NPC is Circe, who attempts to lure the Argives to their doom, but after they have resisted her temptations, she gives Odysseus some advice as to the nature of the challenges he will have to face. In addition to these NPCs, the narrative contains monsters (who do not talk to the PCs, but merely attack), such as the one-eyed Cyclops, who although they cannot be convinced not to attack, tend to be rather stupid and (relatively) easy to outwit.

I think that the game will be enjoyable to play because of the pleasures it offers to its users. The game offers a strong aim for the player – to get Odysseus back to Greece. I think that this aim will be powerful because it is easy for the player to identify with – how many of us haven't experienced that feeling of being lost and unable to get back to the ones we love. I think that the narrative could act as a metaphor for a child's experience of a previously pleasurable trip which goes horribly wrong when the child loses their parents, each challenge in the story representing the child's fight to maintain a spirit of confidence and optimism despite the disappointment of turning a corner and finding that their parents are not waiting around it. Odysseus's wife, of course, represents the child's mother. ...

The game will involve skill in three respects: Role-playing and diplomacy; problem-solving, and dexterity. The player will be expected to navigate his way through tricky interactions, to gather information, and to pacify (or not) NPCs. In addition, he will be expected to come up with ways to bypass the seemingly impossible challenges he is presented with. Lastly, he will have to be fairly handy with the mouse, and good at simulated combat. ...

My game, being largely concerned with narrative, will not contain exceptionally large amounts of rules and economies. One example of a rule, however, is involved in Odysseus's encounter with Scylla (an huge, six-headed monster) and Charybdis (a deadly whirlpool). A rule used in this section states that if the ship enters a special trigger volume by getting too close to Scylla's cave, she flies out and carries away six of Odysseus's men (one for each head), reducing the crew economy by six. This economy is a fairly close equivalent of the standard health economy, in that the game is ended if it gets reduced to zero, although it varies in that the player is hampered when its value is reduced to close to zero, as the ship becomes more difficult to manoeuvre. In this respect, then, it is closer to a strength economy. ...

I have, briefly, presented my game, and it would, I hope, do Homer proud, although, of course, whether it would be possible to sell it to the manufacturers is quite another (and, arguably, a far more important) question!

This piece of work presents a complex understanding of narrative, but one that is informed by the game concepts learned in the course, as well as those he knows from his own experience. The *Odyssey's* episodic structure is realized here in terms of game levels; monsters such as the Cyclops are conceptualized as NPCs (non-player characters), and Odysseus and his crew as PCs, or player-characters: in role-playing or adventure games, players can sometimes choose which character to play, or can play groups of characters as a team. The skills David identifies as those the player will need – role-playing, diplomacy, problem-solving and dexterity – are typical of role-playing games, but are also features of the Homeric narrative, being the key characteristics of the wily Odysseus.

The two key concepts of game design which the use of the software has rehearsed – rules and economies – are important in this rendition of the *Odyssey*. David conceives of game rules, such as the one which states that if the player gets too near to Scylla she will carry off some of the ship's crew. He conflates, though, the game rule and the programmed rule underlying it, that this event is triggered by the ship entering a trigger volume. Where this structure is directly transferred from the software he has used, the use of 'economy' here is novel: he imagines an economy in the game related to the 'strength' of the ship, depleted by the men carried off by the monster.

These conceptions of narrative as rule-based events and formulaic characters contrasts starkly with the ideas of narrative in literacy and literature curricula, which are arguably largely modeled on the tradition of the European novel. This tradition emphasizes naturalism, the psychological development of character, and, despite well-charted exceptions, for instance in the Gothic tradition, the rationalism of the Enlightenment. In effect, it renders its newly literate readership deaf to the ancient traditions of oral formulaic narrative, and infantilises the irrationality of fantasy and folktale. These, as Janet Murray argues (1998), are the forms of narrative closest to the computer game. David's proposal for the *Odyssey-game* makes us realise that

the analogy goes further than character – the episodic structure, the economies of health and magic, the strategic skills required of protagonist and player alike, the function of narrative and ludic rules: all of these suggest strong affinities between game and oral narrative, which demand new understandings of writing in literacy curricula, and new valuations in literature curricula.

Perhaps the implication of this for new conceptions of ‘writing’ provoked by computer game design is that literacy is not always the best metaphor. It needs to be at least complemented by the more fluid, performative kinds of utterance which Walter Ong saw as ‘secondary orality’: a residue of the oral mindset in the electronic texts of highly technologised societies (Ong, 2002).

Two key implications flow from these kinds of suggestion. Firstly, English and literacy teachers may need to re-evaluate the familiar aesthetic usually privileged in work on narrative in classrooms, and consider what is usually anathema – the idea of narrative as formulaic. The advantages would be a more inclusive attitude to popular texts, whether from folk literature or contemporary popular culture; and also a more transparent approach to the construction of narrative, more accessible to more children. The second is to recognize the connections between dramatic forms of representation and popular culture, especially games: both, after all, involve improvisation, imaginary worlds, role-play and bodily engagement (for an extended discussion of the connections between games and drama, see Carroll, 2002).

9. TOWARDS A MODEL OF GAME-LITERACY

The games and game-proposal made by these students suggest that the model of game-literacy which we are tentatively evolving, then, will have something like the following elements.

- 1) It draws on *cultural experience* of games and other media texts
- 2) It requires specific forms of *access* to appropriate technological tools, and the ability to use them
- 3) It requires specific kinds of *operational literacy*: a fluency in the use of the tools for game design provided by the software
- 4) It both requires and develops an understanding of *key concepts* important to game-texts: in this case, rule and economy; but also principles of narrative, such as protagonist, quest. It recognises how these concepts are elaborated in building the grammar of the game. The programmed rules and the associated game rules and economies construct the interpersonal function of the game (in social semiotic terms): they provide opportunities for the player to act within the game-world to meet challenges, overcome obstacles, complete missions, achieve a win-state. The construction of these rules also performs organisational or compositional functions, such as different forms of cohesion and coherence across the game.
- 5) This whole process is *multimodal* and *multiliterate*. It involves visual design, writing in different genres, sound, music, speech, and simple programming within the limits of the rule-editor.

- 6) A wider notion of game-literacy will also involve *peripheral literacies*, many of which will involve writing, in genres such as proposals, interpretative and critical writing, walkthroughs, fan fiction, narrative backstories.

Of course, game-design of the kind enabled by this software package could easily find a curriculum home in any subject where aesthetic and technological design are of relevance. It would be entirely possible to construct different rationales for game-making in Design and Technology, Art, Music, and ICT. The argument in this article, however, is that to see game-design as a form of *writing*, in relation both to print literacy and to media literacy, is to see it as a valuable extension of concepts of narrative, grammar and textuality for learners.

But games also require that the literacy curriculum does some hard thinking about what kinds of narratives it values, and how it conceives of them. Doctor Who, in Eleanor's game, Odysseus in David's proposal, and computer game protagonists more generally, stand in a tradition of popular heroic narratives which stretch back through the superheroes of twentieth century comicstrip, film and television; but also much further back in the oral formulaic narratives of Europe, from Robin Hood to Beowulf; and even further back to the Homeric narratives, as Janet Murray has argued (*ibid*). By contrast, the literacy and literature curricula are more accustomed to privilege the forms of psychological 'realism' typical of the European novel. We need to be wary, then, of simplistic value judgements about formulaic narratives in contemporary media: we might find narratives of Superman or Spiderman reductive texts which value action over psychology compared with narratives of the Brothers Karamazov or Jane Eyre; but we would not make the same judgments about narratives of Beowulf, Achilles or Robin Hood, which are similarly formulaic. To accommodate game-writing in the literacy and English curriculum, then, productively extends and challenges our ideas of literacy at all levels: cultural, aesthetic, technological, conceptual.

ACKNOWLEDGMENTS

I am grateful to my colleagues in the Making Games project: Caroline Pelletier, David Buckingham, and James Durrant; to the students whose work is represented in this article; and to the Economic and Social Research Council which funded the project ('Making Games', RES-328-25-0001).

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