

Games and Learning Interim Report

Survey of existing research and criticism

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September 2008

1. Introduction: Why games and learning?

The alleged connections between children's learning and their playing of computer games have been amplified in recent years. Computer games, it is regularly argued, are ideal media for learning at a time when children's access to ICT is proliferating and their digital media experiences are allegedly accelerating.¹ Books have been written, research centres and major projects established, and government inquiries set up to study how games can support education. Yet, as David Buckingham points out, "in the absence of solid empirical evidence about the actual use of games in the classroom, sweeping claims about their value," which are "often drawn from an uncritical reading of the work of games advocates," he says, "continue to be recycled."²

The purpose of this report, including a survey of the recent literature, research and educational policy discussions around games and learning, is to identify the current state of the debate and to raise a series of challenges and provocations that need addressing. The central aim is to address the question of what kind of learning might be taking place through the use of particular sorts of games and platforms, in what contexts might this be taking place, and in what arrangement of human actors in interaction with social, cultural and technological factors? This means being both specific about games and platforms, and about the profile of their players, as well as being analytical about computer games as a cultural phenomenon produced and circulated in the context of a global industry.

Games used for the purposes of learning are often referred to as "serious games," which designates that they are intended for a purpose other than pure entertainment.³ The term is popular amongst advocates of training simulations and games in the military and health services as well as education, usually used to describe titles specifically designed for those purposes. My focus in this document is more particularly on the use of existing computer games (those that can be purchased off the shelf) and so I only use "serious games" when referring to particular titles designed for training.

The document is organised into a series of sections. I outline the current policy context in the UK, drawing particular attention to the Byron Review, published in spring 2008, and the challenges it establishes for educators, parents and children as well as for the games industry itself, and what it implies for further research in this area.⁴ I focus particularly on what the Byron Review recommends in terms of enhancing a dialogue between the games industry and government. I then outline the survey of the research and literature. It is entitled "Positions" and is divided into subsections which each look at different approaches to the study, development or theorisation of games and learning. After that, I then provide a set of example projects and game developments in this area, and identify a number of emerging arguments which have indirect but important implications for furthering the debate and developments in games and learning.

I am wary of claims that reviews on the subject of games and learning are often produced in lieu of any real research evidence, and sometimes interpreted as if they constitute fresh intelligence.⁵ It has also been claimed

¹ Throughout I refer to "computer games" or just "games," rather than drawing distinct differences between them and terms such as "video games" or "virtual worlds." This is purely for purposes of simplicity. Where certain clarifications do need to be made (for example, in particular reference to multiplayer online games) I make this clear in the discussion.

² Buckingham, D (2007) *Beyond Technology: Children's Learning in the Age of Digital Culture* (Cambridge: Polity): 116

³ For a detailed discussion of "serious games" see Derryberry, A (2007) *Serious Games: Online games for learning* (Adobe white paper).

⁴ The Byron Review (2008) *Report of the Byron Review: Safer Children in a Digital World* (Nottingham: DCSF Publications).

⁵ See Kirriemuir, J (2007) *Groundhog Day for Games in Learning*, *Digra Hardcore Column*, 3 March (<http://www.digra.org/hardcore/hc13>).

that researchers in the field of games and learning suffer from intellectual amnesia, neglecting to note that there is a long history of prior research and publications in the field.⁶ Indeed, this is not the first document Futurelab has produced on the subject of games: a comprehensive literature review preceded it in 2003 and a small handbook for teachers in 2005; a substantive report on the Teaching with Games project and a set of teaching resources followed in 2006.⁷ In this document I make no claims to producing a comprehensive or systematic review—pointing out where others have already done so—but I do raise what I think are substantial and important emerging challenges, not least because of the current policy and economic context for the debate, but also because arguments about games and learning are increasingly disputed and in contest.⁸

⁶ See Egenfeldt-Nielsen, S (2006) Overview of research on the educational use of games, *Digital Kompetanse*, 3(1): 184-213.

⁷ See <http://www.futurelab.org.uk>

⁸ For systematic literature reviews, see Kirriemuir, J and McFarlane, A (2004) *Literature Review in Games and Learning* (Bristol: Futurelab); Mitchell, A and Savill-Smith, C (2004) *The use of computer and video games for learning: a literature review* (London: LSDA); Egenfeldt-Nielsen, S (2006) Overview of research on the educational use of games, *Digital Kompetanse*, 3(1): 184-213; Pivec, M & Pivec, P (2008) *Games in Schools: Literature review* (Brussels: EUN/ISFE), available online: <http://games.eun.org> (25 November 2008).

2. Types of games and play

It is important to note that many different types of play on many different types of games platforms and with different genres and types of games are referred to in the games and learning literature and research. This is also important because the Byron Review states that there is a need for a “focus on the nuances of games and the engagement of play”:

in order for research to be informative for policy, it needs to break down and begin to understand the nuances of the games – differences in content, context, play length, realism, repetition and interaction, which will all potentially have a bearing on the game’s impact.⁹

In this section I briefly identify some of the key differences which are significant in discussions about games and learning.

Informal/formal play

Discussions about games and learning can usually be divided between those who study the use of games outside of school in informal settings and those who study (or recommend) their use inside of school in formal settings. The reality, however, is that the games and learning debate must be seen as part of large-scale attempts to collapse the distinctions between the formal learning supported by schools and the informal types of learning that children are engaged in out of school, especially in their uses of new media.

Informal: There is widespread agreement that games are a significant cultural force in children’s lives. It is regularly claimed that they are more motivating, challenging and engaging than the formal offer of schools, and also that they provide more authentic learning experiences. For these reasons, some commentators suggest that educators and educational policymakers should take note of what games offer to players and reengineer their approaches to teaching to make the learning experience as immersive as playing computer games.

Formal: For some commentators, computer games have specific potential to be used within schools. “Media literacy” advocates, for example, suggest that games can be studied like any other text, and that, given the right software, students can create their own games to explore and demonstrate their understandings about the workings of games media. Others advocate the development of “serious games” that can be played in the classroom to help support the learning of new skills or content.

⁹ Byron Review: 159

Platforms/genres

Computer games are hugely varied, played on different hardware platforms, and demand diverse styles of engagement. In the table below I indicate how different sorts of platforms and genres of games have been exemplified in aspects of the research and literature on games and learning.

Type	Basis for learning	Key games	Key texts
Active games	<ul style="list-style-type: none"> Promotes physical activity Early learning skills (hand-eye, motor-skills) 	<i>Wii Sports</i> <i>Wii Fit</i>	-
Alternate reality games	<ul style="list-style-type: none"> Embodied play experience Authentic real-world experience Social collaboration 	<i>Savannah</i> <i>Uncle Roy All Around You</i>	IGDA (2006) White Paper on Alternate Reality Games ¹⁰
Authoring games	<ul style="list-style-type: none"> Understanding of games' structure, production, effects and audiences Media literacy 	<i>Mission Maker</i> <i>Adventure Author</i>	Burn, A and Durran, J (2007) Media Literacy in Schools
Creative games	<ul style="list-style-type: none"> Creative production Collaboration and sharing 	<i>Spore</i> <i>LittleBigPlanet</i>	-
Epistemic games	<ul style="list-style-type: none"> Professional practice Workplace skills 	<i>Pandora</i> <i>Digital Zoo</i> <i>Urban Science</i>	Shaffer, DW (200) How Computer Games Help Children Learn
Massively multiplayer online games	<ul style="list-style-type: none"> Distributed thinking Collaboration 	<i>World of Warcraft</i> <i>Everquest</i>	Taylor, TL (2006) Playing Between Worlds
Military games	<ul style="list-style-type: none"> Authentic professional training 	<i>America's Army</i> <i>Full Spectrum Warrior</i>	Prensky, M (2002) Digital Game-Based Learning
Mobile games	<ul style="list-style-type: none"> Authentic real-world contexts 21st century skills 	<i>Virus</i> <i>Newtoon</i>	Klopfer, E (2008) Augmented Learning
Persuasive games	<ul style="list-style-type: none"> Critical skills Critical reflection 	<i>Oil God</i> <i>Activism</i>	Bogost, I (2007) Persuasive games
Role-playing games	<ul style="list-style-type: none"> Understanding character and identity Problem-solving 	<i>Deus Ex</i> <i>Tomb Raider</i>	Gee, JP (2004) What Video Games have to Teach Us
Serious games	<ul style="list-style-type: none"> Managing real-world problems Manipulating real-world data sources 	<i>Global Conflict: Palestine</i> <i>Operation: Climate Control</i> <i>Ceduceus</i> <i>Supercharged!</i>	Derryberry, A (2006) Serious Games
Simulations/ Microworlds	<ul style="list-style-type: none"> Management of complex systems Testing real-world ideas and scenarios Constructing ideas 	<i>SimCity</i> <i>The Sims</i> <i>Rollercoaster Tycoon</i>	Papert, S (1993) The Children's Machine
Strategy games	<ul style="list-style-type: none"> Manipulating real-world scenarios Conjecturing and trialling Strategic thinking 	<i>Civilization</i> <i>Europa Universalis</i> <i>Knights of Honor</i> <i>Age of Empires</i>	Egenfeldt-Nielsen, S (2005) Beyond Edutainment

Modes of learning aligned with specific game genres

¹⁰ See <http://www.igda.org/arg/resources/IGDA-AlternateRealityGames-Whitepaper-2006.pdf>. References to all other texts can be found in the footnotes to the main discussion in the Positions section.

3. Policy context

Byron Review

On Thursday 27 March 2008 the British government published the findings of the Byron Review, an inquiry into the effects of computer games and the internet on young people that had been commissioned in September 2007.¹¹ Headed by Tanya Byron, a well-respected child psychologist and television personality, it concluded with major policy recommendations that have direct consequence in the area of games and learning. The first of these was that computer games should all bear age ratings, like movies, to indicate their suitability and protect children from age-inappropriate material and content. One model to be considered was the BBFC (British Board of Film Classification) ratings system used for cinema and DVD content, although some voices in the games industry disputed its appropriateness and pointed out that since 2003 they already subscribed to a PEGI (Pan European Game Information) scheme. In July 2008, a public consultation on age classification was launched by the DCMS (Department for Culture, Media and Sport).

The other major policy focus of the Byron Review related to games was that, since “video games and new technologies” were seen to possess “enormous potential to have a positive impact on children,” it suggested:

Research is needed to dissect the factors that benefit the child, including an analysis of the ‘engaging’ elements of play and contexts in which educational learning are boosted when they take place through technology.¹²

In this report, then, I pay specific attention to Byron’s recommendation that research is needed which analyses what is “engaging” about playing computer games, as well of the “contexts” in which this may take place. The report added that there is a need for a “focus on the nuances of games and the engagement of play”:

in order for research to be informative for policy, it needs to break down and begin to understand the nuances of the games – differences in content, context, play length, realism, repetition and interaction, which will all potentially have a bearing on the game’s impact.¹³

It is following these recommendations that this report concentrates on what kind of learning might be taking place in specific contexts and in what arrangement of other (social, cultural, technological) factors.

Although the potential of games in the review was countered by concerns about safety and suggestions to the effect of more stringent regulation across all new media, overwhelmingly the message emerging from the report was that children should be supported to understand the risks associated with new media, rather than a message about protecting them from it altogether. It specifically highlighted the developmental need for children to experience risk rather than to be brought up entirely risk-averse, and concentrated on their well-being instead of on any perceived harms that new media, including games, might potentially exert. It very specifically stated that evidence about the effects of violent video games in stimulating aggressive arousal was disputable, for example. The inquiry was also methodologically interesting because it invited the views of children themselves; it reportedly received more intelligence from children about their use of games and the

¹¹ Byron Review (2008) *The Byron Review: Safer Children in a Digital World* (Nottingham: DCSF Publications).

¹² Byron Review: 159.

¹³ Byron Review: 159.

internet than adults submitted to it. This pointed to children's own sense of their need for greater information and education about how to use new media safely.

What all of this suggests is a significant policy need for research which interrogates the role of computer games in supporting a safe risk-taking and well-being agenda. Given that well-being is a major plank in the government's strategic Children's Plan and Every Child Matters reform agenda, it is perhaps unsurprising that Secretary of State for Education Ed Balls promised to make every recommendation of the report a policy priority and that Prime Minister Gordon Brown has invited Tanya Byron to conduct a four-year review of progress on implementing them. The Byron Review has the consequence of moving the concern around games from one of "protection" to one of "education," and this is commensurate with the larger government reform agenda for children's services where the focus is on self-responsibility and well-being. Not only is this a question of educating children, either; it implicitly suggests that parents need educating and supporting to understand computer games, something reflected by the need for clearer age-ratings classifications.¹⁴ The report recommends "media literacy" education to address children's safety and understanding of new media; it might also be suggested that it demands some sort of media literacy scheme to address some parents' existing lack of knowledge about games—something to be addressed by a recommended public campaign. This is a complex shift of emphasis, not least because media coverage on the review and public appreciation of its key arguments was highly polarised.

Markets and children

Another important and ongoing government-commissioned inquiry, expected to report in late 2008, is a study by the Centre for Youth, Media and Children at the Institute of Education on the effects of the private sector on children. The theoretical starting place for this review, which is led by David Buckingham, who also contributed to Byron, is that there is a continuum from the vending machine selling soft drinks in the school corridor to the private sector sponsorship of academy schools. What this means is that as soft drinks are perceived to have an effect on children's physical health and well-being, the role of business and corporate profit-making organisations may have an effect on children's educational and intellectual well-being. This is because, for example, academies have significantly more authority to devise their own curricula and manage themselves autonomously than existing state schools.

The implication of this inquiry in relation to work on games and learning is that games are obviously the products of major successful multinational corporations, and their appearance in formal education should therefore be subject to scrutiny. Computer games circulate in popular culture as powerful media produced by organisations whose primary business orientation is not to education but to entertainment and leisure. A more detailed outline of this type of argument is supplied later in the section on challenges and criticisms. Suffice it to say at this point that any debate about games and learning must be attendant to criticisms about the games industry's latent ideologies and economic influences.

Serious games

Several examples of "serious games" designed to meet public policy needs have been produced in the last few years. Some have been specifically commissioned by government departments and by broadcasters. For instance, Rolling Sound were able to fund their youth-led project Soul Control through a short-term Mediabox grant (funded by DCSF); their current project Dead Ends is funded by Channel 4 to market its season

¹⁴ For example, the review found that some parents believed the existing PEGI classifications referred to the level of skill required to play the labelled titles, rather than their content appropriateness.

“Disarming Britain.” A meeting of the Alliance for Digital Inclusion in summer 2008, however, found that there is not currently a co-ordinated approach across government to exploit gaming technologies for public policy purposes, and that the design of games with a social purpose often owes itself more to enthusiastic and creative people within industry, third sector and local government rather than a coordinated and systemic approach. The group found that government sometimes conflated “gaming” with “gambling,” considered games to be “superficial” and suited only to young children rather than older learners, and called for more research evidence that could convince policymakers of games’ potential significance in education.¹⁵

¹⁵ From notes following ADI (2008) Can the Games Be Serious, Guildhall, London, 5 June.

4. Positions: Research perspectives on games and learning

Chris Crawford predicted in 1982 that the products of the games industry in the future would be divided between a mass market “wasteland” of “cyberschlock” and a “more exciting literature” of games as a “social force.”¹⁶ Over two decades later these predictions seem accurate. Games have become a major recreational activity, sometimes considered—especially in the tabloid and conservative press—to be culturally degenerate, yet they have also become increasingly sophisticated and celebrated as a cultural form; they have shaken up the world of entertainment, and they have entered into educational debates and practices. After the Byron Review in 2008, computer games have once again become the focus for educational policy discussion, but there still exists ambivalence about whether games are derivative and homogenous mass market junk or a significant social force. This has consequences for any approach to games as media appropriate for learning.

There is no single orthodoxy for the study and development of games and learning.¹⁷ At least one critic has suggested that “games studies” should be treated as a discipline in its own right, divorced from theoretical perspectives imported from film, literature and cultural studies.¹⁸ The perspective I adopt is that only by looking at all of the different approaches can we derive a fuller and more cogent sense of this area and begin to devise a programme for research and development work. As Jonas Linderoth and colleagues have pointed out in their own “mapping” exercise in this area, “computer games have been studied from a number of different perspectives in different academic disciplines”:

These traditions constitute different discourses, with different theoretical assumptions and with different constellations of references. There is seldom any communication between the actors from different traditions, and after some reading one gets the feeling that everyone is exploring their own ‘area’ without bothering about where to place themselves on the ‘overview map.’¹⁹

Obviously, one of the first tasks that is necessary in the field of games and learning is to map the terrain and locate in it sensible points for navigation. In a recent introduction to a volume on connecting youth, games and learning, for example, Katie Salen states that,

Although there has been a considerable amount written on games and young people’s use of them, there has been little work done to establish an overall “ecology” of gaming, game design, and play, in the sense of how all the various elements—from code to rhetoric to social practices and aesthetics—cohabit and populate the game world.

¹⁶ Crawford, C (1982) *The Art of Computer Game Design* (available online: <http://www.vancouver.wsu.edu/fac/peabody/game-book/Coverpage.html>).

¹⁷ For example, games have been studied from a film studies perspective in King, G and Krzywinska, T (2002) *ScreenPlay: cinema/videogames/interfaces* (London: Wallflower); from a literary theory perspective in Kucklich, J (2006) *Literary Theory and Digital Games*, in Rutter, J and Bryce, J (eds) *Understanding Digital Games* (London: Sage); and from cultural studies in Dovey, J and Kennedy, H (2006) *Game Cultures: Computer games as new media* (Maidenhead: Open University Press); and from ludology/play perspectives in Carr, D (2006) *Play and Pleasure*, in Darr, D, Buckingham, D, Burn, A and Schott, G, *Computer Games: Text, narrative and play* (Cambridge: Polity): 45-58.

¹⁸ Aarseth, E (2001) *Computer Games Studies, Year One*, *Game Studies*, 1 (available online: www.gamestudies.org).

¹⁹ Linderoth, J, Lantz-Andersson, A, and Lindstrom, B (2002) *Electronic Exaggerations and Virtual Worries: Mapping research of computer games relevant to the understanding of children’s game play*, *Contemporary Issues in Early Childhood*, 3(2): 226-250 (227). This article provides a good overview of the literature, mostly north European socio-cultural psychology and north American constructivism, and concludes that academic study should focus not so much on what media are doing to children but on what children are doing with media.

She adds that the “debate around the value of games and gaming” has been, “to date, overly polemic and surprisingly shallow.”²⁰

In this section I outline a number of key positions that have been taken by different commentators in this ongoing debate about games and learning. Some of these are interrelated, but I have teased them into subsections and themes entitled “Digital natives,” “Post-Fordist labour,” “Constructivism,” “Situated practice,” “Epistemic frames,” and “Media literacy.”

²⁰ Salen, K (2008) *Toward and Ecology of Gaming*, in Salen, K (ed) *The Ecology of Games: Connecting youth, games, and learning* (Cambridge, MA: MIT press): 2

Digital natives

Summary

It has become a commonplace argument that children are growing up in a world saturated by new technology and media and are developing new ways of dealing with that world that older generations are ill-equipped and insufficiently familiar to adopt. In the educational context, this means teachers cannot understand the children entering their classrooms, and therefore children are increasingly frustrated by schools being out of step with their out of school pursuits, experiences and practices with media. In short, children are “natives” to the new digital environment, and adults are “immigrants.” This increasingly popular position in aspects of the educational literature suggests that new media products emerging in popular culture, including computer games, are sophisticated cultural artefacts from which children are developing new skills and even new cognitive abilities that may be more advanced than those taught by school, and which are certainly more suited to the emerging conditions of the 21st century than schools, traditional teacher pedagogies, and the academic subject-based curriculum. This position assumes that schools are outdated institutions that need to “catch up” and “match up” to the complex media worlds children are experiencing and learning from informally.

Detailed overview

According to writers who subscribe to the view that children are native to a digital media environment, computer games are regarded as the most sophisticated popular medium around, and more than that, they are more challenging than most of what goes on in schools. Nick Barham, for example, has claimed that

Kids are certainly not too stupid for school. Perhaps school is too stupid for them. Too stupid, too slow, too uncolourful, too mono for a bunch of kids for whom speed, excitement, words, pictures, sound and film are all parts of acquiring and passing on information, all ways of telling stories.... The form, content and method of knowledge delivery within schools is out of sync with the way that people learn elsewhere, with what they value, with what counts in the world.²¹

This logic suggests that the standardised focus in schools on absorbing content and skills is not only demotivating and irrelevant to what children are doing outside of school with new media, but is also outdated at a time when information is immediately available and electronic communication is ubiquitous.

Perhaps the most well-known populariser of this games and learning discourse is Marc Prensky, a US-based consultant, writer and designer of educational games and training simulations.²² In 2001 he published *Digital Games-Based Learning* and in 2006 followed it with “Don’t Bother Me Mom—I’m Learning”: How computer and video games are preparing your kids for 21st century success—and how you can help! The title of the latter text is indicative of Prensky’s populist approach, with its direct appeal to parents, as well as of his view of what “21st century success” might actually be. Prensky’s particular take on games is that “game-playing is as beneficial to children’s development as reading” and that “kids learn more positive, useful things for their future from their video games than they learn in school.”²³ What this means is that because children have grown up in a world where computers, computer games, the internet and mobile phones have always existed

²¹ Barham, N (2004) *Disconnected: Why your kids are turning their backs on everything we thought we knew* (London: Ebury Press): 234

²² Prensky maintains a professional website and a weblog at <http://www.marcprensky.com/> as well as a site acting as a resource bank on games and learning for teachers and parents: <http://www.gamesparentsteachers.com/>.

²³ Prensky, M (2006) *Don’t Bother Me Mom*: xvii & 4

they have developed qualitatively different ways of interacting in the world—in short, children are “digital natives” and adults are “digital immigrants.”²⁴

Prensky draws from research in “neuroplasticity” to argue that playing games helps to reorganise brain functioning, although he admits that no one has ever actually directly observed the brain of a “digital native” to derive empirical findings which support his claims. Dealing with complexity, experiencing failure in a low-risk environment, collaborating with others (often over the web), making ethical decisions, exploring different identities, and managing multimedia information simultaneously are some of the allegedly heightened cognitive competences of Prensky’s digital natives. There are echoes here from Don Tapscott’s *Growing Up Digital*, where children of the new media age are considered savvy, self-reliant, hungry for expression, analytical, articulate, creative, inquisitive, accepting of diversity and socially conscious; as David Buckingham describes it, such “generational differences are seen to be produced by technology, rather than being the result of other social, historical or cultural forces.”²⁵ As Prensky optimistically puts it, games “offer up the most realistic vision of how everyone, young or old, will be learning and working in the decades to come.”²⁶

Prensky’s work is important because it does attempt to engage parents and teachers directly in the debate about games and learning, and because he does provide some sensible suggestions about how to use games for educational purposes, both in the home and at school. So, for example, on the website www.gamesparentsteachers.com, he describes a number of ways in which existing computer games can become the focus for discussions and activities. He suggests using *The Sims* “as a starting point for a discussion on identity,” and tells teachers to “use the game to tackle such challenging issues as personal identity, diversity, and personal, family, and local history.” Rather than shying away from the *Grand Theft Auto* series of games for their notorious levels of violent content, he suggests to parents they might make “a good starting point for discussing video game violence in an open and supportive manner with your children.” These are eminently sensible suggestions for classroom and home-based activities and discussions, but they seem removed from the rest of Prensky’s enthusiastic assessment of how young people are already learning (and having their brains re-wired) from the very act of playing these titles.

Prensky’s views on computer games need to be put in the context of a surge of publications that seek to energise debates about the merits of popular cultural forms. Steven Johnson’s *Everything Bad is Good for You: How popular culture is making us smarter* is an example. He suggests that formats such as television dramas have become increasingly intricate, multilayered, and thus cognitively challenging to follow; that media such as the internet, by virtue of being participatory, creating new channels of communication, and by forcing users to adapt to new interfaces, are “good for the brain”; and that

... games force you to decide, to choose, to prioritize. All the intellectual benefits of gaming derive from this fundamental virtue, because learning how to think is ultimately about learning to make the right decisions: weighing evidence, analyzing situations, consulting your long-term goals, and then deciding. No other pop cultural form directly engages the brain’s decision-making apparatus in the same way.²⁷

²⁴ A range of other terms related to children and new media do similar work, for example, “cyberkids,” “digital generation,” “Nintendo generation,” “net generation,” “boom-echo,” “Google generation,” and so on.

²⁵ Buckingham, D (2008) *Beyond Technology: Children’s learning in the age of digital culture* (Cambridge: Polity): 88. Buckingham argues that it is nonsensical to seek causal relationships between technological development and children’s competence, given that they can only be understood in the light of other changes such as children’s culture, social and cultural policies that regulate children, and the everyday social reality of children’s lives.

²⁶ Prensky, “Don’t Bother Me”: 51

²⁷ Johnson: 117 & 41.

What Johnson sets out to do in this type of analysis is simultaneously demonstrate that games advance players' cognition and that pop cultural forms such as games are complex media products which are as worthy of consideration as great novels and films. In short, he's popularising a set of arguments about the benefits of pop culture. Playing computer games requires mental labour that is seemingly unsupported by schools, so that, even though "classrooms may be overcrowded" and "teachers underpaid," outside of school children's "brains are being challenged at every turn by new forms of media and technology that cultivate sophisticated problem-solving skills."²⁸

Similar arguments are made in Wim Veen and Ben Vrakking's *Homo Zappiens: Growing up in a digital age*, where it is argued that children—the "Homo zappiens" of the title—are almost evolutionarily distinct from adults. They are "active processors of information, skilled problem solvers using gaming strategies and effective communicators" who ostensibly "consider schools as disconnected institutions, more or less irrelevant to them as far as their daily lives are concerned.... In fact, Homo zappiens are digital, and school is analogue."²⁹

Overarchingly, what these examples set out to demonstrate is that the popular culture to which children are daily exposed is composed of powerful media forms of which the computer game is the most advanced instantiation. By virtue of its interactivity, the computer game engages the brain in all sorts of complex tasks that schools do not. Thus, while schools recourse to standards, computer games act to extend children's mental functioning. Computer games are, in fact, these commentators suggest, ideal models for learning in the 21st century.

²⁸ 145

²⁹ Veen, W & Vrakking, B (2006) *Homo Zappiens: Growing up in the digital age* (London: Network Continuum Education): 10.

Post-Fordist labour

Summary

Following on from the arguments put forward about digital natives, some writers add that games are ideally attuned to developing children's competences for an economy that needs creativity and innovation for growth more than it needs a workforce with curricular competence. Computer games are important here not just because they remain significant economic industries in the West and advanced Asian nations but because they seemingly prepare players to be successful in an increasingly turbulent economic climate. From this perspective, children are learning important new skills informally from their new media and games experiences, while schools are failing to do so.

Detailed overview

The current era is a "knowledge economy" where the trade and exchange of information via digital technologies have taken on enhanced significance.³⁰ This view fits well with the emergence of educational texts which call for the education system to adapt to new economic times during which the trade of knowledge is becoming more significant than manufacturing. This shift is often referred to as "post-Fordism" or "post-industrialism" and implies that the methods of mass-manufacturing and mechanical reproducibility characterised by factory-floor production are being superseded in economic importance by the creation of new knowledge in an era characterised by the use of digital technologies.³¹ This matters because the global race is on amongst advanced nations to secure competitive advantage in a marketplace where it is increasingly easy to transcend national borders. In Thomas Friedman's memorable phrase, "the world is flat," India wants your lunch and China wants your dinner; that is, emerging economies such as India and China are increasingly able to compete in a global market, and other advanced nations need to innovate to stay ahead.³² As a consequence, it is increasingly asserted, schools need to change in order to equip children with the skills they will need to thrive. What the economy needs is creativity and innovation, and future personnel with the qualities to ensure that progress is sustainable.

As a consequence of such socio-economic developments in changing times, Veen and Vrakking suggest in *Homo Zappiens* that:

... schools will no longer be institutions training children for certainty; instead they will facilitate learning for a generation that can live and work in knowledge intensive organizations and institutions where they will have to rely on skills of flexibility and adaptability to cope with ever changing conditions and situations.³³

Computer games are ideal platforms for 21st century learning, this argument suggests, because they inculcate skills of adaptability and flexibility. This is in line with the suggestion that successful organisations are primarily concerned with "human capital," the labour and knowledge of their staff, and that in uncertain times the most valuable human capital one can possess is to be adaptable to changing circumstances and conditions. It is not enough to possess one core set of skills and knowledge but necessary to be flexible and able to respond to

³⁰ For key influential statements to this effect, see OECD (2001), Prime Minister's Strategy Unit (ref)

³¹ See, for example, Leadbeater, C (2004) *Personalisation through Participation: A new script for public services* (London: Demos).

³² Friedman, T (2005) *The World is Flat: A brief history of the twenty-first century* (New York: Farrar, Strauss and Giroux).

³³ Veen & Vrakking: 13.

new needs. As Allucquere Rosanne Stone points out, “Post-industrialist capitalist economies are developing into cultures of ‘play’ in which a pervasive ‘play ethic’ is superseding the work ethic.”³⁴

This is also the central thrust of John C Beck and Mitchell Wade’s *Got Game: How the gamer generation is reshaping business forever*, where computer games are regarded as a technological determinant of both cognitive development and economic renewal. The argument is that because of the ways in which children’s brains have adapted to playing games, then the ways they will run businesses and drive the economy in the 21st century are at odds with more established commercial routines and strategies.³⁵

In concrete terms, it is now suggested that children are developing from their use of powerful new media such as computer games the necessary skills of multitasking, “zapping” between different information flows, non-linear behaviours, learning through enquiry, and collaboration. JC Herz claims that games are

perfect training for life in fin de siecle America, where daily existence demands the ability to parse sixteen kinds of information being fired at you simultaneously ... kids weaned on videogames are not attention-deficit, morally stunted, illiterate little zombies.... They’re simply acclimated to a world that increasingly resembles some kind of arcade experience.³⁶

Computer games have become an important focus for thinking about learning, then, because they are seemingly changing the very fabric of the present; they are ideally suited to, and prepare children for, a new economic era that is based on the use of computers and other information and communication technologies. Indeed, computer games are regarded as the “push” technology which will support children to use other computer technologies. As Stephen Kline and colleagues put it, computer games seem to be “ideal commodity forms” for the contemporary period, just as suburban housing developments, cars and electronic appliances were ideal forms in the post-war decades; that is, they embody “the most powerful economic, technological, social, and cultural forces at work” in the present day. In the case of games, they represent qualities of perpetual innovation, style and fashion, fluid electronic consumer experiences, digitally enabled enterprise, and the reorganisation of work and business. Kline and colleagues identify how computer games are “a sort of low-level domestic socialization for high-tech work practices.”³⁷

³⁴ Stone, AR (1995) *The war of desire and technology at the close of the mechanical age* (Cambridge, MA: MIT Press): 9. Stone is cautious about the implications of this shift towards a “play ethic,” but others are far more optimistic. For example, see Kane, P (2004) *The Play Ethic: A manifesto for a different way of living* (London: Macmillan).

³⁵ Beck, JC and Wade, M (2003) *Got Game: How the gamer generation is reshaping business forever* (Cambridge, MA: Harvard Business Press).

³⁶ Herz, JC (1997) *Joystick Nation: How videogames ate our quarters, won our hearts, and rewired our minds* (Boston: Little, Brown), in Kline et al: 76 (see note 37).

³⁷ Kline and colleagues are drawing on Martyn J Lee’s work on “ideal-type commodity forms.” See Kline, S, Witheford-Dyer, N and de Peuter, G (2003) *Digital Play: The interaction of technology, culture and marketing* (London: McGill-Queen’s University Press): 76

Constructing as learning

Summary

The idea that children learn best by constructing ideas and knowledge through activity alongside others has a rich history in educational research and theory. In the games and learning literature, theories of constructivist learning are mobilised to support claims that computer games are ideal platforms for trying out ideas, making decisions, communicating with others, and of exploring or making new worlds. According to this perspective, through the act of playing games, players are active in the construction of knowledge, rather than its passive recipients. This view provides an updated vision of the school as a high-tech institution supporting children to develop complex problem-solving skills.

Detailed overview

Constructivism focuses on the ways in which people learn about the world by constructing knowledge actively alongside others, rather than by receiving knowledge passively from others, namely teachers.³⁸ Eric Klopfer, an advocate for the educational use of games, makes the case succinctly that

constructivist activities are characterized by wide open spaces to explore, room for learning through both success and failure, feedback that learners can use to adjust their own understanding, and multiple possible outcomes. Constructivist activities often take the form of problems that learners are motivated to solve in unique and active ways.³⁹

Put like this, the use of games to support young people's learning seems like common sense. Constructivism needs to be put in the context of socio-cultural psychology. Broadly speaking, this emphasises how children's development takes place through participation in an external social world and interaction with people, events and objects.⁴⁰

In some of the games literature such constructivist accounts of learning underpin the emergence of "constructionism," which extends the theory into an interest in learners' manipulation of materials and their construction of meaningful products. Constructionism is chiefly associated with the work of Seymour Papert (who coined the mnemonic) and colleagues at MIT.⁴¹ Indeed, Papert's writing on computer games suggests that they are "empowering children to test out ideas about working within pre-fixed rules and structures," and that they "teach children what computers are beginning to teach adults—that some forms of learning are fast-paced, immensely compelling, and rewarding."⁴²

These interrelated perspectives from socio-cultural theory and constructivism/ constructionism have lent a constellation of terms to the emerging discourses of games and learning. Learning with games is said to be social, to involve interaction with objects, to be situated in specific practices and events (even if they are virtual or simulated), to be active and participative rather than passive and merely receptive, and to involve

³⁸ Constructivism is closely associated with the work of the psychologist Jean Piaget. A reflection on his legacy is supplied by Beilin, H (1992) Piaget's enduring contribution to developmental psychology, *Developmental Psychology*, 28(2): 191-204.

³⁹ Klopfer, E (2008) *Augmented Learning: Research and Design of Mobile Educational Games* (London: MIT Press): x.

⁴⁰ Socio-cultural theory is derived from the work of Lev Vygotsky. For a detailed account, see Wertsch, JV (1998) *Mind as Action* (Oxford: Oxford University press).

⁴¹ See Papert, S and Idit, H (1991) *Constructionism* (Ablex Publishing). The introductory chapter to this volume is available online: <http://www.papert.org/articles/SituatingConstructionism.html>

⁴² Papert, S (1993) *The Children's Machine: Rethinking school in the age of the computer* (New York: BasicBooks): 4-5

the constant construction of meaning and knowledge. Putting it very simply, you don't find out about computer games by being told about them, you find out about them and figure out their meanings through playing with them; "making" or "constructing" meaning through the process of play. It is the alleged complexity and the diversity of the interactivity with computer games which is claimed to motivate children both to play games and to learn from playing them. Although these claims may be disputable⁴³ (for example, playing a game may well allow players to construct knowledge that is socially or morally questionable), they are persuasive and influential. Papert's work in particular is often considered seminal to research and development in games and learning.

For Papert, computer games that are appropriate platforms for learning are microworlds, or models of an external world that players are able to manipulate. Thus, playing such games (SimCity would be an example) is synonymous with programming and coding, and with developing an understanding of how systems work by interacting with them. This may be important insofar as young people need to better understand how computers are used to construct versions or simulations of some external reality, however complex and uneven those symmetries may be. Strategy games such as the Civilization series are often held up as examples of Microworlds, where players interact with complex systems of economics and resources to manage and manipulate the growth and progress of populations. More recently, Spore puts the player in charge of a simulation of biological evolution. This is a compelling example of the constructionist use of games, yet on its release some commentators questioned whether it could actually be said to simulate evolutionary biology or intelligent design. In its purely representational incarnation—as a depiction of life changing—it appears to model evolution; but as a simulation with which the player is in interaction it appears to model the idea of life as being externally determined.

⁴³ For a critique of constructivist approaches to education generally, see Kirschner, PA, Sweller, J and Clark, RE (2006) Why Minimal Guidance During Instruction Does Not Work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching, *Educational Psychologist*, 41(2), 75–86.

Situated practice

Summary

Perhaps the most influential work on games and learning to date has emerged from researchers and theorists who take “situated practice” as the primary unit for analysis. Situated practice refers to the notion that learning occurs most successfully when it takes place in authentic contexts rather than decontextualised settings. As such, the playing of computer games is regarded as situated practice while learning knowledge to take tests in a classroom is regarded as being divorced from learners’ daily experience. Furthermore, computer games are authentic contexts for learning because they demonstrate all the “multimodal” and “multimedia” features of modern technologies and media. From this perspective, traditional schools stultify children’s capacities by forcing them through formal routines and standards that have no bearing on or relevance to their everyday lives: such schools should be remodelled around the principles of engagement and informal learning provided by computer games.

Detailed overview

The writing of James Paul Gee has been highly influential in stimulating a games and learning debate. A linguist and literacy expert, Gee sees games as requiring players to master new literacy practices, something they do socially rather than only through some individual mental act. What Gee means by “literacy” here is that reading and writing (and this includes the interpretation and manipulation of images and sounds such as in computer games play) are not only mental achievements but “social and cultural practices with economic, historical, and political implications,” and that what goes on in people’s heads is “situated within” a “material, social, and cultural world.”⁴⁴

But games are also, Gee claims, designed to be learned. They “represent a process,” he goes on, “that leads to better and better designs for good learning and, indeed, good learning of hard and challenging things.”⁴⁵ This is because games are ideally suited to practising things in authentic contexts:

Humans need to practice what they are learning a good deal before they master it. ... The fact that human learning is a practice effect can create a good deal of difficulty for learning in school. Children cannot learn in a deep way if they have no opportunities to practice what they are learning. They cannot learn deeply only by being told things outside the context of embodied actions. ... Good video games involve the player in a compelling world of action and interaction.... Thanks to this fact, the player practices a myriad of skills, over and over again, relevant to playing the game.⁴⁶

The skills that Gee sees as especially important are those that allow children to become more flexible and adaptable—or as he terms it, to become “portfolio people” able to “shape-shift” according to immediate context. The “portfolio,” for Gee, is a collection of transferable skills and achievements that people need to be able to manage. And it is the skills of self-managing one’s portfolio that Gee regards as commuting from computer games play into successful knowledge working in the “new capitalism,”⁴⁷ an argument he clearly shares with other enthusiastically “post-Fordist” games advocates.

⁴⁴ Gee, JP (2003) *What Video games have to Teach Us About Learning and Literacy* (Houndmills: Palgrave MacMillan): 8

⁴⁵ Gee, *What Video Games*: 6.

⁴⁶ Gee, *What Video Games*: 68.

⁴⁷ Gee, JP (2004) *Situated Language and Learning: A critique of traditional schooling* (London: Routledge).

A key aspect of this analysis is its focus on player identities. Situated practice with games means taking on the identity offered by a game itself, for example, the identity of a soldier, of an orc, of an adventurous archaeologist and so on. Even if the game only offers you the identity of a “four-inch house-cleaning robot,” as Gee explains in one of his examples, “there are still lots of skills and facts a player needs to master, all of them germane to being a four-inch robot.”⁴⁸ Perhaps more importantly for Gee, though, is that identity is a social construct, something developed in the individual through participation in social organisations. For Gee, the conditions for deep learning from experience “go beyond the individual to include the individual’s participation in social groups that supply meaning and purpose to goals, interpretations, practice, explanations, debriefing, and feedback,” and games do this by:

recruiting distributed intelligence, collaboration, and cross-functional teams for problem-solving; offering players “empathy for a system”; marrying emotion to cognition; being challenging while still keeping frustration below the level of the affective filter; giving players a sense of production and ownership; and situating the meanings of words and symbols in terms of actions, images, experiences, and dialogue, not just “definitions” and texts read outside of contexts of use.⁴⁹

Such arguments have been extended by other games researchers. It has gained special salience amongst those who study massively multiplayer online games (MMOGs) such as *Everquest* and *World of Warcraft*.⁵⁰ In these titles, players join persistent worlds in which they may encounter and communicate with thousands of other players. For Constance Steinkuehler, these online worlds are places where human cognition is always both situated and distributed, that is, they always involve purposeful human action within a specific context, but that gains within such spaces rely on participation within large and distributed communities of players.⁵¹ For Steinkuehler, too, these environments are “push technologies” which introduce and socialise children into high-tech professional practices like those described by Gee:

By demonstrating the potential of such online worlds/cultures rather than reifying the current impoverished use of such technologies in schools, we might one day change the very culture of schooling into something more relevant, promising, and transformative for all.⁵²

For Steinkuehler, models of learning in MMOGs have the potential to inform the design of school experiences, and to enrich a currently impoverished educational landscape. At least partly this is because in playing and participating in MMOGs, players are involved in reciprocally teaching and learning from one another in collaborative networks of expertise and apprenticeship.

Another point to make in terms of situated practice is that computer games are one technology amongst many in children’s media ecologies. As Ben Williamson and Keri Facer have pointed out, children often mobilise many other media when ensuring they are making the most of playing computer games. So, for example, many players will buy or borrow games magazines, will observe their friends playing, and will have ongoing conversations about games with their peers. What this means is that learning through playing games must also

⁴⁸ Gee, JP (2008) *Learning and Games*, in Salen, K (ed) *The Ecology of Games* (London: MIT Press): 27.

⁴⁹ Gee, JP, *Learning and Games*: 37.

⁵⁰ For a broad and detailed perspective on such games, see Taylor, TL (2006) *Play Between Worlds: Exploring online game culture* (London: MIT Press).

⁵¹ Steinkuehler, CA (2008) *Massively multiplayer online games as an educational technology: An outline for research*, *Educational Technology*, 48(1), 10-21.

⁵² Steinkuehler, CA (2008) *Cognition and Literacy in Massively Multiplayer Online Games*, in Coiro, J, Knobel, M, Lankshear, C and Leu, D (eds) *Handbook of Research on New Literacies* (Mahwah NJ: Erlbaum): 611-634 (627).

be seen as a process of learning about games and learning to play games by making use of material and non-material resources that are consumed on an ad hoc basis.⁵³

⁵³ Williamson, B and Facer, K (2004). "More than just a game": the implications for schools of children's computer games culture, *Education, Communication & Information*, 4(2/3), 253-268.

Epistemic frames

Summary

The notion of computer games as epistemic frames refers to the idea that games communicate sets of ideas that are specific to particular sets of knowledge, or epistemologies. America's Army, therefore, provides an epistemic frame for beginning to understand military training and combat. Following this logic, it has been argued, it is possible to use games as epistemic frames for a range of other kinds of "professions" and subject matter. Work on epistemic frames has emerged directly from the theories of situated practice outlined above, but is intended to provide practical models for using computer games in schools in ways which support the development of children's skills and competences for a changing workplace.

Detailed overview

Epistemic frames is a term used by David Williamson Shaffer to describe the use of games as models of professional practice. He refers to games as entry points into particular sets of knowledge, for example, the epistemology of engineers or medical professionals. Shaffer's argument has similarities with those advocates of computer games as preparation for post-Fordist labour, but he develops his ideas more carefully around the concept of situated practice outlined above so that games are seen as part of a wider media landscape that can be used concretely by teachers. He does not assume so straightforwardly as others that playing games alone is ample preparation for employment and entrepreneurship in the knowledge economy. His work is also based on findings from specific fieldwork research rather than conjecture and as such should be seen as a serious approach to the understanding of how computer games can contribute to learning. A website, <http://epistemicgames.org> provides examples and publications supporting these claims.

Shaffer suggests that epistemic frames are particular "ways of knowing, of deciding what's worth knowing, and of adding to the collective body of knowledge and understanding of a community of practice."⁵⁴ Furthermore, he defines an epistemic frame as an "island of expertise," or any set of practices and activities in which learners are completely immersed. As such, the playing of computer games can provide learners with access to such islands of expertise, environments in which they are immersed and developing some level of knowledge of the practices appropriate to it. He aims to "show how games can be more authentic than school: more realistic and more meaningful ways of thinking about problems that matter in the world."⁵⁵

According to Shaffer, playing games as epistemic frames allows learners to develop "collections of skills, knowledge, identities, values, and epistemology that professionals use to think in innovative ways."⁵⁶ Learning these epistemic frames through professional training and practice is very different from the experience of learning in schools, particularly in an education system under pressure to meet test standards. Using games for educational purposes can, Shaffer argues, allow learners to adopt the identities and practices of professional innovators in a variety of fields.

Gee, whose work has close affinities with Shaffer's, makes similar claims. He suggests that really good teaching in any educational domain should be about enabling young people to "play the game," in other words "play the game" of scientist, of mathematician, of writer, geographer, historian, and so on. He sees this occurring

⁵⁴ Shaffer, DW (2004) Epistemic Frames and Islands of Expertise: Learning from infusion experiences (online at: <http://216.239.59.104/search?q=cache:oAJrJmgIXcAJ:www.education.wisc.edu/edpsych/facstaff/dws/papers/epistemicframesicls04.pdf+epistemic+frames&hl=en&ct=clnk&cd=1&gl=uk&client=firefox-a>).

⁵⁵ Shaffer, DW (2006) How Computer Games Help Children Learn (Houndmills: Palgrave MacMillan): 12.

⁵⁶ Shaffer, How Computer Games: 12.

through a four-part process where players probe the virtual world of the game, form hypotheses about it, re-probe it with those hypotheses in mind, and then, based on feedback from that virtual world, accept or re-think those hypotheses. This process, Gee argues, is the basic procedure of the scientific method. He argues that it is pedagogy that needs to adapt to the practices that young people are bringing with them into the classroom from their use of computer games. As with playing games, lessons need to support learners to probe the rules of a system, hypothesise about it, re-probe it, and review their hypotheses.

On the website <http://epistemicgames.org> there are many examples of “epistemic games” developed and used in research by Shaffer and colleagues.

Digital Zoo. In [Digital Zoo](#), players become biomechanical engineers. Using [Sodaconstructor](#), a sophisticated physics simulation, they design wire-frame character prototypes for an upcoming animated film. Players meet with clients and engineering experts, and present their work, developing real-world skills while learning concepts in science and engineering.

Urban Science. In [Urban Science](#), players engage in the professional practices of urban planning and learn how to become ecological thinkers in the process. They work together to tackle the urban issues that face their city, using iPlan, a Geographic Information System (GIS) tool that helps them develop a comprehensive plan for their community.

Pandora. In [The Pandora Project](#), players become high-powered negotiators, deciding the fate of a real medical controversy: the ethics of transplanting organs from animals into humans. Along the way, they learn about biology, international relations, and mediation.

Representation, gender and violence

Summary

For many researchers of computer games, the ways in which they represent content—such as gender roles and violence—is of key concern. They have noted how the majority of games titles have historically appealed more to a male audience, such as through action-based and sports genres, and how, for example, females have been depicted as highly sexualised but usually marginal figures. This is important to the debate around games and learning both because it suggests that games might be more suited to boys and because it raises important questions about the cultural representations to which young players are exposed and from which they may develop knowledge and understandings. Research in this area is not directly concerned with formal education, but provides contextual and theoretical focus for the study of games as cultural forms and products.

Detailed overview

Games studies is a broad and multidisciplinary field encompassing theories imported from literary studies, economics, film studies, semiotics, cultural and media studies, psychology, sociology, and play theory, amongst others.⁵⁷ Rather than attempt to crudely synthesise such diversity, I intend to focus in this section on a selection of key games studies topics of analysis that are germane to the discussion of games and learning. These are representation and simulation, violence, gender, and persuasion.

Representation refers to the way in which a specific medium articulates or constructs aspects of reality, or, as Stuart Hall puts it, the way “we use signs and symbols—whether they are sounds, written words, electronically produced images, musical notes, even objects—to stand for or represent to other people our concepts, ideas and feelings.”⁵⁸ In computer games, representation refers to how all of those kinds of signs and symbols are assembled to create ideas and concepts in players. Of course, this is not a straightforward process—no single player or “audience segment” is likely to respond to the same representation in quite the same way—yet it is important to recognise how very different sorts of games and titles represent or stand for things that are either real in the world or purely imaginative constructions. For example, how do military games represent violent combat? How does Nintendogs represent the experience of being a pet owner and carer? How does The Sims represent domestic life? The act of playing any one of these titles necessarily impacts on what and how it represents, yet as designed environments they all possess representational content. A good example is how games represent the “look” of females, an issue that has generated significant scholarly debate. The argument here is that games have typically represented females as highly sexualised figures, usually marginal to the main action, with the consequence that females have generally not played computer games as much as males; although this situation is changing.⁵⁹

⁵⁷ Useful volumes on games studies which demonstrate its methodological and theoretical breadth can be found in Rutter, J and Bryce, J (eds) (2006) *Understanding Digital Games* (London: Sage); Wolf, MJP and Perron, B (eds) (2003) *The Video Game Theory Reader* (London: Routledge); Salen, K and Zimmerman, E (2006) *Rules of Play: Game design fundamentals* (Cambridge, MA: MIT Press); and Raessens, J and Goldstein, J (eds) (2005) *Handbook of Computer Games Studies* (Cambridge, MA: MIT Press).

⁵⁸ Hall, S (ed) (2003) *Representation: Cultural representations and signifying practices* (London: Sage): 1.

⁵⁹ For a discussion of gender representation in games, see Carr, D (2006) *Games and Gender*, in Carr, D, Buckingham, D, Burn, A and Schott, G, *Computer Games: Text, narrative and play* (Cambridge: Polity): 162-178. Statistics on the gender breakdown of computer games players generally tend to demonstrate a balancing out of male to female player ratios. See, for example, a report commissioned by the BBC: Pratchett, R (2005) *Gamers in the UK: Digital play, digital lifestyles* (London: BBC), which puts the ratio at 55% male to 45% female.

Ideas about representation have been challenged in the games literature on the premise that representation derives from language and from a philosophical view of the world which supposes that signs and symbols equal something in the real world; simulation, however, derives from computer coding which permits users to manipulate it. Jon Dovey and Helen Kennedy have developed a useful way of conceiving of how representation works in computer games. They suggest that games are “simulated worlds” which “deploy representation” as a “fundamental interface; representation is our means of accessing the simulation of the rule-governed world.” Furthermore, because images, signs and symbols have “ideological significance,” then “we clearly need to take seriously the claim that the ‘old’ system of representation is collapsing in the face of the ‘new’ system of simulation.”⁶⁰ What they conclude is that mathematically-coded simulations represent a world that is more complex than linguistic or philosophical representation allows; that is, coded simulations are dynamic models which players manipulate so that they are at least partly participating in the creation of representations.

As observed earlier, for some commentators games are ideal simulations of emerging post-Fordist work patterns, even though such games do not, of course, specifically represent the experience of work in a post-Fordist economy. This continues to raise questions about whether work practices are now being modelled on gaming practices and, thus, in educational terms, whether learning practices are being modelled on the logic of complex simulations which themselves deploy ideological representations for players to act upon. In the case of military simulations like those valorised by Marc Prensky, does this mean that work and learning are more and more coming to conform to simulated military practices? Indeed, it seems in some of the accounts offered above as though computer-based military training is now being lauded as the ideal model for children’s education.

On a simpler level, representation is still key to how games communicate. The design choices made in one of the Grand Theft Auto series of games, for example, represent specific concepts and ideas about cities and urban criminality; The Sims represents certain identifiable aspects of families living in houses, going to work and earning money.

This last concern with representation is closely connected to issues to do with violence and inappropriate content. There is a literature contending that violent games produce short-term aggressive arousal effects in some players,⁶¹ but this is disputed.⁶² The Byron Review took the view that the evidence for games having such effects was insufficient to require specific regulation of violent game content. It is increasingly argued that seeking to identify aggressive effects derived from playing computer games is a simplification of much more complex social issues. Violent and aggressive behaviour have many causal factors that cannot and should not only be attributed to playing computer games.⁶³ Certainly, however, simplistic accounts of computer games as inherently positive and educationally affirmative can be countered with the argument that if this is the case then it must also be the case that their brains could be moulded to an aggressive template. The argument I

⁶⁰ Dovey, J and Kennedy, HW (2006) *Game Cultures: Computer games as new media* (Maidenhead: Open University Press): 10-11.

⁶¹ The best-known scholar in this area is psychologist Craig A Anderson. For a recent overview of his position specifically in relation to children’s learning, see Swing, EL and Anderson, CA (2008) *How and What Do Videogames Teach?* In Willoughby, T and Wood, E (eds) *Children’s Learning in a Digital World* (Oxford: Blackwell): 64-84. This chapter is interesting in that, contrary to many readings of Anderson’s work, he is not opposed to computer games altogether but sees them as having the potential both to reinforce positive and productive learning and to produce negative aggressive arousal. Critics point out that this type of work derives its evidence from laboratory settings and does not account for social contexts.

⁶² A detailed critical account of this literature is provided by Bryce, J and Rutter, J (2006) *Digital games and the violence debate*, in Rutter, J and Bryce (eds) *Understanding Digital Games* (London: Sage): 205-222.

⁶³ This argument is made in Buckingham, D (1997) *Electronic child abuse? Rethinking the media’s affects on children*, in Barker, M and Petley, J (eds) *Ill Effects: The media/violence debate* (London: Routledge): 63-77.

subscribe to is that arguments about games' inherently positive and negative effects are both to be treated cautiously.

There are some key games projects emerging which closely attend to issues of representation and simulation raised above. Perhaps the most notable is the work of Ian Bogost on "persuasive games." By "persuasive," Bogost means the ways in which games operate to influence players. Through their representational and communicative apparatus, Bogost argues, games are rhetorical devices. They define rules of behaviour which serve to influence players as persuasively as written or spoken rhetoric. And this power of games, Bogost argues, has been recognised in politics and marketing as much as it has by educational advocates of games. In short, games allow players to participate in the making of claims and it is in this mental process that games become persuasive.⁶⁴ Bogost thus uses the rhetorical power of games to communicate arguments about contemporary social issues.

⁶⁴ Bogost, I (2007) *Persuasive Games: The Expressive Power of Videogames* (Cambridge, MA: MIT Press).

Media literacy

Summary

“Media literacy” refers to the ability of learners to be able to read and produce media, in the same way that “print literacy” refers to one’s competence in reading and writing conventional printed texts. However, media literacy is also overtly political in that developing children’s literacy in this way means ensuring they understand how media are produced, for what purposes, and to what effects. It means grasping how media organisations operate, how audiences receive and respond to different media, and how the exchange between media producers and consumers impacts on social relations and culture. It should be noted that media literacy is especially important to the discussion of games and learning because its main advocates were commissioned to contribute to the Byron Review. Media literacy is intended as a direct approach for use in schools.

Detailed overview

With the proliferation of ICT and new media in recent years, more and more commentators have urged educators to support children to better understand the effect that these media may have on their lives and on society. As David Buckingham points out, a focus on “media literacy” should permit students to develop both the “critical understanding” of how to *read* media and the “active participation” of *writing or producing* it, and it is part of a wider move towards “*democratization*—a process whereby students’ out-of-school cultures are gradually recognized as valid and worthy of consideration in the school curriculum.”⁶⁵ Media literacy is thus seen as a form of preparation for children to make informed sense of media on their own behalf, rather than a form of protection from what are often perceived to be its negative or even harmful influences.

It should also be noted that proponents of media literacy approaches to learning take as their point of departure a view of audiences as being active and participative, making meaning out of the media they use rather than passively receiving and accepting content from media outlets. In this way, the active-audience model has much in common with emerging work in the sociology of childhood which sees children as active meaning-makers in their everyday experiences, and which therefore proposes reorienting schools to support and stretch their abilities to understand the ways in which their everyday experiences are shaped.⁶⁶

There are two aspects of media literacy in relation to games I describe here: critical consumption and creative production. The first, critical consumption, refers to the ways in which children consume and interpret games in relation to cultural contexts. The tastes, pleasures and opinions of children are always changing according to context and time. This means that in the study of how children engage with computer games, it is always important to take into account both the structure and possible meanings associated with a game, and the social and cultural specifics of audiences that may influence the way they interpret that game. As Buckingham, perhaps the most influential advocate and researcher of media literacy puts it,

we cannot confine our attention to the isolated encounter between the reader [player] and the text [game]. We need to take account of the interpersonal context in which that encounter takes place ... as

⁶⁵ Buckingham, D (2003) *Media Education: Literacy, Learning and Contemporary Culture* (Cambridge: Polity): 4 & 9

⁶⁶ See Prout, A and James, A (1997) A new paradigm for the sociology of childhood, in James, A and Prout, A (eds) *Constructing and Reconstructing Childhood* (London: RoutledgeFalmer); and Prout, A (2005) *The Future of Childhood: Towards the interdisciplinary study of children* (London: RoutledgeFalmer).

well as the broader social and economic processes that determine how texts are produced and circulated. ... Literacy in this broad sense involves analysis, evaluation and critical reflection.⁶⁷

Thus, media literacy involves a conceptual basis which includes questions about representation (how media offer particular interpretations of the world, whose voices and opinions they represent); about language (how media are constructed, designed and structured); about production (who is communicating to whom, and why, including an awareness of commercial influences, marketing, advertising, as well as other interest groups using media to persuade and inform); and about audience (how media are targeted at audiences and how audiences use and respond to them). All of these components are important in developing a critical understanding of how media are consumed. This is not least because media literacy educators tread a middle ground between the sociological oppositions of structure and agency—there is now agreement that children are not automatically determined by the structures of society, nor that they have complete control over the influences exerted by these forces. “In some cases, the structure of textual messages may affect what they think and believe; in others, they may not.”⁶⁸

Creative production refers to the ways in which children can themselves become the designers and creators of media. Andrew Burn and James Durran call this “digital authoring” and suggest that it should not just be seen as an “addition” to critical consumption but as a way of facilitating and supporting learners to develop their critical competences. They place “the creative function of media literacy before the critical function.”⁶⁹ Doing so has been made possible in recent years by the affordability and widespread availability of cheap or even free digital media creation technologies. Video editing packages are now widely available, film and television archives are available online, and there are even emerging software platforms for the creation of animations and mini-games. It is through the use of these technologies for creative and productive purposes, Burn and Durran propose from their own classroom work in English and media studies, that learners can develop their critical facilities because it is by constructing media that issues to do with its design, distribution, representation and audience emerge.

In specific terms of games and learning, media literacy advocates suggest that teachers can focus on different aspects of computer games in the formal classroom. Burn and Durran, for example, report on their own classroom practices at a secondary school in Cambridgeshire. They suggest that “games literacy” includes:

- Learning about the games industry: what companies are involved in the design, production, publishing and marketing of computer games
- Learning about the narrative system of games: what is the narrative structure of a game, what generic characteristics does it have, what character types?
- Learning about ludic systems: what are the rules of games, how does this structure how they are played, and what pleasures and challenges do games construct?
- Designing games: students plan, design, produce and publish their own games, involving the manipulation and transformation of ideas from other games or media.

⁶⁷ Buckingham, D (2008) *Beyond Technology: Children’s learning in the age of digital culture* (Cambridge: Polity): 149-150.

⁶⁸ Burn, A and Durran, J (2007) *Media Literacy in Schools: Practice, production and progression* (London: Paul Chapman): 14.

⁶⁹ Burn and Durran: 13.

Games literacy is thus intended to support children to recognise how a rich textual and media ecology is comprised of a mix of cultural forms, and to ask questions about “how [they] function and how people create, use and engage with them.”⁷⁰

⁷⁰ Burn and Durrant: 113-128.

5. Examples

This section provides a series of outlines of key games and learning projects.

Teaching with Games (Futurelab/Electronic Arts)

Futurelab's Teaching with Games project involved researchers working with school teachers to design practical approaches to the use of computer games in schools.

http://www.futurelab.org.uk/projects/teaching_with_games

Games in School (European Schoolnet)

Commenced in summer 2008, the Games in School project is a pan-European study of teachers' perceptions and uses of games in formal education.

<http://blog.eun.org/games/>

PSPs in School (ConnectED)

In association with Sony, ConnectED has supported school teachers to develop bespoke educational approaches to the use of PlayStation Portable consoles in education.

<http://www.connectededucation.co.uk/Homepage?Plugin=ConnectedED&TTU=0&thelayout=3&docname=SonyPSPPilot>

Consolarium

The Consolarium is a dedicated games and learning centre in Scotland, funded by Learning Teaching Scotland. It sets up national games competitions and, in association with the University of Dundee, has conducted a large-scale study of the use of brain-training games in Scottish primary schools.

<http://ltsblogs.org.uk/consolarium/>

Historical strategy

The use of historical strategy games in the formal curriculum has been the focus of two influential PhD studies.

<http://www.egenfeldt.eu/public.htm>

Games + Learning + Society

GLS is a US university research initiative which aims to support young people to become "tech savvy" new media consumers and to develop complex, academic language in students (something it claims schools fail to do).

<http://www.gameslearningsociety.org/>

Education Arcade

The Education Arcade is an alliance of US researchers and games developers who design and test out games specifically for educational purposes. These include Supercharged!, Outbreak and Ceduceus.

<http://www.educationarcade.org/>

LearnPlay Foundation

The LearnPlay Foundation's Game2Grow project used commercial games, in many cases non-educational games, to help disaffected young people to build 'soft' skills such as social interaction, leadership, and strategic skills.

http://www.learnplayfoundation.co.uk/index.php?option=com_content&task=section&id=5&Itemid=38

Soul Control

Soul Control is a computer game designed by young people to help young people understand the dangers of knife crime. The Soul Control project found that it was the creative *process* that engaged young people and taught them the skills that increased their confidence/ make them more employable. Skills included:

<http://www.soulcontrolgame.co.uk/>

World without Oil

World without Oil was an immersive multimedia game experience in which players had to manage the political economy of a nation after the exhaustion of oil.

<http://worldwithoutoil.org/>

Perplexcity

Perplexcity is multimedia game-like experience, played at a certain time, in which players have to solve complex problems, puzzles and mysteries.

<http://www.perplexcity.com/>

Global Conflict: Palestine (Serious Games Interactive)

Palestine is a role-playing game in which players take on the role of a journalist trying to put together a story after a violent incident in Palestine. By interacting with other characters in the game and by constructing short news stories, the player's actions influence subsequent actions and hostilities.

<http://www.seriousgames.dk/>

Operation: Climate Control (Red Redemption)

Operation: Climate Control puts the player in the position of European president for a year, making key decisions relating to the climate. Sponsored by Defra's Climate Challenge, it is based on official climate data.

<http://makesyouthink.net/games/operation-climate-control/>

Mission Maker (Immersive Media)

Mission Maker is software which allows learners to create their own mini computer games. Based on a simple authoring tool that allows choice of characters, settings and mission structure, it has been used effectively with children in key stage 3.

<http://www.immersiveeducation.com/MissionMaker/>

Persuasive Games

The persuasive games website provides a series of “mini-games” designed to make players think about contemporary social issues, including consumerism and the “war on terror.”

<http://www.persuasivegames.com/games/>

6. Arguments and criticisms

In this section I describe some key counter-arguments about games and learning. As already observed, this is an area in which enthusiasm sometimes stands in for evidence. Overarchingly, these critiques of games suggest that learning from games (whether formally or informally) is something that is more complex than its advocates recognise. From the perspective of this report, these critiques suggest that we should think hard about remodelling education to the mould of playfulness established by games.

Digital natives and digital divides

The popular discourse of children as digital natives has run up against inevitable criticism. Reservations about this discourse include its generalisations and assumptions, its lack of evidence beyond the anecdotal, and its unwillingness to acknowledge that children have very different levels of access to new media of all kinds. As David Buckingham has argued, “the optimistic view of young people as a ‘digital generation’ —as somehow automatically liberated and empowered through their experience of these new technologies—is little more than a form of wishful thinking.”⁷¹ The digital natives argument suggests that simply because anybody born after around 1980 has grown up surrounded by new technology they have been absorbed in it. This has some truth to it. Many young people cannot remember a time before mobile phones and the internet were available and have always known of computer games as mass market entertainment media. Yet levels of access to computer games technologies do differ according to socio-economic context and gender. Even where statistics demonstrate widespread ownership and use of computer games platforms, there is little evidence to suggest that players all use these in the same way.

Assumptions that all players use computer games in a sophisticated way ignores questions about what games people are playing and in what contexts they are doing so. Advocates in this area, it should also be noted, are not so much observing and reporting on the ways in which children are spending their time using games and other new media, as writing those idealised, tech-savvy children into being. And because the majority of this kind of work comes from commentators who take an unquestioning view of social and economic change (and claim that schools need to “catch up” and “match up”), this means that the new construction of children being written is one motivated by the current political economy in which technological progress is seen as key.

There is also a significant question of how the content of games serves to reproduce existing divides between different groups of children. Despite growing evidence that game playing is becoming more popular with girls than it ever was before, it remains the case that military and sports games with appeal to boys retain enormous significance in the games industry. Kline and his coauthors suggest that “this bias privileges themes and representations of warfare, fighting, combat, and conquest along with the subject-positions of aggressive, active male characters ... aimed at the industry’s most reliable customers—adolescent boys and young men.”⁷² Inequalities in computer games play, then, are reinforced by levels of access to technology as well as by content.

Education and entertainment

⁷¹ Buckingham, D (2008) *Beyond Technology: Children’s learning in the age of digital culture* (Cambridge: Polity): 75.

⁷² Kline et al: 194-95

Some commentators have suggested that computer games need to be scrutinized as a cultural phenomena whose origins, production and role in media culture are far from merely benevolent. The main point of reference here is Stephen Kline, Nick Dyer-Witheford and Greig de Peuter's *Digital Play: The interaction of technology, culture and marketing*, perhaps the most sustained and meticulous critical work on computer games produced to date. These authors point out, for example, that the designation "Nintendo generation" to refer to computer games players was part of a high-intensity marketing and branding campaign by Nintendo itself, the aim being "to implant in consumers an ongoing awareness of and identification with the branding corporation." They suggest, therefore, that games companies such as Nintendo act as "colonizers," with "the colonized" being "the children who play the games":

What does it mean to say that Nintendo colonizes its child players? It means that the child's attention, time, desires, ambitions, and fantasies become attached to the Nintendo world, from which he or she derives not only the immediate pleasure (and frustration) of gameplay but also an array of metaphors, narratives and codes for the interpretation of life, and often a whole range of social activities—contests, conversations, clubs, etc. Minds, bodies, and social interactions are thus increasingly "occupied" by Nintendo activities and purchases.⁷³

With this colonisation process in place, the argument proceeds, children's attention is shaped into a source for maximising profits. Computer games should therefore be viewed as part of a complex of corporate marketing, branding and competition for market share in a consumer culture where major entertainment providers have a growing influence on the thoughts and actions of children.

In Jane Kenway and Elizabeth Bullen's analysis of how entertainment and advertising impact on education in *Consuming Children: Education-entertainment-advertising*, it is argued that major media organisations have become a pervasive influence in children's lives to the extent that they compete with schools as sources of knowledge and understanding. Because television, the internet, computer games and so on have become so accessible, entertaining and persuasive, it is claimed that schools increasingly struggle to meet the high expectations that children are developing about how to engage their interest. This is expressed in the demand for teachers and schools to embrace new technologies, to make lessons more fun and to improve the "slickness" of their presentations. As Kenway and Bullen put it:

In many ways, corporate pedagogues have become postmodern society's most successful teachers. Their pedagogies are voluptuous and are consumed hungrily by the young. The corporate curriculum has become the yardstick against which all other curricula are judged and found wanting.... In segmenting children from adults, entertainment from education, and pleasure from school and teachers, the corporate curriculum may have created school students who expect and get no pleasure from the formal aspects of schooling; a cohort of students who do not expect adults to say anything worthwhile except in purely instrumental terms; who are unlikely to take seriously what schools tell them; and who are unlikely to construct their identities through schools.⁷⁴

While Kenway and Bullen are optimistic that there may be benefits to children's engagement with the entertainment world, they retain some caution about the effects this may have on what and how children learn. Corporate pedagogues, they maintain, tend to instil in children affective pleasures—excitement and emotion—rather than the reflexive pleasures of more conventionally learning for its own sake. This is

⁷³ Kline et al: 124-126.

⁷⁴ Jane Kenway and Elizabeth Bullen (2001) *Consuming Children: Education-Entertainment-Advertising* (Maidenhead: Open University Press).

reminiscent of arguments about the “work ethic” being superseded by a “play ethic.”⁷⁵ For many children, the effect of exposure to games and other forms of new media may have been to make school seem more like a deadening chore, a purely functional series of presentations which should rightly be rejected and undermined by the playfulness of consumer culture.

These arguments raise questions about the appropriateness of regarding computer games as ideal learning platforms for the 21st century. Although in the last section I noted how media literacy advocates see games as ripe for critical analysis, there is insufficient evidence that this is taking place beyond a few isolated examples.

Military simulation

Another reservation to raise here is the way in which military simulation games such as America’s Army are used as examples of ideal learning environments. America’s Army is simply a more highly realistic military game than countless other similar titles already on offer and is part of a complex of military simulation and training (or serious gaming) technologies.⁷⁶ As Rebecca Mileham points out, many of the design decisions made in the production of the game gloss over the reality and authenticity of military experience, and “ultimately the aim of the game is to nurture a positive, unquestioning attitude towards the US Army, and all the game designers’ choices seem to support that.”⁷⁷ As she goes on to identify, when games have been produced in the Middle East that represent US forces as an “enemy” they have generally been treated with revulsion in the West.

Kline and colleagues take such an argument further. They claim that computer games are part of a “military-entertainment complex,” where military simulation technologies often contribute to advances in games technology while games developments symbiotically loop back into the developments of an increasingly high-tech military industry. Clear examples of this include America’s Army and Full Spectrum Warrior, though others, perhaps less well-known, include the fact that during the war in Iraq in 1990 both sides had already “gamed” the conflict using advanced simulation media. The “military-entertainment” line of analysis is implicated in a wider argument about the role of technology in the deployment of advanced western ideology—especially American ideology—that Michael Adas regards as a “technological imperative” shaping the “nature of cross-cultural perceptions” and the expansion of US-based global capitalism.⁷⁸ This may seem at some distance from the debate about games and learning but it is important to remember that games, as Ian Bogost has argued, are persuasive rhetorical devices deploying representations that are influential in players’ perceptions and, moreover, that for some commentators games are seen as perfect training for 21st century life and work in a changing society.

Domestic simulation

⁷⁵ See Kane, P (2004) *The Play Ethic: A manifesto for a different way of living* (London: Macmillan).

⁷⁶ For example, see the September 2008 issue of the official US Army magazine, *Soldiers*, which features articles on a range of serious gaming, simulation, and other “non-kinetic” training technologies: <http://lists.army.mil/soldiersmagazine/pdfs/sep08full.pdf>. The main feature article describes a long history of military simulation and gaming, and states how the US Army now transports mobile “gaming labs” so that soldiers can train for a range of scenarios and modify missions based on their own real-life experience in the field.

⁷⁷ Mileham, R (2008) *Powering Up: Are computer games changing our lives?* (Chichester: Wiley & Sons Ltd): 264. Interestingly Mileham’s analysis of America’s Army in the context of the official US Army website where it can be located shows how game-style graphics are used to depict apparently real examples of military heroism, thus producing a “world where you’re not sure what’s real and what isn’t” (263).

⁷⁸ Adas, M (2006) *Dominance by Design: Technological imperatives and America’s civilizing mission* (London: Belknap Press of Harvard University Press).

Countering suggestions that the popularity of games such as *The Sims*, which simulates domestic life, are shifting the balance away from “militarised masculinity” in the games industry, Kline and colleagues argue that the “idea that military simulations provide training for soldiers is familiar,” and that, similarly, “what *The Sims* does is provide civilian simulator training for yuppies.”⁷⁹ The message of *The Sims*, they suggest, is that commodity consumption is key to human contentment. Everything in the game is instrumentalised. It valorises the acquisition of more and better objects. JC Herz claims that:

The Sims live in a perfect consumer society where more stuff makes you happier, period. There is nothing else. So your goals in SimLife are purely material. Work your way up the job ladder so you can earn more money, so you can buy more furniture, a bigger house and more toys.⁸⁰

Although admirers of *The Sims* such as Henry Jenkins suggest that it simplifies a complex real world into a “microworld” and thus invites players to examine their own lives, Kline and coauthors are more cautious, arguing that marketers within the games industry deploy a simultaneous “affirmation/negation” structure which gives the appearance of social critique whilst continuing to perpetuate existing ideologies of consumption. Again, then, such arguments remind us that learning from games involves negotiating a complex of messages about the ideological organisation of the present day. In particular, games such as *The Sims* suggest that ideas about citizenship and domestic life have collided with consumerism, the corporate ownership and commodification of culture.

New economy

Arguments against advocates of games as ideal learning platforms for the new economy need to be put in a wider context of debates about the trajectories of education and society. From the educational perspective, insightful criticism of the knowledge economy argument is provided by Stephen Ball. Ball notes, first of all, that evidence to support the idea that knowledge-intensive productivity is growing is at best weak. He has found that according to official knowledge economic indices less than 17% of UK labour is knowledge-based. Secondly, Ball notes that when education is oriented around the logic of the economy it risks becoming instrumentalised, losing its social function, and becoming subject to the law of markets. In such a scenario, learners are increasingly seen as consumers of educational services, who hopefully in the long run will be able to exchange the educational capital they possess for capital in the labour market. Thus, the skills of adaptability and flexibility championed by games enthusiasts may not have as widespread usefulness to learners as supposed and, furthermore, they are skills and dispositions that are taught to satisfy an increasingly market-based educational approach than socially motivated or human relations-based educational practices. In short, the critics argue, this would serve merely to strengthen the intrusion of private sector economic logic into public sector education and children’s experience. The idea that schools need to adapt to the processes of knowledge producing organisations puts schools in deficit to the efficiency of corporations and capitalist progress.⁸¹

Moreover, in larger sociological terms, Zygmunt Bauman has suggested that flexibility and adaptability are dangerous traits to inculcate in people. For him, the professed new flexible skills associated with this economic

⁷⁹ Ibid: 276

⁸⁰ Herz, JC, cited in Kline et al: 277

⁸¹ For a representative example of scholarly work in this area, see Ball, S (2006) *Education plc* (London: Routledge); Ball, S (2008) *The Education Debate* (Bristol: Policy Press); Dale, R. (1999) ‘Specifying globalization effects on national policy: a focus on the mechanisms’, *Journal of Education Policy*, 14(1), 1-18; Hartley, D. (2003) ‘New economy, new pedagogy?’ *Oxford Review of Education*, 29(1), 81-94; Kenway, J. and Bullen, E. (2001) *Consuming Children: education-entertainment-advertising* (Buckingham: Open University Press).

shift and the social conditions of uncertainty in which it is allegedly taking place are potentially corrosive to cultural values. For Bauman, perpetual uncertainty leads to cultural forgetfulness and the invalidation of current knowledge and “know-how,” so that “much of what we’ve learned we’ll surely have to forget.” It thus requires flexibility—“the capacity to forget fast and promptly dispose of past assets that have turned into liabilities, as well as the ability to change tacks and tracks at short notice and without regret.”⁸² Similarly, Lynn Fendler suggests that these uncertain conditions increasingly seem to require teachers to educate “flexible children” whose values, skills, and know-how are ideally suited to corporate uncertainty, while Thomas Popkewitz disputes claims that “the twenty-first century child has to be prepared to be a global citizen/worker, flexible, adaptable, ready for uncertainties in work as well as in the family.”⁸³ The flexible child, in short, is prepared to respond to the needs of the economic system. The reason for raising these arguments in response to the popularising discourse of games as ideal learning platforms for the 21st century is that its logic assumes the purpose of education is to buttress the existing economic order. Business needs flexible workers; schools must provide them; playing games is the pedagogic model for achieving this.

Yet a global economy may actually prove to be problematic. Merely preparing children for labour and life within it is neglectful of its effects, its potential inequalities and its constant return to the economic bottom-line. In Bauman’s terms, to educate children to be flexible in an uncertain society means educating them to be “spineless,” to “avoid swearing lifelong loyalty to anything and anybody.”⁸⁴ To design educational experiences around the logic of an economic need for flexible and adaptable labour, then, risks telescoping Bauman’s observations about cultural amnesia into formal pedagogical outcomes. Games may be “ideal learning platforms” for a certain type of education system, but it is not a model that is neutral or wholly benevolent.

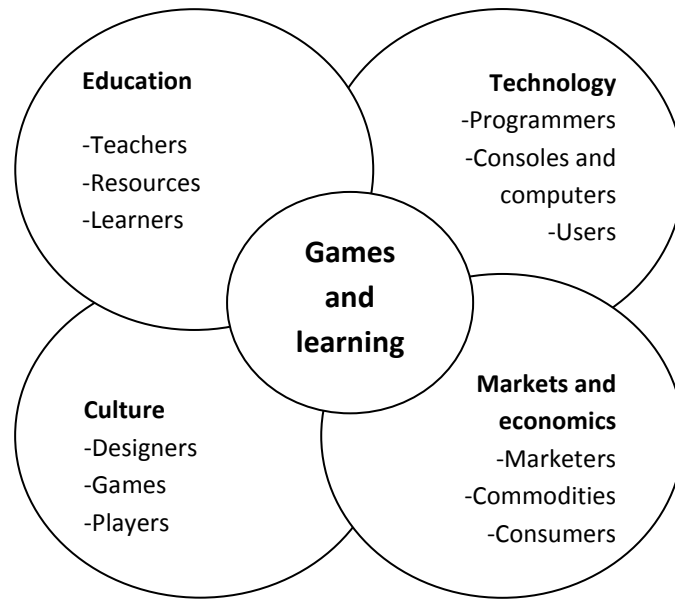
Implications for further research in games and learning

To return to the question posed at the outset of this survey of the current landscape of games and learning, what kind of learning might be taking place through the use of particular sorts of games and platforms, in what contexts might this be taking place, and in what arrangement of human actors in interaction with social, cultural and technological factors? Addressing this question means analysing what games learners are playing, when and where they are playing them, with whom, and how this relates to or is influenced by other factors such as social background, cultural trends, economics, and technological developments. The act of playing games itself takes place in the context of technological advance, the production and consumption of cultural meanings, and the marketing and selling of products. Any conversation about how computer games can contribute to learning, then, must add an educational component to this mesh of practices. Analysis in this area starts from the centre of the diagram below, but takes into account all four of the circuits.

⁸² Bauman, Z (2008) *The Art of Life* (Cambridge: Polity): 66.

⁸³ Fendler, L (2001) *Educating flexible souls*, in Hultqvist, K and Dahlberg, G (eds) *Governing the Child in the New Millennium* (London: Routledge); Popkewitz, T (2007) *School Reform in the Age of Cosmopolitanism* (London: Routledge).

⁸⁴ Bauman: 66



Mesh of games and learning⁸⁵

Each circuit, represented by the “petals” on the diagram, represents an arrangement of actors. So, in the technology circuit, there are programmers, consoles and computers, and users; in the culture circuit, designers, games and players; in the marketing circuit, marketers, commodities and consumers; and in the education circuit there are teachers, resources, and learners. This model is intended to indicate that the person playing a computer game is variously seen as a technology “user,” a games “player,” a cultural “consumer,” and a “learner.” At the same time, their digital media experience is one that has been designed by teachers, programmers, designers and marketers, while the games being used are resources and commodities accessed through console or computer hardware. These are not necessarily stable categories, but indicative of how research into games and learning is implicated in a complex mesh of factors. Analysing all of these factors simultaneously would be an onerous undertaking. Instead, rigorous research into games and learning could comprise of a series of research activities organised to study each of the “petals.” This draws attention to the need for specificity in terms of the technologies being programmed and used, the types of games being played and their cultural associations/representations, the position or identities offered to the player/learner, and the ways in which such games are produced and consumed.

⁸⁵ Adapted from Kline et al’s three circuits of interactivity (culture, marketing, technology) see Kline et al: 53

7. Resources

This section provides some useful links and resources.

Journals

Games Studies: <http://www.gamestudies.org/>

Gamasutra: <http://www.gamasutra.com/>

Games and learning websites

Serious Games (US): <http://www.seriousgames.org/index2.html>

Serious Games Interactive (Denmark): <http://www.seriousgames.dk/>

Serious Games Institute (UK): <http://www.seriousgamesinstitute.co.uk/>

Games + Learning + Society: <http://www.gameslearningsociety.org/>

Education Arcade: <http://www.educationarcade.org/>

Games discussion lists

Games Research Network: <https://listserv.uta.fi/cgi-bin/wa?A0=GAMESNETWORK>

Games-related websites

Games Domain: <http://www.gamesdomain.co.uk/indexuk.html>

Digital Game Archive: <http://www.digitalgamearchive.org/home.php>

How They Got Game: http://shl.stanford.edu/research/how_they_got_game.html

Adventure Classic Gaming: <http://www.adventurecollective.com/index.shtml>

Research Communities

DIGRA: <http://www.digra.org/>

Game Culture: <http://www.game-culture.com/index.html>