Towards an Appreciation of the Place and Potential of Computer Games in Education.

By

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Abstract.

Our objective was to investigate computer games to assess their educational potential. We came to the view that it would serve best to identify cultural, ideological, and pragmatic concerns that could present obstacles to the introduction of games into the classroom. Therefore, the focus of our research changed in character from a theoretical to a pragmatically informed basis. Given the relative youth of the field that constitutes educational games research, we set about creating an overview of the field in order to establish a semblance of direction towards the production of viable games. To complement the prevalent view that games might be successful because of their motivational qualities we proposed a balancing principle that alternative views had also to be countenanced. We took the position that because computer games as entertainment were self-motivating it did not necessarily follow that similar motivational factors could be relied on for application in education. We therefore analysed the positivistic bias we had identified as problematic because it did not seem to anticipate the possibilities of counter reaction and resistance from the students who were expected to learn with educational games and the teachers who would be expected to implement them.
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11.3.2. Supporting Recommendations
Imagine instructional techniques that engage students so effectively that it is
difficult to drag them away from the assignment. This type of education is
going on with students every day—but it is not happening in schools. Rather,
it is happening in the video games students are playing in their free time”
(Hommel 2010, p.148)

1. Introduction.

In recent times a change has taken place in relation to the question of computer
games. Where once they were assigned the cultural and social status of pariahs they
now have gained lustre in academic studies and are the cynosure of research from a
range of journals, periodicals, conferences and organizations dedicated to
understanding their cultural and educational potential. Their well-established impact
in the entertainment sector has drawn the interest of academics interested in assessing
the possible impact of a variant of digital technology (Squire 2007). It should be noted
however, that the engagement of academia has not been reflected by an identifiable
shift in the overt or covert resistance that other branches of social discourse continue
to express. We will review alternate views in our chapter on culture however the
theme of resistance to electronic games will pervade much of the study. Though
writers such as (Gee 2004, Squire 2003, Squire 2005, Williams 2006) have argued
that the impact of electronic games could be as significant for this century as cinema
was for the last there are grounds to expect that games, because of their capacity for
interaction, may have greater impact. Such is the newly found enthusiasm for
electronic games that they are identified as powerful avatars of social and societal
change. In this milieu they are seen as avenues to the acquisition of skills that exceed
what can be achieved in traditionally based classrooms (Steinkuehler 2006,
2007). Electronic games, as a prime instance of participatory culture function as the
elective medium for a significant portion of young people. Since they require learning
they are seen as inculcating either an extension of original literacy practices or, (Gee
2004b) originators of a range of distinctly new literacies. Among proponents of
electronic games a consensus has emerged that forms an oppositional basis to the
older teaching practices of conventional schooling; notably a reliance on traditional
literacy practices based on print media to which they are “shackled”(Squire 2007) The
accusation levelled at conventionally orchestrated education is that compared with the
possible learning that obtains in video games, what is learned in the classroom is not
meaningful (Prensky 2001, Squire 2002). We have formulated our approach in the following study as a survey which seeks to locate some of the more salient “fault lines” we consider are located within the debate over educational computer games. In a sense the perceived enthusiasm of those who promote games for education is itself a fault line in that it can be argued that such enthusiasm might be interpreted as overly zealous and possibly become a locus of resistance.

“video games offer pedagogies of interactivity where players can inhabit possible worlds and participate in vibrant learning communities with trajectories of participation far more consequential than those found in schools” (Squire 2007)

Motivation for research derives from several sources, curiosity, fascination, admiration, even wonder and certainly excitement. All of these motivational energies were present to a greater or lesser extent in the decision to undertake research into the question of digital games in education. At that time the question was seemingly straightforward and the answer assumed to be positive. Computer games were highly popular among learners, they had potential for learning and the objective was to determine how best to accomplish this. I am not the first to conjecture about the potential for education if even a fraction of that passion, that attentiveness, that commitment could be harnessed or diverted for educational purposes (Gee 2004, Prensky 2001, Malone 1981, Squire 2003, Kafai 1994). The contrast between the engagement of children in consumer culture (particularly, for the purposes of the present discussion, in their involvement with and enjoyment of electronic games) placed against the passivity they display in school settings has long been noted (Buckingham 2003a).

A term frequently utilised is “harnessed” which connotes a redirection of dynamic energy for a purpose other than its original. What is it about education, about teaching, about learning in schools that has left it in dire need of inspiration from other sources? I realized that my own ideological assumptions had to be interrogated. Further reflection suggested that that it was critically important to unpack the ideological assumptions that, unwittingly or otherwise, I had imported into the study. Even the title I had chosen for my theses betrayed an assumption that was and would continue to be troublesome unless it were confronted. Calling the study “The
Educational Potential of Computer Games”, as originally intended, creates a tableau of traditional education sitting Queen like on a throne of judgement while the clever and the ambitious brought their wares for approval or sanction. The Queen came to the throne with the First Industrial Revolution. Her subjects are regimented, unquestioning and obedient. She is both creator and monarch of the classroom, the curriculum and the examination room. Even as the world changes and new powers grow, new ways to learn, novel means of communication, innovations in learning, her power remains. Those who, discontented with her reign, champion educational technology, whether in earlier forms or in newly emergent computer games, and keen to expose the shortcomings of traditional education promised much and have been criticised for their failure to deliver on those promises (Cuban 1983). The driving force informing this study is the desire to know if those who promise educational transformations from current developments are likely to be any more successful. This study is marked by a real dilemma. While we are fully prepared to concede that traditional education as it continues to be practiced is in dire and grievous straits still we defend for two reasons. One is that notwithstanding its reactionary conservatism, it offers stability to a culture and a world that is increasingly incoherent. The second is that we suspect the bona fides of those who would supplant traditional education with seemingly progressivist alternatives.

The word “potential” is inflected with positivist assumptions. It should, from a properly detached perspective, allow that the potential of computer games in education might be either positive or negative.

1.1. The Research Problem
The field of games research and the field of research into the use of games as educational tools is wide ranging in its interdisciplinarity. It is also a relative newcomer to academic research (Aarseth 2001). In the course of preparing our research for this study we noted how the field seems to prefer certain modalities, adopt certain positions, and create a shared set of expectations about what educational games were and what educational games were going to be. It seemed to us that either aware or unaware of this process, the field was developing a series of fault lines which could, if ignored negatively affect the forward progress of its development. Therefore our objective became to draw an alternative map that attempts to situate the identified instabilities in the field and delineate the more notable fault lines. We
intend to argue that the terrain of educational computer games is marked by certain cultural, procedural and educational anomalies. We are proceeding on the basis that there is an insufficiently holistic sense of the problems that attend research into educational computer games. It was the observed ease with which children seemed to learn that drew us to reflect on the possible use of games in education. Making our position clear; we are enthusiastic about computer games for use in learning; so enthusiastic that we are concerned about the obstacles to that happening. By identifying some of the tensions and instabilities in the field we hope to contribute to a refinement in the future development of educational computer games. Originally, it was our intent to perform ethnographic research out of which we could draw empirical conclusions. The problem with conducting ethnographic research is that it entails an essential imbalance of power between researcher and research subject as identified by (Scheurich 1995). Scheurich’s view is noted however we would argue that the imbalance of power is not necessarily nor always slanted to assure that the researcher is the power in the relationship. The more substantive reason was a sense of reluctance to engage in one more quantitative study, with the probability of asking much the same questions and finding much the same answers. A growing concern that there were a number of questions of a qualitative nature that had not received either full recognition or attention sealed our choice. Of concern was what Becker (2007) and others have noted as the seemingly increasing disconnect between academic research and the pragmatic needs of those teachers who might have considered the practicalities and obstacles of deploying educational games in the classroom. It is our central contention (and in one form or another will be repeated in the course of this study) that somewhere in the discourse that surrounds the issue of the possible use of computer games in education is a promise that electronic games will become an actual presence in the classroom and in education generally. The degree to which that promise had been or could be fulfilled was the foundation of our research question. The research problem then became how to assess the progress of that project, to assess the work accomplished, the milestones achieved, and the problems ideological, practical, and theoretical that might impede or obstruct its eventual realization. Even for a doctoral dissertation it might have seemed a daunting, perhaps overly ambitious undertaking; however our intent was to provide a form of survey. We needed only to alert others to possibly emergent issues. If our concerns were legitimate and our arguments convincing we would have served to advance the area of study. Was there
a need for this kind of contribution? During the course of the initial readings which shaped and altered our original thesis it began to appear that there was an insufficiently holographic sense of the project of games development. We mean specifically that there was a lack of a coherent sense of possible obstacles, practical, cultural, technical and legal might present as obstacles to educational games development. Giving due deference to other issues, however, we came to the belief that cultural forces would ultimately have the casting ballot on the feasibility of educational games.

Video Game theory has gained critical acceptance within academia, in large part because of the social consequences games are said to be producing. Last year sales of computer games outperformed the total revenue of the global cinema industry (ESA 2010). At the commencement of the new century, increased attention from the public, media, and academics, improvement in available technology and the possibility of increased funding from public and private sources has seen a resurgence of interest in producing digital games for educational use. This development has been marked by a high level commitment of resources in the United States, Great Britain, the Nordic countries and Australia. In the U.S. the Serious Games Initiative is now a locus for conferences that facilitate exchanges between researchers and developers. At MIT the Games to Teach project, set up by Jenkins, has given a new impetus to game research and the University of Wisconsin, at Madison has founded a research team led by Gee whose seminal work on games in , What Video Games Have To Teach Us About Learning and Literacy (Gee 2004b)is widely referenced in the research literature.. The team of researchers at the University of Madison also include influential researchers such as Squire, Steinkuehler, and Halverson. The U.S. based researchers are less interested in content and skills (Squire 2007)rather they investigate the discrete structure of computer games to reveal how they might be deployed for educational purposes. The University of London has several projects aimed at the educational use of computer games such as the Making Games project. Learning Lab Denmark has created a number of partnerships between researchers and industry as have researchers at the University of Malmo in Sweden. The IT University of Copenhagen is at work on developing a new format for serious games. The researchers at these institutions are motivated by a conviction that it is possible to go
Beyond the limits of edutainment based games and achieve a closer integration between learning and the play experience.

“Whereas schools largely sequester students from one another and from the outside world, games bring players together competitively and cooperatively – in the virtual world of the game and in the social community of its players” (Shaffer and Squire 2005, p.106).

That the average age of the game player is now thirty five is an indicator that the medium is maturing with an appeal to older audiences (Ibid) Video games have recently attracted the attention of educators and educational policymakers (Gee 2004b, Jenkins 2009). This is attributed to the fact that games require problem solving and that this requirement is situated in a playful and pleasurable environment (Hayes 2010).

The gamer and the student inhabit the same reality, yet their social, cultural and learning realities are utterly estranged from each other. The student produces work for the teacher that hardly anyone other than the teacher will ever see. The digital gamer forms communities create wikis, takes part in discussion groups, and publishes online. Digital games create a technological imaginary; a space for situations. By creating integrated worlds in virtual space games bring about something unique but rare in traditional education-the fusion of knowledge and action.

The problem solving focus inherent to computer games is regarded as fortuitous as it parallels an alleged shift to an emphasis on problem solving in traditional schooling (Prensky 2001, Gee 2004b). The perception among educators of life in the 21st century is that children should be equipped with new skills to deal with ever increasing complexity and risk (Baker 2007, Gee 2007)

This study aspires to be pragmatic. Pragmatism requires that we attempt an understanding of the culture out of which computer games have emerged, how that culture has shaped the formation of games and how games are affecting culture in turn. We must consider the theory which underpins the promotion of computer games as educational assets. Prior to the emergence of computer games technology was already noted for its augmentation of cognitive functioning (Cole 2005). The consideration of the use of educational games consists of analyses of a number of
trials and experiments in the creation and application of educational games by researchers in countries from Holland, the U.S., Greece, Denmark and Great Britain. We are concerned also with the question of ethics in technology, education and games. Ethics are a concern in debates over culture, hegemony, gender and education however ethics also have a pragmatic application in identifying possible legal obstacles to the development of educational games. The significance of educational computer games is their potential for education on a global scale and because of their digital basis the capacity to leapfrog stages of development in countries with underdeveloped educational infrastructures. It might seem odd to typify games as parochial given their global reach and impact however in the sense that computer games influence and are influenced by a western Weltanschauung it is fair to observe that much of the world does not subscribe to such an ethos. Educational games developed for a non-western audience might assist under resourced educational systems.

1.2. The Course of the Research.

The acquisition of a viable base of knowledge was initiated by devoting a year to intensive reading, making notes of references and possible directions while trying to avoid the conscious formulation of conclusions, no matter how tentative. Nevertheless, by the end of the first year certain threads had begun to appear By the end of the first year the initial enthusiasm for the educational potential of games had begun to lessen in favour of a more temperate view that was influenced by certain concerns that had begun to emerge. We were still broadly convinced of the educational worth of computer games, however, it would now be a longer, less simplistic, more considered project than was previously envisaged. We became convinced that the play of culture was neglected as a factor in the formation of mainstream and educational games. Within culture also we witnessed the unrestricted operations of various ideologies the effects of which acted as developmental obstacles for games. Part of the methodology of a qualitative analysis would have to entail a consistent wariness of what seemed at times to be an overly optimistic set of expectations. One of the pillars supporting the argument for computer games in education was the power of games to stimulate motivation(Gee 2004b, Prensky 2001, Malone 1981) however we could not find any arguments which balanced the optimism of motivational theory. We felt that balance was desirable and that it was a quality that could have been more apparent in the discourse on motivational
dynamics. If motivation was a thesis then somewhere there must be an antithesis. We could find none readymade, at least not in the literature of educational games studies. Apart from a more cautious attitude from theorists such as (Egenfeldt-Nielsen 2007, De Freitas 2006) on the lack of research to date and a study by (Hayes 2008) on the relative lack of effectiveness of many educationally purposed games there were few reports that offered any alternate sense of to the general optimism.
Chapter 2. Reviewing the Literature.

In the following we will identify the contributors that helped in the development of our research. If we created an icon to represent the contribution made by those who have been cited in the current study it might look something resembling a pyramid. The base of the pyramid would consist of the many contributors who provided support to particular arguments or positions. In many instances they supported contentions made by theorists who occupied greater attention. Occasionally they provided alternative arguments. In the course of this study we attempted to fashion a series of lenses with which to look into the field of computer games studies in general and educational games studies, in particular. We will use a similar approach in attempting to justify the various selections we have made and the choice of research personalities that attracted our attention. The account provided here does not aspire to be complete. In the closing stages of the study we were still uncovering sources of knowledge that had worthwhile contributions. Our hope is that we have achieved sufficient coverage of what is a diverse and often eclectic range of topics.

A qualitative study draws from a plethora of sources as it seeks to provide a multi-dimensional perspective on its subject matter. This research is heavily informed by such an ethos; perhaps more so than might be usual because, as we argue elsewhere, the field of games studies was heavily dependent for its creation on contributions from a wide range of disciplines. The very contributions from outside sources however raised certain defensiveness from practitioners within the field who questioned the credentials of analysis of games originating from theorists who did not play games (Aarseth 2001, 2003). This notion eschewed the view of games as story telling models. Others continue to insist that games have the potential to be analysed from a literary or at least, a narrative perspective (Atkins 2003, Aylett 2006). The present research draws from cultural and gender studies, ethics, media studies, social cognitive theory, educational theory, cognitive development, the psychology of education, health and prevention of disease, disability studies, game design and
development, the history of educational games research, hegemonic control of video games, motivation and resistance theory and the discussion on the nature and meaning of play in mainstream entertainment and educationally purposed computer games. The philosophy of knowledge, of education, and technology made their contribution. The study made use of recent research on studies of violence, and underperformance of males relative to females.

Focusing on research in applications of computer games to curricular subjects we reported on attempts to apply games technology to History, Geography, and Civics. Of particular interest was the trend towards the self-creation of learning games by students. Second Language Acquisition received attention because of the perceived ability of games (particularly online games) to promote and encourage language learning.

Certain practitioners sought to determine the educational value of games commonly available in existing form and which might be applied for learning in a relatively inexpensive manner (Puente dura 2007). With the continuing movement of technology from previously static positions within homes and schools it was necessary to address the potential for mobile games to provide educational opportunities.

Having commenced with the original thesis that computer games in education was an unalloyed good and then been led, by a process of extensive reading, to entertain a more moderate view as to the comprehensive nature of their potential effectiveness in education we formulated the hypothesis that while computer games did have potential in education it would be a useful research contribution to begin the process of mapping those areas where the promise of games may be realized and conversely other areas where that promise might be either frustrated or obstructed. This would constitute the bulk of the research problem The phenomenon whereby research began with certain views and sureties only to require amendment due to exposure from later knowledge is one that occurred on more than one occasion. It occurred when we realized that what had been discussed almost anecdotally with no more intent than describing the emergence of games studies as a distinct academic field i.e. the antagonism between those “inside” and those “outside” games research (Aarseth 2001), might have more consequence than originally considered. This is an area of controversy and might have been dismissed as an example of one of those academic turf wars of which there are more than a few. There did not seem to be sufficient writing to counterbalance many of the assumptions made by those who promoted
games for education. Was that a result of mutual antagonism or was it due to a positivism towards the application and further deployment of technology? As with other writers we felt inhibited by the limitations of dualistic thinking and exposition. It had its place nevertheless when we came to areas of real interest we were enmeshed in the views of certain theorists that seemed to ignore troubling questions as to the stability of their positions. This was particularly evident in areas prone to ideological inflection for example the predominance of constructivist theories of education and the formidable challenges posed to them by such authorities as Mayer(2004), Clarke (2005) and Kirschener, Swellner and Clarke (2006). In our view this is an area of real controversy, at least it should be. Granted the possibility that we failed to uncover a source of research that attempted a rapprochement between the competing discourses, our own research found theorists in both camps quietly determined to carry on with their views. This was particularly in evidence from the Constructivists.

We were helped by Sfard’s (1998) refusal to submit to a mono dimensional perspective and an exposition of how to engage with and entertain seemingly antagonistic viewpoints. Sfard led us to Habermas (1972) who offered the principle that it was not necessary to endorse one idea at the expense of another and that competing theories should be accommodated within the same discourse so as to have a counter balancing effect on one another.

Our hypothesis developed from what we argued as an almost abject failure to allow that play has vastly more significance in computer games as entertainment and in education. Linking play to male underperformance in education, we discussed the situation of play in postmodern culture where we argued that an insufficient appreciation of the pre-eminence of play was leading to a lack of motivation and resistance. Beginning with Huizinga (1955) we traced the importance of play in all facets of human life and what Huizinga observed to have been its degradation in the service of corporate, mainly capitalist interests. Caillois (1961) formulated the principles of the aleatory and the agonistic subjects who exhibit contrasting approaches and styles of play. At this point we noticed a juncture between Caillois’ typifications of the contrasting types of players with a parallel to contrasting styles of learner. Our thinking began to crystallize when we discovered recent studies by Virvou and Katsionis. The researchers noted how a previously underperforming group of students responded to an educational game with noticeably higher scores while
their high performing counterparts did not show significant improvement from their usual high scores. This phenomenon had been noted obliquely in a Carbonaro et al (2008) study on student game authoring however Virvou and Katsionis gave it prominence. This was a significant milestone in our research because now we had tracked a line of development from play to underperforming males and their resistance to orthodox education (Sanford and Madill 2006, 2007), formation of masculinities (Connell 1995) to the point where previously marginalised students would respond positively to games that were educationally purposed. In a section of our discussion on resistance we referred in what we titled “The Bart Simpson Syndrome” to the possibility that certain students would actively resent being taught through computer games. We raised this topic as a means of questioning the blanket optimism we have observed in many of the discussions of educational computer games. This possibility may form the basis of future research. Other questions that arise are, to what extent is culture being underestimated in its capacities for evolving resistant attitudes not just to traditional education but to the types of educational games which some (e.g Prensky 2001) consider might make school bound education a thing of the past?

2.1. Seminal Contributions.

There were a small number of writers who had contributed significantly to the development of thought in the field.

2.1.1. Gee.

Gee (2004) has made important contributions to the study of New Literacies and questions received notions of reading, writing and the teaching of both. Becoming interested in video games when taking an interest in the video gameplay of his son the Mary Lou Fulton Presidential Professor of Literary Studies at Arizona State University was struck by the degree of difficulty and challenge the games seemed to require but which was of no obvious concern to his ten year old (Gee 2004). Gee recommends that literacy theorists and instructors should play games in order to change their perspective from empirical/pedagogical to the participative and thereby evades the accusations of ivory tower speculation levelled at many other theorists by Aarseth (2001). Gee’s approach to literacy is pragmatic, concerned with “use” and the idea that reading and writing does not take in abstracted contexts but are embedded in specific communities of practice or “semiotic domains” (17 ibid).
We will present a brief summary on the more influential theorists we encountered in the course of the present research. However we should distinguish between those theorists who have wide influence and those who directly impacted on the eventual direction of our own research. To that extent although he has had a seminal impact on the field of games studies (and therefore on the present research) may have had less influence on our research because we were attempting to challenge some of the conclusions reached by Gee for their possibly practical and ideological consequences on the creation of educational video games.

We came to experience a sense of dissatisfaction when reading Gee. For some time this remained only a felt sense and was not immediately accessible to intellectual discernment. The problem with Gee’s conclusions emerged from what was initially observed and considered to be a minor issue but finally proved to be of central importance. We noted PuenteDura’s (2007) concerns with the use of commercial games in education. There is no sense in contradicting Gee’s view of the emergence of the knowledge manager - it is widely evident. The question is where to draw the line between free form (that is unstructured) learning and the present limitations of traditional schooling. Our ultimate disagreement was with Gee’s vision of the purpose for the “new” literacies.

2.1.2. Kirriemuir.
In the course of research we came upon a number of other theorists who were key to the shaping, and re-formation of our thesis. Kirriemuir (2002) and Kirriemuir and McFarlane (2002) provided assistance in providing an appreciation of what teachers and students felt about the actual deployment of games within a school setting. Of interest was the predilection among teachers to be resistant towards the kinds of computer game that seemed only to contain a “fun” element. There were also empirical concerns whereby teachers felt constrained, due to shortage of funding, lack of training or pressure of time to give leeway to games in the classroom. Kirriemuir (2002). The researchers did not formulate any judgements as to how much weight to give to the practical objections of teachers as opposed to their ideological or institutionally derived objections. Concerned with a possible attribution of parochialism (the studies referred to were carried out in the U.K.) we looked further afield to locate a study reported from Hong Kong (Tam and Milton 2007). The most
pertinent feature to emerge from the Chinese study was that teachers and administrators alike were enthusiastic and positive about the prospect of using an educational game in class. They provided encouragement and support to the developers. However, when the game was ready for delivery and the developers began to look for orders there was a complete volte face. The previous enthusiasm changed to negativity, much to the consternation of the developers (Ibid). We consider this observation as deserving further study. It makes no sense to pour large amounts of scarce funding into the development of educational games, even where the end user have given enthusiastic indications, only to end up with quantities of educational games that are unwanted and unused.

2.1.3. Prensky.

As already noted Gee (2004a, 2004b, 2005, 2007, Gee and Hayes 2010) have made significant contributions to the study of literacy. Prensky (2001, 2006, 2007, has been more enthusiastic than Gee in his optimism and expectation of what he considers educationally purposeful computer games might achieve. Prensky has coined the terms “digital native” and “digital immigrant” (2001) to typify the gap of technological comfort that obtains between the younger and older generations. As with Gee, but possibly for more substantial reasons, Prensky leaves us with mixed impressions. On the one hand his contributions to the project of educational computer games have, if anything been more directly instrumental than Gee’s. His development of the computer game, the Monkey Wrench Conspiracy demonstrated an alertness to a key challenge to the constructivist (and constructionist) underpinnings of educational computer games as proposed by Mayer (2004), Clarke (2007), and Kirschner, Swelner and Clarke (2006). In a series of papers Mayer, Clarke, Kirschner and Swelner argued that Constructivism (and by extension all its progeny e.g. Problem Based Learning, Discovery Based Learning was unsupported by a single instance of scientific proof and was more a product of ideological positioning. Their strongest practical objection was the difficulty of building knowledge without knowledge coming from a source external to the learner. In devising The Monkey Wrench Conspiracy Prensky included a form of Cognitive Apprenticeship which enabled the learner to obtain instruction in the course of the game as necessary. In doing so Prensky answered a powerful challenge to the theoretical credentials of educational computer games. As a promoter of video games for education Prensky has, however more questionable
attributes. The most apparent to us was a strong populism and an assumption that the return of commercial games companies into education would be an unalloyed positive.

2.1.4. Egenfeldt-Nielsen.

It would be difficult to minimise the impact of Egenfeldt Nielsen on the field of educational computer games in general and on this research. First contact with his book on the educational use of computer games was briefly disconcerting as it gave rise to the question of whether or not there was any justification in pursuing similar research. Close reading of Egenfeldt Nielsen’s work, however, served to show that the work in question served as a departure point for subsequent issues that required further investigation. What was striking and helpful in Egenfeldt Nielsen was not so much the breadth of expertise (though this was present in abundance) but a refusal to conceal the more problematic issues that attend the viability of educational games. This was apparent even when it might have adversely affected the positions the author was seeking to advance. We were inspired by this impartiality to seek to emulate it in our research.

2.2. Motivation and Resistance.

The edifice that is educational computer games depends for its structural support on the thesis that playing games is intrinsically motivational. As the study progressed we became increasingly aware that it was insufficient simply to consider motivation as the sole explanation for how students either acquired or constructed knowledge. It became apparent that we had to consider what forces might operate to deflect that possibility. We set about creating a strategy where motivation and anti-motivation i.e. resistance could be understood as complementary. Hollander and Einwohner’s (2004) proposed that certain forms resistance might possess the quality of invisibility. The notion of resistance as invisible accorded with the phenomenon of an oppressive, disciplinarian society intent on exacting conformity from all its constituents; conceivably the greater the powerlessness the more urgent the need for invisibility. Some theorists opted for a positive interpretation of resistance. From this perspective resistance could be interpreted as a creative act to counter the impact of oppressive social relations (Walker 1985). Shuy (1986) argued that an emphasis on an academic style of teaching would foster resistance among students.
Resistance, whether from students or teachers became a more important part of our research. Connell (1995) has reformulated the notion of “masculinity” into a series of masculinities which are varying and performatively based. Those who engage with the new digital technologies do so out of a sense of alienation and marginalization from hegemonic forms of masculinity. Against the more dominant forms their mastery of technology gives them both protection from and membership of the power elite (Keif and Faulkner 2003). Boys have mobilized their interest in technology and games as an act of resistance to the mores of the wider society and particularly against the acquisition of traditional literacies (Sanford and Madill 2006). Girls also have an interest in technology but this interest is said to have a school-based focus (Rowan, Knobel, et al 2002). The theme of Resistance came to light once more when we came to consider the teaching of geography through the medium of a video game. What was most striking from the results of the Virvou and Katsionis (2005) study was how the underperforming students responded to the use of a video game. The formerly disruptive and uncooperative students were observed to be working quietly and with concentration. When their results were tallied, while the usually high performing cadre of students performed up to par with their usual scores, the underperformers returned significant improvements. These observations seemed to have significance for three possible reasons:

1. They suggested that the potential for games in education as currently perceived, i.e. that games would have a homogenous and indiscriminate appeal to learners in general, has to be reconsidered.
2. That Motivation is key to understanding how educational games succeed but that motivation has a corollary and this also has to be entertained.

Many of the theorists of games credited the technical constitution of computer games with their potential to be educational. An exclusively technical explanation would suggest that the high performing students in the Virvou and Katsionis (2005) study would have demonstrated a proportionate improvement. This was not the case and implies that human factors i.e. motivation and resistance are in play.

2.2.1. Player as Resister.

A fortuitous observation provided us with deeper insight into the nature of resistance among game players and their attitudes towards games as a medium for education. We accorded our observations the title, “The Bart Simpson Syndrome” (Groening
2004). Bart’s exclamation, “How dare you teach me something “and his rejection of the video game was certainly a resistive act however it was possible to wonder first, how comprehensive was his resistance and second how deeply was the issue of culture imbricated in his counter position.

Was Bart objecting to education or rather was his objection to edutainment, a practice stringently criticised by Egenfeldt Nielsen (2007) as an attempt to conceal educational agendas within entertainment? If this is not the case we are led to consider another problem whose ramifications are more problematical for the future success of educational computer games. We noted how educational games are at a considerable disadvantage because their developers cannot match the budgets of their commercial brethren. Players are habituated to lush graphics, sound effects and profligate use of Artificial Intelligence the likes of which cannot be matched by educational developers. As commercial games reap ever more success their budgets will expand and the gap with educational developers can only widen. The conclusion for games studies is not positive in that we have a situation where academics are formulating theories in a field that is heavily skewed by non-academic, i.e corporate interests. The seeming unawareness of the legal complexities likely to impact on certain kinds of games development is another example of a seeming unawareness that games might have theoretical potential for education but the practical obstacles may yet prove overwhelming.

2.3. Modernist versus Postmodernist Discourse.

Lyotard (1984), Harkin (1998), Constas (1998), Cole, Hill, and Rikowski (1997) and Usher and Edwards(1994) supplied an approach to education viewed through the lens of postmodern analysis while Lakatos (1978) alerted us to be aware of the tendency among theorists for “monster barring”; i.e. the ability to reject or ignore other considerations. The instantiation of children as the new consumer was explored by Buckingham(2003), Buckingham and Sefton Green (2003) and Grimes (2007). Dovey and Kennedy (2006) proved eminently helpful in terms of cultural and gender analysis.

2.4. Fantasy and Play.

While we were keen to explore concerns we had noted about the place and meaning of play within games, we were constrained to preface our discussion with an extended reflection on the topic of fantasy. With the aid of influential theorists we set about demonstrating that play depended on fantasy for it originating energy. Bettelheim,
(1976) and Hillman (1984, 1991), linked the operations of fantasy to a self-protective behaviour in human beings while Coleridge, S.T. (1920, dismissed fantasy in favour of the imagination. However Jung (1916, 1926, 1956, 1963, 1967, 1978), influenced Bettelheim and particularly Hillman and did much to explain the centrality of fantasy in play. The two major theorists of play, (Huizinga 1955) and Caillois (1961) approached the topic from divergent viewpoints, nevertheless had profound effect on its theoretical development. Both these writers were of importance, nevertheless we felt impelled to go further in search of what had been identified (by Huizinga, in particular) as both a dilution and corruption of the instinct to play. We found a thread in Bakthin’s (1981 and especially 1984) idea of Carnival. We extended the discussion on the contribution of fun to learning discussed by Bisson, and Luckner, 1996. We were of the view that “fun” in the cultural context is problematical.

2.5. Game Development.
An exploration of the hegemonic nature of the games industry was initiated by Fron, Morie, et al (2007). Aldrich, 2009 provided details on the construction of games and simulations. We identified one significant obstacle in the actual and potential conflict between those interests that control corporate games and the emerging project of student authored and created games (Lessig 2004, Castronova, 2004.)

2.6. Psychology and Human development.

2.6.1 Technological Impacts on Learning.

2.6.2. Classroom Practice.
Squire (2005) investigated the effects of computer games entering the classroom. We were concerned with the effectiveness of games Randel, Barbara et al 1992, however our attention shifted to identifying underlying factors which could either drive or retard successful learning with computer games. Given its central importance in education and in the recommended use of games for education we discussed motivation (Dornyei 2001, Malone 1980, Malone and Lepper 1981,1987, , Poole

We have adopted categories here for convenience and we tended to do the same in the general study. However it was neither desirable nor possible to hermetically seal one category from another and there were numerous instances of authors having reports to make in more than one category. Blair, and Sandford, (2004) were prominent in drawing the issues of male underperformance at school, linking it with resistance, and theorizing on the possible impacts this phenomenon would have on the preservation of older literacy and the formation of new.

2.7. Education and Technology.

Several research studies were useful in formulating knowledge of how research into educational games were constructed and what these studies concluded about how to construct games for learning. We reviewed case studies carried out in history to see first how history could be taught through video games. We were also interested in how narrative is constructed through games. Such an ambition was helped by Akkerman, Admiraal, et al. However, a question began to emerge as to a certain bias in research which, we argued, tended to be more technocentric than informed by educational or pedagogic theory. A more rigorous study in the teaching of history by means of a computer game (Egenfeldt Nielsen 2007) was then reviewed that was more concerned with educational outcomes and did not demur from reporting negatives. Schut 2007, and Ferguson (2006) analyzed the pedagogic value of history as taught in computer games. Barab and Thomas et al (2005) and Tuzun, Zilmaz Soylou et al analysed the use of the Quest Atlantis game for learning Geography.

There are three avenues leading towards the development of educational computer games and while we came to the view that the attempt to utilise existing commercial games in the classroom was a questionable option we were persuaded that students
creating their own games for educational purposes might be the best avenue to explore. We reviewed an important contribution by Carbonaro, Cutumisu et al (2008) as a means to understanding the requirements. This was supported by Salen (2009).

2.8. Literacy or Literacies.
The stage was set by Schaefer, and Gorman, (2009), and Cope and Kalantzis, (2000), for the debate between those who maintained the centrality of Literacy and those who argued for the emergence of a bundle of specific literacies adapted to technological change.

3. Methodology.

3.1. Introduction.
We will begin our discussion with a review of the core elements of our research. There is a central structure to the research which will be outlined. Other issues, though important, are secondary and provide support to the spine of the study.

3.2. Objectives of the Study.

We have multiple objectives for the study but there is only one primary objective. Our primary objective is to decide whether or not there is potential for education in electronic games. There are a number of secondary objectives but these serve the purpose of the main objective. The issue of the educational potential of electronic games has received attention from disparate sources and a range of disciplines and the perspectives that were offered derive from the background discipline of the
researchers. Since our particular background is humanities/cultural theory we look at the field from that perspective. Educational games are an evolving discourse. The discourse now occupies a space in academic and to a lesser degree in public consciousness.

3.2.1. A Unitary Approach.

The unifying approach to the study is framed around the necessity of forming an overall picture of the landscape that constitutes educational games research. Thus we employ a cartographic metaphor to communicate the sense of disciplined exploration that must inform the study. All exploration has an intended objective and ours was to map the route to successful educational games. This is of course vastly over ambitious nevertheless we can reasonably expect to delineate part of the route. We have benefited from the work of past explorers and hope to contribute to future efforts. It can be seen, in a sense, as a cartographic survey but one that is carried on in more than one dimension. In what amounts to an attempt to achieve a holographic appreciation of the viability of educational computer games we propose to employ a triangulated perspective composed of an analysis based on cultural modalities; the culture of games and of educational games but also of culture in the macro sense as it articulates and is articulated by computer games. We also attempt to take perspectives from the theory that supports educational games and the theory that educational games has generated. We examine the practice of educational game.

There are weaknesses with such an approach which need to be highlighted. Overall is the difficulty of categorisation and of seeking to deal with an issue, e.g. culture as if it were a topic that could be hermetically sealed from the other categories. Indeed our review of culture should be seen as a preamble because the serious cultural issues emerge later in our discussion on theory and practice. Therefore our review of culture reveals only current difficulties surrounding educational games. An apparent weakness in attempting to explore the practice of educational games is that for much of the chapter we are actually exploring the practice of educational games research.

Our methodology was informed by, but not confined to, analyses from culture, gender, technological, educational and postmodern perspectives. We explored theoretical considerations underpinning the creation of successful games. We then proceeded to a consideration of how theory and practice has either been applied or misapplied to continuing research efforts that are seeking to establish the practical requirements of successful games. Our research left us with the sense of having
encountered various anomalies that constituted obstacles on the landscape of educational games. We have characterised these obstacles as procedural gaps or rifts.

In terms of structure the study can be seen to be supported by a central spine.

3.2.2. Structure

The spine begins with fantasy, leads to play, from there to flow, which generates both motivation and resistance which results in the production of learning outcomes. Looking at a more usual structure would entail a progression from play to flow to motivation to learning (Paras 2005). The line of development we have drawn is longer and (we argue, necessarily) more complex. We propose that one cannot begin with play; one must begin with fantasy; its dynamic antecedent. Play itself needs to be reinterrogated to delineate what we interpreted as the waste of creative energy by culture and society. While motivation is assumed to be in the positive we will attempt to demonstrate that people can also be motivated not to follow a certain course of action or behaviour. Therefore we have to debate the impact and meaning of resistance. An addendum to play is the question of carnival. Where is the space for play? Should it have a defined space or is it all pervasive, temporally and spatially and culturally?

Spines need to be supported, however, and since we intended to review such issues as the nature of play (and the even more nebulous concept of fantasy) we had to ensure the support of established theory. Our discussion of fantasy was underpinned by contributions from Psycho Analysis and particularly from Analytical Psychology. The section on play was supported by the contributions to the subject by, historian Johan Huizinga (1955). This equipped us with a sense of the classic theory of play however Caillois (1961) may have been ultimately more useful for locating play in sociological terms and thereby making it amenable to analysis from educational theory.

The heart of this study lies in the interplay between motivation and resistance as they are both produced by flow. There is a procedural and methodological weakness around the issue of flow and it lies with the lack of major contributors other than the psychologist Csikszentmihalyi to the field. Certainly there have been contributors but nothing of the stature of the Hungarian doctor. While Csikszentmihalyi’s contributions are bothe seminal and influential it is a concern that when discussing flow there are no other voices of similar stature to offer either alternative or complementary views. Flow is thought to be highly motivational, keeping the subject invested in the activity for extended periods at high levels of immersion. We came to
ask, after our review of motivation, where the antithesis of motivation might be and why was it missing from the literature we had reviewed? The value of taking the subject as a discrete psycho-cultural entity distinct from the normalised category that constitutes the object of motivational research is to see that this character can operate against the grain. We therefore sought out established theory of resistance but when we looked at educational research we were disappointed to find any resistance theory that was up to date or exactly relevant. Useable theories of resistance came instead from sociology. This is where we first engaged with the notion of covert resistance. We proceeded to modify existing theory on the motivational potential of educational games by recommending an alternate view of the learning subject that was as likely to be both reactive and resistive to educational games. We identified a cultural habitus that valued fun and pleasure over learning.

We utilised a piece of quantitative research by Kebritchi (2008) to outline the various educational theories that were employed in the construction of educational games. To a greater or lesser degree these educational theories proved to be variants of discovery, experiential or problem-based learning. Since these theories of learning are themselves based on the principles of Constructivism we brought forward a substantial challenge from Educational Psychology that questioned the basis of Constructivist learning. The result was to produce a variant of learning through educational games known as Cognitive Apprenticeship. Developers of educational games reacted to the criticisms of a lack of learning support by instituting the availability of the necessary knowledge. This facility designed to fade out as the learner made progress. We will now outline our overall approach to the topic of culture.

3.2.3. A Pragmatic Approach.

If there was a term we would have wished to apply to the current study, it is “applied”. There seemed to be too much certainty, too much discrimination and sense of focus in the term that persuaded us that we might be overly ambitious in adopting that phrase. We settled for the term “pragmatic”. Computer games are so far from achieving the position vaunted for them by their partisans that most work is and has to be of a theoretical nature. (Egenfeldt-Nielsen 2007), in his conclusion, sees the advent of games into education as quite some distance away. However in the espousal of computer games as having educational potential there is an implied promise that at
some point in time computer games will enter the classroom as an educational force. This expectation extends from the optimism of (Prensky 2001) who anticipates the marginalisation of teachers in the new participatory culture to the more temperate expectations of other writers such as (Egenfeldt-Nielsen 2007) who propose that, whatever form educational games assume, they will be ineffective without the framing and guidance of teachers. The basis of our enquiry is that much of the theory generated ignores this basic promise and that there is a disconnection between theory and pragmatic issues that need to be before considered educational games can become a reality.

When a debate or a project has gone to the point where it no longer has relevance or where the prospects of realizing the project in actuality have diminished one might hear phrases such as “that is all academic, however” or “the discussion is purely academic”. Such expressions typify attitudes towards academic studies as either irrelevant, impractical or disconnected to the “real” world. This is not a treatise on the ills of the academy however the methodological basis of our study is premised on the view that educational games studies should have tangible and measurable outcomes. Furthermore we perceive a continuing obstacle to that desired end in the lack of a holistic, or at least a holographic approach to the area. It is akin to the distinction made by Drucker (2002), between inside an outside knowledge. Inside knowledge is knowledge generated within the corporation of institution which preserves its institutional basis but does not contribute to its long term viability. Outside knowledge is often sourced from outside the organization (2002). Successful corporations are adept at the in-house cultivation of knowledge and innovation. If Drucker is correct then it seems likely that there is always a tendency for work to prefer inside knowledge. If inside knowledge preserves organisations, it also preserves careers. Therefore if we achieve anything of value in the study it will be the detection and location of outside knowledge. There is a slight irony in that the idea of outside knowledge conveys the impression of the esoteric, the hyper complex and highly specialised. This is almost always not the case and is certainly not so in this study. Rather we offer fresh perspectives. The knowledge we deploy is readily available as can be seen in the Bibliography.

We suggest that researchers looking into computer games for educational advantage have, wittingly or unwittingly, strayed into the commercial sphere making promises
that can and should be evaluated pragmatically. An example of lack of pragmatism might be an evident enthusiasm for independent games creation (fully justified) without a sufficient consideration of how such games might be received in the real world. We therefore took a legal perspective to explore the consequences of creating educational games without attention to legal ramifications.

Another instance of lack of pragmatism is the failure to engage with the consequences of educational games having only a small fraction of the development budgets of their entertainment based counterparts. One can conduct studies on the educational potential of computer games but if questions of a pragmatic nature are not addressed the research can hardly be of lasting value.

It seemed as if we had uncovered so many issues that a decision would have to be made to choose one or two and abandon the others. However we began to consider where we were positioned in the discourse and it seemed to us that we should retain all the issues to formulate an overview of the problems afflicting the area. Any elements of value thus identified could be taken forward in later research.

A pragmatic approach does not neglect theory when it is useful. In the following we will seek to demonstrate why we chose to borrow principles from seemingly contradictory discourses.

3.3. Culture.

We decided to devote a complete chapter to a consideration of how culture had shaped and would continue to inform the development of educational games. Having focused on the issue of culture as a meta concept we refined our approach to investigating the makeup of the particular cultural iteration of educational computer games. The most salient drivers of cultural formation would have to receive attention. Among these would be ideology, hegemony, and gender as they operate with males and females. Looking into educational games from the diverse perspectives offered by hegemony, ideology and gender would create a series of lenses through which to look for obstacles to the development of educational games.

3.3.1. The Problem of Ideology.

We had occasion to use the term “ideology” on several occasions in the course of this research and some effort should be made to establish a sense of what we intended by the phrase. Ideologically based discourse is too vast to attempt a definitive use of the
concept. We propose that ideology means the persuasive use of intelligent power that proceeds by soliciting rather than enforcing acquiescence (Gramsci 1971). While we would say that ideology is not so much a view of the world as a view of the world that is manufactured and consumed we attempted to uncover ideological tendencies thought to operate in technology and culture. As far as education is concerned, there can hardly be an area of living that is more ideologically inflected.

We were aware of the presence of a personal ideology brought to the research from life and prior education but also shaped and formatted in the course of preparing the study. Our personal ideology values pragmatism over theory even as we make copious use of theory to make our argument. Theory should be treated as a powerful servant but a servant nevertheless. The journey undertaken in the study is an account of an engagement with an interesting and significant subject.

Educational games are heir to the ideological legacy of the larger field of games studies. One of the more pertinent is the sense of a certain newness to the field which does not bear reflection. The field of games studies is ten years old, (Aarseth 2001) For all his defensiveness about the colonizing attitudes of outsiders Aarseth is probably incorrect in this assertion. Substantial research was already being generated around the issue of games studies when electronic games first emerged in the late 1970’s. In fact their initial application was thought to be educational only (Ito 2005). The phenomenon of games as an entertainment medium came later. Of the foundational texts of the study of electronic games as educational,(Malone) “What Makes Things Fun To Learn, Heuristics for Designing Educational Computer Games” was published in 1980. Despite Aarseth’s (and other “ludologists”) tendency to approach games studies as a self-sustaining discipline the field was created through interdisciplinarity and is marked by an intertextual approach . It therefore made use of many of the tools fashioned in other places for other purposes and this is possibly the basis of Aarseth ‘s complaint

Possibly of more significance are the ideological assumptions evinced by theorists such as Gee (2007), and Hayes&Gee (2008) who are of the view that educational games must be part of the overhaul of traditional education so as to prepare western countries for competition with emerging economies. While the initial motive is sensible, we argue that the creativity that educational games are said to encourage may more properly be sourced in a liberal arts education; the very education that has attracted so much odium from technologists.
3.3.2. Hegemony.

Our first approach was to look for the operations of power and ideologies in the games industry. As such we looked for the play of hegemonic factors; how these influenced the production of games, the kinds of games produced and how it limited the operations of other productive options and choices. Of particular interest to us was how the control exerted by hegemonic influence worked to limit the creative energies and personal contributions of those who are not regarded as part of the hegemon. It is reasonable to point out a possible procedural weakness in that we go into the research carrying our own ideological baggage. Did we find hegemonic influence because that is what we set out to find? We would respond to this by contending that power and hegemonic operations are largely what we found subsisting in what is a highly concentrated, centralised and hierarchically controlled industry. There is a perception that media organisations are losing ground to those who are making unlicensed use of Intellectual Property (Lessig 2004) The fact is that these companies are successfully consolidating their control - the instances where they lost control e.g. file sharing, and had to watch as the music industry in its then form was destroyed, acted as a warning and one which has been heeded. Our proposed structure might be seen as prone to excessive linearity, however throughout the course of the study we attempted to remedy this perception by creating linkage between an issue in one chapter with a complementary, or contrasting issue in another. It is therefore possible to interpret our discussion on legal impediments to student self-authoring, and the problems associated with End User Licence Agreements as an instance of the hegemonic nature of the games industry.

3.3.3. Gender.

Closely allied to the debate on hegemony is the question of gender. The term is itself prone to gendered assumptions in that it seems to imply that the debate exclusively involves the disempowerment of women. We began our discussion on the impact of computer games on females but we spent more time on the consequences of games for young males. Masculinities provided a vantage point to look into the operations of gender as they applied to men. Inevitably the cast of the research was shaped by the particular strengths and weaknesses we brought to the study. We had insufficient contact with feminist theory to embark on an in-depth analysis of gender issues as they affected females. Therefore we confined ourselves to noting how gendered stereotypes and presumptions impacted on female interaction with games. Knowledge
gained from Masculinities, however, enabled us to gain a perspective on gender but it also identified a thread which was to run through much of the study. Beginning with gender, moving to considerations of male marginalization and resistance, we were led to an analysis of why students could react positively to educational computer games (Virvou 2008) and why, in different conditions, they would reject these same computer games (Egenfeldt-Nielsen 2007).

3.4. Postmodern Aesthetics Versus Modernist Theory.

“The postmodern recognition of the deeper ideological complexities embedded in the discourses of social life gives qualitative research a major impetus” (Holliday 2002, P. 15)

It was difficult to see how a valid methodology involving questions of technology, culture, and education could be formulated without recognition and consideration of the tensions between modernism and postmodernism. While Holliday makes a reasonable point we should not fall into the trap of privileging a postmodern perspective when, by its own aesthetics, it refuses to privilege any others.

3.4.1. A Utilitarian Approach.

The difference between postmodern and modernist perspective is that modernism takes the human being as possessing agency and therefore capable of affecting or amending her life while postmodernism does not (Harkin 1998). Modernism insists on the possibility of progress and human justice though the project, (Habermas 1972), is far from complete. It is possible to detect both postmodern and modernist narratives in the course of this study. We are aware of the ideological claims both discourses might exert (perhaps less so about how these influences may have shaped our personal ideology). We will tend to use both perspectives in a utilitarian fashion. The reliable solidities of modernism are sometimes preferred to the de centred nature of the postmodern aesthetic, and sometimes not. Education is interrogated for its ideological and reproductive tendencies, its adherence to traditional values even as we defend it from the zeal of those who imagine that it is the centre of society’s ills and a poor ally to survive the post capitalist challenges of the new century (Hayes 2010).

We deploy postmodern modes of analysis when we unpack the personal and social operations of ideology and seek to reveal the operations of resistance by different
agencies. We also deploy postmodern analysis to unearth implications in published texts. Our analytical style tends to be influenced by postmodernist tendencies that seek out the falsifying effects of ideology. However we hold that certain positions are centred and sufficiently stable as to be capable of being defended. We will therefore utilise Modernist concepts as and where they are deemed to be pertinent. We approach postmodernism as a borrower from its toolkit, contending that one does not require complete knowledge as to how the instruments were fashioned in order to make use of them. An attempt to comprehend Derrida is likely to be persuasive that complete knowledge is impossible. Although we attempt to deploy postmodern principles we remain modernist both by conviction and temperament. While we attempt to use postmodern vehicles we have no enthusiasm for where they would tend to take us. We believe that there is educational value to be found in computer games but we propose the attendant debate to be more attenuated, underdeveloped, and ideologically complex than some might concede. We deconstruct what we perceive to be monolithic and positivist tendencies occurring in the discourse surrounding educational computer games. It would be a mistake, in our view, to believe or conclude that because the debate over educational games is new it is ideologically pristine.

3.4.2. Postmodernity and Education

Drawing from Foucault, Derrida, and Lyotard, (Usher 1994) have sought to introduce the concept of postmodernity to education. Accepting the allusive predilections of postmodernism they recognise that meaning will always be hard to fix and “although it is customary to define what one is writing about, in the case of "postmodernism" this is neither entirely possible, nor entirely desirable” (6).

Postmodern culture is marked by increasing erasure between the public and private spheres. With the blurring of boundaries the ludic is free to evolve an epistemology evolved to suit the ethos of a technologically advanced society (Dovey 2006). Victorian capitalism relied on empirical observation as its epistemological basis. The current age is increasingly reliant on simulation as a mode of knowledge generation (Ibid) The relationship between play and simulation seems to be dogged by the same escalation of erasure as we note in the postmodern. Both simulation and games emerge from the ludic however Dovey warns against the tendency to interpret this as indicative of a humanist or humanitarian paradigm.
Postmodern theory has long had an interest in education. This has not been accompanied by any clear sense of the nature of postmodern educational enquiry. Postmodern educational enquiry has its own animus; it distinguishes itself by its own representational styles, its methodological practices, and particularly, we would argue, by its political goals (Cole 1997).

The arrival of postmodernism garnered many responses but two are notable. The first response was to create distance from a discourse (or quasi discourse) with its arsenal of neologisms and near incomprehensible theorization. That distance was sometimes extended by accusations of intellectual charlatanism and the abandonment of the progressivist idealism central to the future progress of education (Ibid). Those impressed by the advent of postmodernism chose to adopt a position that the relativistic/end-of-the-grand narrative attributes of postmodernism made it consequently impossible to have clarity of definition or perspective (Usher 1994).

Postmodernism challenges monolithic approaches to all narrative assumptions, including the educational. In this section we will attempt to parse the more notable assumptions made in and through educational theory, particularly as it links to technology and, by extension, to computer games.

### 3.4.3. Postmodern Assumptions.

Lakatos (1978) developed the principle of “monster barring” to denote the proclivities among theorists to exclude the unexpected and anomalous. A broader exploration is beyond the scope of this study yet it serves to consider whether those who write about games are inspired by a modernist or postmodernist sensibility. One might think, given the alacrity many critics display in their dismissal of traditional education, that they are essentially postmodern. Of course postmodernism has little tolerance for any essential position. This is more than just a passing curiosity. The attitude of those who promote educational games as an antidote to the failure of education forms a thread running through this study. In the end, however, it should become plain that their position is instrumentalist and has little to do with postmodernism. It would appear to be modernist for example in their positivism, in the manner in which they treat the anomalous.

### 3.4.4. Postmodern Challenges for Education.

In postmodern times—education has come under severe theoretical challenge. Realist conceptions of representation and rationality are now seen as untenable and therefore education, which relies on the underpinnings of these concepts, is, according to
certain postmodern theorists, itself in crisis (Usher 1994). Education is criticized for a proselytizing ethic which claims to enlighten students as to transform them into reflective and self-realizing social agents. This is interpreted by some as yet another fantasy of capitalist modernity (Ibid). With the advent of New Media a series of profound changes began which have altered the normative relationships between new technologies, young people, and education (Buckingham 2003a, Prensky 2001). The globalization of media markets, the fragmentation of mass audiences, and increased interactivity have transformed everyone’s experience of media. Arguably no such transformation has occurred for children and students. They have grown up in a digital world and are supposedly habituated to its’ effects (Prensky 2001). Formerly rigid separations between producer and consumer are breaking down along with the boundary between mass and interpersonal communication. Many of these changes apply with particular emphasis to children who have emerged as an identifiable market and one of intense interest to the corporations that own and/or control the new technologies (Grimes 2006). There is an attempt to ameliorate this unfavourable impression by the valorisation of an image of the child/consumer as alert, savvy and streetwise (Ibid). Children are being offered a sometimes illusory sense of independence and autonomy as consumers in the new economy (Kenway 1995). The individualization of society is valorised and marketed as a choice to young people packaged in the superficial confidence in personal power and agency (Featherstone 1990). The gap between how young people experience their lives outside of school and how they experience school is widening. Those who equate change as progress will point to the non-evolution, the backwardness of schooling as an impediment to social and cultural development. Others posit the inception of a condition where the gap between a generation of technologically aware kids is threatening to become unbridgeable (Prensky 2001). There are suggestions that schooling, unsure of its status in a society which questions many of its stabilizing values, is retreating into some form of “educational fundamentalism” the outcome of which is to enable the defence of relationships within the school and between the school and the outer world (Kenway 1995). The inter-generational and intercultural tug of war that is going on between parents/teachers on one side and students on the other is nowhere more apparent than in the area of media education. Video games are a prime locus for this struggle encompassing as it does most, if not all, of the more prominent topics in New Media. It covers the issues of consumption and overconsumption. Parents are
commonly said to be of the view that children spend far too much time on video games. The issue of violence in video games is symptomatic of a more profound social debate; who is responsible for what children consume? The issue of whether or not education can have a place in video games throws up certain instructive insights into the debate. At a superficial level it might be argued that children are ideologically free but this contention does not stand if society is viewed as a space for competing ideologies. Certainly students may reject educational ideologies and do so with the sanction of those critics who see orthodox education as unsuited and irrelevant in a changing society. Postmodern ideologies of personal pleasure and individual self-realization are on hand to justify a movement away from the orthodoxies valorised by those who establish and perpetuate educational policy. This opens up a potential area of debate between those who demand educational change and those who resist those demands.

“Drawing on the work of Habermas, a distinction may be made between language used for the imposition of will through power and violence, and the potential of a common will formed in non-coercive communication. It is the case that much interaction in education is based on the former. However, the latter is possible and desirable” (Harkin 1998 430)

While scepticism appears to be justified in terms of the grand narrative of progress, particularly that driven by a technologically biased agenda it is important not to abandon the notion of progress “in agreed human terms, while adopting a more reflexive and critical stance”(Ibid). Giddens(1990) is of the view that we are not so much in the throes of postmodern crisis but rather living out the final and inevitable consequences of modernity; “(Giddens 1990 3).

3.5. The Importance of Competing Approaches.
We need a new relationship to knowledge, or the possibility of knowledge. While postmodernism refuses to endorse a grand narrative or give any position central importance the risk remains that the one position it endorses is its own.
The culture that has given form to the computer, the internet, and digital games is participatory. It rises and falls on participation. There are several battle lines to be negotiated in the course of this current study, not the least of which is the antagonism between competing concepts of how to teach and, perhaps, since so much value has been placed on independence, the value of autonomous learning.
It might be of value to discuss the possibility of reconciling the competing discourses. The practice of research is located between the metaphors of acquisition and participation: the acquisition metaphor seems to occur more in older texts while participation appears in the newer. (Sfard 1998).

Human learning has traditionally been typified as an acquisitive process. Since Piaget (1952) formulated learning as a process of concept development, knowledge became the recipient of a process of collection and refinement into ever richer constructs. It followed, therefore, that the human mind would itself become metaphorized as a container, a receptacle to be filled with an ever growing collection of gathered knowledge.

The emergence of the participatory metaphor was energised by theories of communities of practice (Lave 1991). The important change was in a switch from the emphasis on concept as reified object to an emphasis on process i.e. on knowing. The postmodern credentials of the participatory metaphor can readily be seen in the emergence of the centrality of context. Learning is now perceived as a process of becoming a member of a community of practice and such membership requires a new literacy to communicate with the community and act according to its governing norms.

Replacing the Acquisition metaphor is to risk encountering problematic aspects of the participation metaphor: “

“When it comes to research some important things that can be done with the old metaphor cannot be achieved with the new one. Besides, the Participation Metaphor, when left alone may be as dangerous a thing as the Acquisition Metaphor proved to be in a similar situation” (Ibid 9).

Sfard notes that there is a profound risk in an overly purist application of the participation metaphor. It has to do with the attendant difficulties of transfer. Adherents of participation eschew the notion of some quantity or substance being moved from one area to another (even if it is only inside the human mind). Lave considers the idea of transfer as “seriously misconceived” (Lave 1988 39). Transfer involves carrying knowledge across conceptual boundaries. If it is forbidden to regard knowledge as a self-sustaining entity there is nothing that can be carried over. Participationists appear not to be unduly concerned by this, confident as they are in the power of context as ultimate teacher (Sfard 1998).
“To sum up, it seems that even if one does not like its objectifying quality, one finds it extremely difficult to avoid the acquisitionist language altogether. Whenever we try to comprehend a change, the perceptual, bodily roots of all our thinking compel us to look for structure-imposing invariants and to talk in terms of objects and abstracted properties. We seem to know no other route to understanding”(Sfard 1998 100).

Sfard counsels against the abandonment of an acquisitionist metaphor of learning in the face of the almost hegemonic presence of the participationist metaphor.


The first part of this phrase puts the emphasis on education, the second part emphasises technology. This is the crucial difference underpinning the use of educational computer games. Are educational games grounded upon a substantive theory of education? Learning in games, based as it is on problem solving and discovery, is constructivist. Yet we will see that constructivism came under real challenge for lack of empirical reliability. Prensky and others attempted to address the implied challenge to games by proposing the mode of Cognitive Apprenticeship.

3.7. Summary.

Our methodological approach is premised, first of all on cultural factors. We have taken the position, and will seek to demonstrate that certain cultural dynamics, will have the final say on whether or not educational games prosper in the classroom. We propose to adopt a pragmatic approach to the problems that might inhibit the development of educational games. This pragmatic approach extends to trying to identify and anticipate some of the problems that may inhibit educational games. Two of these are the legal question around copyright and the other is the inability of educational games to deploy the expensive technology of the entertainment sector. While these are real issues they should be seen more as symptomatic of a lack of in educational games research. We believe in the need for a more pragmatic ethos to underpin future research for two reasons. First the idea of educational games carries an implicit promise and second a pragmatic approach is attractive to those outside academia who have important contributions to make
In the next chapter we turn to the theory that has been generated to support the viability of educational computer games.

Chapter 4. Computer Games, Education, and Culture.
4.1. Introduction.
Computer games in their present form have been a subject of vast cultural import to a
range of social actors. Politicians have beaten the populist drum before John
Ashcroft’s (2001) warnings over their alleged violence inducing effects.
Advocates of educational computer games range in their zeal from the stipulations of
educational games as a moral necessity (given the imminent failure and unsuitability
of traditional education) (Prensky 2001, Katz 2000) to the more temperate
contributions of writers such as Egenfeldt Nielsen (2008).

4.2. Games and Cultural Development

“What does it mean to say that games have culture? Or what is game culture?
Looking at the lessons from cultural anthropology, linguistics, and cultural
studies, culture can be seen as the structure and key mechanism of sense
making. We see things through our cultures, culture is part of every why and
how of our actions because we are creatures of culture down into our core. If
we pick up a pebble on a seashore or draw a line into the sand, there is culture
in the very gesture. Digital games were the moment when microprocessors and
memory chips became the production lines of culture for wider audiences”
(Mayra 2007 103).

What is culture? Mayra may be attributing too much significance to digital
games in identifying the moment when digital technology in the form of computer
games became “the production lines of culture”, nevertheless his comments on the
sense making functionality of cultural forms are well taken.

“Culture is not something readymade which we “consume;” culture is what
we make in the practices of consumption.”(Storey 2000 59) Brief as this definition is
it serves several purposes. It shifts the concept of culture from an acquisitive to a
participative mode. In this view culture is relegated as the result of the consumerist
choices made daily by millions of citizens. Computer games are both a culture and
part of culture; they are part of the “practices of consumption”. They are container
and contained. Up until the late 1990’s computer games were heavily ignored by
postmodern, feminist, art, technologist, and cultural critics who preferred to direct
their attention to the emergence of the internet or a more nebulous entity that created
its own panic; virtual reality (Dovey 2006). This lack of attention was due to several factors, among which were a view that computer games was directed at children and thus solely a pedagogical concern. The other was an inherently negative set of attitudes that viewed computer games as addictive or violent.

Computer games have been a feature of the cultural landscape for between 40 and 30 years. They have been the object of scholarly attention for considerably less than this. Interest in games began to grow as their significance on the cultural stage and the numbers playing games as well as the lengths of time devoted to games, began to increase. The rise in popularity of computer games has attracted considerable interest and turned them into an object of study in their own right. However some theorists—loosely defined, or referring to themselves as “ludologists” have asserted that games are an abstract, rule based system removed from the symbolism of cultural forms. To this end any impressions, emotions or feelings that are prompted by a narrative based interpretation of the game are irrelevant and not part of the game experience (Aarseth 2001, Eskelinen 2001, Juul 2001). Such a claim might be seen as formalist and is the subject of continuing debate. It also might be viewed as a typical example of the gulf that separates those who theorise about games from those who make them.

The central concern of many game designers presently is how to inject more emotion, more humanity into games (Perry 2009a). The best that can be said of the formalism of ludologists is that it acts as a spur to those who value the contribution of narrative to clarify the role of symbolism in games and to relate the form to pre-existing cultural forms (Murray 2006). Aarseth’s proclamation as 2001 being “year one” of game studies should not be taken literally, even though it marked the first publication of an important new organ of debate and research. Computer games share DNA with various disciplines and can claim a range of patrimonies. Indeed this has been a subject of contention for the founding fathers of computer games studies (Aarseth 2001) who were wary of the claims of interest from sources as varied as, education, social science, human-computer interaction, game theory, cultural theory, and cinema.

Computer games, as seen from the perspective of Cultural Studies, have generated a considerable cultural interest, particularly in the last decade. Throughout much of the research that has emerged is a sense that there is an original quality around computer games which mark them as distinct from mainstream culture. This is particularly in evidence in the defensiveness with which specialist researchers e.g. (Aarseth 2001)
react to the perceived encroachment of non-dedicated researchers. However the self-regarding tendency to see a new culture or a new technology might better be seen as an ideologically biased project for normalisation: “the most potent ideologies achieve precisely this status, being taken for granted as part of the ‘common sense’ understanding of particular regimes, rather than recognized as ideology” (King 2006). Cultural Studies have attracted criticism from some quarters because they are “a tendency across disciplines, rather than a discipline itself” (Miller 2006). Cultural studies thrive on the conflict of ideas and the questioning of settled presumptions. It seeks out ideological operations often finding them in unexpected locations. The evolution of computer games has been marked by a process similar to the developmental history of other technologies:

“The early history of electronic media is less the evolution of technical efficiencies in communication than a series of arenas for negotiating issues crucial to the conduct of social life; among them, who is inside and outside, who may speak, who may not, and who has authority and may be believed.” (Marvin 1988)

Stereotypical views of gamers persist even as awareness grows that customary perceptions are rapidly being outdated (Copeland 2000). The acceptance of computer games into the cultural mainstream, their increased presence among diverse classes, sexes, and stages of life has significant implications for the project of educational computer games. It is difficult to see how computer games, under the old aegis of the preserve of marginalised, male, white, adolescents could attract serious consideration as a powerful tool for education. Most studies of gender in computer games culture seems to have retreated, if not from defeat, at least from prolonged confrontation with gendered assumptions. Many of the available studies on gender in video games seem to take it for granted that “boys” play differently from “girls” and that the best course is to deal with that and find ways to gain greater access into video games for girls even when the games girls play have (Cassell 1998). While remaining uneasy about this kind of ordinance, it is possible to agree with the pragmatism of the view outlined. Cassel and Jenkins (Cassell 1998) are cautious about the automatic rejection of stereotypical female interests which they interpret as possible acts of resistance against patriarchal culture. Interest in games has been seen as an avenue
leading to more serious and challenging engagements with computing technology thus enabling a form of computer literacy. (Loftus 1983).

‘The essentializing moment is weak because it naturalizes and dehistoricizes difference, mistaking what is historical and cultural for what is natural, biological, and genetic’” (Hall 1993).

It is possible to disagree with this and propose that the impact of cultural formation may be constantly underestimated. This is our position regarding educational games when we contend that essentialising forces have exerted influence on games development. Rather than shifting the focus to female gaming groups it might be better to embrace a critical re-examination of the place of female gamers in those spaces which have thus far been reserved as exclusively male (Shaw 2009). Neither is the male position one of inflexible and static persistence. In our analysis of male resistance we propose, with the support of Sanford, and Madill (Sanford 2006a, Connell 2000, Connell 1995), that males, specifically boys, should not be seen as a homogenised instance of patriarchy but as a group that are challenged by conflicts, and subject to oppression by masculinist elites.

The texts deemed most worthy of study tend to be the texts that define the study of video game culture. This is in turn affected by the proclivity among academics to study those games which tend to attract the most attention either on controversial grounds e.g.violence or popularity (Shaw 2009). The complex interweaving of the various factors which have resulted in certain games attaining recognised cultural status needs to be more fully understood (Shaw 2009). For example some games may have achieved higher status through successful commercial promotion where other games of better quality failed because their publishers did not have proper resources for promotion.

Academics have shown growing interest in computer games over the last decade. However their contributions, insightful though they might be, are by no means the final word on a still emerging cultural force. These concerns should be seen neither in the sense of taking a defensive posture over games nor of sanctioning various criticisms. Our interest here-and in much of the study that follows-is to track the various issues, concerns, problems and promises created around, through and by computer games in order to detect if there is a navigable route to the introduction of instructional computer games into education.
4.3. A Brief History of Educational Games Research.

Underpinning the project of educational computer games is the assumption that with the right kinds of research and development into educational theory and educational technology a stream of quality games fit for education would be forthcoming. There are strong cultural and market forces likely to exert an effect on the availability of good educational titles. Games have been deployed for education well before the advent of the computer. The first successful developers and users of games were the military, in particular the Prussian military of the 19th century (Egenfeldt-Nielsen 2007). In the late 1990’s the United States military began to look at digital games for use in both training and learning. Early attempts at games that focused on the enhancement of hand/eye coordination were less than successful. The military persisted, focusing on the promotion of higher level skills e.g. team tactics, procedures, problem solving and the evolution of strategies (Prensky 2001). Games such as America’s Army bear comparison with the best commercially produced titles. Since training is such a major component of the military budget it made sense to develop high quality games to support the process particularly with the budgetary resources of the Pentagon. The US military are considered to be the single biggest purchaser, and user, of simulation games (Prensky 2006). The American Department of Defence has an established Defence Modelling and Simulation Office. In 1996 it organised a conference to which both military trainers and representatives from the entertainment industry were invited. As well as members of the film industry, game developers and academics were also in attendance.

“The military uses games to train soldiers, sailors, pilots, and tank drivers to master their expensive and sensitive equipment. It uses games to train command teams to communicate effectively in battle. It uses games to teach mid-level officers how to employ joint force military doctrine in battle. It uses games to teach senior officers the art of strategy. It uses games for team work and team training of squads, fire teams, crews, and other units; games for simulating responses to weapons of mass destruction, terrorist incidents, and threats” (Prensky 2001).
There is an issue here of the difference between a game and a simulation. In some estimations there is now no longer a clear distinction between educational games and simulations. However Clark is of the view that a key difference still persists in that educational games still seek to recruit pleasure as part of the learning experience while actual simulations are meant for adults in specific training/learning contexts. One can see this as a tenable position given that the military use of simulations would not be premised on whether or not their users had enjoyed the experience.

Computer games are a logical consequence of design and developments in computers. They are also affected by the problems encountered in computer game development including structural problems imposed by technology and market conditions. Educational computer games face other challenges arising from a plethora of applicable learning theories. In 1971 a research company based in Minnesota, MECC, produced Oregon Trail which is on the market to this day; a remarkable achievement given the relatively short shelf life of contemporary commercial games. In 1973 the Plato project succeeded in making a teaching game for maths that avoided the standard drill and practice technique. The 1980’s saw a marked increase in the release of educationally oriented titles. The adventure was the preferred format of the educational games because it allowed a forward narrative progression, maintaining a high level of interest and motivation (Malone 1980). The adventure genre was useful in fusing the play experience to the learning experience and was the genre of choice for educational game developers in the 1980’s and 90’s. New technology, in particular the introduction of the graphical user interface was as beneficial to educational games as it was to mainstream entertainment games. A significant contribution to educational development emerged from a collaboration between Microsoft and MIT. In 2001 the Games to Teach project developed ten prototypes of educational games to support math, science and engineering at upper high school and undergraduate level. Among these games is Hephaestus, a multiplayer management game intended for learning the principles of physics. Replicate is an action game which teaches Virology and Immunology while learning about the behaviour of viruses, The Jungle of the Optics solves optics based problems through the use of various instruments such as microscopes, cameras, telescopes etc.
There are considerations to do with educational computer games which tend to moderate the apparent optimism evoked by current research. According to Dipietro (Dipietro 2007) there are two substantive factors which might impede the establishment of a sound basis for research into computer games. First they contend that the very inter (or cross) disciplinarity which marks so much of the research is not an unmixed blessing not because of the failure of an inter disciplinary approach but of research tendencies to over specialise: “This is not to suggest that game researchers do not attempt to understand the full context of their work; rather, it is to propose that gaming research does not neatly fall into one discipline” (Dipietro 2007). The second factor is the relative youth of the field: “research on electronic gaming is enjoying a rather recent resurgence; we do not have a large research base from which to draw important implications for teaching and learning” (Dipietro 2007).

4.4. Culture, Technology and Intelligence.

The relationship between people and technology is increasingly symbiotic in the sense that as cognition has developed new technologies, the new technologies, in turn, have augmented cognition (Preiss 2005). The “old” literacies, i.e. reading and writing are not unaffected. The word processing abilities of computers are said to enable the restructuring of information in a way difficult if not impossible in longhand. Similar effects have been found in mathematics where old style computational skills are of less consequence than previously (Preiss 2005). We know that tools amplify the power of the mind, changing its conformation as it does so (Cole 2005). Brain scanning is beginning to reveal the ability of digital technology to “rewire” the brain (Montague 2008). We could cavil with such mechanistic notions as “re-wiring” at a time when research is beginning to show that the brain operates by vastly more complex processes (Cole 2005). Digital games may be more than a cultural tool; they are certainly not less. As cultural tools they are inter-generational gifts which make the learning of the following generation easier and faster (Preiss 2005). Prolonged use of computer applications with graphic technologies enhances the visual acuity of the user and the ability to navigate computer generated spaces productively (Subrahmanyam 2001). In what came to be referred to as the “Flynn
Effect", sociologist J.R. Flynn (Flynn 1987) linked the measured increases in intelligence to the proliferation of computers and their applications. The rise in levels of intelligence had commenced before the widespread appearance of computers and other powerful forms of media had been making their presence felt prior to that time. The notion of computer literacy has arisen with the increased sophistication and social presence of computing technology. Many of the proponents (Gee 2007, Prensky 2001) of computer games as educational are convinced of the potential in games as a contributor to this phenomenon. Traditional reading and writing is a relatively closed system; allowing for limited emendations which do not transform over time. Computer literacy is technologically dependent and changes as the technology evolves (Lin 2000). With the increased availability of software applications the ability to sort through and make sense of vast quantities of information—i.e. problem solving, has demonstrated people’s capacity to adapt to changing circumstances (Sternberg 2005).

4.4.1. Technology and Cultural expectations.

The appearance of new technology on the cultural stage encourages optimistic expectations “followed by a precipitous fall from grace after failing to deliver on an unrealistic billing” (Ito 2008). While the zealots and the sceptics of technology may seem to be operating with contrary and contrarian discourses they share an essential tendency to fetishize technology as an omnipotent force outside the strictures of history and free of the limitational logics of society and culture (Ibid). The disadvantage of such perspectives is a failure to regard technology as a logical consequence of the productive qualities of culture. The problems and promise of new technological forms is realized (or not) through an evolving dialectic of use, trial, reuse, and retrial. New technologies go through what is referred to as a period of “interpretive flexibility” (Ito 2008) before it is ultimately decided what (if any) social actors will become the prime adopters of the new technology. What we are seeking to establish in this study is the basis for the emerging consensus among a set of theorists that computer games can and should be deployed in a non-entertainment sphere i.e. education.

The notion of computer literacy has risen with the increased sophistication and social presence of computing technology. Many of the proponents (Gee 2007, Prensky
of computer games as educational are convinced of the educational potential in games.


“Although the video gaming industry contends that violent video games are just that, mere games whose sole purpose is to entertain, others maintain that the games are targeted to children, who may in turn target others in real acts of violence” (Anders 1999).

Government statistics in the U.S. reveal that, with a background of juvenile violent crime at a 30 year low researchers into the violence promoting effects of media found that those in prison for violent crimes had consumed less media than the average person in the general population (Jenkins 2004a). This suggested that the generally held view that exposure to media was a factor in encouraging violent tendencies among youth was questionable. While the majority of games do not have any violent content (Perry 2009a) the fact that 90% of youth play games and the most high profile games tend to have violent content have been linked by politicians and the media to create a popular consensus that video games lead to violence. There are over 300 studies on media violence, many of which are inconclusive and some of which have been criticised on the basis of flawed methodologies (Jenkins 2004a). Several of these studies consisted of presenting images of violence to research subjects and monitoring their reactions. Many of the studies showed a correlative, but not a causal connection between violent games and violent actions. Therefore it could be argued, that violent people chose violent games and that the disposition to violent behaviour was a pre-existent condition. (Jenkins 2004a). Violence in video games has to be seen in a wider context i.e. preoccupation with depictions of violence in the general media. So intense is this preoccupation that research into media violence “has become a huge academic subculture” (Trend 2003) Trend goes on to argue that, far from being an incidental, if unfortunate aspect of society, it is the defining feature of western culture. Consequently the entertainment industry- counting video games as a major presence- is answering a demand which it did not originally create and which it could not perpetuate through its own efforts.
“Rather than blaming the entertainment industry for producing violent television, movies, and games, it is important to consider why demand for them is so strong. Like racism and sexism, the desire for violent representations is not a deviation from the social norm. It is the norm” (Trend 2003).

The norm has, according to Trend, evolved from a paradoxical development in recent history. As the world became safer from the threat of political (wars, revolutions) and natural (disease and sickness) violence, the fact of violence diminished but fear of violence increased, boosted by the contemporaneous development of a new media industry capable of reproducing millions of low cost images. Pinker (2007) also tracked the decline in socio-political violence. The implications are reassuring in one sense and unsettling in another. On the one hand it assures us that the world is a safer place, despite the fact that the capacity for violence was never greater. On the other we feel less safe. Capitalism—ever ready and willing to monetize an aspect of human experience—was not tardy in filling our culture with violent, mass produced imagery. We will return to the topic of media perceptions of violent computer games later when we review cultural criticisms directed at the *Grand Theft Auto Series.* (2007)

In a society prone to litigation the alleged link between violence and digital games led to several widely publicised lawsuits. After the shooting of a policeman by a criminal in 2003 several game developers were sued for their alleged encouragement of real life violence (Williams 2006). Politicians, alert to populist backlash, have been keen to subject digital games to well publicised scrutiny. The family of one of the victims of the 1999 Columbine High School murders charged a number of game developers with complicity in the killings on the grounds that the perpetrators were found to have played certain violent fantasy games for extensive periods. The United States Senate convened hearings before which a number of scholars and experts were called to testify on the links between violence and video games (Jenkins 1999).

A 2001 report from the U.S. Surgeon General stated that the greatest risks for school shootings originated, not with repetitive play of unsuitable games but with more basic factors such as state of mental health and quality of home life (Jenkins 2004a). Jenkins argues that the state of moral panic generated around violent video games is potentially more harmful in that it increases the alienation of young people.
devoted to a participatory culture and does little, if anything, to address the root cause of violence among young people.

The history of earlier media forms however may indicate that those who orchestrate popular opinion are prone to the construction of discourses based mainly on fear and panic. The appearance of the telephone garnered fearful responses but none more so than the advent of television which, it was predicted, would rot the moral fibre of society (Biltereyst 2004).

The role of computer games has provoked controversy and a number of theories have proposed a range of viewpoints. No theory has definitively concluded that computer games trigger violence though some suggest that they promote violent emotions. General arousal theory proposes that the subject will behave in a manner consonant with the most recent form of arousal (Dorman 1997). This suggests the notion of the individual as powder keg primed for violence. Social learning theory posits the child as reacting in a manner influenced by a significant other (Dorman 1997). In this view players who consume violent video games are rewarded for their aggression by influential others.

Catharsis theory, on the other hand, proposes that the experience of a specific emotional drive leads to a lessening of the likelihood of acting out of that emotion. Kestenbaum and Weinstein (1985) suggested that computer games might assist young people with the challenges of managing complex feelings related to anger and aggression. Whereas students who exhibited a lack of self-confidence could find in games a release and a means of boosting their sense of self and social acceptance it was found that students in enriched classes spent less time playing computer games (1985). A study of third level students in Scotland involved exposure to three different video games. Based on a hostility inventory, no significant levels of aggression were detected and it was concluded that violent computer games did not dispose the subjects to aggressive feelings (Scott 1995). Thus catharsis theory differs from general arousal theory in that there are no strong negative emotions for the subject to carry forward.

In 2001 the Attorney General of the United States, John Ashcroft attributed a recent series of shootings to the Dope Wars game (Ashcroft 2001); notwithstanding that it was text, not graphics driven, and designed around a DOS base that was 20 years old. In everyday reality, media outlets have portrayed real time missile attacks where real people die in a technologically sanitised depiction of death. Therefore it would seem
that is not the fact of violence that is objectionable but its depiction. The objection seems to go more to violence than against killing. Apparently anything can be shown but it must not risk offending the sensibilities of the viewer.

When the online fantasy role playing game *World of Warcraft* was launched it was equipped by its management with the ability to monitor rates of use. Attention was targeted at measuring the number of players, frequency of play and the duration each player spent online. Within an eight month period it was noted that 15% of players had reached level 60, which would only have been possible if the player had spent two months playing continuously (Leadbetter 2009.). Linked with the question of time investment in game play is the question of isolation. This is a criticism directed at video games despite the observed fact that they are a highly social activity. Over 60% of gamers play with friends (Jenkins 2009) Nevertheless newspaper and television persist in their narratives of alienated loners so addicted to video games as to be incapable of having a normal life.

4.6. Hegemonic States in Video Game Production.

“...computer games are largely the product of “dominant technicities” working within the ambit of very sophisticated, tightly organized industries that are risk averse” (Dovey 2006).

The culture of video games is now established and recognisable. As with all hegemonic visions it has a particular founding myth; an account of how it came into existence. The founding myth is a narrative of young, introverted, usually white males, locked in their bedrooms, risking the onset of Carpal Tunnel Syndrome in a dedicated pursuit of the ultimate game. This figure has now emerged into the cultural mainstream as it supplies part of the myth of origin for digital games (Dovey 2006). In the history of games development, however, we saw that many of the more influential developments originated with engineering students at elite universities or came to market through the persistence and ingenuity of successful entrepreneurs. The quasi mythic figure of the original gamer still informs the market rationale for the demographics which perpetuate a number of gender and racist practices (Dovey 2006). A 2005 report for the International Game Developers Association analysed the personnel structure of the games industry. It found that 88.5% were male, 83.3% white and 92% heterosexual (Fron 2007). One interviewee responded with a position
at odds with the facts established by the report:” The most qualified person should be hired, beyond that I don’t care what sexual preference, colour, creed or any other pop culture label they are” (Fron 2007). This comment came from a disabled person. The notion of “qualified” however is problematic as defined by the games industry because it is constructed as to exclude people with experience from other areas, notably from educational software (Fron 2007).

As many of the early companies who prospered prior to the crash of 1983 fell away the market moved into a consolidation phase. Driven by escalating costs it evolved a hegemonic style of management, design, development and production which is now threatening to inhibit its forward progress (Fron 2007). The present day game industry exerts a dominant interest over the playing experiences of individuals and groups. The outcome is a reinforcement of the industry’s production, technological and cultural investment in its own monopolistic vision of what the games industry should look like (Fron 2007). A psychology of permanent upgrade is now central to corporate profits in a globalised economy whether the production is a PC, cell phone or digital game (Dovey 2006). The power structure that controls corporate video games is almost exclusively, white male and middle class. This group promotes the interests of a small number of global publishing companies who work with (if they do not own) a limited number of retail distributors. There is a particular norm i.e. the hard core gamer, to which much of the design and marketing is directed (Fron 2007).” A minority of gamers with a particular set of tastes command a large cultural space which is disproportionate to their numbers (Dovey 2006).

Games studies are at risk of complicity with hegemonic and elitist practices in the games industry when a game or series of games is critiqued as if it were the normative reality. When this happens the possibilities of greater diversity in games is effectively ignored (Fron 2007).

Educational computer game research is one of the more unique academic research areas. This might be due to the possibility that for once in a limited number of instances academic research has wandered into a non-academic area; an area heavily dominated by powerful corporate entities informed and driven by the profit motive and the requirement to protect and extend that ethos. As we note in our review of gender while one might assume that decision making was based on purely rational grounds i.e. the profit motive, this was not always the case.
In our analysis of hegemony in computer games we are indebted to Feenberg’s (1999) analysis of technology as non-essentialist and anti-deterministic. The tendency to view technology as efficient and informed by a rationalist philosophy is called into question. We would argue that a similar absence of rationality informs the gendered habitus of those that utilise technology for commercial purposes. Feenberg described the process whereby non-business actors can successfully co-opt technology to serve their own purposes; purposes which the owners of that technology had neither envisaged nor intended. This resonates with the strategies said to be employed by females to achieve outcomes that were not originally intended (Dovey 2006). Feenberg challenges the prevalent modes not only of experiencing technology but of producing technology. His claim is that technology has the capacity to imprison society in a reality constructed by experts; a reality that excludes vital human needs from consideration. Earlier we noted the evident disdain of technologists for the possibility of educational computer games (Earle 2009). We noted that commercial games make little to educational use (McFarlane 2002). We demonstrated that there is little enough potential in attempting to repurpose commercial games and a freight of attendant problems. Taken together with the industry’s evident protectiveness of its Intellectual Property the educational games project would do well to consider a path that is free and independent of commercial interest.

4.7. Gender.

“… the digital game medium, because of its cultural and technological construction, is predisposed toward presentations ... that are stereotypically masculine, highly systematic, and focused on spatially oriented interactivity”(Schut 2007).

The first computer programmer was said to be a woman. Ada Lovelace was reputed to have written a programme for Babbage’s never completed Analytical Machine. Notwithstanding an early female presence the origins of the modern computer industry were thoroughly masculine; from the scientists, researchers and engineers of the Cold War to the early hacker culture of the 1970’s (Griffiths 1996). In subsequent decades the gender balance shifted, however the industry continues to be heavily male dominated (Cassell 1998).
The impact of gender imbalance has produced a distortive effect on the development of the games industry. It has retarded the progress of computer games (Fron 2007). Given the scarcity of studies on gender in general entertainment (computer) games it is hardly surprising to find a corresponding lack of gender studies relating to educational games.

We will utilise Butlers (Butler 1997) politics of performative resignification as a framework to discuss the notion of the strategies used by young women to resist gendered positions. Butler proposes that a subject becomes intelligible through interpellation and this intelligibility is the sine qua non of agency. Through interpellation gender identity is performatively reconstituted:

The performative is not merely an act used by a pre-given subject, but is one of the powerful and insidious ways in which subjects are called into social being, inaugurated into sociality by a variety of diffuse and powerful interpellations. In this sense the socially performative is a crucial part not only of subject formation, but of continuing political contestation and reformulation of the subject as well. In this sense, the performative is not only a ritual practice: it is one of the influential rituals by which subjects are formed and reformulated. (Butler 1997).

Gender is therefore not something pre-set or pre-determined but is “performed” in various social settings and as such there can be no essential gender beyond its immediate performance. Traditionally computer games were designed by males to be consumed by males (Griffiths 1996). Their focus was usually on competition and violence with a heavy interest in sports and adventure games. Girls were socialized out of contact with aggressive or competitive experiences and also made to consider themselves distanced from a domain of technology which they were led to perceive as “precise and unforgiving, often lacking creativity and having little connection to people” (Koch. 1994). Girls have been reported as demonstrating less positive attitudes to technology (Young 2000). Studies have also suggested that girls are more interested in creative rather than violent games (AAUW 2000, Yelland 2001). Boys also spend significantly more time playing games than do girls (Bryce 2003, Griffiths 1995). Design considerations for educational computer games will have to be mindful of the gendered practices inherent in the consumption of games by males and the
defensive, resistant practices adopted by females as well as the strategies they negotiate in making games part of their lives. Boys are said to be stimulated by iconic images whereas girls (particularly young girls) opt more for narratives and show a preference for stories (Gorriz 2000). Although boys can and often do socialize in game peer groups they do so for acceptance and recognition (Sanford 2006a), while girls seek emotionally toned relationship both in game and with other players:

"Females are not as visually stimulated as males but are more likely to be stirred emotionally. In resolving conflicts, males want a head to head conflict, while females prefer conflict resolution and diplomacy. Girls don’t want to be lone heroes in virtual reality, saving the universe on their own. They want companions. They take their opponents feelings into account. In the end females want emotional issues resolved. They want stories that engross them in characters and endings. The solution must benefit the player and the other characters”. Game Developer Sheri Ray Graner in conversation with Vail. (Vail 1997).

Learning software, properly designed, may be of more benefit to females who are thought to be more task oriented than males. Following this logic there is a need to produce software that would appeal more to female values and activities (Subrahmanyam 2001).

Kafai (Kafai 1994) determined that girl gamers preferred realistic settings and characters without a specific gender bias. In contrast to boys girls displayed a preference for minimal or zero violence. The girls showed a preference for interaction and cooperation while the boys gravitated towards more confrontational relationships.

A study by the American Association of University Women Educational Foundation (AAUW 2000) reported preferences among girl gamers for characteristics that emphasized:

- Strong, (i.e. Engaging) Narrative.
- Challenge-appropriate for the level.
- Role play requiring positive, creative action.
- Strategies and skills other than combat or use of weapons.
• Opportunities for communication and collaboration.

The last mentioned feature recurs in a range of similar studies. Gorriz and Medina (Gorriz 2000), summarized the different tastes, attitudes, and attributes that females bring to computer games.

• Similar to the AAUW (AAUW 2000) report girls value collaboration over competition.
• Girls prefer exploration and are not driven to ending a stage of play. Girls like to have the freedom to move about in a game without being impelled to move on.
• Girls are not particularly keen on testing their hand eye or reflex skills. They are interested in puzzle solving skills.
• Girls are interested in the complex social dynamics that can occur in computer games. They are interested in the types of relationships that are possible with game characters.
• Girls identify with characters they choose from games and sometimes mimic their behaviour. They enact other lives that reflect some of the experiences of people they know.
• Consequently girls tend to rate Virtual Reality applications (VR) as the kind of software they enjoy most. The kinds of VR applications that appeal include bungee jumping, shopping and travel.

• Older girls display a preference for educational games while the younger opt for stories.

Boys of a young age used computer games to learn Maths and Spelling. However as they got older they began to place a greater emphasis on the pure entertainment value of their games. Looking over some of the points in Gorriz and Medina’s (Gorriz 2000), summary one might question if there is not a possibility that educational games might appeal more to girls than boys. Studies of Flow in games observed that girls tended to prefer a narratological feature while boys opted for the ludological, more playful attributes of games (Inal 2007). This would seem to support Gorriz and Medina’s, (Gorriz 2000) observation of younger girls preference for stories.
Educational games designed to cater to extended exploration might work more towards a learning outcome more than one driven by the male impulsion for closure. A preference for puzzle solving is possibly of more educational value than optimising hand eye coordination.

4.7.1. Lara Croft; Feminist Icon or Villain?
Before the appearance of Lara Croft the characters, or avatars, of computer games were almost exclusively male. Females, where they did exist were relegated to the status of trophies for successful campaigns. A postmodern analysis of Lara Croft would view the character as cyborgian, embracing multiple subjectivities while simultaneously resisting the Barbie body type of male fantasy (Dovey 2006). How well patriarchal subjectivity is resisted is a matter of debate. In cinematic terms the “shots” of Lara are taken from a third person perspective, behind and below; the “camera” dwelling on her fantasised proportions. The character is thereby, property of the male gaze (Mulvey 1970). The Nude Raider patch is a pornographic add on which renders the character as fetish object of male attention (Atkins 2003).

Certain feminist readings are perturbed by prevalent trends in games culture that produce fetishized ideals of the female body for male consumption. Other readings are less concerned contending that readings of the female must take account of subject positions other than the heterosexual male (Dovey 2006). Turkle (Turkle 1995) contends that vast numbers of predominantly heterosexual males can benefit from the identification with and the opportunity to take on an alternative female identity.

Women now outnumber men playing web based games (Jenkins 2004a). Motivated by a consensus that girls were being isolated from a powerful medium efforts were made in the early 1990’s to develop games suitable for the female gameplayer; albeit with mixed success (Jenkins 2004a). Some views recommended the adoption of strong female icons as a strategy for young girls to promote self-confidence (Jones 2002). Female game characters e.g. Lara Croft, are powerful representations of female agency yet they communicate mixed signals. Lara Croft can be interpreted as an avatar of the corporealized fantasies of the male adolescent (Kennedy 2002). Video games can be sources of sexist, racist and Eurocentric interpretations of the world. They operate from a worldview that is hierarchical, hegemonic, and emphasizes the patriarchal values of competition, rationality and power (Sanford 2007). As was previously noted in the discussion on hegemonic practices the games industry is
overwhelmingly controlled by corporate interests (Fron 2007). This is a crucial concern, not only for the future development of the industry as a whole but also for any proposed application of games in education.

It is a testimony to the pervasiveness and deep seated nature of gendered attitudes in the games industry that management, whose professed objective is to maximise market share and profitability are nevertheless seen as inhibiting significant growth through agendas of patriarchy and control (Fron 2007). Women are absent in large numbers from the games industry and where they exist they encounter severe impediments to their ambitions to create games that would appeal to sectors beyond the male orthodox and culturally sanctioned. Brenda Laurel, an influential figure and pioneer in early game development, encountered strong, resistance:

“Why weren’t there any computer games for girls? And why did I wind up losing my job every time I suggested it? It couldn’t be just a sexist conspiracy. The boys’ game industry generated billions of dollars; surely even the most virulent sexist in Silicon Valley would be happy to reap the corresponding millions from girls if he could figure out how to do it. Nor was the male culture of computer games simply an artefact of the history of the industry. Something more subtle and complex was going on, and I knew it had to do with the construction of gender in every aspect of our lives- in play, identity, work, technology, and business” (Fron 2007)

Laurel was to get her opportunity in the early 1990’s with the launch of Purple Moon, a development aimed at producing games for girls. The venture collapsed, however, starved of financial support and the time required for any venture to establish itself successfully. One female designer, having created a credible female action hero encountered objections to the characters attire. It was suggested that combat fatigues should be replaced by a string bikini (Fron 2007). Purple Moon did not attempt gender inclusivity. Rather it focused on the experience of being a girl as valuable in itself: “This is mine, this is for me, I own this and you don’t get to make fun of it” (Cassell 1998). This creation of specialised games for females has attracted criticism. In a critique of female empowerment (or lack of it) in digital games Kennedy warns against the retrieval of gendered stereotypes through a repackaging of values and appearance “It is similarly vital that in a construction of a critical discourse about games we encourage and stimulate innovative and alternative images of men and
women that do not simply reinstate doggedly rigid gender stereotypes.” (Kennedy 2002).
In 2001 a report from PC Data online showed that the numbers of women playing games online had surpassed the number of men (Guernsey 2001). This data was significant in that, up to this time the market created by women was both underserved and unrecognised. It was observed that between 20% and 30% of women were playing games originally designed for the male market and which, in some instances, disenfranchised them (Taylor 2009). Women play games online for the sense of community and social contact that is one of the attractors of online games (Laber 2010). The online Massively Multiplayer Online Game (MMOG), *Everquest* allows for the creation of up to eight characters from a single server. Such scope is readily taken up by women in an exploration of alternate identity (Taylor 2009). By foregrounding both their “femaleness” and their skill in the game they offer a different set of meanings to computers, computer games, and technicity. By bringing their own bodies to the arena, they disrupt the assumption of a white, male, heterosexual player (Dovey 2006). Fuller and Jenkins (Fuller 1995), have observed that virtual spaces are privileged landscapes that enable new kinds of freedoms. Since gender in these kinds of online virtual spaces is neutralized women can enjoy a freedom of movement not readily available in normal social spaces. Nevertheless online game communities should not be seen as spaces of uncontested freedom. Aggression towards females has been taken beyond the character to the personal level and females have reported harassment from aggressive game play and aggressive dialogue (Morris 1998).

Women are said to have devised ways to redeploys games that were neither primarily intended nor marketed to them. The freedom of virtual spaces holds out the possibility of a heterotopian space where older identities may be reprised, re-interrogated and reconceptualised. It has been established that there are hegemonic forces at work in the digital games industry and that these forces are heavily gendered. There are opinions which tend to the view that, rather than a successful renegotiation of the terms of contact with male intended games, females find themselves alienated from computer games by their lack of relevance:

Unfortunately, the majority of today’s games are aimed at a male market and in addition are not of particular interest to girls... Thus, in many cases a girl’s
first experience with a computer is a negative one and can turn her off of computing right from the start (Gorriz 2000).

One of the possible conclusions that emerges most strongly out of this is that it is problematical to presuppose, that a multibillion dollar enterprise, i.e. the computer games industry, will be run along professional i.e. impartial lines, in order to maximise corporate performance and profit. Instead we have a situation where the digital games industry is” horribly stunted “because of its resistance and unwillingness “to look beyond itself to its audience”(Laurel 2001). The phenomenal rise in the number of women playing computer games has been interpreted by Dickey (Dickey 2006) and others as an opportunity to garner insights into interactive educational environments.

Games designed for girls that foster an interest in fashion design will not inevitably lead to an interest in engineering (Vail 1997). As we have seen there are arguments for females engaging with computer games. However arguments have also emerged which suggest that the case cannot be fully settled. It was suggested that women had found ways to subvert patriarchal agendas while prosecuting their own (Dovey 2006). In a sense the observation made by Dovey and Kennedy above is unscientific as it argues from localised conditions while it could be argued that the overall condition is informed by an ethos that is consumerist and has no discernible motive for the enhancement of personal freedom. It is possible that notions of subversion by girl gamers might only serve to consolidate inequalities by reinscribing male/female binaries. Cassel and Jenkins (Cassell 1998) caution that as long as patriarchal values remain alternative designs will risk dismissal and trivialization.

We will discuss masculinities later and it might be problematic to discuss the full implications devoid of a foundational basis. Nevertheless we will refer to certain implications as they impact on our discussion of female gender. Our contact with the theories of masculinities left us with one powerful impression. This was the sense that that hegemonic masculinities (because of the quality of performativity in gender, as observed by Butler) has the facility to reformulate and repackage itself as a strategy for disarming the more stringent feminist and cultural objections (Connell 1995). The view that agents are able to disrupt the operations of power is tenable if consumer culture is an amorphous mass that no one controls. But if we take the view that culture is impacted by popular media and that these media are under the ownership and
control of a hegemonic male elite we have to reconsider the degree of agency the gamer (in this case, female gamer) is presumed to have.

The foregoing discussed instances of female engagement with games as an example of female negotiation and circumvention of gendered attributes linked to the use of technology. Research has also emerged, however, to report that females of school going age are part of a recently observed movement away from interest in computers and computer technology (Gorriz 2000) Children of both sexes, have their first learning contact with computers through the medium of computer games and the reported flight from computers is of educational significance. The consequence of unreflective and possibly gendered use of stereotypical imagery in educational games has potentially serious consequences. In our view gendered imagery continues to be culturally and psychologically toxic and the case has not been made by those who contend that, in a post-feminist era, girls are equipped to negotiate with previously objectionable material.

Whatever verdict is passed on the use of gendered tropes in computer games as popular entertainment it is likely that gender issues in educational games will be held to a different and higher standard We have seen arguments,( inspired perhaps by post-feminist , postmodernist notions) that females are alert and resistant to gendered imagery and practice in games. However the arguments are not convincing. In any case this is no justification for allowing gender based games unrestricted access to the classroom.

The discussion on gender and its impacts on the mainstream entertainment industry as well as its potential effects on educational games flowed from a consideration of hegemonic influences. The debate attempted to be wide ranging however we focused particularly on two main issues:

- Exclusion of females from participation in the games industry.
- Formation and marginalisation of male identities through computer gaming.

Butler (1997) began the process of establishing the possibility of female agency in the face of patriarchally derived influences in the reproduction of technology. In our view the notion that females have succeeded in negotiating identities enabling them to engage with games that might previously have been the objects of feminist excoriation was, and continues to be troubling. The issue of gender is critical to the possibility of ever introducing educational games to the classroom. If we ignore
gender, we have effectively excluded half the classroom. Much of the debate about educational games seems to be centred around adolescent males. We have given this character as much, if not more attention than we paid to his female counterpart. This is justifiable on the basis that an engagement with masculinities does not deflect attention from female rather it provides a vantage point from which to confirm one of the more challenging aspects of male behaviour. Males are a non-homogenous grouping where sections are powerful but the majority are both powerless and complicit with power (Connell 1995). Masculinities are seen as fluid, adaptive and capable of reformulating social identity to be more acceptable to feminist inspired mores while remaining essentially unchanged and unchallenged (Connell 2000). Research has highlighted significant variances between the engagement of females with computer games as compared with how males approach and consume video games. Girls have been reported as preferring games where they could socialize, and be creative (AAUW 2000). Boys spend noticeably more time playing games (Bryce 2003). Boys are stimulated by graphic imagery while girls prefer games with a narrative bias (Gorriz 2000). Boys socialize in peer groups for game play but do so for acceptance and recognition (Sanford 2006a), while girls tend to seek more emotionally toned relationships with other players and with game characters. These two views emerging from research can possibly reveal certain problematic attitudes on the part of the researchers. This is particularly in evidence in the recorded research concerning boys. Boys come together for recognition and acceptance (Ibid). How is this different from the behaviour of girls? Is acceptance not an emotional need? Are the needs of girls other than recognition and acceptance? The problem derives from the use of language to posit two phenomena (acceptance/recognition versus “emotional” relationships) where only one exists. The (ideologically inflected?) misapplication of language allows for the anomaly that girls are permitted to find emotional nurturance in computer games without those needs being specifically defined while boys are permitted to obtain nurturance in computer games without an overt recognition of its emotional context. The issue of violence speaks to the formation of male identity. Research has highlighted the alleged male tendency towards violence by emphasizing the preference girls are said to have for non-violent games. Over 87% of games are violence free (Perry 2009a) so we have to question the research which identifies the relative pacifism of girls and aggressiveness of boys.
Boys at a younger age showed interest in using maths and spelling, however, they tended to lose interest in these games as they got older, showing a preference for the play dimension of computer games (McFarlane 2002). Gorriz and Medina (Gorriz 2000) observed a movement into learning games as girls get older which is the opposite of the trajectory described for boys. Girls are said to be displaying a preference for narrative while boys are opting for the ludic, and the playful.

Much of the research that has been developed on the differences between what girls seems well founded however one would need to be cautious when interpreting it. In our view electronic games, whether mainstream or educationally purposed, are sites of contestation between cultural debates that have never been settled satisfactorily. The problem with much of the research is, in our view, that it tends to fall back on the notion of “hard wiring” of the brain. We attempted to show how gendered assumptions can be smuggled into research by the unreflective use of language. We have no conclusion to offer in terms of what should be preferred. All we proposed to do is assess what the obstacles might be to a release of educationally effective games. In our view gender is a vital concern and one that has not received sufficient attention.

In reviewing the effects of culture we adopted a number of approaches so as to gain a perspective on how culture was operating on the formation of computer games generally and how it might operate on educational computer games in particular. The initial review of cultural formation and effects on intelligence were meant to set the scene for a discussion of the important cultural dynamics of hegemony and gender. Since hegemony could have been subsumed under gender (the most salient hegemonic practices being gender based) we would have to conclude that gender is the most salient cultural dynamic to be identified in the chapter. However we should also stipulate gender to be the most salient issue to emerge thus far. In later chapters we will identify culturally based dynamic which, we will argue, have greater impact on the educational games project.

The issue of gender needs more attention in educational game research because, as we sought to demonstrate, there are marked differences between how females and males encounter computer games. Certain post-feminist notions were expressed that seemed to imply that girls could successfully negotiate with gendered texts, thereby profiting from their use while being insulated from their more toxic effects. We disagreed in
part because the argument is not convincing and in part where females have been observed to negotiate with gendered texts they seem to have more maturity than could be expected from schoolchildren. Since half of a class is likely to be female it is important that gender based issue are properly aired and resolved before the introduction of educational computer games.

**Chapter 5. A Theory of Educational Games versus an Educational Theory of Games**

“Education, which has always been in the business of capturing and holding attention, has sustained serious blows to its capabilities as core values, along with traditional tools, means, and purposes, have been progressively troubled, destabilized, and finally unseated by new literacies and digital epistemologies. Vastly complicating this challenge is a corporate-owned, profit-driven means of educational production transplanted into the heart of the public school: networked digital technologies of construction, representation, expression, and communication” (De Castell 2004, p.381).

**5.1. Introduction.**

We begin the discussion with a review of the ethical principles that inform the use of digital technology before proceeding to the main issue which is to consider whether or not the project to create educational games is informed by a theory of education or a theory of technology. In our view there is a critical difference between having an educationally based theory of computer games and a technologically based theory. If the theory that supports the creation of educational games is educationally based it has a compass by which to progress. If the theory is technological it will, by its nature, serve technology and not education. It is fitting to consider the topic of ethics in computer games within a discussion of who decides how best to utilise the technology.

**5.2. The Ethical Basis of Games.**

“The development of technology is seen to obey an autonomous and value-neutral logic in which science-based, technical elites (engineers, city-planners, physicians, architects, etc.) realize ever more effective and reliable means to attain the necessary, incontrovertible goals of modern society. As such, existing technology at any particular moment in time appears to have a self-
evident rationality and necessity which repels the very possibility of authentic ethical choice and political debate” (Doppelt 2001 156)

Are computer games ethical? This would seem an curious question to pose at this point with all that has been said of violence, gender, and hegemony. If games are to be accorded a place in education surely the question of whether or not they are ethically informed needs to be asked? The obvious answer (given everything that has been discussed) might seem to be no. It is possible, however, to argue that games have ethics; but what are the nature and more importantly, the effects, of these ethics? Games are an activity and activity encounters choice which can assume ethical choice. Is it possible therefore to question if a game is a morally bound object? If games are moral objects are game designers morally accountable? It would seem that if games are not moral objects then there is a grave problem justifying the construction of Serious Games in particular and entertainment games in general. Games are ergodically structured. Ergodics in a game “includes the rules for its own use, a work that has certain requirements built in that automatically distinguishes between successful and unsuccessful users (Aarseth 1997 179). Ergodics are part of the material construction of the game. They are an architecture of meaning built on code. Code is an artefact designed to produce a series of prescribed experiences. A computer game is a power structure; it is not value neutral. The rules have to be accepted by the player prior to play. The rules impose architectural constraints which either punish or reward, depending on player behaviour. Games are not, therefore a neutral structure but can be seen to have some of the characteristics of a surveillance and disciplinarian system in the Foucaultian sense. Once the relationship of power is accepted the player is manoeuvred into an exchange of freedom for pleasure or knowledge. To operate in the ergodic system that constitutes the game the user becomes a node in the structure of power. The possibility emerges, therefore, that the computer game is more than a moral object. The game is a moral agent. Granted this agency is artificial and might attract criticism from those who would insist that morality can reside only in the human. However, a person could be injured by a device designed to harm by another person who had left the scene; in the same way a game may be a moral agent in the sense that an agent can stand in for a person. This brings the discussion back to the responsibility of the game designer. The question of ethics might obtain more reasonable consideration in an area where the player is involved in the authorship of the games.
This loss of personal power is evident not only in the game as game but involves complicity with hegemonic consumerist ideologies. *The Sims*, for example sets up an ergodic architecture which stipulates that in order for the player to be successful in the game the player is required to engage in endless consumption. The consequences of refusal of the ergodic requirements of the game is instant expulsion.

Computer games are ethically accountable. This accountability derives from the rhetorics constructed in and by its ergodic architecture. Ethics themselves have become grist to the mill of computer game design in games e.g. where players are faced with ethical choices as part of the game play. In a sense, this was inevitable given a certain contiguity in the activity of ethical choice and the algorithmic nature of programming. In reality, however, ethics cannot be conflated with the numeric quantifications of code. Algorithmical decisions are ethically vacant but not the humans who have devised the algorithms.

**5.2.1. The Ethics of Games as Persuasive Technology.**

Interactive media has a profoundly persuasive effect on people (Fogg 2002). The computer game *America’s Army* was devised by the Pentagon to promote military careers to young people and should be seen as a (very successful) recruiting device. As we shall see games can be deployed in a rehabilitative effort (Griffiths 2003). However games have also been linked with low incidences of physical fitness (Vandewater 2004). Gentile (2004) reports low levels of pro social behaviour as an outcome of playing computer games, however we have cause to argue against this, not least on the highly social nature of gaming.

Game design and developers tend to evade their ethical responsibilities for the effects of their games by a reliance on free speech legislation (Dodig-Crnkovic 2005). This constitutes an ethical problem given the far reaching and profound effects games are exerting on millions of young people (Ibid). Professional ethical guidelines need to be established in order to minimise the more saliently negative effects.

Continuing debates in education and in the discourse around educational computer games are marked by vigorous debate and many of the positions taken are polarised and oppositional. There are few places where the polarised positions are more in evidence than in the debate over who controls student attention. De Castell and Certain kinds of computer games develop a different set of cognitive processes than those fostered by earlier modes of communication e.g. print media (Greenfield 1984). This is, in part because computer applications—specifically visual applications—tend to
shift information processing from verbal to visual processes (Subrahmanyam 2001). Computer games are participatory and this might provide a valid research space in which to observe coordination between children’s attention and performance (Greenfield 1994)

Action computer games include elements that are dynamic, dimensional and spatial. A number of interrelated events may be happening at different points in the game, all of which have to be present to the player in order to maintain control. The effective game player develops a parallel processing ability to divide attention and retain task focus. This is not new to present day computer games but was a feature from the earliest and most popular forms. In the early maze game, Pac Man it was necessary not only to protect the main character, but to keep track of a number of monsters, their location, and an awareness of where and how to access the energisers. Since Pac Man, game demands on players have become even more extreme. In a 2003 study (Green 2003) demonstrated that habitual game players displayed measurably greater attention capacities than non-players. Variations in attentional capacities went to the level of type of game. Players tested after playing Tetris, a puzzle game displayed less attentional capacity than players assigned to Medal of Honour. The anomaly was attributed to the observation that, while Tetris is challenging, each task is sequential whereas in Medal of Honour multiple events are occurring in different locations and must be tracked simultaneously by the player. It is possible that the player’s cognitive capacity is challenged more by concurrent demands. Representational skills are augmented with the use of computer games. Iconic representation is the ability to create and deploy images; a prevalent feature of digital games where representational styles are heavily dependent on graphic imagery.

The views reported above should be interpreted in the context of other possible effects of technology on developing minds. Certain researchers have seen that rather than augment intelligence, digital technology may be adversely impacting on the attentional capacities of young people leading to cognitive malfunctioning. Lanham (Lanham 1997) citing Healy came to the conclusion that the phenomenon of information and sensory overload that children are now being said to experience as a result of the arrival of digital media is having a negative effect on children’s cognitive functioning:
“In a recent book, Jane Healy considers the manifestations, popular and clinical, of what has come to be known as ADD or Attention Deficit Disorder…The proposition she entertains comes down to this: the modern overload of information, especially the sensory overload of electronic media and the fragmentation of family life have collaborated to wire the brain of her students in a different way…Digital display may create a deficiency in the vital ingredient, the "capital," of an economy of attention—attention itself. If so, the hypertextual universe of thought may have generated the seeds of its own destruction” (Lanham 1997 n.p.)

This is an instance of the alleged connection between exposure to digital media and cognitive dysfunction. These positions have to be approached cautiously, however. Lanham concedes that Healy’s views are those of a teacher consulting the available literature and therefore not an accredited researcher from the field of neurophysiology or the related sciences. It is unclear as to the aetiology of the neural effects. To a generation raised with the warnings of the effects over exposure to television would have on the developing brain it might seem reasonable to believe that sensory and information overload is the proximate cause of Attention Deficit Disorder. In our later discussion on Children and Disabilities we note that scientific research has reported that playing computer games (children’s most prevalent behaviour in the “hypertextual universe”) is highly beneficial to treating those children already diagnosed with the disorder (American Psychiatric Association 1994, Houghton, Milner et al 2004)(American-Psychiatric-Association 2000). Healy’s position (and thereby Lanham’s) is questionable in that it conflicts with empirical evidence and can be seen as supporting a populist tendency to generate moral panic. The panic in this case is the allegedly negative effects of digital media on developing brains.

Earlier, we discussed the rupture between an educational culture based on acquisition and the participationist culture that in some views (Jenkins 2004,2006), seeks to
We noted from Sfard (1998) that there are grounds to believe that the two parties to this controversy— notwithstanding their mutual polarization— need each other more than either would care to admit. Attention has long been the key currency around which education and learning are transacted (Castell and Jenson 2004). Attention is guarded by the institutional power of the school with a system of rewards for observance of the ordinances and disciplinarian measures for any forms of resistance against it. However with the changes brought about by the rise of Information Technology that was premised on participation, both in its inception and continuation, the original power relations in the class began to be disrupted to the point where the teacher is now the supplicant for the attention of the student and finds herself in competition against other modes of learning (Ibid).

“What is different here is children’s sense of entitlement: whereas under earlier conditions students had to earn, to merit, to “deserve” their teachers’ attention, nowadays increasingly the tables are turning, and it is the teacher who must earn or deserve the attention of her students—or her students will turn it elsewhere” (Ibid 382).

It is possible to hear a note of complaint in the passage above. There is a certain plaintive quality in the observation of a fondly remembered time when children’s attention was there for the teacher’s asking. If we consider that the reasons why “the tables are turning” we are led back to the effects of cultural hyper complexity.

In the networked economy children’s attention is a valued and valuable asset and the children are aware of this. Corporate media networks have created an environment in which children have their affective and cognitive awareness shaped by the forces of advertising and image creation. Increased work demands on parents mean that children are receiving less supervision while the disappearance of safe urban playspaces is a factor in children’s’ uptake of digital technologies (Jenkins 1998). Castell and Jenson (2004) believe that matters have now become so retrograde that “little worthwhile is left of the traditional separation between education and entertainment” (Ibid 383). Noting the comprehensive success of computer games to fascinate and impact on the lives of millions of children they turn to video games for what they can reveal about new learning environments. The commercial success and proven viability of computer games has resulted in massive financial investment in supporting design and technologies. This has resulted in the emergence of a learning based technology that would not exist otherwise. The ability of games to absorb and
immerse children is perceived by both teachers and parents as a threat (Ibid). De Castell and Jenson (2004) explain the success of games by their ability to exploit the dynamics of the emerging attentional economy. This might be correct if we recall the contentions of others who suggest that games are powerful learning systems because they incorporate exploration, testing, and hypothesizing as core activities (Prensky 2001, Gee 2004, Maher 2009).

In the following we discuss the conflict between two distinct approaches to the place of technology in education. In the second view i.e. that of an educational theory of technology (one to which we would tend to subscribe) we discuss the proper place for technology in education.

We begin however with an examination of the view that technology is an uncomfortable bedfellow for education no matter how persuasive the supporting arguments. Olsen and Clough (2001) report that Postman observed the Faustian nature of the bargain struck between education and technology. In a 2001 critique on the negative impact of technology on learning they quote from Postman’s 1985 analysis of Sesame Street in *Amusing ourselves to death: Public discourse in the age of show business*:

"Which is to say, we now know that "Sesame Street" undermines what the traditional idea of schooling represents. Whereas a classroom is a place of social interaction, the space in front of a television is a private preserve. Whereas in a classroom, one may ask a teacher questions, one can ask nothing of a television screen. Whereas school is centred on the development of language, television demands attention to images. Whereas attending school is a legal requirement, watching television is an act of choice. Whereas in school, one fails to attend to the teacher at the risk of punishment, no penalties exist for failing to attend to the television screen. Whereas to behave oneself in school means to observe rules of public decorum, television watching requires no such observances, has no concept of public decorum. Whereas in a classroom, fun is never more than a means to an end, on television it is the end in itself”

Postman is one of education’s foremost critical theorists. That being said it is possible that, though much remains pertinent, much of what he says on the effects of actual technology has been superseded by events. Postman is often quoted by others intent on a deconstruction of the negative consequences of technology. However it is
possible to wonder if that tactic is fair to Postman. This writing is from 1985, at which time there would have been no basis to expect that Postman could either have been aware of or anticipated the possible emergence of digital technology. Consider the quotation above. Postman’s critique is accurately focused on the limitations of television as an educational medium. There are grounds to support the view, however, that the same criticisms would not apply to computer games but might support the view that in games we are seeing the emergence of a creative technology with a wild card element. The wild card element is play which, funnelled through the experience of immersion has potential; to transform education. Postman laments the lack of social interaction in television. As we have seen computer games are all about social interaction. The availability of vast amounts of online data means that students can have access to more information than their teachers could hope to provide (Gee 2010). The development of a language facility is central to effective gameplay (Din and Calao 2001, Zhao 1990, Garrett 2008, Duff 2002). The choice of Postman is therefore questionable, perhaps more so given that Olsen and Clough were writing in 2001 and might therefore have been expected to have shown more awareness of the consequences of digital technology than could have been expected of Postman. Similar to Postman, Olsen and Clough evince a certain antipathy towards the notion of fun or at least the popular cultural tendency to give fun its pre-eminent status. Given our debate on the nature of play and the tendency to typify fun as a corrupt and corrupting form of play it is difficult to cavil with that position. They may be idealising education when they ascribe to it the facility to deploy:

“prior knowledge, grappling with new experiences, struggling to make sense of those new experiences, thinking about thinking, making new connections, and finding that prior connections no longer make sense are serious and difficult struggles requiring much effort, diligence, and perseverance on the student's part” 2001 (p 9).

Against this we should recall Chi, Feltovich and Glaser’s (1982) study in which students were able to ingest information for successful reproduction in exams but were unable to produce it as knowledge suitable for real world conditions. Olsen and Clough (2001) continue with the assertion that the presence of technology in the classroom militates against the ideal educational outcomes described above. It is possible that we do Olsen and Clough a disservice. Consider first of all that their
paper was written in 2001, 3 years before Gee’s analysis in *What Video Games Have To Teach Us About Learning And Literacy*. Computer games are not mentioned nor discussed in the writing and it would be unfair to presume to know what their position on educational computer games might have been. We argue against a theory of educational technology (which broadly is what Olsen and Clough have done) in favour of an educational theory of technology which does not support the educational use of any of the technologies referred to in Olsen and Clough (2001).

5.3. Conglomerates and the Colonisation of Education.

Before the 1980’s the conglomerate, as we now know it, barely existed (Wu 2011). There were many large companies that tended to operate within a defined industry where they could maximise their knowledge basis to generate maximum profits: their only real concern. This changed with the economic uncertainties of the late 1970’s and 1980’s. The driving force became not so much profit generation as guaranteed survival and continuity. In the pursuit of this element the corporation integrated above and below the chain of production so as to control costs and ensure continuity of supply (Wu 2011). In the case of education companies began to change their posture from supplying information and services to taking active roles in education in order to leverage their skill and knowledge base.

Conglomerates protect themselves by seeking to maximise the advantages they possess or control. Thus a media company will expand into every form of media. An information company will similarly expand into a sphere which it identifies as information driven. This is the corporate logic behind the conglomerate expansion into education. In the 1980’s companies supplied education with technology i.e. computers, but the relationship went no further.

“The corporatizing of public education has taken a distinct turn as we approach the twenty-first century. No longer content merely to argue for the application of business principles to the organisation of schooling, the forces of corporate culture have adopted a much more radical agenda. Central to this agenda is the attempt to transform public education from a public good benefiting all students to a private good designed to expand the profit of investors, educate students as consumers and train young people for the jobs
of the new global marketplace. And the stakes are high. According to the Education Industry Directory the for profit education market represents 600 billion dollars in revenue for corporate interests. And this is an expanding market, larger than either the military budget or national security” (Giroux 2000, p.85).

The gap between an educational theory of technology and a theory of educational technology is an identifiable fault line in the landscape where education co exists with technology. The issue as identified is not new, it is certainly not ours. It has been a concern of a number of writers although we first encountered it in De Castell.

**5.4. Competition for Attention.**

De Castell and Jenson are aware of an attrition occurring in schools whereby the most valuable currency, and formerly the exclusive property of the classroom, i.e. the attention of the learner, has been channelled by various digitally based epistemologies. To make the matter more of a concern is the recent emergence of a for-profit sector which intends to colonize education as yet another profit centre. The chief resource of the conglomerates that have targeted education for commercial advantage is technology, in particular digital technology. Computer games are the most recently emergent avatar of the new technology and educational computer games have been an offshoot of that process. When we began this study we were forthright in stating that we believed that the operations of culture attenuated through the processes of ideological formation was the single most important issue attending the development of educational games.

**5.5. An Economistic Discourse for Education.**

Giroux (2000), has named a certain type of academic as complicit with the encroachment of corporate interests into the classroom and, given their economistic ethos of games for education it is difficult to see how Gee and Prensky could be excepted from this critique. The topic of the failure of traditional education has assumed almost mantra like proportions yet we would argue (with Nussbaum 2010) that a shift to a technologistic education, intended to defend the west from the economic encroachments of developing countries will signal a grievous loss to society and may be counterproductive in the long term. Arguably the views of those who see the ends of education as no more than training ground for a technological elite displays a lack of vision as to what an education should include. When discussing ideology one never approaches the possibility of full clarity. In the case of Prensky we
have a thinker who has profoundly influenced the discourse of educational computer
games. His contributions have been many and effective. We have credited him with
the ability to respond to one of the more serious critical challenges posed by
educational psychology, (Kirschner 2006, Clark 2007, Mayer 2004). Yet in other
writings, e.g. *Don’t Bother Me Mom, I’m Learning!* (2006) we observe an anticipation
for the entry of conglomerates into the production of educational games. Prensky is
painstaking in developing pathways for students to author and create their own
games. In the end we cannot dismiss Prensky both because of the value of his
contribution and the fact that an avowed enthusiasm for the participation of the
corporate sphere is leavened by more detailed work on independent learning. Anyone
wishing to find shades of pure black and white in the area of educational games will
not be successful.

The unreflective acceptance of games in the classroom is the basis for a theory of
educational technology. On the other hand the reflective use of computer games in the
classroom is an educational theory of technology.

One of the apparent features of the evolution of digital culture—from the perspective
of the educator—is a growing clamour that exhorts the educational uptake of digital
technology. Dissenting voices are marginalized and ignored (De Castell 2004).

The traditional public role of pedagogy has been undermined by a private corporate
view of education. In this new dispensation students are regarded as monetisable
assets to be bought and sold (Grimes 2006). Schooling, students and citizens alike
have had to adapt to the fact of the hegemonic presence of the globalised market
(Ibid).

Commercial and corporate interests are moving into the ascendancy supported by a
new class of entrepreneurial academic which endorses and lends legitimacy to the
market driven approach. The emergence of the “education marketplace” is supported
by a partnership between designers and developers committed more to the production
of goods suitable to an economistic discourse than to serving underlying educational
goals. This is the setting for “today's dot-com challenge to education- the integration
digital tools into the resiliently analogue environment of the typical public school”
(Ibid).

“Universities are not simply undergoing a technological transformation. Beneath that change and camouflaged by it, lies another: the commercialization of higher education” (Noble 1998).
The above statement can be extended to education at all ages, indeed it can be even more precisely focused on the very young whose sphere of living is subject to surveillance by corporate interests (Grimes 2006). Nowhere is this intrusion more in evidence than in the area of the games children play online. This raises the spectre of what is likely to happen if children are entrusted to the commercial interest that create and produce educational digital games both at present and for the future. The alarmist rhetoric sparked at the time shifted with the arrival of the new computer based technology where a concerted effort was set in train to raise educators conscious of the educational promise contained in the new technology and to warn against the consequences that a parallel illiteracy would mean for students in the new technological era (De Castell 2002). Despite massive promotion however utilisation of computers was relatively slow:

“Success in making new technology available obscures, however, the divergent goals spurring the loosely tied coalition. Some promoters sought more productivity through better teaching and learning. Others wanted to transform teaching and learning from traditional textbook lessons to more learner friendly, student centred approaches. And some wanted students to become sufficiently computer literate to compete in a workplace that demanded high level technological skills. Have these varied purposes been achieved in schools?” (Cuban 1983, p.177).

Apart from the utilitarian attitudes towards the use of the computer in the classroom we can see that the recommendation that educational computer games act as tools to promote technical competence is not innovative but was a feature of the earliest discourses attending the use of computers.

Teachers who have used games in class are aware of the priority of keeping within a structure and operating towards clear, finite goals. “The teaching strategy is exactly the same as conducting a real experiment: good worksheets, structured questions and finite goals are necessary. I have no doubt that left to devices the children would have concentrated on the game and left the biology.”(Carter 1995, p.28).

De Castell et al characterizes the drama of technology in education: “The stage... is populated with a familiar set of characters – the concerned parent, the enthusiastic child, the harried teacher, the bewildered administrator, and the miracle worker”(2002, p.2) . De Castell’s interpretation is not only appropriate to video
games but is intensified and raised to a new and more urgent level. Parental concerns are triggered by issues around violence and addiction and, as we have seen, the press and print media are alert to both the inception and prolongation of moral panics. The enthusiasm of children for digital games has amplified to such a degree that some of its proponents for widespread adoption in education contend that conventional class based education has alienated a generation of children raised in the new participatory culture and that traditional modes of pedagogy are almost defunct (Prensky 2001).

Caught in the crosshairs of social/parental expectation and curricular requirements the teacher is pressured to accept new technology and many seem, at least at first observation, to have an accepting attitude to games in the classroom. A press release from EA games cited a recent Mori poll which reported that 59% of teachers surveyed in the UK would consider using computer video games in the classroom. The MORI poll was commissioned by Futurelab (2005), a body set up to pioneer the use of technology in education. Acceptance is mitigated by a range of obstacles, from lack of time, lack of training, and unsuitability of games, as outlined by Kirriemuir and MacFarlane (2002c). Tam and Milton (2007), reported an attempt to introduce a game into everyday schooling. During the course of designing an educational game for use in Hong Kong schools they received the support and encouragement of the teachers. Yet when they returned with the finished product expecting the same enthusiasm they were disappointed at the lack of interest and commitment among the teaching staff and administration. Those who might be expected to approach technology informed by educational theory are also prone to resistance and a defensiveness regarding their own privileges.

The MORI poll reported that “The majority of teachers polled believe that playing mainstream games can lead to improved skills and knowledge. For example 91% felt that players developed their motor cognitive skills while over 60% thought that users would develop their higher order thinking skills and could also acquire topic specific knowledge (Futurelab 2005)” Computer games make complex and extensive demands of cognitive functioning and for the player it is a large factor in the game experience. Although computer games are good at learning, the issue is are they good for education and the learning that takes place in education which is a different domain with different requirements (Egenfeldt-Nielsen 2005).

Engle (2001, p1) takes a more confrontational approach:
“the pervasive intellectual deceit documented in the tobacco industry is not unlike that currently being perpetrated by the popular media, computer industry, and certain members of the educational community, resolute in their determination to erase the intellectual boundaries between the profit-generating models of business and the intellectual pursuits of the academic community.”

The erasure of boundaries has been a recurrent issue in the course of the present study. In a work, (2011), on the reassertion of corporate control over the internet, Wu recommends the legislative separation of certain spheres of economic and industrial activity as a strategy to both preserve democracy and retake lost democratic ground. One of the crucial separations recommended is that there should be a disconnection between those entities that create knowledge and those who disseminate that knowledge. The creators of knowledge should not be allowed to remain in a position to profit from the knowledge they create. The consequence of creators controlling dissemination is the eventual corruption of knowledge. Knowledge has a new master and serves a new (corporate) purpose. In essence, however, knowledge has always had a master (Wu 2011). Wu’s specific focus was on the large communication and information industries yet it requires no undue effort to conclude that the principle holds equally well for the colonization of education by corporate interests.

“Computer games, particularly online roleplaying games consume vast quantities of personal time which could be better used in face to face contact with other people. This leads to the destruction of a shared sense of community. Human interaction through digital games is inauthentic because important cues derived from physical presence and body language are missing (Stoll 1999).

Stoll raises a valid objection, but his objection should be restricted to the context of online games. It has been established that games are highly social and have been seen as creating rather than destroying communities. The objections posed by Stoll is against the absence of tactility in the contact that takes place in technically based environments. In truth there is no means of devising an answer to the issues raised. Both arguments have merit. The sense is that technology is on trial for failings
characteristic of human society i.e. isolation, lack of cohesion, hostility; failings that have predated the development of most forms of technology.

The reported success of the deployment of digital tools in the classroom has cleared a space for the arrival of the “miracle worker” (De Castell 2002). The educational miracle worker, upon arrival, sets about the remediation of the production of knowledge for educational contexts. The education worker’s status is recognized by promotion to a managerial role while the status of the teacher is downgraded from broker of knowledge to broker of information (De Castell 2002). The success of the education worker is measured in terms of the ability to provide narratives based on dramatic successes but even more by the generation of discourses that give the appearance of radical transformation of the student’s engagement with information. What is really taking place however is the “the banal reproduction and passive consumption of existing forms, as the …these romantic narratives about the significant changes that invariably ensue when a school adopts the miracle worker's platform are the stock in trade” (Ibid p.5)

There are several theories of educational technology most of which take as given the positive effects of technology in education. However an educational theory of technology would seek to understand the uses of technology from the standpoint of purpose and values.

As important as it is to have sound theory it should not be assumed that nothing productive can take place until established theory is in place. As an example we will see later that game authoring emerged as a series of fortunate coincidences. Therefore an educational theory of technology must not only be prescriptive but also have the capacity to identify use applications that already exist. An educational theory of technology would stabilize an educational epistemology it would identify technical capabilities capable of serving an educational purpose.

The earliest cultures of public schooling down to the present time have been occupied with shifting paradigms that considered substantive educational questions about theories of learning, the nature of the learner, the meaning of pedagogy, the nature of knowledge and how it can be communicated (De Castell 1986). These foundational elements of educational theory have been challenged and in cases, supplanted, by a corporate driven ethos informed by different priorities. Early attempts to ask challenging questions about the nature of technology and its likely impact on
education were frustrated. Instead educational questions were re framed around
market based values in a drive towards the commercialization of education, the
 corporatisation of the University and the establishment of an elite at third level whose
loyalties are mixed at best (De Castell 2002)

Franklin (1990) sees technology, not as an artefact, but as a set social practices,
However Grint and Woolgar’s (1992) typification may be more useful as it concedes
that technology may have a deterministic power but that largely it’s effects are
articulated through the discourses people create around it.

Digital technologies represent a powerful means to reshape human knowledge,
communications and educational structures. They offer the opportunity of
reformulating our social practices and epistemic concepts. Educators, for their part,
cannot evade the charge of complicity, or at least of passivity. The greatest threat to
the democratic nature of education comes from the sphere that would monetize and
transform education for commercial gain The trend is, if anything, more noticeable
with computer games. For this reason we propose certain strategies which would
protect educational games from corporate intrusion. We identify certain issues to do
with possible legal vulnerabilities on the part of those who might use commercial
properties in education. We identify game self-authoring as possibly the most
worthwhile avenue for educational games. As previously mentioned, we recommend
greater awareness of possible legal sanctions to an incautious use of Intellectual
Property within self-created games. In our discussion of fantasy we sought to
establish the grounds for creating original characters with the attraction of Harry
Potter .It would be a serious miscalculation on the part of anyone intending to utilise
Intellectual Property in the design of an educational game. Intellectual Property is one
of the pillars that corporations rely upon to protect their existence (Wu 2011).

The response of education to the new technologies was the use of CD Roms, or Web
based content exploiting few if any of the potent features the digital age had to offer.
De Castell describes it as “using a jackhammer to insert a picture hanger into drywall”
(De Castell 2002) Our phrase was “using a Ferrari to deliver pizza” (Murray 2011).
De Castell continues to compare those educators who are aware of the failings of
technology, not as Luddites, but as akin to the child who notices that the Emperor is
De Castell et al argues against a growing trend where educational administrators and ministries of education are diverting resources away from the need to integrate existing technologies to support an ever burgeoning educational corporate sector.

“Better by far to reallocate time and resources to teachers and learners for harnessing, themselves, new forms of intelligence and new functional capabilities to participate directly in the world of digital technologies as purposeful and capable producers of artefacts, and not merely as consumers of the products of others. The public school today has become the charitable arm of technology industries, scaffolding and supporting their growth and development, rather than supporting the technological growth and development of teachers and learners themselves.” (De Castell 2002)

By failing to identify and investigate the problems generated by the lack of success in integrating technology to education educational theorists have failed education and left the opportunity for the encroachment of the corporate sector. They agree with Penly and Ross who assert that the hidden dynamic of both educational and cultural technologies is to deploy surveillance and information gathering systems to enable the management and control of large populations (1991). In this view the net effect of commercialized education is a lowering both of standards and of expectations.

The researchers take note of an attribute of technology which is that it is as likely to present a solution as a problem. Possibilities still exist for knowledge creation that could support public educational goals. The unregulated spaces that constitute evolving technologies offer opportunities to teachers and educators to reconsider their “business as usual” approach to education and to reinvent educational practises. They are also acutely aware that this opportunity is time sensitive and will not be available indefinitely.

“For probably a very short time, digital tools have given the public, a global public, the possibility of unregulated knowledge-transfer and infinite interpersonal relationship capabilities. Because of the interpenetration of the market with these technologies - technology as the proverbial Trojan horse - there exists tremendous pressure on public education to reorganize itself along business lines.” (De Castell 2002)
Educational discourse has become so heavily influenced by the economistic rhetoric of the corporate sector that it is increasingly irrelevant to the lives of students and their teachers. Educators would be taking the wrong option however, to disengage from technology, rather they must confront the new offerings with the view to discriminating what may and what may not fulfil an educational purpose.

Various theories have been identified and recommended as strategies to counter, or at least resist, the encroachment of a corporatist instrumentally based culture in personal life and, by extension to education. De Castell (2002) recognizes the influence of Haraway’s concept of the cyborg as a key site for minorities to assemble tools to mediate their encounter with the world of new technologies. Whatever its poststructuralist credentials; there is a possible defect in recommending this as a strategy of resistance to the evolution of a corporate education. Haraway’s formulation is devised for and suited to minorities. The problem of the advance of corporate education is a mainstream problem not a minority concern. To adopt the strategies of the minority is an admission of defeat. It is to leave the site of conflict even before the battle has been fully joined.

Is it even possible to formulate a resistant concept to address the advance of for-profit education? Not all knowledge can be acquired by the academic/intellectual route. Sometimes one has an intuition, a felt sense that something is wrong. This sense was strong when reading Prensky and Gee. It was that much stronger because of a pre-established tendency to value and defer to their standing in the field of research into educational games. It persisted during an extensive reading of earlier works but was strongest when reading Don’t Bother Me Mom-I’m Learning. The felt sense finally crystallised in to a question of boundaries. There was a sense of boundaries having been breached. This was a new experience- normally the question of boundaries would be something to be aware of and alert to in one’s personal relationships especially those of an emotional nature. The nature of boundaries and the breaching of them is always based on the notion, intentional or unintentional, of power and the assumption of power. The assumption was that commercial computer games were good for education and that the presence of commercial games and the companies who produce them could not, and should, not be long delayed.

5.6. Some Components of Educational Games.
Given the number, range, and degree of game application presently emerging it is as likely that a tool that can be mobilised for education will emerge almost accidentally as it will by a process of considered research and design. Carbonaro is an example of the almost accidental nature of the process by which good educational games emerge. De Castells’ approach is more considered. What the two studies share is an attribute for staying outside the profit driven ethos of the corporate sector. This can be seen as an important, perhaps even indispensable, feature for the development of successful educational games.

To recap, features which would support an educational theory of education (according to De Castell) would include:

- Low-or no-cost.
- Highly accessible.
- Low connectivity
- Relevance to teacher/student.
- Well scaffolded
- Self-contained-no requirement for expensive support.

In the context of computer games for education we would add some recommendations:

Both self-authored games and particularly those partly constructed by expert contribution through social media.

Are low/no cost.

They recruit skills and deepen knowledge.

They are accessible, shareable, and changeable.

Educational games applicable to the general curriculum can be financed by government thus preserving educational games from corporate access.

Existing commercial offerings often fail to be educationally specific.

We have seen struck by the way a new tool for promoting creativity, motivation, and independent self-learning has come about (Carbonaro 2008). Games relied heavily on independent, unpaid hackers to create the foundations of the industry. The instinct for adaptation and tinkering never quite disappeared and in time the developers began to
release tools with new products on the grounds of pure self-interest- as a way to ensure player involvement and the resultant brand loyalty but also to harvest any original ideas for commercial exploitation. The fact that the toolsets released by the companies e.g. *Aurora* for the *Neverwinter Nights* series only suggests that they had no interest in a wider amateur audience. Then along came *Scriptease*. Here is the interstitial space between a theory of educational technology and an educational theory of technology. Those who support a theory of educational technology become the prisoners of technology. Those who remain committed to the difficult task of formulating an approach which allows the power of technology to operate in education as a servant will gain access to a tool which will, as the enthusiasts predicted, have a transformational effect on education.

5.7. Conclusion.

The quotation from Giroux with which we began sets out with stark clarity why it is difficult to believe that educators have the luxury of time, and opportunity to evolve a sound educational theory of technology. We are not saying this is impossible but given the factors which militate against such a project it is and will be difficult. Giroux quoted a figure for U.S. for-profit education which exceeded defence and national security budgets combined. It serves to provide a sense of reality about the scale of the problem. Ranged against a corporate structure committed to exploiting this market are a few isolated voices in education, academia and society. De Castell has referred to those academics that align themselves with the project of corporate expansion into education but if anything the problem is wider than a few academics. To question technology is to be assigned to the category of Luddite. This permits the conglomerate to take and hold the moral/ideological high ground; a formidable strategic advantage.

In a previous section we have argued that technological “progress” is irresistible. The human experience of new technologies as akin to a person fording a fast flowing river. Often it is a bigger problem to go back than to go on. If we get back we are still on the wrong side of the river. The only course is to persist and forge ahead. This should not, however, be interpreted as an endorsement or a passive acceptance of technology. In a basic sense technology is power rechanneled to human advantage. As such it is value free, and can be turned various purposes, personal, social, ideological
etc. Seen from that perspective technology is as likely to come up with a solution as it is with a problem.

The question to be asked, looking forward to the introduction of computer games into education is will this be the cultural mould that awaits educational computer games? How often in the previous discussion on reports of case studies have we witnessed researchers driven by a variety of motives except the most crucial one; a sound theory of education? Where there was a focus on history the learning outcomes were confused and student resistance was notable (Egenfeldt-Nielsen 2008). The study of Geography was marred by politics (Tuzun 2009) The common factor was the lack of a considered educational theory of technology.

Is this the fate that awaits the introduction of educational computer games? Are there strategies to evade, or at least navigate around the monolithic presence that is commercialized education? Given that we seem to have detected a strand of complicity in those that theorise about educational games and the corporate sector we should ask is this what games are intended for? We have known for several decades that games develop skills (Bateson 1972) and if that were all there was to the agenda of those who lament the failures of traditional education it would be well and good. In fairness to Prensky he does advance the proposition that educational computer games could take on the drudgery of teaching allowing the teacher to devote precious time to more important pedagogical tasks (Prensky 2006). Again the question of proper boundaries raises itself. If teachers could be confident in believing that learners might acquire knowledge from games that would augment and enhance teaching in the classroom they might display less of the evident caution they have towards educational games. And who can blame them? We would need a new set of boundaries for such a condition to operate. Capitalism is many things but it is no respecter of boundaries. Having considered some of the influential macro forces that affect education, and consequently educational computer games, we will move to review the existing theories that are deployed as the educational basis of computer games.

6.1. Introduction.

Digitally based games have become ubiquitous on our cultural, educational and personal radar. We either are players or are closely connected to those who play games. Games are being played at home, at work, at school, and increasingly, with the spread of portable devices, on the journey to the locations already mentioned. The majority of boys (80%) play digital games in some form and half of all girls (Jenkins 2010). Games range in complexity from simple challenges which can be solved in a bus ride to games which encompass the creation of virtual worlds and require several hundreds of hours to navigate (Leadbetter 2009).

6.2. Constructivism.

Since the theoretical support for educational computer games is heavily dependent on a Constructivist theory of Education therefore we must attempt an overview of what we consider Constructivism to represent in the creation of educational games. There is a marked dependence on constructivist theory throughout much of what follows, however we are not deaf to other voices who have questioned, and sometimes flatly contradicted the stability of Constructivism. We are aware of a need to choose or favour a particular side in the argument but we deliberately refrain from doing so. In keeping with Habermas’ (1972) recommendation of the value of entertaining contradictory positions we have also advanced arguments that question the worth of Constructivism. The foundations of Constructivist theory are usually ascribed to Piaget (1952) who formulated proposals on how knowledge is created by children and young learners. A key tenet of Constructivism is the notion that responsibility for learning remains exclusively with the learner. This marks the site of contestation between those who, in their advocacy of derivatives of Constructivism (e.g. Experiential and Discovery Learning) tend, in the view of their critics, to abandon the learner to their own devices. As we will see some critics of Constructivism seem able
to cite scientific data to support their positions. The value of not preferring one side to another is borne out by the emergence in computer games of the idea of Cognitive Apprenticeship which seems to support Constructivist principles even as it redresses the objections of its critics.

6.2.1. Problems as a path to learning.

Much has been made of the problem based nature of game play and its value to learning (Gee 2004a, Prensky 2001, Barrows 1996) What are the likely educational effects of the choice of a particular educational component as carrier of the educational problem? In order to find their way through a game by negotiating various challenges students may encounter intelligent tutors who pose questions the answers to which may help the learners to make progress. Virvou (2008 et al) made use of such a device to encourage learners to participate in a mode of knowledge acquisition known as Human Plausible Reasoning Theory (Collins 1989 et al). It is not difficult to sense the Constructivist underpinnings of this theory. The Player learner is left to approach knowledge through a series of questions that elicit responses that in turn generate more pointed questions.

Something unique to digital games occurs when a player begins a game and provides a view into the Constructivist basis of computer games. As the player is learning the game, the game is learning about the player (Maher 2009). This interactive attribute is unique to electronic games. No text, book, film nor television programme can react to the behaviour of a single player/learner on an individual basis. If the player is struggling the software relaxes the playing conditions to the point where the player makes progress. Alternatively if the player is moving quickly through the game the game conditions will tighten up, keeping the player in the game and extending the experience. The design of the game is balanced so as to give the players a sense of challenge but not to overwhelm the players (Maher 2009). This is a feature common to most computer games. It should be noted that the institution of this facility by games developers was not primarily for an educational purpose but to generate an involving and immersive play experience nevertheless educational games theorists such as Gee (2007) have been alert to point to the educational potential of this feature. The learner is maintained within an effective layer of learning. This amounts to a deployment of the Zone of Proximal Development (Vygotsky 1981). The Zone of Proximal Development is theorised to be a space the learner can occupy that extends between what is possible to learn and what is overwhelming for that particular learner.
6.2.2. Discovery Learning.

Discovery Learning Theory is an approach by which the student interacts with the environment, handles objects, asks questions and attempts experiments (Ormrod 1995). The theory proposes that students can learn more readily if the item of knowledge is something they themselves have discovered. Discovery Learning is the theoretical basis for the development of *The Monkey Wrench Conspiracy* (2000). It is a multiplayer management simulation game developed at Carnegie Mellon University. Spectre and Prensky (Cited in Kebritchi 2008) have laid out five instructional events as the theoretical foundation of the game:

1. Ask questions that allow mistakes in a way that motivates multiple senses.
2. Provide feedback and reinforcement.
3. Offer challenges, goals, and problems that are relevant to the learners.
4. Allow the learners to learn by performing authentic tasks.

The objective of the game is to teach engineers how to use 3D software. The engineers assume roles as agents sent to take back a space station from alien invaders. Neither tools nor weapons can be carried and so the agents have to design and develop everything they will require for their mission. The game format is appealing and therefore motivating. Many of the learners will have come upon similar plot lines in popular science fiction films. The game provides a safe environment in which learners can experiment with various scenarios without the overt consequences of failure (Prensky 2006). The game utilises elements of situated learning by locating the player in environments where they are challenged to solve problems and challenges before progressing. The issue of guidance is solved by the addition of a “Cognitive Apprenticeship” model that provides overviews of the tasks and instructions on their completion (Spectre 2005b). More educational support is provided by continuous scaffolding and step by step coaching until the learner has reached a level of competence at which point the support is designed to fade. This deploys positive
educational practices in helping the learner as needed but preserves learner autonomy by a progressive diminution of assistance.

*Gamenomics* (2006) is designed to teach basic concepts of economics. The teachers can create and manipulate a variety of changing and challenging economic conditions with which the students have to cope. The students are immersed in a virtual market economy where they are allowed to invest in stocks, bonds, and properties in competition with one another. They are tasked with complex economic decisions, for example, deciding correct buy and sell points, levels of production, supply chains, and changing commodity prices (Kebritchi 2008).

**6.2.3. Situated Learning in Communities of Practice.**

Knowledge is gained through real life application and takes place within a community of practice (Lave 1991). A community of practice is a group of people habitually disposed to engaging in a common set of interests and who benefit from the shared learning that happens as a result of their activities in that community (Wenger 1998). The competitive driving game, *Racing Academy* (2006) teaches engineering skill by building and preparing high performance racing cars for competition. The game software contains real time vehicle dynamics that model the behaviour and performance of a racing car in racing conditions. The players build and maintain their vehicles and prepare them for competition. Interaction with a community of engineers and drivers, and data generated from testing enable the players to monitor and analyse their performance. Player’s knowledge of engineering is enhanced through social interaction, e.g. competition, conversation, and posting to the game message board (Sandford 2004).

**6.2.4. Cognitive Apprenticeship.**

“Cognitive Apprenticeship, while sound, is hardly new deriving as it does as a corrective measure to safeguard that the inherent freedom granted under the aegis of Constructivism will not ultimately result in the learner being left floundering and unsupported” (Jonassen 1999, p.140).

Cognitive Apprenticeship is an approach that utilises the principles of situated learning. This is an educationally informed theory that has already been referred to in
our review of the *Monkey Wrench Conspiracy* (2000). It is claimed to be dependent on discovery learning but arguably it succeeds more because of the extensive support ethic that informs the game. The term “apprenticeship” is well used because it implies a breadth of time where a learner with incomplete knowledge is dependent on an external source for both the knowledge and support required to achieve competence. There are three phases or events in cognitive apprenticeship. The first is the presentation of situated tasks. The second is the provision of coaching and scaffolding to complete those tasks. The third is to reduce the level of help and monitoring so as not to infringe the developing competence of the learner (Brown 1989).

The Cognitive Apprenticeship Model is an example of an educational theory applied to technology rather than a theory of educational technology.

1. Players are given an extensive amount of the information on the tasks they will have to accomplish.

2. Coaching is available and continuous.

3. Knowledge is scaffolded. The player can only move forward on the success achieved in an earlier phase.

4. Learner progress is monitored and when progress increases support for learning declines. This seems to amount to an interpretation of Vygotsky’s Zone of Proximal Development (ZPD)(1981), as deployed by commercial game developers. The ZPD is the cornerstone by which commercial game makers entice the players and keep them immersed in the game. Conditions of play are relaxed sufficiently to challenge but not so much as to discourage the player. Where *The Monkey Wrench Conspiracy* (2000) is different is that it withdraws monitoring as the player improves, unlike commercial games which are designed to raise the level of difficulty, not to serve any pedagogical function, but to keep the player in the game.

*SimSchool* (2004) is designed specifically for training teachers by developing their classroom management abilities and, in particular, to adapt instruction to suit different learners or learners with different cognitive abilities. The requisite skills needed by teachers have been built into the structure of the game (Kebritchi 2008). Learners are
helped through the learning process by the direct provision of information where necessary, and extensive feedback. *SimSchool* (2004) ensures that the learner is increasingly challenged as competence develops. A number of concepts linked to learner assessment have influenced the pedagogical foundations of the game. Tasks are organised into four levels of difficulty as proposed by Webb(1999).

1. Recall. The recall of a fact or definition.
2. Skill level. Evidence of some processing event beyond the habitual.
3. Strategic Thinking. Requiring the use of evidence, planning, deduction.
4. Extended Thinking. Complex reasoning over a protracted time period(Ibid)

*KM Quest* (2005) is an internet based game designed to teach knowledge management skills utilising cognitive apprenticeship principles (Leemkuil 2003). The instructional phase of the game incorporates apprenticeship in which an expert models the task to allow the learner to formulate a conceptual framework for eventual reproduction. This is followed by the coaching phase where the student is monitored for any difficulties and help is supplied as needed in the scaffolding that follows and the helpful presence fades as the learner grows in confidence This game has three further stages. Articulation encourages the learner to state the content of the learning The penultimate is Reflection in which the learner has the opportunity to compare their experience of solving the problem with the approach of the experts. Finally Exploration allows the learner time to explore the problem.

**6.2.5. Experiential Learning.**

Briefly defined experiential learning is a process of capitalising on previous experience to promote learning. Kolb’s strategy, cited in Kebritchi (2008), for experiential learning requires the following events:“Concrete experience, Reflective observation, Abstract conceptualization, and Active experimentation”(Ibid, p. 1747) The process begins with Concrete experience which provides the basis for Reflective Observation. Reflection leads to the generation of new concepts which promote other actions. The experience of the new actions leads to new reflection and thus a cycle is generated. The learning process is a repeated cycle of experiencing and exploring (Kolb 1984) Utilising the principles as set out by Kolb, *Global Conflict Palestine* (2007) was designed by Egenfeldt Nielsen (2005) to promote understanding of the basis of the continuing conflict between Israelis and Palestinians.

**6.2.6. Guided Experiential Learning.**
Guided experiential learning could, along with Cognitive Apprenticeship, be interpreted as a reaction to criticism of discovery driven learning by educational psychologists such as Clark (2007) Kirschener, Swellner, and Clark (2006) and Mayer (2004). See section following. *Full Spectrum Warrior* (n.d.) and *SLIM ES3* (2005) were developed using guided experiential learning to promote strategic thinking skills. *Full Spectrum Warrior* (n.d.) is a first person strategy game in which the player is presented with a variety of concepts, procedures, reasons and outcomes. The game emphasizes critical thinking and planning skills. *SLIM ES3* (2005) is designed to promote analytical skills for intelligence gathering. Both games are designed for military use and not general education (Kebritchi 2008). There has been a tradition of resources funded by and developed for the military and hopefully these games will soon see civilian application.

6.2.7. Learning by Doing.

The primary purpose of Learning by Doing is to foster skills and the acquisition of information for the context in which it will be used. It is based on the assumption that learning best occurs where there is a relevant goal for the student. Learning by doing follows a number of instructional events:

“Define goal, Set mission, Present cover story, Establish roles, Operate scenarios, Provide resources, Provide feedback” (Kebritchi 2008, p.1745)

The theory of Learning by doing has been productive in terms of the emergence of educational games. *Bio Hazard*, (2002) creates a medical emergency in which the learner is immersed of the role of medic faced with an outbreak of infectious disease. Learners are familiarised with aspects of the human body, medical instruments and technology, emergency procedures and resource management. *The Jungle of the Optics* (2001) is designed to convey the basic principles of optical physics. The players are dropped into the Jungle of Physics from which they can escape once they master the construction of various (optically based) instruments such as telescopes and cameras. *Daedalus’ End* (2002) is a virtual world where the player assumes the role of civil engineer engaged in the construction of dams and roadways. The player is introduced to an awareness of the ecological effects of engineering projects. Resources are limited and the project is time sensitive. The game is multiplayer and thus ideal for the project management. The instructional events as set out by Schank
et al (1999) provide a design template for games such as those mentioned above which have the characteristics of needing to achieve specific goals in the course of which they role play and react to feedback.

6.3. A Challenge To Constructivism...

The Kirschener (2006) and Mayer (2004) studies have implications for the development of educational computer games and left unanswered they might pose obstacles to long term development. It is encouraging to note, therefore, that one of the co-authors of the Kirschener report (2006), R.E. Clarke, was also the author of the research that addressed the implied criticisms of educational games (Clark 2005).

The issues raised by Clark (2007), Kirschner, Swellner and Clark (2006) and Mayer(2004), should give concern to developers of educational games. The researchers do not seem to have mentioned educational games specifically but it is difficult to believe that they could be excluded given their constructivist foundation. Kirschner et al (2006) do not mince words:

“All instructional procedure that ignores the structures that constitute human cognitive architecture is not likely to be effective. Minimally guided instruction appears to proceed with no reference to the characteristics of working memory, long-term memory or the intricate relations between them (Ibid, p.76).

Educators are faced with real difficulties when presented with the recommendations and the outcomes of constructivist based learning and many opt not to take constructivism on as central to teaching practice.

“The result is a series of recommendations that most educators find almost impossible to implement - and many experienced educators are reluctant to implement - because they require learners to engage in cognitive activities that are highly unlikely to result in effective learning. As a consequence, the most effective teachers may either ignore the recommendations or at best, pay lip-service to them”(Ibid, p.76).

They summarise their objections by noting that, notwithstanding a considerable amount of diligent research no sound proof of a scientific nature had been uncovered to justify the claims made for constructivism:

“All after a half century of advocacy associated with instruction using minimal
guidance, it appears that there is no body of research supporting the technique. In so far as there is any evidence from controlled studies, it almost uniformly supports direct, strong instructional guidance rather than constructivist-based minimal guidance during the instruction of novice to intermediate learners. Even for students with considerable prior knowledge, strong guidance while learning is most often found to be equally effective as unguided approaches. Not only is unguided instruction normally less effective, there is evidence that it may have negative results when students acquire misconceptions or incomplete and/or disorganized knowledge” (Ibid, p.83).

Kirschner et al (2006) seem to imply that there may be potential for advanced learners to engage in constructivist pedagogy however the available research still supports the case for direct, teacher initiated guidance. Researchers in educational games such as Egenfeldt Nielsen (2007) echo this view with their recommendation that the teacher should always be on hand to provide context and support during the use of educational games.

Some to a very high degree some to a lesser, all, bar one of the learning approaches included in Kebritchi’s report rely on the minimal guidance / constructivist approach that is critiqued heavily by Kirschner et al (2006) and Mayer (2004). *The Monkey Wrench Conspiracy* (2000) is a notable exception. The game is heavily oriented to provide the player with initial knowledge continued information as required, monitoring, and feedback. The implications of *The Monkey Wrench Conspiracy* are encouraging because it is a comprehensive answer to the challenge posed by Kirschner et al. (2006)

6.3.1. Scaffolding

Although learners can extract sound learning outcomes from games, they rely on the support of teachers for the generation of extra scientific concepts (Egenfeldt-Nielsen 2005). The quest is a successful strategy in mainstream entertainment and educational games partly because it deploys the energy of the narrative. Narrative works through
scaffolding knowledge in educational games. Since scaffolding is dependent on the notion of outside help, both scaffolding and coaching are central tenets of Cognitive Apprenticeship (Collins 1989 et al).

6.4. Assessment.

How do players know they are making progress? In a commercial game they know because they have killed their opponent, completed the level etc. They also have the validation of fellow players and this can happen in the course of an educational videogame. The larger question of assessment of learning outcomes has yet to be given sufficient attention. Certainly researchers were keen to establish what the player/student had learned but no comprehensive means of assessing learning outcomes seems to exist (as yet) for educational games. This amounts to a significant fault with educational games research and possibly a foundational challenge to the usability of educational computer games in the classroom. One possible explanation for the absence of effective assessment techniques is the lack of longitudinal studies. Developing assessment techniques for a new technology takes time and time is one resource that seems to be scarce for researchers. We have suggested that the scarcity of time allowed to research might originate from the same negative ethos that seems to be displayed to the actual implementation of educational games.

It could be observed that the apparent lack of available assessment methodologies for learning through computer games is symptomatic of the relative youth of the field. One can possibly acquire a more grounded appreciation of institutional resistance to computer games after observing how researchers have neglected to consider how learning outcomes from educational games might be assessed.

6.5. Knowledge Gained.

We postulate three types of knowledge that can be gained from computer games: Declarative, Procedural, and Strategic. Declarative knowledge is the most recognisable from the traditional curriculum in which the learner is required to reproduce or replicate a specific item of information. As an example of this students using a game based on Newtonian physics were able to answer more questions on force and motion problems than those that had not played (Garris 2002 et al). Procedural knowledge refers to the how and wherefore of performing a task. The learning outcome requires the application of rules and skills to a specific situation. Strategic knowledge involves the application of learned principles to other contexts.
The strategy game is one of the most often used type of game in educational game design.

Styles of game play may have an impact on what benefit students take from the use of games in the classroom. It is possible that the different game styles of player/students and whether one group of students is more skilled at computer games would demarcate the class on competence i.e. where one group is problem solving and another guessing at random (Ko 2002). Specificity of application to learning outcome is of central importance:

“More attention should be given to each piece of educational software, with careful consideration of why a specific package would be useful, what activities the child does with it and how, and what concepts are learned through it (Ibid 31).

Many of the games we will study later have some form of strategic thinking at the core of the learning outcome. As we will see in our discussion on Egenfeldt Nielsen’s (2007) study conducted with Europa Universalis 2 (2001) a possible problem with certain types of strategy games is that they become too complex too quickly thereby vitiating the opportunity for students to abstract and reflect on learning principles. The quandary for educational game designers is to avoid hyper complexity while retaining the sense of challenge that is an essential and defining feature of computer games (Malone 1981)

Hoffman and Nadelson’s study was not specifically targeted at educational computer games, however they concluded that “Our evidence suggested that games are unlikely to fulfil instructional expectations” (Hoffman 2010, P 121). Their focus was on engagement and its ability to motivate players. Engagement is linked to achievement, motivation and task persistence. It has been discussed elsewhere but it bears repetition in the present context that a strength of educational games may reside in what Gee (2003) proposes as the game’s ability to create domain experts. According to Gee computer games are in the business of creating the specific expertise required to address the task at hand, i.e. the completion of the game. Gee further asserts that this process emulates the scientific process of hypothesize-probe-test-elicit data-hypothesize. Contrast this with the reported (Chi, Feltovich and Glaser 1981) problems linked with the traditional mode of teaching science. In their study
Chi et al found that students who had attained high marks in classroom examinations were unable to translate that knowledge into real time laboratory work.

6.6. Serious Games.

“Serious games can be defined as the use of game, and game technology for other purposes than just entertainment.” (Frank 2007 567).

“I have been involved in more than 60 studies conducted by classroom teachers on the effects of games on student achievement. These studies showed that, on average, using academic games in the classroom is associated with a 20 percentile point gain in student achievement. This is a relatively strong finding” (Marzano 2010 1).

A first glance “Serious Games” is an innocuous phrase meant to convey a worthy purpose. Notwithstanding our own view that the term verges on redundancy we recognise that the term has been accorded currency by a wide range of theorists and practitioners. We would argue that the term signals a misapprehension. If games are serious does that mean they are no longer playful? The seriousness of a game surely depends on its application. Those who categorize certain games as serious arguably posit the existence of non-serious games and betray an attitude that non serious games (i.e. those strictly for pleasure) lack a respectable purpose. These kinds of views support the narratological view of games but, we would argue, at the expense of the ludological. We propose later in the study that a serious difficulty facing the development of educational games is navigating a safe course past attitudes that are inherent to a consumerist and hedonically driven society. Kids just want to have fun. However the phrase may not be as innocuous as first thought. It might be an attempt to build a bridge across the chasm that seems to exist in our society between practices informed by the love of pleasure and gratification and the area of life occupied by the need for discipline and deferred pleasure. It is possible to wonder if so much of the ire directed at education is the resentment of the Id against the Superego.

The Serious Games Initiative was launched in 2002 at the Woodrow Wilson Centre for International Scholars in Washington. When it was set up it brought together the disparate abilities, views, opinions, and expertise of a range of specialists from media
development, psychology, technology, and literature. The two strongest disciplines came from education and game research. Educationalists (with a substantial body of research already in place), would now be required to gain deep insight into the principles of game design while game designers would have to familiarize themselves with the theory of education (Kirriemuir 2004). Central to our argument is the contention that, worthy as the original intention might have been, educationalists may have had too much to say about computer games with the consequent neglect of important contributions from what will always be a discipline that is dependent on multi and interdisciplinarity.

The stated aim was to create educational games that have the attraction and engagement energies of entertainment games but also have the capacity to “educate, train, inform, or treat” (Frank 2007 566). The design of serious games is more challenging than the design of strictly commercial games because the designer has to retain the motivational and pleasure giving aspects of the game but also to achieve its serious purpose (Ibid). As matters now stand educationalists are driving the project to design an approach to educational games (De Freitas and Oliver 2006, Amory 2007). Serious games are faced with the quandary of how to achieve meaningful, measurable educational outcomes while retaining the sense of pleasure players experience in entertainment games. Researchers believe that motivation is indispensable if these outcomes are to be realized (Malone 1980, Garris 2002).

De Freitas, (De Freitas 2006) proposes a four part model for evaluation. The first part deals with location; where the play/learning is being carried on. The second perspective focuses on the learner to determine their background and what influences it might be having on their learning. The third level focuses on the game and how well it immerses and engages with the player. The last part deals with methods and frameworks that support learning practice.

The idea that games have a part to play in learning is not exclusive to educational research. Games designers have long been aware of this. Crawford, a leading designer in early game development is of the view that, “the fundamental motivation of all game playing is to learn(1982 p 2)(Crawford 1982). As video game research has become more firmly established on academic foundations it has started to display a multidisciplinarity and inretextuality both in range and depth. A spectrum of research activity encompassing social science, computer science and the humanities has developed around the field. Disparate areas from game design (Fullerton 2004),
psychology (Gee 2004a, Prensky 2006, Newman 2004) and aesthetics (Atkins 2003), have contributed extensively to the enlarging discourse. Researchers no longer view games as an isolated technology but as it affects society and the likely effects they may produce, intentionally or unintentionally. Serious games are intended to be playful while accomplishing a serious purpose. The game is dependent on the topic, nevertheless, the objective is to create an engaging game. Serious game design requires that:

- The learning objective has to be clearly stated.
- The learning context must influence the game design (Frank 2007)

An entire initiative has been generated around this concept with a declared purpose of designing and developing games that can have a substantive effect on society in terms of raising awareness about political, social, cultural and health issues (Serious Games Initiative 2002). We will consider the use of computer games in the section on health and also when we review *Food Force 2*, (2007) a game designed to teach management of food shortage and local development in India. Some are of the view that Serious Games is a key representative of educational research into games but Squire (2007) sees a commercial interest operating in the background.

“In fact, "Serious Games" is not the representative majority of extant games and the learning field, but rather a strand focused on developing new markets for game producers. As such, it does not at all represent the growing work on games and learning, but rather an emerging business sector... As an organization, it has mostly been an industry capacity-building exercise concerned with developing non-entertainment uses for gaming technology, a legitimate and useful function, but one that does not necessarily meet academic needs” (Squire 2007).

While Squire’s scepticism about the motives of the commercial sector of computer games is tenable there is one possible point of disagreement. Taking the view that the commercial sector has any grand designs on the educational game project is to overestimate the importance of the educational sector to the commercial sphere. When electronic games (in their present form) were first mooted they were regarded as exclusively educational in potential application (Ito 2005). After some costly failures industry turned to the entertainment uses of games and for now, the commercial
sphere has little if any interest in educational computer games designed for the curriculum (Dalesio 2009). Granted Microsoft has an established interest in the link between electronic games and education but arguably a company of that size has cannot allow itself to be absent from a sphere (i.e. education) which uses software and generates high revenues.

6.7. Edutainment.

“To this point computer games with educational features have not fared well in the marketplace. The educational content tends to come at the expense of the gameplay and control is taken out of the hands of the player... Game buyers (as opposed to concerned parents) are wary of edutainment”. (Leyland 1996 n.p., Alessi 1991)

Arguably an attempt to define edutainment might countenance the notion of smuggling. This is because of a view that learning, with its ethos of duty and discipline incurs the resistance of learners and therefore it might be better to conceal learning outcomes in experiences that children would identify as innately pleasurable. Edutainment games were initially held out as the great hope of education because of their simultaneous ability to educate and entertain. It was expected that this new teaching technology would operate effectively at all levels, teaching students a range of subjects.(Alessi 1991, Gredler 2003, Gros 2003). Relatively quickly, however, edutainment games attracted less favourable attention for their failure to live up to initial expectations. The promoters of edutainment games recommended their titles to their principle market, i.e. parents, but also to policy makers in public and academic discourse as sophisticated learning tools with far reaching and positive consequences for the user (Kirriemuir 2004). Reasons given for underperformance include an overly simplistic format, repetitive tasks and poorly designed and unappealing content. In marketing terms they succeeded in the short term because they appealed to ambitious parents who assumed that learning could be included in their children’s play lives using pleasure as the carrier (Sutton-Smith 1984) and failed in the longer term because they did not satisfy the needs of the end users, the children. Lack of possibilities for further exploration was noted as a key defect (Mitchell 2004, Kirriemuir 2004). The excess of enthusiasm for the anticipated potential of computer games followed by a backlash of condemnation has to be seen within two contexts. First the enthusiasm espoused for games derived from a linked optimism for the
computer and its vaunted role in education: an optimism which we have observed in Cuban (Cuban 1983) was at least intemperate. The second context derives from the problem of teaching and learning.

With so many theories of learning bidding for attention it was almost inevitable that a magic bullet solution would seem attractive. Papert (1998) regarded edutainment games as “Shavian Reversals”. This refers to an anecdote about George Bernard Shaw who was accosted by a notable beauty of that time. She suggested they mate on the basis of the wonderful children they might produce, given her looks and his brains. Shaw’s response was to raise the possibility of the child having his looks and her brains. This attitude towards edutainment games; that they contain the worst attributes of educational practice, while losing the entertainment value of the computer game seems to be the accepted position with regard to edutainment games.

Edutainment games are regarded by some with a more pragmatic and less theoretical orientation as worthy of consideration in certain conditions. For example the lack of sufficiently powerful computers in schools to operate the newer games (when they are available) has been noted (Kirriemuir 2002c). Given the lack of processing power certain theorists recommend for the return of Edutainment:

“Some survey authors have suggested lower-level games from the edutainment category, such as those in the Math Blaster series, may likely be placed on school computers because of low processing power requirements” (Rice 2007).

Certain edutainment titles succeeded (and are still in use e.g Mathblaster) because they target specific skill e.g. algebra and can be effectively integrated into the school curriculum (Squire 2003). Carmen Sandiego (Broderbund 1985), is a classic edutainment game that seems to have withstood the rest of time. The player takes on the role of detective who follows a trail of clues left by the thief, Carmen Sandiego. Most of the clues lead to geographic locations and are thus useful in a geography lesson. While the structure of Carmen Sandiego is typical of the drill and practice approach of edutainment games it does teach the content effectively even as it encourages lower order thinking skills. In edutainment games the competition factor is included to add enjoyment to the learning. The game goals are the learning goals (Alessi 1991). Competition motivates the student to engage in drills. In the basic math game “Number Munchers” (Minnesota Educational Computer Consortium) the student is required to “munch” through numbers to increase their point total avoiding
the evil troggles in the process.. In one series students learn the factors of three by “munching” their way through the correct answers, avoiding non multiples of three which loses them a life for every incorrect answer.

Edutainment is criticised for its attempt to package learning with marginally related gameplay in an often problematic attempt to make learning more acceptable (De Castell 2007, Squire 2003). Influenced by the tenets of Behaviourism these Edutainment games inculcate a reward system for the effort of learning. However the reward usually fails to have tangible impact as it is said to be insufficiently integrated into the play experience. The players therefore have little or no intrinsic motivation to pursue learning (Malone 1987). The outcome is that: “the player will often concentrate on playing the game rather than learning from the game” (Egenfeldt-Nielsen 2008 212)

Sometimes the critics of edutainment are less vocal seeing the failures of edutainment as due chiefly to a contemporary lack of sound theoretical understanding (Egenfeldt-Nielsen 2007).

The dialectic between edutainment games and serious games is akin to the adolescent struggle to achieve self-identity. First one image is adopted with energy and zeal, then cast off in favour of one that reflects an increasing self-awareness and so the process continues. We would argue, however, that early forms should not be easily cast aside as they may have at least the germs of future development. We would also submit that edutainment is a more complex phenomenon than the one that is taken to task so readily by Egenfeldt Nielsen (2007) and others. There is a certain prurience in the rejection of edutainment. Rather it might serve if there were a wider attitude that the dynamics that created edutainment i.e. insufficient research and a tendency to over simplification, are qualities that never disappear completely and the return of edutainment is always a possibility if it ever really can be said to have left.

It is a theme of the present study that cultural assumptions on the part of certain games researchers have either created potential obstacles or failed to see educational games in a broad enough context. Educational computer games, and their attendant discourses are centred on western ideologies of the primacy of fun in learning. The notion is problematical because of its behaviourist ethos. Pleasure is a reward for learning. The problem is that it is an extrinsic reward. We discuss the creation and use of a serious game when we consider the benefits of *Food Force 2*. We were struck by ennui of western game players and their rejection of any dilution of their pleasures with the passionate yearning among the poor for education on any terms.
The notion of Edutainment may itself be a false distinction. Those who carp at its negative effects seem unaware of the culturally bound nature of their own positions. All the work of Malone and others has to be regarded as culturally specific and non-universal. Researchers seem to make the error of assuming that they are objectively free of the research they produce. They fail to consider that persuasion is ideologically informed and that the new technology might be as suspect as the old. Researchers should be clear and admit that what they propose in new technology may be different from the old but is still in the business of smuggling in the learning. As an example of the culturally bound nature of Edutainment we offer a study of a serious game that could be seen as based on Edutainment principles that nevertheless achieves important educational outcomes.

6.7.1. The Case of Food Force 2. The Definitive Serious Game.

The following case study addresses theoretical, practical and ethical formation in the design of educational games. As we will see the writers do not shy from speaking about a moral dimension for games and this marks a departure from the largely relativistic approaches in much of the available research. In our view what we have in a game such as Food Force 2 is a compelling argument for global ownership of games, for an expansion of the relevance of games and finally a reminder that education through virtual technologies, particularly in developed countries, is undervalued in terms of relevance and urgency.

Gupta, Taneji and Singh (Gupta 2009) criticise the limitations of the traditional format of school bound education in which the student is assigned the passive role of recipient of information. Lessons learnt rarely have practical value and are intended only for the passing of examinations. Citing Squire they assert that the opportunity to encourage more permanent values such as intellectual honesty and the ability to think analytically. It is the quintessential Serious Game.

Food Force 2 is a game developed in India to suit Indian requirements and to address conditions unique to that country. Nevertheless it is innovative in avoiding traditional practices of information disgorgement, rather it seeks to impart learning through gameplay based on the skills that have been identified as key learning areas. The game is designed to teach the students about proper nutrition, the problems of hunger, disaster planning and the use of relevant technology. The student acquires a sense of social responsibility and moral value from the game:
"we teach children how to respect their elders, to care for the poor, they work to help develop homes and other facilities for the needy villagers. In short, we can say that they become more humane and more responsible human beings by playing this game" (Gupta et al 2009 102) (Gupta 2009).

The student also gains insight into the work of the United Nations and the World Food Programme. This game has been designed to be deployed in India to address a set of problems which, while not unique to India, are a key to the challenges faced by that country. We begin to get a sense of the universality of application of computer games when we see them deployed to help address a problem of deep human significance. Crucially it is important to note that outmoded teaching practices were dispensed with when faced with an issue of importance and urgency. The game, originally developed for the sub-continent, has now been redeveloped for application in other countries threatened with food shortages. Later we will be discussing the problems that flow from following a theory of educational technology rather than evolving and working with an educational theory of technology. However we can see here that the developers have identified the key attribute of accessibility as central to their educational project. With that in mind they have ensured that the game is unrestricted by commercial interest or agendas. The game has been written on open source software and designed to run on multiple platforms including Windows, Mac and Sugar (Sugar is available on more than one million laptops distributed to children in the world’s poorest countries). The game has been restructured to take account of different languages and local conditions.

Gupta et al see games as having made great strides in achieving their potential for education. However they take games to task-and, by implication, their designers- for a perceived lack of moral vision (Gupta 2009).

They criticize games for a lack of humanitarian vision, and a failure to transmit moral values to the players. They argue that games are effective at stimulating the young but leave their behaviour unaffected. They also take games to task for the widespread neglect of the vast storytelling tradition within world culture. This failure to avail of the wealth of story in world culture motivated the designers to come up with their own form of storytelling in the game. Food Force 2 is a customizable game platform which teaches through interactive play and the use of stories. The game develops analytical abilities as it encourages teamwork and the promotion of social and moral
values. The game is innovative in promoting the possibility of game authoring by the students and the use of a talking storyboard which enables direct communication.

*Food Force 2* is dedicated to children at risk from starvation. It is designed to be used by the children themselves to learn and to develop strategies to reduce their vulnerability to hunger. The storyboard in the game is based on a character from Indian village life; the *Sarpanch* who runs the *Panchayat*, the committee that oversees the village. During the game the player learns how the village works, how it cooperates, trades and collaborates with external agents. The need for game authoring arose when it became obvious that one story would not serve in a variety of locales and that each player would have to have the freedom to write their own story(Gupta 2009).

The game itself is modelled around a number of key concepts:

1. **Facilities** are the hard structures that are vital to village life. They comprise Houses, Hospital, School, Farm, Wells and Workshops.

2. **Resources** are required to set up facilities and are also consumed by people. Cost of resources is dependent on market resources. They include Water, Building Material, Rice, Seeds, Wheat and Sugar.

3. **Indicators** are measures of the progress being made by the village. The aim is to achieve a holistic view of development in the village. The Indicators are Housing, Health, Education and Training(Ibid).

Maintaining an overview of facilities, resources and indicators provides the player with a sizeable cognitive challenge. For example a lack of resources may prevent the addition to the hospital which will impact on Health. Decisions have to be considered carefully lest they impact unfavourably on future generations (Ibid).

The aim of the game is self-sustainability for the village through the production of the necessary resources. There are three crucial aspects to the game: the first is trading resources. The price of resources is determined at market level and a skilful trader is key to the success of a village.A successful trader will bring the resources necessary to build facilities and upgrade those that already exist:

"*FoodForce2* assists player to integrate into the trading system and multi-lateral trade negotiations. It develops skills for unbiased, rule based and non-discriminatory trading system. A child can trade for resources from the central market available in the game or can also make negotiations with other players
while playing in multiplayer mode. This also helps him learn the basic demand-supply concept of markets” (Gupta 2009, p.103).

The design architecture of Food Force 2 is basic enough to make it efficient and flexible enough to accept new features at any given time. As the software is open source the design has been rendered so as to allow external programmers to gain access and contribute.

Food Force 2 emphasises stories and storytelling as a key means to learning. The storyboard is of a father and son dedicated to the development of their village. Indian children relate well to the characters and enjoy learning through the story. In order to extend and develop alternative stories the game comes with a Dynamic Story Builder Tool which “takes it toward making it a complete educational platform. By using the story builder tool, a teacher or parent can create their own storyboards, implement the lessons they want to teach the students and the students are able to practically implements well as learn at the same time” (Gupta 2009, p.102).

Food Force 2 is customized to enable and enhance collaboration. Thus one student in one village-or class- can collaborate with a student in another to share knowledge, techniques, advice etc. As part of a programme dedicated to the promotion of survival skills for people in danger of environmental hazard Food Force 2 simulates emergencies so as to develop crisis management skills. To develop a sense of realism over what can and cannot be done in a crisis the player is constrained by the conditions that obtain in the village prior to and as a result of the crisis. Food Force 2 is therefore a strategy game useful for the promotion of high quality decision making skills. In a western strategy game by contrast, the consequence of a bad decision is to miss a level whereas with a game such as Food Force players are acquiring skills that impact on life and death outcomes. The direct link between the game and actual reality lends the game play a compelling quality.

Two conclusions come from this study; one directly, one indirectly. The indirect goes to a discussion which will take place later on the issue of accessibility and low cost. Here we have a game (Food Force 2) developed to promote living standards in rural India. There are no large budgets so people make do with what is cheaply available. The second is that games are global and that they have purposes and voices that could not have been anticipated. Furthermore the game was designed to be informed by a
set of moral imperatives. We will see later how games also serve well to assist people suffering from disabilities. This seems to imply a less than flattering verdict for games simply as vehicles of entertainment. There is a clear contrast with the sense of urgency invested in these kinds of games compared to the hubris of western game players who must be seduced from their pleasures to take the opportunity to learn. Granted the Serious Games Initiative has campaigned through games to raise awareness on a set of troublesome social issue however these issues have mainly to do with westernised civic problems, lack of understanding of politics, etc and do not have the urgency or relevance of a game such as Food Force 2.

There is also the possibility of deciding, or attempting to decide how much of what we have assumed to be established verities that are applicable universally are culturally bound and the outcome of ideological assumptions. The single issue that seems prone to cultural distortion is that of Edutainment. In previous discussions on this topic we noted the failure of Edutainment to gain purchase in western based attitudes and beliefs about educational games. What happens if we alter the cultural context? Would similar dispositions towards the kinds of basic learning that are the basis of Edutainment still persist? Consider a poor country outside of the developing countries. Given the still plummeting cost of digital software, the increased sophistication of mobile learning devices, and the basic nature of Edutainment games, might these kinds of artefacts supply an educational need that cannot be met otherwise? It seems unlikely that players in these circumstances might reject Edutainment games on the basis that they were not playful enough as might their western contemporaries. If one accepts this position, then the possibility opens that educational games in a western context are pandering to the hedonic inclinations of spoiled western youth. The possible consequence that comes in turn from that conclusion is that the project of educational games for western contexts is faced with a serious problem. If the urge to play games is informed by the desire for pleasure (as it surely is) and pleasure is prone to changes of taste and fashion, then educational game developers are faced with an audience whose tastes are unstable and ever changing. Mainstream entertainment games are not faced by any dilemma that is remotely similar.

6.8. Literacy or New Literacies?
The case made for the use of computer games in education is heavily dependent on its capacity to foster “new” literacies; literacies that are said to be required to cope with
the changing technicities of the new century. We refer in our discussion of masculinities and resistance to studies which indicate that emergent literacies may be a reaction to enculturation and reproductive practices. The idea of resistance continues to be in play.

In our discussion of children’s attentive capacities we noted Greenfield’s (1994) thesis of computer games fostering different sets of cognitive processes than those developed through contact with earlier forms of (print) media. The explanation advanced to support this was a shift in the type of cognitive processing required from print to the iconically based games format (Subrahmanyam 2001, et al, Gee 2004a). New Literacy Studies, as a field, looks beyond an emphasis on a procedural set of cognitive activities to a range of practices that are socially situated and embedded in a particular context. The linguist, James Paul Gee, has made pioneering contributions to this field. Gee (Gee 2004a) is intent on questioning received notions of reading, writing and the teaching of both. Gee first discovered video games when taking an interest in the play of his son and was struck by the degree of difficulty and challenge the games seemed to require but which was of no obvious concern to his ten year old (Gee 2004a). The notion of communities of practice is popular in game theory however it was evolved in earlier contexts to illustrate how people operated productively in social groups (Lave 1991). People have been adept at taking on new social and personal practices to enable them to operate in virtual communities. As a consequence of the appearance of the virtual community some have argued; Gee in particular (2004a), for the need to recognise the commensurate emergence of “new” literacies. Much as Connell (1995) has taken the older term “masculinity” and retired it in favour of “masculinities”, meant to convey that there is no longer a dominant interpretation of manhood but multiple practices in which to be a man so also has “literacy” received a post structuralist makeover to “literacies” denoting multiple pathways for communication. In this way, for example, Salen and Zimmerman (1997) propose that literacy is achieved in a video game when the players acquire the rules that make the game meaningful to them. In an echo of Aarseth (2001), who bickered with the colonising behaviours of experts outside of games studies, Gee recommends that literacy theorists and instructors should play games in order to change their perspective from empirical/pedagogical to participative. Gee’s approach to literacy is pragmatic, concerned with “use” and the idea that reading and writing does not take in abstracted contexts but are embedded in specific communities of practice or “semiotic
domains” (Ibid, p.17). Gee goes on to argue that there are “many different ways of reading and writing” and that both skills are “a lived and historically changing set of discursive practices” (Ibid, p.24).

A separation of reading and writing as technically based skills from situated practices results in a loss of understanding of the motivations behind the development of literacy. The result in literacy classrooms is “many times children are expected to read texts with little or no knowledge about any social practices within which texts are used” (Ibid, p.16) The notion of “use” ties in with the concept of play in computer games. We contend, in our discussion on the place of play in computer games that this tie in—and other putative benefits—are devalued by the marginalisation of the play element in games. Games, as Huizinga (1955) noted, observe the rules, but they are the rules as set by the game and no external agency.

Gee’s (2004a) proposition that literacy has both fostered, and been enabled by the emergence of new technologies has established the notion of “new” literacies. The worth of such a position is not without consequence first because if it is valid then there are major implications for culture and society but particularly for education. The second consequence is more intractable. Given a certain tendency in society to valorise the new at the expense of the old we have to wonder whether the faults of the “older” literacy are the representations of ideologically driven opinions. In Prensky,(Prensky 2001, 2006, 2007) for example, despite an otherwise important and substantive contribution to the study of the educational potential of computer games, we encounter a devaluation of older teaching practices which, at times, reaches almost propagandist intensity. It is noteworthy that “new literacies” has been coined rather than “new literacy”. Literacy has a historical stability and monolithic identity which is prone to interrogation from a postmodern aesthetic. Literacies evoke the notion that there are multiple positions from which to achieve and practice literacy and that no particular position is more privileged than another; except, seemingly as it pertains to the old literacy. Whether or not these kinds of notions destabilize any aspect of the older idea of literacy is the basis for much of the following discussion. One of the ruptures in games studies is the disagreement between those who see games as games, i.e. rule bound systems and those who see games as continuations of the narrative form.
The present age is unique to the degree that its greatest problem and its largest promise derive from an identical source (Bolter 1984). The technology that is said to be energising the age is simultaneously insulating social life from the natural world and the possibilities of alternative experience of reality.

While reading Schaeffer and Gorman’s (2009) essay on the philosophical trysts of Derrida and Ong we marked the comment, “the death of presence” we noted the following:

“Ong says that, at its strongest the analysis offered by Derrida and other “textualists” serves to remind us that much thought about language has been led astray by a “bias” towards written forms resulting in the assimilation of orality to literacy leading to a general assumption that there is a one to one correspondence between spoken words and written words on the basis of which, (Here Ong is quoted directly)...the naive reader presumes the existence of an extra mental referent which the word presumably captures and passes on through a kind of pipeline to the psyche... Derrida excoriates this metaphysics of presence.”(Ibid, p.48)

The provocation arose through a sense of contiguity between Ong’s resistance towards Derridean deconstructionism and the rise of a technologically based literacy which underpins the insulated reality which Bolter (1984) proposed to be a consequence of a technologic existence. Definitions of literacy range from the basic ability to read and write alphabetic print (Goody 1999), to a form of practice in oral and written communications (Resnick 1999). Literacy is the subject of constant renegotiation as we are increasingly affected by information and technological change (Alloway 2007).

With the progressive development of various forms of digital and digitally based technologies a consensus seems to have emerged that traditional print formats, will not, at least unaided, support the pressures and demands of being a successful participant in the culture and economy of the 21st century. Schools are regarded as laggards in their failure to adopt new attitudes to literacy or revise the older (Castells 2000, Tyner 1998). Prensky’s (2001), “Digital Natives” are said to be immersed deeply in a digitally imbricated out-of-school environment which is formulating and developing skills that are diverging from those valued in a pedagogical setting (Lankshear 2006). A revision of the traditional pen and paper curricula is now deemed urgent (Cope 2000, Kress 2003, New-London-Group 1996). Students are seen as in
need of an extension of their repertoire of skills in order to equip them for success in the new millennium (Kellner 2004). Beavis (2002), is satisfied that users of games have opportunities to evaluate information, construct complex narratives, and navigate through multimedia environments while retaining the significant elements of traditional reading and writing Online computer games, such as World of Warcraft, are seen as ideal for developing new sorts of literacies required to operate in the virtual world (Steinkuehler 2007).


“Typing is soooo last century”- Skydirt in a World of Warcraft forum post reacting to Blizzard Entertainment’s proposal to introduce voice chat to World of Warcraft (Moberly 2008).

In 2007 Blizzard introduced its 2.2 patch on its Massively-Multiplayer Online Role-Playing Game (MMORPG), World of Warcraft, which would allow the players to speak to each other through Voice Over Internet Protocol (VOIP). World of Warcraft (WoW) had, according to its Frequently Asked Questions (FAQ) page, no plans to replace its text chat facilities with voice communications. WoW was required to provide VOIP by the availability of Skype and other protocols which players were using to talk in off game channels. While the benefits for language learning in these kinds of initiatives are well established, the prospects for literacy and composition are more perplexing, not least because situated at the heart of the matter is a tendency for literacy itself to morph and change under the influence of new technologies.

A verdict seems to have been arrived at by a corporation intent on maximising their franchise that writing is a hurdle to be overcome or ignored in its pursuit of the most immersive game experience possible (Moberly 2008). Teachers wishing to incorporate games into their pedagogies (World of Warcraft, in this instance) are faced with a dilemma of using a resource which has now set its course away from the use of written text.

In the following we will examine the discourses surrounding computer games to detect trends towards a downgrading of the importance of writing. We will note that computer games are constructed around, in, and through conventional writing practices. The symbolic environments that support games are generated from writing which Bolter and Grusin (2000) argue requires a strategy of concealment on the part
of computer game design to keep from acknowledging its debt to writing. As VOIP becomes standard across the range of Massively Multiplayer Online Role-playing Games there is a palpable sense of attack upon writing because of its relative slowness compared to verbal communication (Moberly 2008). The company that supplied VOIP to Second Life and Eve Online warns its customers that writing is likely to get them obliterated in the game. Rob Seaver, C.E.O. of the company concerned goes on to characterise text as something from the Dark Ages:

“all these businesses are trying to build community around their brand. They are either trying to get better interaction among their users, they’re trying to augment the immersive nature of their virtual world; they’re trying to get people to do more around their consumer brand. And yet the internet is stalled in sort of the dark ages of communication. You can only communicate with text in most cases” (Moberly 2008, p.286)

Seen here writing is no more than an impediment to the future progress of the companies committed to VOIP. A key driver towards the embrace of unceasing innovation is the perception among bloggers, gamers, and users of the internet that being online is an inauthentic experience which is less real and therefore less satisfying than it ought to be. What is wanted is an experience of complete absorption into another dimension where the experience is intense and immediate. Bolter and Grusin (2000), refer to this experience as “transparent immediacy”. The greater the transparency i.e. the less other, unwanted stimuli intrude (i.e. the interface), the more immediate the experience: ““the user is no longer aware of confronting a medium, but instead stands in an immediate relationship with the contents of that medium” (Ibid, p.24)

Corporate interests compete and profit from the gradual development and introduction of modes, devices, and protocols which will bring the user forward on the search for the ultimate virtual experience. The longing of the user/player for an authentic experience of alterity is a journey, not a destination. This is to the advantage of the developers as they hold out the inviting prospect of the newest offering which might achieve that elusive dream:

“If somebody were to invent a new device for visual representation, its inventors, users, and economic backers would inevitably claim that it was better in some way at achieving the real or authentic, and their claim would involve a redefinition of the real or authentic that favours the devices. Until
they had done this, it would not be apparent that the device was a medium at all. (Bolter 2000, p.65).

Magic from now on is apparently to be created in games by technology, not language. Writing has, arguably, not lost any of its relevance but now the games must operate to cloak the importance of writing if they are to retain the “magical” cast with which they were endowed by writing.

This sequestering of the writing process is never completed; it is transmuted to the services of the game. Take a typical role playing game. The first requirement for the player to operate in the virtual world is that they have an “avatar”. This is their virtual identity and the player is provided with a palette of choices in order to construct the online character. The player is not provided with any writing, however, there is a compositional process required in the generation of a new identity:

“while WoW does not allow players to “write” descriptions of their characters, its icon-driven menu nevertheless requires players to engage in what is essentially a process of writing—to create rhetorical identities for themselves by arranging the pre-defined, symbolic elements that the game supplies in accordance with the underlying discourse imposed by the menu. This process culminates in a moment of authorship, when, having supplied names for, and thereby signed their characters, players hit the accept button and the results of their work are transmitted (written) to the game’s servers” .(Moberly 2008, p.292).

Thus the potential for composition exists within games and offers scope for a greater sense of identity and self-definition (Bolter 2000). Reading and writing are activities which take place on paper and in computer games alike. The effect is felt not on the paper or an electronic screen but on the person who created the meanings (Moberly 2008).

Video games are a discursive environment which challenges past and current understanding of “reading” and “writing” in a larger movement into digitally formatted discursive environments. We have argued that digital literacies have the same genetic basis as the older form, however, there is a case to be made for the prospect of digital literacies challenging the older in terms of the re conceptualisation of writing pedagogy and how it can be taught in the classroom (Alberti 2008).
Traditional literacy practices require the student to develop competencies acceptable to external requirements in, for example, other academic pursuits or for the requirements of future employers (Alberti 2008). These requirements are said to be in the best interest of the student, nevertheless students are hardly consulted on what is considered best for them. Teachers of writing have yet to engage fully with the imaginative possibilities contained in virtual environments:

“Digital discursive environments...contain imaginative possibilities for the transformation of writing pedagogy that we are still only beginning to explore. From a pragmatic perspective, they are the literacy environments in which our students have developed and now live as writers, readers, and players. Neither utopian fantasies nor dystopian nightmares, digital writing environments at the very least need to be explored and understood by every contemporary writing instructor. As I have suggested, the obstacles to this exploration have more to do with the assumptions and controlling metaphors we bring to literacy instruction than with the technological unfamiliarity of new software programs, although many instructors still code their anxiety over the new kinds of critical consciousness demanded by digital discourse in terms of technophobia” (Alberti 2008, p.267).

Awareness exists that games hold out “imaginative possibilities” for the enrichment of literacy practices and pedagogies. A more balanced view of the possibilities of computer games is offered and the tardiness of many instructors to engage with games is laid at the door of technophobic tendencies. Alberti (2008) reports on the re-emergence of literacy in digital settings through the exchange of texts, emails, blogs and backchannel discussions that support much of computer games.

There seems to be potential for a deeper, more nuanced deployment of literacy practices through the use of digital technology and particularly through the use of computer games. There are problems, however. Arguably the most serious is one which has appeared of late, and appears, at first view, to be innocuous. It has to do with the appearance of Voice Over Internet Protocol (VOIP) There is simply no possible means of predicting what the impact of voice recognition software, specifically, VOIP, will have on digital communications but if it becomes pervasive it will be hard to see how the promise of enhanced literacy- at least in terms of written composition- can be kept. While proponents of the use of online games for language learning might find real facilities in these games to promote verbal skills the fact
remains that this is not all there is to Second Language Acquisition. While this technology is good for the production of language learning it frustrates the possible learning that was predicted could happen through the exchange of text and the creation of composition. When it is more fully considered it poses a troublesome question that goes to the heart of the educational potential of computer games. So much of our present interaction with games are based on and, arguably, encourage literacy practices. The question is, how long and to what extent can that continue? World of Warcraft (WOW) promised to leave their text messaging features in place. Corporate decisions are market driven, however, and WOW introduced a speech facility in response to pressure from other companies. We have seen a drive towards making the gaming experience as seamless as possible. The provision of VOIP will help that project but at the loss of the messaging and text based conversations that went on heretofore. Nor is this confined to online games. Players of console games can also avail of VOIP.

Rather than support the fostering of new literacies through interaction with digital technologies some theorists contend that precisely the opposite effect is being achieved. In this view digital technologies” have in fact enabled a return to older, preliterate attentional practices” (Lanham cited in De Castell and Jenson 2004 389)(2004, p.389).

“We feel the primary reasons computer games have not been more fully integrated in the writing classroom are because of traditional conceptions of work and play that highlight differences between classroom space and gamespace as binary opposites (Shultz Colby 2008, p.302).

There is a difficulty inherent in predicting the benefits of a technology which is still in evolution. Shaffer et al (2005)and Prensky (2006, 2001) and Shultz Colby and Colby (2008) among others, have argued that the gap between the school experience of the student/player and the out-of-school-life of incessant immersion in digital technologies will create a rift which will result in a general perception among students that school is out of touch, and possibly irrelevant. We have noted an argument for the debt owed to writing by online media and an argument for a new form of literacy that parallels and complements the older. However there is still a
need for older literacy in daily life and how this will survive the challenges of digital media is by no means clear. VOIP is the latest in a line of technological innovation designed to tie the consumer ever more tightly to the corporate offering. Its implications for learning support Shaffer (2005) and Prensky’s (Prensky 2007, 2006, 2001) contention because it weakens the relevance and perceived necessity for learning of reading and writing.

There is one encouraging feature that seems to be emerging from the question of resistance to the deployment of technology in education and in this context, the use of computer games in education. We have seen only the outlines of this feature as it extends outside the present study. It seems as if educational games might appeal better and consequently operate more effectively when the initial theory that supports their development is based on an educational theory of technology rather than a theory of educational technology. We believe the difference between an educational theory of technology and a theory of educational theory is crucial to the potential success of educational games.

7. From Fantasy, to Play, to Flow, Motivation, and Resistance, to Learning Outcomes: Tracing the Line.

7.1 Introduction

“a waste of time, as idleness, as triviality, and as frivolity” (Sutton-Smith 1997, p.201).
“It is in playing and only in playing that the individual or adult is able to be creative and to use the whole personality, and it is only in being creative that the individual discovers the self” (Winnicott 1971, p.54).

“games foster play, which produces a state of flow, which increases motivation, which supports the learning process” (Paras and Bizzochi 2005).

Sutton Smith credits the Protestants and their work ethic with the denigration of the instinct for play. The final quote above from Paras and Bizzochi is useful for mapping a proposed line that runs from play, to flow, to motivation and finally, to learning. We would amend that progression however, in two ways. First we propose that play has an antecedent without an appreciation of which it is difficult to see how play itself can be critically understood. Second we will expand our discussion of motivation by arguing that its position as a central pillar of learning is weakened by a failure to take the countervailing energy of resistance into consideration.

It was not immediately obvious where to place the discussion of play. It occupied several spaces in the study, the last being appended to the end of the Introduction. The reason is that play has, we propose to argue, an elusive, anarchic, and creative nature that offers challenges to categorisation. It is not an easy fit. The burden of the following debate on play will largely consist of seeking to justify this contention. There was never a question as to the necessity for considering play as it is a key link in the chain that leads to successful learning. As we noted at the outset there is a notion extant that if computer games could be “harnessed” for education the benefits would be positive. We cavilled with the precise notion of harnessing and continue to do so. In our view when theorists speak of harnessing games they really mean harnessing play. We hope to find, in our exploration of both the liminal and the subliminal aspect of play, a justification for the view that play as we know it in everyday life is often the servant of cultural and commercial forces. Grimes and Feenberg, have advanced a rationalizing basis for the understanding of play given its rules and structures, however they do not eschew the notion of the non-rationalized basis of play. Play is a familiar presence in the everyday world of conscious living but play is situated liminally, meaning that it has the capacity to exist either side or on the borderline between conscious and unconscious thought. This, we contend, is where it is endowed with its creative quality. Play asks severe questions of every
discourse practice, theory, agent, and user who seeks to harness its power. We propose that the questions play poses to education in general and to educational computer games in particular, are particularly challenging. Despite the insights of thinkers of the calibre of Huizinga (1955), Caillois (1961), Winnicott (1971), Sutton Smith, (1997) and Rifkin, (1995) play, is poorly understood and therefore vulnerable to the exploitative forces of late capitalism: “Postmodern consumer culture ... converts play into the engine of insatiable consumption, which drives the economy without leading to personal fulfilment” (Oriard 1991, p.484).

We have discussed the degradation of play in other places (Maher 2009), however we would contend that play presents a fundamental challenge (and opportunity) to the development of educational computer games. It is no more possible to discuss games without considering play than it is to discuss food without considering nutrition. Yet this is what corporate interests have achieved, albeit long before the development of the computer.

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7.2. The Fantasy of Play.
“Games have been culture from times immemorial, and play can even be said to anticipate humanity, as proved by the play behaviour exhibited by higher animals”. (Mayra 2007, p.106)

The image above was one of a series captured by Norbert Rosling on a recent expedition to the Canadian Arctic. Given the reputation of the polar bear this photograph is all the more remarkable. Research does exist to indicate that animals within species use play as instruction and bonding. However bear and husky are not of the same species and yet are playing. As can be seen the husky was chained up when the bear arrived. Instead of the usual outcome the bear went into a play bow to which the bear reciprocated. It cannot be offered that perhaps the bear had eaten and was not disposed to killing. According to reports (Brown 2010), the bear returned to play on the same time on several more occasions.

Before focusing on the general nature of play we will first propose that there is an energizing element central to the dynamic of play which, if better appreciated might lead to the creation of more meaning driven games. We propose to argue that a miscomprehension and misuse of fantasy is central to the poor estimation in which play is held particularly by those who develop and produce computer games. If the project of educational computer games therefore, is ever likely to be successful we would argue that those undertaking the project should engage with the principles of fantasy and play with greater insight than that of their entertainment based counterparts. To understand games one must understand play and play itself cannot be understood without engagement with its secret heart, which is fantasy.

7.2.1. The Importance of Fantasy in Play.
In the following we offer a view of the reasons play is misunderstood and poorly appreciated by those that profess and practice an interest in games development. A process of revaluation of the structural aspects of games is necessary for games in general and also for the design of successful educational games. Central to this project is the necessity of gaining a deeper understanding into play and central to this is the need to form some insights into the operation of fantasy. We propose that play and fantasy need to be re-evaluated by those who design and develop games as underlying structuring elements capable of energising the creative
evolution of the medium. Fantasy is interpreted here as appearing throughout all game forms, and not confined to its own recognisable genre.

We propose, that the commercial interests that are frustrating creativity in video game production may be interpreted as symptoms of a more subtle, but no less, vital problem which performs an obstructive function in diverse spheres of productive and creative activities. The focus here, however, is on how this under appreciation affects the evolution of video games. As to the more prosaic, but no less important consideration of education we contend that education can only benefit from a more lucid and creative approach to the creation of games.

Although video games are influenced by the norms of the wider society, they have the potential to adopt critical positions. The problem addressed below relates to a lack of creativity. Our methodology for the analysis of fantasy draws from narrative, anthropology, mythology and analytical psychology. Our objective is twofold to demonstrate that fantasy occupies a position of central importance in personal and creative life despite its historical marginalisation and to argue that the rationalisms practiced by society are themselves of limited value. Possibilities exist for the enrichment of games that successfully embed the creative principles underpinning the elements of fantasy contained in mythological narrative. The mythological and consequently the psychological must take precedence over any other form of analysis on the basis that, as Jung (1963, Jung 1967, Jung 1978) argues, every thought generated; sane, insane, artistic, inane, literary, critical or intellectual finds its point of origin within the human psyche. Hillman (1984) sees psychology as the modern counterpart of myth. This is an important idea, nevertheless it risks creating the impression that mythology is bound into the past. However, we observe that myth making is as alive and active in modern culture as it has ever been. Therefore motifs, images and symbols that recur in anthropology, psychology, folktales and the visual arts have a creative contribution to make in one of the newest technologies. There is no basis for the assumption that inspiration or illumination might be forthcoming from the past alone. We are urging an appreciation that fantasy’s “arresting strangeness”; the antipathy directed towards it by the everyday mind -as Tolkien (2008), observed, acts as a blind which conceals its ubiquitous and ever-present nature.
In Swinfen’s (1984, p.184), study on the place of fantasy in literature she contends that: “None the less some critics and academics condemn the whole genre with a passion that seems less than objectively critical.” What might explain Swinfen’s observation that passion leads the critics of fantasy to an abandonment of objectivity? We will argue later that the solidity of the basis from which critics dismiss fantasy i.e. empirical realism, is as unstable as the target of their criticism. This lack of capacity for objective criticism is also of interest when considering the design, production and study of videogames. Lack of appreciation for the significance and potential of fantasy has consequences for the design of compelling video games. Psychological and mythological studies have shown that human wisdom i.e. the ability to make good choices, is transmissible via customs, ritual, dreams and art forms. This evolutionary knowledge is pre-technological but not necessarily pre-rational. We will contend that this knowledge is rational in its best sense even as it attracts the antipathy of a certain form of rationalism. In case the seeming elevation of fantasy should raise the ire of diehard ludologists it will be shown that far from weakening the ludic nature of gaming it is the playful, (and playfilled) nature of games that reap the greatest rewards from a deeper appreciation of fantasy. A deeper insight into the creative potential of fantasy is an approach that makes games better, i.e. more emotional, more meaningful and consequently more engaging. For the purposes of education these are also indispensable and desirable qualities.

We advocate the adoption among game developers of a “Poetics of Fantasy” as a critical practice which will help to endow their creations with greater depth and richness. This notion may be problematical to an exclusively rational paradigm but we will attempt to demonstrate that the rational mindset is based on a certain view of the empirical nature of reality which is not actually supported by science itself.

Assured and self-confirmed in our notions of the real we wait for fantasy to be given meaning by our monolithic interpretations of reality. The consequences are that we become comfortable with our own mundane view of what we take to be real which then restricts our capacity for creativity and original thinking.

7.2.2. What is Fantasy?
The answer to the above question could easily be “What do you want it to be”
The term seems to have a linguistic plasticity although many of the connotations that accompany it are either negative or pejorative. Fantasy tends to collocate with terms such as “mere”, “pure”, “idle”, and “just”. The dismissive qualities inherent to this view are in contrast with the empirically reliable basis of reality (MacMillan 2002). Fantasy is routinely seen as an escape tactic from the demands of reality. Alternatively others have argued that fantasy can be employed as a means of evaluating the demands of the real world (Swinfen 1984). The marginalised quality with which fantasy is associated is of interest for this analysis. Fantasy’s association with imagination, leads to an area where fantasy receives serious consideration i.e. the investigation of mythology, of mythological studies and ultimately to the disciplines of Analytical and Depth Psychology. Fantasy: “stimulates creativity which develops what is not (yet) and it acts as the psyche’s balancing mechanism offering the person a self-help tool to achieve emotional equilibrium” (Wick 1984). By this definition, Fantasy can be seen as having a simulatory function testing various scenarios before they emerge in the world as the activity recognisable as play. “In all the wild imaginings of mythology a fanciful spirit is playing on the borderline between jest and spirit. Now in myth and ritual the great instinctive forces of civilized life have their origin: All are rooted in the primeval soil of play” (Huizinga 1955). Here we find the idea of fantasy as existing on the edges of conscious and pre conscious thought. In terms of Analytical Psychology an agent that exists on this borderline is what is known as a Psychopomp, a guide capable of taking the Hero (Player) into uncharted regions. Play is folded into the myth making processes of fantasy. Fantasy is the “fanciful “spirit” of play (Ibid, p.83).Fantasy is play in dancing form. Both play and fantasy are situated in an archetypal dimension of the human unconscious which now needs to be briefly explored.

7.2.3. Archetypal Psychology
Freud considered the unconscious to be personal, full of memory and repression while his contemporary and once co-researcher, Jung, theorised a deeper archetypal layer in the unconscious mind in which all of humanity participates (Jung 1956). An approach to archetypes requires an imaginative, almost metaphorical style of discourse that regards archetypes as
“the deepest patterns of psychic functioning … sober operational definitions in the language of science or logic are no less metaphorical than an image which presents the archetypes as root ideas, psychic organs, figures of myth, typical tales of existence, or dominant fantasies that govern consciousness” (Hillman 1991, p.23).

Before proceeding it might serve to reflect on the term “psychic”. Many will attribute a disreputable meaning to the word and rightly so in the sense that it is often linked with people who claim dubious and unproven abilities to converse with the dead, find lost objects, etc. Freud’s co-worker and former collaborator concluded that the unconscious is structured in two parts, an upper layer, the Personal Unconscious, and a deeper layer, the Collective Unconscious. This deeper layer is ubiquitous in art forms (regardless of quality) and mythology (Jung 1963, Jarret 1981). The Platonic concept of forms or dispositions preexisting conscious thought assisted Jung in the formation of the archetype although Kant and particularly Schopenhauer may have had greater influence (Jarret 1981). The phenomenon of the archetype is ubiquitous appearing in disparate scientific enquiries ranging from evolutionary psychology to anthropology, biology and psycholinguistics (Stevens 2006)). Archetypes propose that the human being arrives in the world psychologically equipped with certain unconscious (collective) images and dispositions which have striking commonalities across cultures separated by time and distance (Jung 1956). Jung considered the archetypes as clusters of psychic energy that express the major themes of living and are: “the unconscious images of the instincts themselves” (Jung 1967). Archetypal motifs are present throughout all of the world’s cultures. Comprising the collective experience of what it means to be human, they are a form of distributed memory. The memory, moreover, seems to be reserved for knowledge that is evolutionarily useful. Fantasy presents itself in the conscious mind in the form of inspiration, dreams, reveries, affects, and playfulness (Jung 1978).

7.2.4. Characters in Fantasy
The Hero is the most identifiable character in videogames. He (or she), is the character with whom the player (male or female) identifies. Mythologically, there is a three stage movement from Separation, to Initiation, to Return (Campbell
1978). The heroes of myth and legend were cunning, ruthless, patient, full of guile, master tacticians and strategists e.g. Ulysses (Bly 2001). We will see those qualities when we come to consider the fantasy of *Grand Theft Auto*. Excepting ruthlessness (and sometimes not even then) these qualities seem applicable to the most effective gamers.

The heroic journey is structured in a mythic pattern beginning in a state of innocence and ending in a return to point of origin having survived a series of physical and psychological trials to attain the ultimate reward (De Vries 1963, Rank 1952). The shoot-everything-that-moves hero is a product of Western culture, by no means standard nor accepted in the wider world (Vogler 1999).

Overuse is a feature of current game design. It is apparent in the repetition of motifs such as subterranean settings, the vocabulary of elves, wizards, goblins, magical swords etc. In a broad sense this is part of a trivialization of symbolism evident in modern culture (Postman 1982). The design of subterranean environments in games include the use of muted colours, darkness, and prevalent shadows; all intended to create a sense of fear and mystery; what Jung described as being in the presence of the “Numinous”(Jung 1967). The design is so ubiquitous as to be clichéd. A clever designer might use this to advantage by threatening the hero in a setting which was previously established as warm, benign and safe. In terms of physical space, Jenkins has observed that games have taken on a new importance with the disappearance of freely available urban playspaces (Jenkins 2009). Of more pressing concern should be the loss of interior space occasioned by the importunities of a culture which is edging close to creative bankruptcy. In gaming players occupy an imaginary space where personal and interpersonal skills are readily developed. “Videogames enabled players to create fantasy worlds for themselves where they were heroic, active, and respected” (Sandford and Madill 2006). Computer video games create a psychological imaginary in which the hero confronts problems, solves riddles, overcomes opponents and experiences a sense of empowerment, heroism and achievement. This is the bright side of computer games. We will now turn to the dark side.

7.2.5. The Devaluation of Fantasy
We would contend that fantasy is underappreciated in terms of what it has to offer as a source of play and meaningful experience. More than this fantasy has a store of inspiration to offer much of which is commonly and deliberately ignored if not reviled.

“Fantasy, of course, starts out with an advantage: arresting strangeness. But that advantage has been turned against it and has contributed to its disrepute. Many people dislike being arrested. They dislike any meddling with the Primary world.” (Tolkien 2008, p.60).

This can be interpreted as a literary insight into a psychological problem. It requires understanding if we are to enrich our creativity in the design of video games.

Tolkien picked up on the disdain for fantasy and the elevation of the imagination. He also rejected it. However, for the sake of what we hope to achieve in a revised approach to fantasy, it might be worthwhile pointing to elements in Tolkien’s fiction which imply that he was not completely free from the tendency to elevate and fetishize. Consider Tolkien’s antinomies in *The Lord of the Rings* (Tolkien 1954). The bucolic ruralism of the Shire is in contrast to the corruption brought by the industry of the invaders. The Orcs are brutish, animalistic cannibals contrasted with the ethereal wisdom and grace of the woodland elves. Tolkien is revolted by the Orcs. He wants Orchood: “sealed in precisely the same underworld from which Blake wants it to erupt” (Helms 1974, p.69). Helms might have noted that the hobbits, heroes and victors of the novel, had large hairy feet, a symbolic link to the animalistic and natural dimension of being.

“Some games procedural representations serve mostly to create an entertainment perspective, a fantastic situation that transports players to another world” (Bogost 2008). There is little expectancy here that the fantasy dimension of gaming might achieve more than entertainment. Any sober review of the present state of fantasy in games would do little to persuade otherwise. Valorising the potential in games for raising social consciousness through critique and satire is certainly valid (Ibid). However, it is difficult to comprehend how the “entertainment perspective” could be excised from any video game and expect it to continue to be a game.

Complementary to the Hero, one of the prevalent Jungian archetypes in video games is the Shadow. The Shadow is the opponent with which the Hero has to struggle. The Hero may lose or the Hero may win but either way the Hero cannot
refuse to fight. Often the struggle takes the form of a violent conflict leading to the defeat of either the Hero or the Shadow. Defeat or victories are not the issue in the realm of the mythological. Only the struggle is important. According to Jung everything that is in the unconscious is inverted. Therefore to win can be to lose, and to lose can be a victory. Video game developers might reflect on this if they wish to build meaningful games.

The figure of the Shadow represents all the content which the conscious mind seeks to bar from consciousness (Jung 1978). In *Harry Potter and the Sorcerer’s Stone*, (Rowling 1997) Voldemort is Harry’s nemesis and Shadow. For Harry, (and the viewer/player) Voldemort has knowledge which Harry does not consciously know because it is hidden: “in the dark, unlived and repressed side of the ego complex” (Von Franz 1987)(Von Franz 1987). In First Person Shooter games the interaction with the Shadow is basic; kill or be killed. In the confrontation with the Shadow players abandon conventional thinking to immerse themselves in violent fantasies. Awareness of a capacity for cruelty and transgression is part of the experience:

“it, like killing someone, blasting them in the head… maybe it’s cause you can’t do it, it’s such a forbidden thing, but like they make it so real and powerful, like in a game you can have the ability to smoke people continuously” (Sanford 2006b, p.9).

The player is aware of violent and sadistic tendencies occurring on the level of fantasy where it is psychologically safe to give them expression. The encounter with a personal knowledge of one’s less admirable capacities is a means to inner growth: “One does not become enlightened by imagining figures of light, but by making the darkness conscious”(Jung 1978). According to Jung the threatening nature of the Shadow is a function of conscious repression and a refusal on the part of the conscious mind to acknowledge that there are appetites, desires, lusts and ambitions held in the unconscious seeking expression and release. The player engages with a consciously unacceptable dimension of experience while immersed in the fantasy of game play.

This parallels the psychologically protective functions of fairy tales on the minds of very young children. When a child is disciplined he or she can experience narcissistic rage toward the figure of authority; usually the mother. It would be psychologically damaging however for the child to harbour powerfully negative
feelings against the person on whom it is dependent for love and comfort. Folktales resolve the dilemma with the figure of the wicked stepmother who supplants the good mother and marries the father. The child now has a suitable target for its rage and is free from the guilt of negative feelings towards its love object (Bettelheim 1976).

7.2.6. The Scurrilous Nature of Fantasy

Much has been made of violence in video games, particularly by the media. The Grand Theft Auto (GTA) series of games has attracted critical attention for extreme violence in the games. Nevertheless the games are highly successful and have a devoted following. But is violence the secret of success for GTA? The media landscape is saturated with depictions of violence. What might explain the success of GTA? Immersivity is certainly an obvious factor. The performance of transgressive acts in a fantasy environment has already been discussed. Is there more? Consider the look of GTA in its later iterations. The characters controlled by the player (and non-playing characters) have a certain appearance. They are heavy featured, dangerous, coarse in their looks and behaviour. There is a strong suggestion of marginalisation, the “lowborn” about the characters. Their behaviour, i.e. the player’s behaviour is deliberately and consciously scurrilous i.e. transgressive. This “scurrility” is a feature of unconscious fantasy.

Earlier we referred to the heroes of legend as cunning, ruthless, patient, full of guile, master tacticians and strategists e.g. Ulysses (Bly 2001). Look at these qualities and consider how well they serve a master game player. The power of computer games lies is the facility to blur the distinction between scopic observer and participant. The player is no longer on the side line observing the drama; the drama enfolds the player. Thus we have two powerful draws to magnetize a person into wanting to play computer games. One is the freedom to exorcize psychologically troublesome elements, i.e. meet the shadow and survive the encounter. The other is to be a hero. Bly (2001) makes a telling observation in distinguishing between the warrior and the soldier. By his logic not all soldiers are warriors and not all warriors are soldiers. A warrior is one who opposes evil and protects good. By that logic there must be a lot more warriors out of uniform than in uniform. This is not to imply that soldiers are not warriors, many of them are, but they are a small minority in a civilian population.
It is possible that in the psychological imaginary, i.e. the fantasy space provided by computer games young people are finding a place to encounter fundamental questions on the nature of good and evil and to assimilate the answers not only in intellectual terms but in terms of developing their identity. Note that heroes were cunning, and full of guile. How different is that from modern culture’s icon of the naive, innocent but hyper violent hero? The hero with guile has absorbed some of the qualities of the Shadow. She may not have the quality of “niceness” but neither is she naive.

The question can be asked as to whether the developers had such a consciously artistic, psychological, or critical project in mind when they created *Grand Theft Auto*. The answer, surely, is almost certainly not although it would be encouraging to think so. This might lead to a rebuttal of the critical justification on the premise that if a criticism is not consciously conceived, developed and executed then it is not a viable criticism. Such a notion can be seen as modernist and elitist. *Grand Theft Auto* may not have been consciously informed by the values and attributes discussed above, however it displays real creative talent in its design and is surely the key to its continued success.

### 7.2.7. Useful elements in fantasy dynamics

The most apparent characteristic of successful video games is that they are difficult; in effect difficulty and the attendant need to solve problems has been seen as the major educational feature offered by video games (Gee 2004a). Video game producers tend to treat difficulty as a feature novel to games. Historically, however, culture has put a high value on difficulty and complexity and this is reflected in legend and folktale; from the labours of Hercules, (Kerenyi 1988) to the little girl in *Rumplestiltskin* ordered to weave gold from straw in the course of one night (Grimm 1998). Could this be why theorists such as Gee (2004b) and Prensky (2001, 2006, 2007) take such a dim view of school based education because of its perceived failure to offer learners the challenge of problem solving? Anyone coming into contact with a videogame for the first time will notice first how challenging they are and second that there are neither guide books nor software to drip feed information on how to proceed. In fact games make very little concessions on this issue. Instead the player approaches the game by trying a move. If it works she has the knowledge of how it worked and can progress. If it failed she knows what does not work and that information will go to formulating
an alternative attempt. This is, as Gee(2004a,2004b,2007), observes, the basis of the Scientific Method. Contrast this with reported instances of school taught students being unable to apply principles to practical scientific problems even though their written exam answers indicated that they had all the information required for the solution (Chi 1981)

Having referred to a positive feature of videogames it is necessary to refer to an identified negative. Games are a product of culture and are no more likely to be free of the effects of ideology and the dominant technicities than any other cultural artefact. Unlike the heroes of legend, the gamer never quite seems to complete the task/quest with comparable Herculean finally. We have noted, based on Huizinga’s, (1955) observations, an observable corruption of the play instinct by corporate and commercial interests seeking to exploit that energy. Many games do not either admit or permit conclusion. Too often the game concludes (if there is a discernible conclusion) without resonance, drama or catharsis, above all without emotional closure. Is it lack of design/ technical capacity that causes this or is it because in an upgrade culture it is essential to have a consumer retain the expectation of finding in the newer version what he or she failed to find in the older? Lack of technical capacity is hardly an explanation and is declining in relevance, if it has not already done so (Perry 2009a)

The experience which the player sought and failed or only partially succeeded in finding was the fantasy. Paradoxically, had the player found a completely satisfying experience in the game the result might be to desire a new experience of the same. This might explain why there are games e.g GTA and the Final Fantasy Series which base their appeal on satisfying the fantasy cravings of the player and there are games which frustrate those same cravings. An example of the latter would be World of Warcraft which despite its technical merits does not possess the sophistication of either GTA or Final Fantasy.

“The film need not be well made but it must provide resources consumers can use in constructing their own fantasies (Jenkins 2006a). This is an acknowledgement that media is experienced within the person. It makes the fantasy element indispensable. Substitute “film” for “game” and the statement is as relevant, if not more so, to videogames.

The process of symbol formation is as active with modern motifs as with older elements. Take levelling as an example. It is a common activity shared by a wide
variety of games as a means of progressing through various stages. The level is a marker of progression. If the player “dies” she can return to the last level she saved and resume. Levelling, however, is also a powerfully symbolic movement fraught with psychological resonance. Descending from upper to underworld is an adventure full of excitement and dread. A levelling movement upwards promises emergence into the light and defeat of enemies, who almost invariably cannot come above ground i.e. into the light of consciousness.

Postmodern theory has a contrasting approach to fantasy even as it fails to mention it specifically:

“The Postmodern would be that which in the modern invokes the unpresentable in presentation itself, that which refuses the consolation of correct forms, refuses the consensus of taste permitting a common experience of nostalgia for the impossible, and inquires into new presentations-not to take pleasure in them, but to better produce the feeling that there is something unpresentable.” (Lyotard 1984, p.81)

Postmodernism refutes the previous distinction between fantasy and reality. Fantasy is rescued from its marginality and given a role of central importance in delineating the incoherence at the core of any attempt to make definitive statements about reality(Lyotard 1984). Fantasy is not mentioned specifically by Lyotard yet the idea of the “unpresentable” conveys the same sense of difficulty with normative reality. The term is illuminative conveying the sense of otherness, marginality, even shamefulness that modernism has ascribed to fantasy Modernist metaphysics are challenged by a prioritisation of fantasy which functions as an agent of postmodernism’s fragmentation and undecidability.

We sought to provide a critical defence of a certain feature of video games which could be under threat from those who oppose video games for their objectionable qualities. This feature we have named “scurrility”. The term is suggestive of that which is demeaned, impoverished, hidden, secret and guilty. If we are looking for somewhere to lay the blame for the antipathy towards fantasy we might look to the romantics and not the rationalists. This might seem paradoxical given the lengths taken to expose the weakness of the rationalist position. The weakness of the romantic position is their elevation of imagination and denigration of fantasy; specifically Coleridge who dismisses fantasy as mechanical gimmickry inferior to the creative
powers of the human imagination (Coleridge 1920). This view sees fantasy as a trivial distraction fit for the instruction of children and the ignorant. It remains to the Irish poet, W.B. Yeats (2001) to provide an alternative with the insight that, while imagination is a thing of the heart, as the romantics declared, the heart is, a “foul rag and bone shop” into which the artist must descend to reconnect with the deeper wellsprings of life.

We began our discussion of fantasy by noting the quality of “arresting strangeness” as attributed to it by Tolkien. Fantasy draws upon myth and mythological knowledge that has been analysed principally by Jungian psychologists and others who have developed the notion of the Archetypes as the basis of Analytical Psychology.

In our discussion of fantasy we reviewed the psychological significance of two of the most prominent archetypal symbols; the Shadow and the Hero. We went on to show how such figures are evident in the cultural artefacts familiar to young people, specifically the Harry Potter character. Elsewhere we sought to demonstrate the risks attending a naive use of these kinds of commercial characters in educational games. Should a student intent on creating a game has an insight into the psychological processes that informed the characters created by Rowling and others, she can set about designing her own characters free of the threat of legal sanction. There is no copyright protection for ideas (Lessig 2004).

7.3. The Nature of Play.

Those who take an interest in play seem to approach it from the use they have for it. Thus anyone interested in telling stories with play takes a narratological approach, while those who see play as purely abstract and independent take a ludological approach. Play has many interpreters with some of more consequence than others. We take time here to review its more seminal theorists. There are others who have contributed to our knowledge of play but these two are regarded as foremost.

7.3.1. Doyens of Play; Huizinga and Caillois

We have embarked on a discussion of the nature of play and what we propose are generalized inabilitys to understand play at a deeper and more productive level. However, given what we earlier identified as a hegemonic, conglomerate and profit driven practices by those interests who control gaming it would not take too much effort to see conspiratorial motivations behind the perceived indifference to play:
“...another presentation by a game developer seemed to turn usability on its head in terms of how to create just the right amount of challenge, early reward (not too much, not too little), and the continual lure of partial success to guarantee addiction. Just like a slot machine or the megabucks lottery for many losers and a few winners”(Marcus 2007, n.p.)

For all its observations of the alleged perfidy of games developers is highly improbable that they are as deliberate in their strategies to ensnare and addict games players as has been outlined here. W hardly touched upon the question of addiction to computer games. There were two reasons for this. The first is that addiction is too vast and complex to get proper treatment in a study of this kind. The second is that we took a fundamental decision to examine the operation and effects of certain cultural dynamics we believed were affecting the potential of educational computer games. Discussion of addiction would have taken us too far out of our way.

We will now turn to the major contributors to our present notions of play before proceeding to a discussion of play and its consequences for present society. In the following we will begin by discussing Huizinga as a prime influence on the emergence of the theory of play. This will be followed by a review of certain of the more prominent theories and theoreticians that have influenced some of the more important discourses generated around play. Caillois(Caillois 1961) showed that it is not possible to take on all of Huizinga’s pronouncements, giving form to Huizinga’s more abstract thought, nevertheless, Huizinga (along with Caillois) is considered to be the classical theorist on play.

Huijinga.

Johan Huizinga was the foremost Dutch historian of the twentieth century and is known for his medieval study The Waning of the Middle Ages. Outside the circle of historians, however, he would be better known for Homo Ludens: A Study of the Play Element in Culture, a seminal contribution to the understanding of play. A cultural historian Huizinga recruited knowledge from the studies of art, literature, psychology and sociology (Collie 1964). As a cultural historian Huizinga displayed greater fascination for religion, manners, morals, ritual and sentiment than to the more “serious” topics of politics and economics subjects which lent themselves more readily to the imaginative sphere of play (Anchor 1978). On his appointment to the
chair of history at the University of Leiden in 1915, his first task was to prepare a series of lectures on American History. American sport drew his attention for the promotion of individual development:

“Play is culture. Play can pass over into art and rite, as in the dance and in sacred stage presentations. Play is rhythm and struggle. The competitive ideal itself is a cultural value of high importance.” Cited in Anchor (1978, p.72).

Ultimately, however, sport is co-opted by the forces of commercialism and organisation: “In the immense sport organizations, like those of baseball and football, we see free youthful forces and courage reduced to normality and uniformity in the service of the machinery of rules and play and the competitive system” (Ibid).

Huizinga puts western life under the microscope (his focus was on America but it can be broadened to the remainder of western culture) and finds it wanting. Commercialization, trivialization of culture, materialism, anti-intellectualism, and an anti-metaphysical attitude among scientists and intellectuals are targets for criticism. Research interest in Huizinga is notable by its absence. Homo Ludens is commonly cited as a foundational text and part of the canon of computer games. Yet one cannot evade the impression that Huizinga’s study is referred to more as a nod to academic respectability and a strategy to lend an intellectual cachet to a recently emerged area of academic interest. There is more going on here than the antagonism between the uncultured and the cultured, between the common world and the world of the intellect. The tension is between two worldviews, one driven by an instrumental rational consumerist ethos and one informed by a critical, anti-materialist perspective which, elitist though it may be, is liberal and democratic.

Huizinga provided one of the classic and often cited definitions of play:

“Play is a voluntary activity or occupation operated within certain fixed limits of time and place, according to rules freely accepted but absolutely binding having its aim in itself and accompanied by a feeling of tension, joy, and the consciousness that it is different from ordinary life (Huizinga 1955, p28)

Much of our critique of play in the following derives from a conviction that “certain fixed limits of time and place” no longer apply in a ludically driven culture that consumes the productions of play.

By exploring the history and theory of play we will gain insight into how it shaped the development of digital games. The early theories of how play operated in culture, notably Huizinga’s (1955) sought to provide a schematic of the relationship between
There are suggestions that the older theories are in need of radical overhaul so as to be relevant to contemporary requirements (Dovey and Kennedy 2006). Huizinga could have been said to over emphasize the other worldly nature of play and thereby lend to play an unbalanced sense of escapism. However, we will argue, in support of Huizinga, that it is this other worldly aspect that lends to play its creative dynamism. We do not consider the corruption or debasement of play as unique to western industrialized or corporatized culture. Huizinga seems to have done so but we are conscious that such a view tends, by implication, to lend a utopian cast to earlier societies. Pinker (2007) reports on the high incidence of violent death as evidenced by archaeological research of early societies. Where would play find its place within such societies? If play is, as we have argued, energized by fantasy, then it must be largely instinct driven. Therefore, as an instinctually based process it is no more free from perversion than the urge to eat, have sex etc. This marks the difficulty with reaching a definition of play. On one hand we can see that it is an instinct. On the other it seems to have teleological qualities that, necessarily, must be extra biological.

Play can also be seen as a means of commentary, even criticism of reality as well as a means of strengthening social bonds (Lasch 1979). It could be argued that the principles Huizinga adduced about the nature of play are highly relevant and that it is the corrupting influence of a hegemonic capitalism that has created the conditions of irrelevance. Huizinga, working from a modernist position free from postmodern theorizing that declined extended narratives and the possibility of adopting a firm position, performed a great service by detrivializing what had come to be regarded as a marginal activity (Dovey 2006). Huizinga interpreted play as an important, extra biological function in life. Play was an activity that helped assign meaning to the world. He regarded play, not as an early form of social practice ultimately leading to the development of culture but anticipated that culture would adopt and internalise a playful element as it evolved (Huizinga 1955).

Our discussion of play is motivated by two related questions that go to the core of the present study. The first question centres on the extent to which play can provide an experience of pleasure and freedom and how it does so. Given a positive verdict does this mean that such experiences are potentially educational or is the self-absorption evident in computer games a form of debased behaviour?

Caillois.
The tendency of play towards unpredictable behaviour and anarchy is not a fanciful notion derived from humanist or literary perspectives. It has a certain amount of scientific support:

“In our world of radically and unpredictably changing environments, an evolutionary potential for creative responses require that organisms possess an opposite set of characteristics usually devalued in our culture: sloppiness, broad potential, quirkiness, unpredictability, and, above all, massive redundancy. The key is flexibility, not admirable precision.” (Gould 1996, p.48).

The suggestion that Gould appears to be making is that in conditions of increasing complexity the less well organized individual may fare better than in previously stable conditions where those more organised might do better.

Caillois, (1961) developed a number of concepts to describe different kinds of play, or players informed by different motivations. The agonistic subject is rule bound, given to conformity, to “playing the game”, to achieving set goals by extensive training and self-discipline. The aleatory subject on the other hand is anarchic, counter cultural, contrarian to the degree that normative values and standards will always be an object of challenge (Ibid). Caillois suggests that societies, particularly those societies that experience a strong degree of change or randomness, will seek to minimise that experience on the basis that too much of it is unpleasant and unacceptable. The rift between the agonistic and the aleatory is, according to Caillois (1961), a small part of the larger rupture in society in transition from a perceived state of order through discipline and effort to a more unstable view of a world where chaos and chance play a greater part and the course of events is entirely more unpredictable.

The aleatory subject is resistant, quirky, anarchic, values chance, randomness, and lack of predictability.; elements many teachers observe in underperforming students. In our later discussion of Virvou and Katsionis’ (2008) study we will observe that researchers detailed how educational computer games worked better and appealed more to students who normally underperformed and were disruptive in class. We will try to demonstrate that the underperforming student is a type that resembles the traits common to the aleatory while the high performing student who knows how the system operates( it is his raison d’etre) more closely resembles the agonistic.

Finally Caillois’ theories suggest a possibility. He detects a general movement in society from more to less control, from stability to greater instability.
In this movement the aleatory, i.e those comfortable with change and increasing states of unpredictability might prosper. Callois may not have anticipated the digital age or the rise of participatory culture but he would have been aware of the dislocating effects of technology. The conclusion for education is to take notice of the contentions of Prensky(2001)and others who predict serious challenges ahead for traditional educational structures. Certainly when one reads Prensky one detects a certain sympathy for gamers as opposed to a certain negativity towards those students skilled at knowing the system and what is required from them from traditional education. The implications for educational games are profound because it seems possible that computer games, and in the present context, educational computer games, have arrived at the start of a cultural turn. Whatever challenges theorists might expect the overall challenge is surely to figure out how to deal with escalating complexity. What the previous writers appear to suggest is that a new subjectivity emerges to deal with conditions of instability and that this subject fails to prosper when conditions are settled and predictable. We first encountered the Aleatory and the Agonistic subject in discussion of play types. It occurred to us that they could also be learning types. What we are suggesting is that the underperforming student who exhibits learning improvements when exposed to an educational computer game is the aleatory subject. There are two implications for education; one promising, one disturbing. The promising is that educational games might have the potential to reach previously unreachable learners. The disturbing is the possible conclusion that education so organizes itself as to cater for those students who best know how to mollify its need for regimentation and order.

7.3.2.Devaluation of Play.
We hold to the view that without a more creatively intuitive appreciation of play society is consigned to witnessing and taking part in the debasement of play. In a world where play has become the new work and an important mark of consumerism (Maher 2009) it is every bit as vulnerable to postmodern valorisation as it was to the denigration of modernity:

Play has a symbiotic relationship to rules and yet the relationship (on play’s part) is temporary, partial, anarchic, and literally, playful. Play dices with the possibility of breaking the rules. Play is liminoid, liminal, at times subliminal. Small wonder that the engineer, the designer and the theorist seem to be challenged by it (Maher 2009).
“The commodification of culture is above all else, an effort to colonize play in all of its various dimensions and transform it into purely saleable form.” (Rifkin 1995, p260)

Capitalist interests seem hardly troubled by play even to a mild degree, instead play is corrupted and fetishized, made to serve commercial purposes (Maher 2009). With the introduction of ever more efficient technologies into post-industrial capitalist economies millions of workers will find themselves superfluous to demand. The challenge becomes finding new roles for the former workers and reinvesting value in other activities that fall outside the production paradigm (Rifkin 1995). The major portion of that free time will be given over to leisure and that brings the debate about play onto centre stage. Schor (cited in Shultz Colby 2008) takes a different tack when observing the place of play in post-industrial societies. Rather the contention is that the instantiation of capitalism has led to “a crisis of leisure time” to the extent that rather than an emergence of play onto cultural centre stage as an anodyne to the perceived loss of usefulness and relevance in the lives of workers supplanted by technology, play will lose ground both in social esteem and relevance.

7.3.3. Play and Development.

Throughout infancy and childhood play contributes to the physical, emotional, cognitive, social and language development of the child (Nicolopoulos 1993). Play is regarded in occupational therapy as the primary activity of the child. Through play children learn effective communication skills on how to socialize with others in a system of rules. The change from considering play as occupation shifts the focus on the impact of play on the child itself to a consideration of the child within its environment and the modes in which it transacts experience (Pollock 1997) Active participation in sport and physical activity has been reported as teaching the child a sense of its physical capacities and self-concept (Eppright 1997). Play is a core human activity. There are grounds to suggest that play was involved in the one activity unique to humans; the development of language. Sutton Smith proposed a language like process observable in the play biting of animals. (1997) He
proposed that play biting is the expression of a negative prior to the formulation of a negative in language. In play fighting movements are dance like, the body shapes are curvilinear. Fur is unruffled and eye contact is soft. What is being communicated in a pride of playful lions may be difficult to make out but something is being communicated through play by creatures that have no access to language.

Studies carried out at Duke University showed how play is central to fostering early language use among young children (Malcolm 2000). In the course of play the children used directions “go”, “jump”, descriptions, “big jump”, and responses, “my turn”. Play acts as an organiser of behaviour providing practice in language exchanges. The pleasure of play derives from social behaviour patterns formed through symbolic communication.

Play seems to act as a means of cultural preservation and augmentation. Playing games is an efficient means of establishing useful habits, of creating action in sequential form (Murray 2006) Culture is mimetically based and mythically influenced. In a mimetic culture games establish links between the action/object and language (Murray 2006)In a mythically influenced culture games persist as a bridge between augury and numerical skill in the play of symbolic gambling games. Utilising its formal structure as a system based on rules and open to participation, play is a powerful source of social interaction. This extends the operation of play into commerce, the law and even into making war (Ibid).

Huizinga (1955) is clear that play should not be seen as providing the evolutionary basis of civilization. If play is taken as the creative basis of myth, however, and myth the progenitor of civilization it follows that play displays the same dynamism as myth. Winnicott argues that play is productive of personal identity and culture and performs as an interface between the interior, personal life and the life of social interaction.

“...on the basis of playing is built the whole of man’s experiential existence...We experience life in the area of transitional phenomena, in the exciting interweave of subjectivity and objective observation, and in an area that is intermediate between the inner reality of the individual and the shared reality of the world that is external to individuals” (Winnicott 1971, p.64).

There is a fundamentally anarchic element in play which is insufficiently recognised, let alone understood. The notion of fixed rules is a central pillar in the structure of game theory yet we have proposed that the stability of this notion is itself
questionable. The project of introducing educationally purposed games into the classroom is at risk from the lack of understanding of what play is about. We discussed play in some depth because we were keen to delineate its challenging nature and to conclude thereby that corporate interests (be they commercial or educational) fail to give play due recognition. At its best play is freedom. Parents have long had the experience of buying an expensive present at Christmas only to find the child getting more pleasure from the box in which it arrived.

7.3.4. Play and Carnival

We live in an increasingly ludic culture. Between the blandishments of consumer capitalism with its exhortations to enjoy ever more products and experiences, the rise of technology which completes tasks at the press of a button and a liberal, individualist society that insists on our rights as autonomous beings to be free of external pressures we have the time, space, and technology, to entertain, distract, recreate, solve puzzles and thus occupy our increasing amounts of free time. Central to our narcissistic existence is the concept of play. We have argued, however, that it is less our devotion to play that informs our lives as it is a desire to be entertained, to have fun.

In our consideration of cultural framing we draw from the work of Bakthin (1984) for an analysis of the disappearance of the play space known as carnival. According to Bakthin (Bakhtin 1984) the world of everyday, mundane realities hid the possibilities of revolutionary change. The potential for change is folded in language which is not neutral but a vessel of meaning and knowing. Social vitality was to be found in common life. Bakthin found a precedent for this in the Rabelaisian carnival of the sixteenth century. Many of the notions which appear in the carnivalesque depiction of sixteenth century life seem to reappear in computer games.

The carnival brings an air of licentiousness. When it arrives in town it camps on the edge and after the townspeople have gorged themselves on sights, sounds, tastes of Dionysian experiences, it leaves. Bakthin makes it possible to see the culture surrounding computer games in a new way but also helps to understand the player of the game. The decorations of carnival are anarchic, spontaneous and exotic. This could also be seen as an aesthetic of video games with their tendency to make free use of their ability to morph and reshape from the commonplace to the beautiful, from the ordinary to the unexpected, from the peaceful to the violent. In the face of such an
aesthetic a new form of language is crafted from the uncertainty and ambiguity that is always close to hand both in carnival and in games.

Time is central to both the experience of carnival and the playing of a game. Bakthin’s idea of the *Chronotope* is an evocation of immediacy, where time, space, and activity are blended into a greater whole. Bakthin insisted on a crucial distinction between this experience that could only take place in carnival and not in the official world of regulation and restraint. The atomisation and fragmentation of the normative is allayed by the sense of collectivity and participation in carnival:

“The individual feels he is an indissoluble part of the collectivity, a member of the people’s mass body. In this whole the individual body ceases to a certain extent to be itself; it is possible, so to say, to exchange bodies, to be renewed (through changing costume and mask). At the same time the people become aware of their sensual, material, bodily unity and community.”

(1984, p.255)

The above quotation, taken again with insertions is a possible description of the experience of playing a video game:

“The individual feels he is an indissoluble part of the collectivity, (Immersive experience) a member of the people’s mass body. In this whole the individual body ceases to a certain extent to be itself; (Substitution or Sublimation of Identity) it is possible, so to say, to exchange bodies, to be renewed (through changing costume and mask). (The Avatar) At the same time the people become aware of their sensual, material, bodily unity and community.” (Interactivity).

The masking or changing of identity is a central theme in folk culture and is also a marked feature of computer games. The mask is, according to Bakthin (1984) “connected with the joy of change and reincarnation, with joyful relativity and the happy negation of uniformity and similarity; it rejects conformity to one’s own self. The mask is related to transition, metamorphoses, the violation of natural boundaries” (Bakhtin 1984). In video games the mask enables us to interact with other virtual identities, to adopt other bodies, other role, other minds. So seamless is the transition from Bakthinian ideas to the virtual world of the game that it opens the door to the possibility of addiction, certainly for those of a weaker personality. The excitement
and allure of a dimension which raises the sense of pleasure, which establishes a hypereality more vibrantly real than the real is difficult to refute. And all this happens without a sense of consequence. This marks where an element of corruption inherent to videogames begins to exhibit itself. In carnival there is always the possibility of being seen, a friend or neighbour. No one is watching in video games. This may offer liberation but it may also lead to a darker side of game play. What is pleasure and how much of pleasure is composed of the sense of release from restraint are topics well beyond the remit of this study. It could be argued that video games do not so much signal the return of the carnivalesque but an attempted return of what carnival represents; that dangerous, highly contested territory that lies between the accepted and the forbidden.

**The Abandonment of Carnival.**

There seems to be a symbiotic relationship between restraint and pleasure. The carnival is a nomad because no one wants it around all the time. What would happen if it came to town and never left? Is that what has happened with computer games? We will discuss the issue of boundaries as we go forward but it is striking to wonder if the transgressions being perpetuated are not individual but are orchestrated by a conglomerate project for financial gain. Culture set aside time for carnival but now it is carnival all of the time. Culture has lost its power to sanction unbalanced activities. “Nonetheless, a few cultures have earmarked a few days of the year for total play. A period of licence which some call Carnival and other cultures call something else (Eco 2007 72). Eco holds that “if Carnival is to be enjoyable and not fatiguing, it must be brief” (Ibid 72). This is true but only if “fatiguing” is taken as more than a wearying of the natural appetites for sensation and novelty. If Carnival is to be a refreshing experience then it must be limited in duration. Eco’s interpretation of carnival is politicized yet we also find the same postmodern trend to blur or even erase boundaries:

“Carnivalisation of life is the power of having a comedic film or show on television every day, several times a day. Carnivalisation of life is an American political convention where the participants, including the candidate, are dressed and act as though they were on a Broadway stage. Carnivalisation is the political forum on television in which the politician says presumably
serious things, while standing next to a scantily clad women, who talks about the calendars she appears in.

The ultimate carnivalisation of life is when Pope John Paul II, the venerable and virtuous old man, participates in a concert for young people where a rock star with a bared belly-button sings to the crowd - something that would never be allowed in a Vatican audience. Carnivalisation of life is the loss of the boundary between what is serious and what is performance”(Eco 2002)

While Eco does not venture a discussion as to either the genesis or effect of this perceived blurring of social, political, and cultural boundaries in this writing we would argue that the same dynamic is operational in the sphere of entertainment and that the ubiquitous and permanent nature of entertainment is part of the logic of hyper capitalism. This erasure of boundaries extends into the area of play with computer games; it would be surprising if it did not. We raise this concern because it must have consequences for educational computer games. In a discussion of the dynamics of resistance which follows later we wonder how the postmodern subject will react to educational games given the impact of the commercializing energies directed towards him

There has never been an ideal nor golden age of play. There are no records of a utopia in which citizens were at liberty and encouraged to develop their ludic potential purely for personal gain and self-enrichment. Our concern in tracking the credentials of play is motivated by the need to understand what this altered view of play means for their application in education. We have argued that the corporate sphere is the origin of the debasement of play. Play makes up a wide collection of global industries. Rather than liberating the creative and imaginative potential of human beings play is welded firmly to the cash nexus (Woudhuysen 2003). However simply consigning the ruin of play to the charge of commercial interests is overly simplistic. Every group with a special interest in play is implicated, from schools, to parents, to governments. The most unexpected group is young people, the ones who (romantically) were seen as being deprived of their play heritage.

The discussion of play began with a review of the thought of Huizinga(1955) who argued for the fantasy based origins of play but who then went on to propose that play
had been solicited to serve the interests of capitalist forces. Though Huizinga was influential in his classical theorization of the origin, nature, and cultural place of play, Caillois (1961) was particularly useful in considering how play and games might straddle the border between entertainment and education. The idea of the Agonistic and the Aleatory subject seem to recur in the school setting. Caillois detects a moment of cultural transformation in which the subject that normally thrives through their assiduous devotion to structure and order is faced with the rise of a character that prefers, or at least is adapted to, the increasingly high levels of social and cultural complexity that are a feature of postmodern culture. Within schools the space between those who prefer order and prosper as a result of their preference and those who opt for lower levels of determination can be seen in the contrast between those who perform to a high level and those who have been marginalized or have opted for self-marginalization. Tracing a route from low performing students, to resistance, to recuperation of self-identity (Sanford 2006a), we arrived at last to consider reports from Virvou et al (2005) who had observed a reengagement with learning from hitherto low performing students. While high performing students did well with the game they did not significantly improve their scores over non game options. The low performers, however, displayed significant improvements. The data available currently is limited and therefore cannot justify any settled conclusions, therefore we would urge others to recapitulate our route from the possible contribution of resistance to low academic performance, from there to the choice of games as a means of recuperating self-identity to a reengagement with learning through use of educational computer games. We will next consider the place that we argue is played by the phenomenon known as Flow in learning through educational games.

We have argued for an established relationship between fantasy and play. If play is to be taken seriously as a presence in education then fantasy must also receive serious consideration. The corruption of play was noted and discussed. It looks back to the earlier discussion of hegemonic practices but, more importantly, it suggests that a new relationship to play is necessary for the future creation of educational games.

Our discussion of play was intended to argue for a present state of miscomprehension of the nature of play and a consequent set of restrictions on the creative contribution that play could make to the production of successful games. Given our focus on educational games we contend that a better appreciation of play is, if anything, more
necessary if games are to succeed in education. This is arguably because while play in
entertainment is automatically licenced, play in education is accorded a certain
distrust and occasional suspicion.

7.4. Flow.

“the holistic sensation people feel when they act with total
involvement”(Csikszentmihalyi 1975, p.36).

Because computer games generate and require a prolonged state of high
concentration and effort they produce what Csikszentmihalyi has termed “flow”. This is an altered state of heightened awareness where tasks of extreme difficulty are
accomplished without a sense of undue effort or anxiety (Ibid). Writers on
instructional design have proposed flow as a basis for explaining how motivation
operates. Since the capacity to mobilize motivation is the central appeal of computer
games for education, we must consider what is purported to be its underlying
foundation.

7.4.1. Optimal Conditions of Flow.

Csikszentmihalyi (1971) summarised the requirements for flow:

1. Goals are concrete and rules are manageable.
2. Opportunities are capable of change to suit varying abilities.
4. Distractions are kept to a minimum.

7.4.2. Elements of Flow.

One of the readily observable features of flow is the submergence of a dualistic
perspective as the player merges thought and action.

“When awareness becomes split so that one perceives the activity from
outside flow is interrupted. Therefore flow is difficult to maintain for any
length of time, without at least momentary interruptions” (Csikszentmihalyi
1971, p.38).

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This seems to resonate with Huizinga’s (1955) idea of the magic circle marker where, if the player’s concentration or awareness is broken he is ejected from the sense of immersion in and contact with the game. A condition of flow is that the task or activity be neither impossible nor perceived as such (Csikszentmihalyi 1971). This is a point worth noting for educational game design.

Flow requires a narrowing of focus to the task in hand “a centring of attention on a limited stimulus field” (Ibid, p.41). This narrowing of attention may explain an observation by Paras and Bizzochi (Paras 2005) and others who have noted an inability on the part of those playing educational games to provide reflection on the learning taking place.

Flow promotes feelings linked with a loss of consciousness (or at least a loss of self-consciousness), a sense of self forgetfulness when the player is faced with the reality of a situation that demands complete and exclusive attention (Csikszentmihalyi 1971). A fourth element of flow is that the activity still leaves the subject in command and does not unduly trouble him with the loss of control.

7.4.3. Flow and Motivation

The theory of flow seeks to explain an often observed phenomenon where a person engaged in a, demanding task find themselves operating without undue difficulty but effectively and pleasurably. As such flow becomes a bridge linking to motivation theory e.g. the ARCS theory of motivation as developed by Keller (1983).

We list the properties of ARCS as follows;

A. Attention. Strategies are evolved to attract curiosity and interest. This is a given in successfully designed video games.

R. Relevance. Are the strategies meaningfully linked with the player/learner’s needs and interests? This is a compelling feature of video games. Commercial games depend for their appeal on whether the user likes them or not. They do not have the disciplinarian power of the classroom.

C. Confidence. Video games employ the equivalent of Vygotsky’s (1981) Zone of Proximal Development to maintain player effort without the discouragement of failure.

S. Satisfaction. Apart from the pleasures derived through the immersivity of flow games also reward with levels completed, lush graphics, victories over virtual or real life opponents and extensive opportunities for socialization. Players also gain
deep rewards from membership of a player peer group in which they are accepted and which values their contribution (Sanford 2006a).

There is an assumption on the part of those who wish to introduce games into the classroom that teachers are ineffective at teaching,(Prensky 2001, Gee 2004a) or at least in the forms of teaching that will match the needs of the new century. Assuming that flow is absent from teaching is to restrict the understanding of the concept of flow. There are ineffective teachers, certainly; however the effective ones are familiar with flow. Csikszentmihalyi (1971) observed a phenomenon that long predated computers. At a presentation to a TED conference, (2004) Csikszentmihalyi stated that flow usually came only after long periods of practice and apprenticeship. We noted how players though encountering real challenges in learning how to play computer games (an experience that itself was experienced as pleasurable) mastered the games relatively quickly. Games would not sell if users had to spend large amounts of time in order to play them. Therefore it appears that the conditions for experiencing flow are more elastic than previously allowed or young people have faster learning abilities when it is a question of mastering a task that is innately pleasurable.

Flow is seen as the basis of motivation because of its capacity for producing altered states of awareness that the subject interprets as pleasurable (Csikszentmihalyi 1971). We proposed that the link to motivation could be seen readily in the ARCS model of motivation (Keller 1983). Electronic games are constructed so as to stimulate and attract the attention of the player. The issue of relevance needs to be interpreted in two senses. Game developers have based their games on what they perceived to be the popular tropes occurring in entertainment geared for youth. By utilising a creative approach to games, as suggested by our review of fantasy, it is possible to build an acceptable alternative to the popular commercial games. Granted online games are expensive to build and maintain. World of Warcraft cost 80 million dollars to build and such budgets are well beyond the reach of educational games companies. However there are possible alternatives in mass online collaboration that in part are now operating and in part are yet to have their potential realized. For all its dominance online games such as that mentioned above are hugely reliant on the free labour of thousands of unpaid contributors -14,000 in the case of World of Warcraft (Leadbetter 2009.). Postigo(2003) has analysed the motivations behind the willingness of so many people to donate their time and labour to non humanitarian
initiatives. Reasons such as boredom, status and skills development were cited. As the medium gains maturity, however it is therefore not inconceivable that such talent and expertise might find an alternative to swelling the coffers of companies such as Blizzard or EA Games in developing free for use educational games.

Flow is thought to produce motivation and we have argued that, if it does, then it also produces resistance. It could be argued that since flow is an energy, a physiological stimulus, it produces nothing but depends on the reactive choice of the subject. In many cases the subject reacts in a similar way and this is how the assumption is made that the stimulus produces a positive reaction. We argue that, at some point, intermediate between the experience of Flow and the production of the response, a choice is made. If this were not so we could not argue that flow could also “produce” resistance. Consider Bart Simpson. He was enjoying the game (in a flow state) up until the moment he realized what was happening. An understanding of Flow that assumes that the subject can only be positively motivated is an echo of Behaviourism and does not relate well to the postmodern, hyper reflexive consciousness.

7.5. Motivational Theory and Educational Computer Games.
We began the present study by noting the popularity of video games, how they were constructed around proven learning principles and how, if we took these two observations together, it suggested a viable basis for the notion that computer games had a significant contribution to make in education. However children play games for pleasure while their relationship to education, though not excluding pleasure, is a good deal more complex. Therefore it is reasonable to look for the reasons and causes which might bring the child to a computer game either designed or intended for learning.
There are said to be two forms of motivation; Extrinsic motivation where the subject is energised by an expectation of external reward, e.g. getting that promotion,
passing that exam, and Intrinsic Motivation where the subject finds reward from some aspect of their personal experience. Even when motivation commences extrinsically, e.g. starting a course to achieve a qualification intrinsic factors may come to sustain the progress in the longer term (Harmer 2006). Developing lifelong learners capable of learning independently and autonomously through intrinsic motivation has long been a fundamental goal of education (Small 1999). There is a certain genius in the design of computer games which ensures that, although the player is gravely challenged, the degree of challenge is monitored by the software of the game so as to measure the players progress and keep the play at the limit of the players capacity but never exceeding it (Maher 2009). This is in accordance with sound motivation theory where the learner must never be left to believe that the task is beyond him (Small 1999).

There are various justifications offered for the recommended use of computer games in education. Through technology games create rich visual spaces which draw the players into a prolonged and pleasurable experience which can either be fantasy based or real or can combine elements of both aesthetics (Poole 2001). Games are highly motivational, challenging the player to have fun; a key component in the human learning process (Bisson 1996). Winning is central to the sense of fun and extends further than defeating an opponent or driving a game to victory. Winning includes learning the laws, conditions, mores, and motifs of a new world, becoming a part or character in that world and engaging with others to achieve a shared objective. Pleasure is enhanced for the player by instantaneous visual feedback (Prensky 2001).

There are broadly two kinds of games: "mini games" which allow for quick outcomes and more complex games which are prolonged and can involve extensive and complicated play activities (Mitchell 2003). Gee (Gee 2004a), has identified 36 learning principles in computer games. Players are challenged in games that can last hundreds’ of hours in the process being obliged to engage in intense cognitive effort centred on problem solving and experimentally based thinking (Ibid).

Games are highly social. There is a stereotypical image of a youth, isolated in his room, cut off from normal socialization processes. The norm, however, is that games are played with, and against other people. The socialization aspect of online games and potential for language learning will be discussed later but it should be noted that online games-in this case, World of Warcraft (Blizzard 2010) - are organised in guilds.
of up to two hundred people— an ideal environment for multiple forms of learning. The continuing necessity in games to solve problems while adapting to changing environments develops personal flexibility and creativity. Computer games have been used to foster critical/creative thinking at college level (Doolittle 1995). Games are value neutral and the general sense of involvement and accomplishment they promote can be positively experienced by those either sensitive to peer pressure and/or low in self-esteem (Dempsey 1994).

Success in an online game such as World of Warcraft requires the development of social, technical and organizational skills that some argue will be of more value in the 21st century than the skills commonly available from the drill and test ethos of traditional education, (Hayes 2010, Steinkuehler 2007). The various internet forums which host a variety of discussions on technical questions e.g. players arguing over the mathematical procedures for determining points, require the deployment of scientific skills often unavailable in classrooms (Steinkuehler 2007).

Motivation is a term which is freely deployed in both educational and psychological circles. The precise definition of the concept is elusive and few theorists seem ready or willing to agree on all its ramifications. The challenge is compounded when an effort is made to reconcile different streams of influence from affective, behavioural and cognitive areas (Gardner 2006). Part of the problem regarding definition stems from the presence of so many variables that certain researchers are prepared only to accord the term an umbrella status covering a multitude of disparate and often contradictory theories (Dornyei 2001). Motivation research has a long history and it might seem reasonable to expect it to be in a position to deploy theoretically sound recommendations in the pursuit of effective teaching, but such is not the case (Ibid). Motivation is central to any effort to understand how and why players learn in computer games. We begin with a consideration of motivational factors which might lend themselves to educational outcomes however we will conclude with a discussion of a study by Hoffman and Nadelson (2010, Garris 2002) that questions previously held verities.

Approaching computer games from the perspective of their instructional potential poses three main questions. What are the essential aspects of games which are relevant from an instructional perspective? Secondly, how do these aspects trigger motivation? Third how do games produce educational outcomes given an understanding of the first two conditions? These three questions go to the heart of
how motivation generates instruction by the use of computer games. This is the theory; how to actually build successful games is a greater challenge, one marked by frequent failure:

“Unfortunately, there is little consensus on game features that support learning, the process by which games engage learners, or the types of learning outcomes that can be achieved through game play. Ultimately, we run the risk of designing instructional games that neither instruct nor engage the learner. Bargain bins in software stores attest to the difficulty in designing appealing and instructionally sound computer games” (Garris 2002, p.442)

Lack of consensus in the answers to the questions posed earlier leads often to games that fail both as entertainment and instruction. Though behaviour can be extrinsically motivated (the person seeking external rewards e.g. money ) most research models have emphasized intrinsic motivation where the person derives the reward as part of the participation in the task itself (Malone 1987). Malone (Malone 1981), proposed three dynamic factors as intrinsically motivating and applied these to the pleasure derived from playing computer games and consequently, in their design and development. As to the procedure of game design; it follows in three stages The first stage is to identify certain characteristics of game play. Second these identified characteristics will trigger enjoyment and interest (Garris 2002).Finally the pleasure generated will encourage persistence and willingness to remain on task and encourage learner feedback. The key feature from an instructional viewpoint is not so much the pleasure gained as the willingness to continue playing:

“the key component is the game cycle that is triggered by specific game features. A central hallmark of game play is not that users play a game and then put it down but that users are drawn into playing a game over and over” (Ibid, p.446).

The game cycle is central to the design of a successful computer game. Designers of educational games seek to maximise the amount of time a player spends in the game and work to ensure that they are motivated to return to playing. As the player moves in the game he is actively constructing the knowledge of the home environment and the game conditions.

Garris , acknowledge that what they are seeking to exploit i.e., the tendency of players to persistently return to successful games, is pathological:
“Although we are not concerned with the pathological aspects of computer game usage, one hallmark of addictive behaviour is that people repeatedly return to that behaviour” (p.448).

In a game cycle the motivational processes are mobilised when the player enters a cycle of enjoyment and feedback. The game generates a cycle of dependencies in three phases. Interaction and feedback from the play creates cognitive/emotional reactions which stimulate desirable behaviours from the learner (Ibid).

7.5.1. Debriefing.

“The most common error teachers make when using games is to add up team points and move on. The whole point of playing academic games in the classroom is to provide opportunities for students to examine important content in a lively and enjoyable venue. To stimulate analysis of important terms and phrases, a teacher can ask students which questions were difficult to answer and why” (Marzano 2010, p.72).

Marzano goes on to offer the example of a maths class where students had difficulty in creating an image to represent the Fibonacci sequence. At the conclusion of the game the teacher would enquire of the students about their difficulties representing the concept. What resulted was a pedagogically useful discussion on the concept of the sequence (Ibid).

Debriefing is the link between the game cycle and the learning outcome. It is the point where the teacher gets to ascertain what, if any, are the learning outcomes that have emerged. Debriefing serves to encourage reflection by the player/learner which allows the player to make cognitive connections between the experience of the game and that of the everyday world (Crookall 1990, Gaba 2001). Debriefing promotes a deconstructive approach to the learning activity in which observations and experiences encountered in the virtual world are related to those in the real world (Gaba 2001). The debriefing process is seen by some as the most critical element of the experience of educational games. It is the point at which the teacher is in a position to decide if the use of educational games was justified; the most critical part of the gaming experience. During debriefing a review and analysis is conducted of the events and features of the game (Lederman 1992). The player/student can draw parallels; make inferences, and comparisons between game world and real world events. Garris et al (2002) seem to be of the view that if the game were a “pure” game
it would be difficult to extract learning value from it as the game would exist solely for its own sake. This is in direct contradiction to the widespread view that COTS i.e. Commercial Off The Shelf games can be retasked for educational purposes (Randel 1992).

Experiential learning, however, does not happen in a vacuum. The player/learner must be properly supported for effective learning to occur. Dewey’s (1938), dictum “experience plus reflection equals learning” come into play when the learner has the opportunity to express and reflect on the experience of the game. Mayer, Mautone, et al(2002), concluded that evidence for pure experiential learning without support is almost non-existent. The issue of the effectiveness of experiential learning is highly contentious and has been critically challenged(Mayer 2004, Kirschner 2006). Debriefing can be seen as one answer to the challenge in that it does not leave the learner isolated.

7.5.2. Hoffman and Nadelson Offer an Alternative Interpretation of Motivation in Computer Games.

Hoffman and Nadelson sought to provide insight on three questions;

1. What factors do individuals consider when deciding to engage in video gaming?
2. What aspects of the experience contribute to consistent reengagement?
3. What are the significant motivational variables associated with video game play?” (Hoffman 2010, p.250).

The answer to question 1 was in three parts; escapism, social connection, and the achievement of a task related goal. 84% of the students interviewed nominated pleasure as their chief motivation for computer gaming. Pleasure took the form of escape from the demands of normality. While most students approached games from the aspect of fun some valued games as a means of sharpening their cognitive capacities:“‘it is a recreation, but, um, I enjoy—I enjoy thinking. I enjoy thinking, I enjoy learning, I like strategy-type games that let me really think my way through something.’”(p.260).A sense of self efficacy and flow combined with the need to repeat pleasurable experiences was the basis of question 2 and these factors seemed to repeat for question 3.
Gameplayers were observed to demonstrate high levels of commitment and engagement to the game. Interviews reported that players were task directed. The Zeigarnik Effect, cited in Hoffman and Nadelson (2010) is a concept drawn from Gestalt psychology and proposes that an obstacle to the achievement of the desired goal elevates the value of the goal. If the player believes the goal as attainable the value of achieving the goal increases with a consequent increase in the level of engagement and motivation. However this cannot be viewed in isolation According to Hoffman and Nadelson the correlations for mastery and goal performance orientation were surprisingly weak: “survey data indicated neither mastery or performance goal orientations, nor ego goals were predictors of engagement”(p.266). This appears to contradict the earlier findings that relegated socialization to a secondary role. Hoffman and Nadelson suggest a solution by proposing that it might be a case of competing motivations. It is a universal human experience that the experience of pleasure is spoiled by the introduction of a non-pleasurable stimulus. Therefore a player cannot obtain pleasure exclusively from play if he provokes resentment from his peers and co-players by overly dominant or aggressive game play (Ibid).

Conscious that current research supports the notion of transfer of skills from computer games the researchers enquired whether the subjects learnt anything from playing games. Responses were lukewarm:

“Participants indicated knowledge acquisition in some domains, such as learning statistics related to sports games, but answers varied broadly from learning advanced strategic knowledge to gaining nothing at all. A few participants claimed accelerated ability in logic, critical thinking, and the development of creative ideas, while most rejected the possibility that any meaningful learning occurred. One participant summed it up for us stating, ‘Like as much as you might learn something when you go to a movie.’” (Hoffman 2010p.265).

It is important to note that the question of incidental transfer of skills has not loomed large in the considerations of the educational potential of computer games. Scholars such as Squire (2003) have indicated that transfer does not take place in any significant sense in educational contexts whereas other experts report studies that have displayed notable improvements e.g. in the surgical skills of doctors performing laparoscopic surgery (Prensky 2001). One may well wonder at the choice of subject to demonstrate improved learning. At the least one can point to the difference in context.
Doctors are adults and already motivated. This debate will possibly be settled when the parties agree to a clearer definition of terms and objectives. Squire seems to lean in an academic/educational direction while Prensky is interested, here at least, in the kinaesthetic acquisition of skills. In the study under review, while none of the participants indicated a desire to learn as their motivation to play they did report incidental or tacit learning:

“So, whether or not I can learn anything I’m not sure, but it is—it’s not a mindless process. You have to really be thinking about some of the things you’re doing. I guess I’m saying that just in improving your critical thinking skills, really” (Hoffman 2010, p267).

Kiili (2005) and Owston (2009) observed that players acquire skills during the course of game play. Creativity, deductive reasoning the ability to form and test hypotheses, and collaborative skills are fostered through playing computer games. Although there seems to have been a sense of awareness that game play did promote cognitive activity the main motivations for the participants in Hoffman and Nadelson (2010) were hedonic, with the opportunity to socialize and achieve set challenges as important secondary considerations. The hedonic factor was the prime factor as revealed by regression analysis which indicated that players were spending a considerable portion of their time in playing games. Socialization, however, could not be underappreciated as it was also a catalyst for play (and for prolonged play) even when the player was not particularly successful (Ibid)

The research by Hoffman and Nadelson begins to diverge from earlier studies by proposing that the antecedents of engagement are dependent on a predetermined interest in gaming and moreover, that this interest was marked by strong effects towards gender and hours of play. Decisions taken pre game as to game type and genre had strong influences on the degree of engagement:

“Our results represent a conundrum for researchers who speculated that video gaming is a context for academic learning and opportunistic pedagogy. Our evidence suggested that games are unlikely to fulfil instructional expectations unless a direct relationship exists between the game and the learning context. Participants did not perceive, nor enter into video gaming with an educational
intention. Engagement in video games for socialization, and not learning is consistent with findings of a recent 3-year ethnographic study on the use of digital media and games conducted by the University of Southern California and University of California, Berkeley” (Hoffman 2010, p.268).

We have considered the main issues around motivation as it impacts on the development and application of computer games. We have emerged with a sense that this is not a topic which can easily be clarified. Malone and Lepper individually and collectively, have contributed foundational research to the problem of motivation, much of which was relevant here. However, there is a recurring feature when dealing with research on digital technology and it is not the irrelevance of previous research but the way in which technological and cultural change combines to throw up new variants in attitude and behaviour. We will close this section by considering the implications of a cultural verdict on computer games.

“Gaming participants appear to experience a different context for developing skills than those associated with real-world classrooms. The gaming context is a recreational forum designed to provide entertainment. Many traditional learning environments are competitive, evaluative, and unforgiving to those that do not achieve. Thus, we believe there is limited transfer of motivational engagement between the context of recreational gaming for entertainment and most current educational domains due to vast contextual differences.” (Hoffman 2010, p.267).

A pattern of this study is that we have critiqued an observed tendency in electronic games to invest in core concepts supporting games but to come up short and not go further in understanding and utilising the concepts that have been identified.

7.6. Resistance.

A central pillar of the worth of computer games for educational purposes is their ability to motivate the player/student. If this is questioned then all then the main cognitive benefit i.e. problem solving also comes under challenge. Occasional and informal use of computer games in the class does not, in our view, fall under the aegis of the larger claims being made for educational computer games. Teachers may utilise
games for the sake of engagement, however, games so used are no different from any other pedagogic option the teacher might choose to adopt.

At the outset we noted the prevalence of the idea that games could be harnessed for education; that their observed energies for pleasure, engagement and motivation could be diverted into education with all the expected benefits that would thereby ensue. We subscribed to similar notions and it was only when we began to debate the effects of ideologies of education and technology that our views began to change. To put it briefly, there is a possibility that the project of educational computer games is vulnerable to a postmodern critique. This is because the empirically based notions of harnessing and diversion can be viewed as essentialist, instrumentalist, and ideologically driven. Here we have industrial education drilling into the ground water of computer games to irrigate its lack of inspiration and motivation.

Critics responding to our scepticism about the unqualified nature of the motivational power of games for education might ask where such concerns arose from. Are there precedents? Can we cite an instance where research has observed and recorded even one example of actual resistance? The answer is no. All we have is reasoned analysis supported in part by application of knowledge from comparable circumstances.

Sanford and Madilll (2006a) argue that resistance is a badge of identity for alienated young males intent on the formation of their own forms of literacies. Hollander and Einwohner (2004) argue for the invisibility of resistance as a strategy by the powerless to counter the overwhelming power of the oppressor. We would take these two observations one step further and contend that it is possible that resistance is not always fully conscious and may not make its appearance unless and until repression requires it to do so. Repression seems an extreme term to employ in a debate over games and education. However we would see at least an aspect of repression in the tendency to ignore or disrespect boundaries. We have argued for the possibility of a boundary existing for the young player/student between the ludic sphere of private life with the sphere of discipline that circumscribes education. Certainly one can find the playful in education and discipline is a necessary aspect of private life, however for the purpose of this debate the actual nature of the boundary is not relevant. Whether it is a distinction between two genuine spheres of living or whether it is an artificial distinction established by culture we contend that the boundary is no less real and will provoke resistance if those who advocate educational computer games march across
that boundary with the expectation that the games they bring will be accepted with unquestioning enthusiasm.

“In the attention given in recent years to the role of schools in economic, political, social and cultural reproduction we may identify a set of ideas which might usefully be called resistance theory (Walker 1985, p.63).

Attributing the reported low levels of motivational transfer to “contextual differences” might be understating the problem. Arguably it goes to a failure to question the monolithic stability of motivation theory. Both theoretical and empirical studies of resistance categorize it as a product of reproductive processes rather than equalization processes in schooling and education (Erickson 1984, Giroux 1983, 1988). Schools function as nodes of manufacture and representation of dominant ideologies and secure the distribution of the necessary skill pool that will ensure the social division of labour.

While Hoffman and Nadelson (2010) are effective in questioning the motivational ethos of games their approach is observational and not concerned with why certain students did not seem to display enthusiasm for learning with computer games. We propose to argue that lack of motivation is more than just an observable absence and is symptomatic of resistance in a muted but all the more effective form. Furthermore we suggest that the phenomenon that Sanford and Madill (2006a) observed where resistant males constructed alternative identities through encounters with digital technology is an exhibition of resistance against social reproductions of acceptance and conformity. The concept of resistance has gained currency although there are qualms as to whether resistance has an active, intentional aspect (Hollander 2004). The tendency to romanticize resistant practices can occur and warnings against this attitude are well taken (Walker 1985).

The problem of definition goes further, however in that so many are wont to employ a concept of resistance for their own purposes (Hollander 2004). Resistance theory is useful for highlighting the potential of conflict in school environments; whether that conflict is overt or covert. Our business with resistance in relation to educational games is to question the safety of the assumption that educational games can be introduced to the classroom en masse without there being consequences. In our view there is limited significance in noting that research groups of students have found
educational games interesting. We justify this position by pointing to the biasing effects of short term application in classroom settings and students tendency to please their interlocutors.

The problem with motivation is that the subject is assumed to be positively motivated. The theory does not seem to be set up to cope with the notion of a subject who is motivated not to do something; that derives pleasure and agency from consciously or unconsciously, visibly or invisibly, countermanding the policies, plans and agendas of the wider society or schools as the avatars of that society. It is possible that the reason motivation theory does not seem to have sufficient exchange with resistance theory is that they come from different disciplines; motivation from education and educational psychology and resistance largely from sociology and gender studies.

Given an evident expansiveness in the degree of latitude that writers on resistance seem to allow themselves it is incumbent on us to at least formulate a sense of direction in which we intend to take our discussion on the issue. We are interested in the phenomenon of resistance as it occurs in education. We are interested in resistance as a form of behaviour among a certain type of marginalised student. Even more exactly than this we wonder to what degree that marginalisation is self initiated and maintained as a form, perhaps, of protest. Virvou and Katsionis (2008), reported in their study that using games in classroom seemed to benefit the students that customarily underperformed and who often were the same students that were obstructive or uncooperative in routine classroom conditions. This entails two possible consequences. Either Virvou and Katsionis have found a way to overcome resistance or the resistant subject in one cultural context is not as resistant in another. It is even possible that both conditions might operate simultaneously. We will return to this later as we have yet to establish a satisfactory condition for the reader to accept our contention that resistance in education is a topic that cannot be ignored if we are to understand both the motivational, and anti-motivational aspects of the computer game in the classroom. It is part of our contention that a premature or ill-considered deployment of computer games in education could have consequences for a later deployment of effective games. In the spirit of an applied approach we would offer that an insufficient sense of the consequences of covert and overt resistance could affect the eventual success of educational computer games.
There are several key attributes to look for in a consideration of resistance; however we will try to confine our discussion to the more germane issues. To begin with, what is the scale of the resistance? How widespread is it and how pronounced? Of real consequence to the place of resistance in education and educational games is the target of resistance. Are resistant students directing their animus at the school authorities, the teachers, the modes of teaching, the family, or society with its freight of ideological assumptions? What are the intentions of resistance, if such intentions actually are in play? Young people may not be so politically radicalized as to wish to mount a revolutionary offensive upon society, nevertheless their resistance might have a substantial effect in serving the preservation of a sense of self and group identity in the face of perceived social and political encroachment (Sanford 2006a). The preservation of a sense of identity is a powerful agent for resistance (Hollander 2004).

The dual concepts of recognition and intent are key to the comprehension of resistance. There is disagreement with scholarship that insists on the visibility of resistance:

“One issue is the visibility of the resistant act: Must oppositional action be readily apparent to others, and must it in fact be recognized as resistance? Early work on resistance, which focused on large-scale protest movements and revolutions whose members confront their targets directly and openly, took for granted that resistance is visible and easily recognized as resistance” (Hollander 2004, p.539).

Scott stipulates that organised, visible resistance might be unworkable and dangerous for the powerless and that more subtle and less visible forms of protest might come into play:

“In contrast, more common, "everyday" forms of peasant resistance "stop well short of collective outright defiance. Here I have in mind the ordinary weapons of relatively powerless groups: foot dragging, dissimulation, false compliance, pilfering, feigned ignorance, slander, arson, sabotage, and so forth" (Scott, cited in Hollander 2004)

Incidences of pilfering, slander, arson and sabotage notwithstanding, examples of dissimulation, false compliance and feigned ignorance are common enough experiences in the classroom. The issue of intent is only marginally less important
than recognition (Ibid). Central to the notion of intent is the degree of consciousness in the resistive act. If the act is consciously resistive then it must be apparent.

Should resistance be visible? Put another way, if it is invisible, is it still resistance? Opinions are divided here and there is a view that where resistance is not deliberate, overt and recognised by its target, it may no longer qualify as resistance (Hollander 2004). However, our focus is on young learners where, we would argue, that the requisite life skills of self-awareness and self-expression being still at a formative stage, the practice of resistance is inchoate and, as yet, unformed. Also, as we have seen with the peasants, there is an advantage in unorganized opposition and that is the inability of the disciplinarian institution to locate a precise target for retaliation.

Rather than consigning resistance to an eternity of resolute, if unproductive, opposition some theorists began to take the view that resistance could be a creative act leading to social and cultural renewal. Resistance, in this interpretation was more than a reactive opposition to authoritarianism but might tend to subvert “the reproduction of oppressive social structures and social relations” (Walker 1985, p.65). While considerable research has been amassed on the practices of exclusion in education progress has also been made in formulating theoretical explanations for the strategies that explain how people, in groups or as individuals resist situations that they regard as oppressive (Knight Abowitz 2000).

Shuy (1986) takes the view that an emphasis on academic subject matter is a provocation resulting in resistance to teaching practices. Consequently a classroom that encourages students’ personal knowledge and a responsive teaching style will foster a culture of compliance (Ibid). There is a potential weakness in these kinds of theorizations in that they fail to view the student in his out of classroom experience. We contend that the space to expand compliance and limit resistance is limited if the student is only viewed as an avatar of the classroom. The vast and complex bundle of opinions, attitudes, beliefs, frustrations and expectations which each student brings in from a non-school culture must surely have bearing.

Resistance is “opposition with a social and political purpose” (Knight Abowitz 2000 878). This implies a teleology that the muted, but nonetheless effective opposition of youth does not display to any noticeably significant degree. In a context of students and youth it could be argued that covert resistance is immune to the blandishments which would be directed towards organised opposition by corporate producers.
Children have a complex and not unreflexive attitude towards the consumption of media. For example a recent survey of Canadian children between ages 3 to 10 revealed that *The Simpsons* was their favourite TV program. However they were clear that this same program was the one they did not want their juniors to be watching. As a site of resistance pop culture can be seen as an alternative curriculum, (Masterman 2001). Educators who insist on hermetically sealing pop culture out of the classroom neglect connections to the lives of their students. Homer and Bart Simpson engage in an ironic critique of the norms and mores of American culture even as they promote commercial products. Education is a strong theme but they have also targeted issues as disparate as gender, religion, race, class, age, sexuality, corporate responsibility, corruption, nuclear energy and workplace behaviour. We will see a recurring theme of the hierarchical nature of school authority (and resistance to it) transposed to a technological substitute when we consider Bart’s encounter with an educational computer game.

### 7.6.1. Resistance and Masculinities

“We have suggested, tentatively, that the pleasures in technology described here are pleasurable in part because they provide a sense of mastery over uncertainty to people who often do not otherwise feel very powerful. Others have argued that building technologies and exercising engineering-type skills bring with them a powerful sense of mastery that acts as symbolic compensation for a lack of power or competence (so, felt mastery) in other realms, including the emotional and social” (Keif 2003, p.320).

Keif and Faulkner report an underlying anxiety in the relationship between children and technology. Aware of the basic uncertainty underpinning technology, technologists respond with technical solutions to minimise that uncertainty, intended to offer players a sense of agency and control.

Western (i.e. patriarchal) society has responded to the alteration in gendered subjectivities with a rigid policing of masculinity. The response on the part of those who would challenge this is to posit that there is no such concept as “masculinity” rather a series of masculinities which the male is free to choose from (Connell 1995). Post Structuralist theorisations allow for multiple ways of constructing masculinity. Male subjectivities are open to negotiation and renegotiation.
Masculinity is not taken as set prior to social interaction. Masculinity is performative and can be enacted in hegemonic, complicit or subordinate modes (Ibid). Hegemonic versions of masculinity:

"are most highly valued, that is, performances of masculinity that embody "the currently accepted answer to the problem of the legitimacy of patriarchy, which guarantees (or is taken to guarantee) the dominant position of men and the subordination of women" (Ibid, p.77).

Hegemonic masculinity describes the elite that govern the development and production of technology (Connell 1995) and, by extension of video games. Adolescent male masculinity can be said to be subordinate, on the basis of age, yet it is also complicit with a patriarchal structure in as far as it consumes gendered stereotypes of women. Others have observed that boys are actively engaged in a process of resistance to the totalizing tendencies of both hegemonic masculinity and femininity (Sanford 2006a). Youth have mobilized new technologies, particularly, computer games as tools of resistance in out-of-school environments. Boys spend more time on computer games than do girls. Girls use the internet more than boys but use it for educational and social purposes (Rowan 2002). Males are socialized into different attitudes to machines and science from an early age.

7.6.2. The Trouble with Boys; Literacy and Male Adolescents.

Resistance by students to attempts at cultural domination sometimes result in the diversion of these students from routes leading to later academic achievement (Erickson 1984).

In a landmark study of the operation of resistance, Willis (1977) proposed that a form of resistant work culture is channelled through a habitus of counter school culture that is itself mediated through the working class culture of the family and neighbourhood.. Echoing Erickson (Erickson 1984) these males, having identified their masculinity as opposed to intellectual work, are thereby prepared for manual occupations having distanced themselves from a school based culture. The Willis study was carried out in 1977 which is a considerable length of time when dealing with issues of social and cultural transformation. How relevant is Willis today?

In recent times concern has grown on foot of reports of a decline in literacy rates among boys as compared with girls (Sanford 2007) The issue continues to be a media
and parental concern worldwide. Tests are reported as indicating that boys are not coming up to par, compared with girls, in reading and writing. Solutions have been proposed from increasing reading levels, to remediation, to identifying interests that appeal to boys. Recent research in Britain (Millard 1997), and Canada (Blair 2004) have thrown doubt on whether simplistic solutions are applicable and have begun to take a more considered view of gender issues linked to literacy. These studies have suggested that there are a set of gendered activities linked to the literacy practices of boys. It was found that boys have a range of literacy practices which they have acquired in out-of-school-contexts. These include literacies acquired in “chat rooms, internet, comic books, cell phones, blogs, trading cards, zines, film creation, and video games ... a few of the new and alternative literacies that students are engaging in largely outside of school spaces” (Sanford 2007, p.434). The emergence of these new media forms has led to a reappraisal of the concept of literacy, extending the definition to cover text forms emerging from information and multimedia technologies (Sanford 2007).

"the culturally and linguistically diverse and increasingly globalized societies...account for the burgeoning variety of text forms associated with information and multimedia technologies). In other words, literacy pedagogy needs to move beyond the "formalized, monolingual, monocultural, and rule-governed forms of language" (New-London-Group 1996, p.6)

A disconnect is said to exist between the practices recognised and encouraged by teachers and the out of school contexts in which children are adopting and adapting other literacies. Video games are a new literacy form, however, as we have argued earlier ,the emphasis must be placed on “literacy” rather than “new”. Moberly (2008) has made a case for the continuation of literate practices within computer games, albeit in a changed and heightened form. Therefore the “new” in new literacies can be said to reside more in the opportunities and pitfalls offered by a new technology such as computer games and not a retirement of older literacy practices. Rapid intensifications of knowledge must inevitably lead to a world in which the learner with technological insight and skills will have a competitive advantage (Sanford 2007). Kress (2003) argues that the combined effects of four transformational factors-social, economic, technological and communicational- will
have, indeed are having, a profound effect on society; an effect moreover for which schools are as yet unprepared. In this cultural mix boys are engaging heavily with new media forms i.e. computer games and this engagement is argued to have the effect of creating new literacies.

The perception is that of videogames as a form of resistance against the older form of literacy learning: “By engaging in these activities that resist traditional literacy learning video game players are keeping up with the changing technological world faster and more productively than schools are” (Sanford 2007, p.288) Resistance was interpreted as a constitutive element in a boy’s self-perception of their masculinity. This extended to cover all forms of femininity, restrictive i.e. hegemonic masculinity and consciously practiced resistance to the rules of society and school. Boys were found to have access and were playing adult rated games.

Whether consciously or unconsciously boys are playing video games as a path of resistance against the prevailing mores of society. Increased skill levels and consequent success in game play gave the boys a sense of stature and acceptance in their peer group (Sanford 2007). In videogames boys are said to find alternative spaces from the patriarchal reality of adult society. The restrictive, rule bound nature of this mundane reality is said to be one boys strive to resist. Gameplay creates a fantasy space where youth are at liberty to engage in transgressive activities while remaining in a place without real world consequences (Ibid). Videogames appeal to boys because of the transgressive potentialities they enable.

We asked if the judgement expressed by Willis (1977) was relevant to a society almost 35 years on from the time of the study. If one considers a number of variants the answer seems to be surprisingly so. Granted one might have difficulty locating the kinds of working class societies that Willis posited as the hotbed of working class disdain for education and its reproductive ideologies. Many of the kinds of manual jobs that sustained these neighbourhoods have either been automated or moved to low cost economies. In a post-industrial society debate has started as to how to occupy the the millions of former manual workers who will now have to accept an existence of enforced leisure (Rifkin 1995, Squire 2005).

7.6.3. The Bart Simpson Syndrome.
“We feel the primary reasons computer games have not been more fully integrated in the writing classroom are because of traditional conceptions of work and play that highlight differences between classroom space and gamespace as binary opposites” (Shultz Colby 2008, p.302).

If the term “writing” were deleted from the comment above the passage might well be applicable to all classrooms. The writers are correct and in all probability fail to state the case starkly enough. The classroom space and the space players occupy in games are oppositional binaries however ascribing the cause to “traditional conceptions of work and play” is to render in soft focus what is, we would argue a structural problem that might derail the project of educational games. Once more it has to do with the possibility of both overt and covert resistance.

During a recent episode of the Simpsons (Simpsons 2011), Bart found one of the old arcade type video games. Play consisted of matching the states of the U.S. to the correct capitals. Bart was enjoying the game until he realised to his horror that he was in an educational situation. With a cry of “How dare you teach me something” he crashed the game (Simpsons 2011). Given Bart’s disdain for schools and schooling it would be easy to dismiss this as an amusing vignette of typical Bart behaviour. However, are The Simpsons, with their accurate finger on the pulse of western culture, asking a deeper question? This form of behaviour is an example of what can be typified as overt resistance Bart was happy to play a learning game up to the moment he became aware he was being taught. Arguably his “How dare you teach me something “utterance, is not an objection to learning as much as it is an objection to teaching. Bart did not say”How dare I learn something”, which was what he was doing. If we regard the character of Bart as an archetype we can see that his actions are archetypal. Given this possibility it is possible that Bart is resisting the conflation of the ludic, id driven, sphere of his life with the dimension of regimentation that he seems to identify with school and schooling. Bart is the aleatory subject par excellence.

If in some as yet undefined future a formal decision is made to embrace the new technology of educational computer games, games will become ubiquitous in the classroom and students will find themselves playing games, not just in isolated cases for limited periods of time as with so much of the present research but everywhere
throughout the educational area and all of the time. Reference to research brings up another issue. To what degree can research using games in classrooms for a strictly limited period be relied upon? Have the researchers in educational games studies considered all the possible consequences of the widespread application of educational computer games? If games become the new normal in class how will it change the relationship children have with the games they play outside of school? Games create a space for a child to be a child without the looming presence of adult supervision. In that sense they tap into one of the most primal needs of childhood. If games become widespread as an educational tool it will largely be as a result of academic research. Therefore it is simply not good enough to blithely assume that the motivational appeal of games is all that will be required to keep games in the classroom. We also have to consider anti motivation, or to give it is orthodox name, resistance. If, as Bart suggests, the ludic sphere is being conflated or interpolated into the area of the superego and the disciplinarian what we are potentially looking at are occasions for massive resistance. There is need to recognize boundaries and the assumption that the motivational appeal of games is all that is required for their introduction to the classroom, such boundaries are not being recognised.

One possible consequence of launching educational games at the classroom before considering all possible objections is that games might fade away after a relatively brief time leaving researchers and developers with the sense that, for all the effort invested in diligent research, for all the painstaking and patient study, for all the funding devoted to ensure that the mistakes of the past would not be repeated, we emerged with little more than Edutainment 2.0. The best time to deal with a problem is before it becomes an expensive problem.

We believe that games for education is an opportunity offered by technology to realize at last the promises made on behalf of technology. However the opportunity could be squandered by launching games into education without due consideration for their intended audience. Neither motivation nor resistance theory will suffice on their own. There must be an interchange between the two disciplines to answer vital questions in due time.

We have proposed that motivation and resistance should be considered together and that by doing so they might shed light on each other, although we cannot escape the impression that resistance has more to say in the conversation than motivation. It is like a dysfunctional marriage where one partner monopolised the conversation. Now
that the other partner has been given the opportunity to speak they have quite a lot to say.
The kind of resistance theory we utilised discussed seemed to come more from sociology than education. Resistance taken from a sociological direction seemed to give more fruitful perspectives for two reasons. The first was that the resistance theory of Giroux (1983) and others from that time, while sound, was top down and concerned with the analysis of ideological positions. The second was that sociological theory concerned itself with resistance from learners. It was bottom up and more suited to our purposes.

The concept of resistance need not be confined to students and young people. Adults in key positions are capable of displaying effective resistance. Interestingly, in the different modes of resistance of students and teachers we see the imbalance of power between the two groups. Much of the resistance of students was mute and covert. On the other hand resistance from teachers and educators is decidedly overt and confrontational, as we shall now see.

7.6.4. Institutional Resistance.

“We resolved to develop a digital video game to address the two pressing needs in Hong Kong outlined above: the requirement for supplementary English language instruction and practice, and for increasing users’ sensitivity to environmental sustainability… We didn’t want to develop another drill and practice traditional educational game. Our target audiences are initially Hong Kong primary and secondary school students” (Tam 2007).

We will now look at the results of an attempt to introduce educational games as a long term practical element of a school’s activities. The study originated from Hong Kong where the issue of declining standards in English language acquisition among school goers combined with the awareness of a looming environmental disaster spurred by the economic success of the former colony led to the development of an educational game designed to address both issues. The vaunted ability of educational computer games to encourage and develop critical thinking skill was judged especially valuable in this context (Tam 2007).

Game Design.
More than two hundred teachers were consulted for their views on what would make a successful game. Many of the teachers were keen to emphasize the element of motivation and expected to see it as a feature of any intended design. The developers concentrated on developing scenarios which would challenge the learner/player to mobilise high level thinking skills. This was combined with a selection of required language features appropriate to the age of the student. It is interesting to note that while no direct reference is made to the theoretical support of Willis and Willis (2001), the developers seem to have made skilful use of the principle of Task Based Learning. By combining a relevant pedagogical issue i.e. environmental catastrophe, with a language learning activity they reap the rewards of learners being unaware of a specific focus on the latter.

The game is structured around a quest narrative which tasks the main character with the challenge of rescuing and rebuilding the home town after environmental disaster. Players can take on the identity i.e. avatar, of the main character as a means of focusing participation and encouraging motivation. The player traverses the town encountering a variety of challenges, problems, and opportunities interacting with a number of situations, objects, and Non Playing Characters, (N.P.C’s). In the course of this the players are required to read, listen to and respond to English Language dialogue(Willis 2001).

The development process required two artists, two programmers and a designer. The intended development period overran from six to fourteen months, however, it resulted in a much more substantial and sophisticated product than originally intended. The input of both teachers and students was encouraged through the establishment of focus groups. Notwithstanding the volume and extent of the work required to bring an educational computer game to fruition the designers found the challenge of “actual deployment of the game an even greater task” (Willis 2001)

The reason was resistance from school administration. Having initially garnered positive responses from teachers and principal the response became cooler when asked to purchase the finished product. Another problem was connected to an unequal availability of appropriate computer technology in many Hong Kong schools. This was an issue in spite of the effort by the developers to keep the system requirements for the game as undemanding as possible. Responses continued to be disappointing even when an offer of free games was made to the schools in return for development
data. This pointed to an even more worrying concern; that the negative attitudes derived from other than financial objections.

“We were astonished by the distinct lack of enthusiasm for the game that we encountered among teachers. Their main concerns were understandably entered on how they could measure students’ interest in the game and acquisition of knowledge through the game. We were able to offer clear evidence of significant improvement in the two targeted areas: increased English language skills and increased awareness of environmental issues. We had gathered this data from the children, who almost universally responded positively to the game during the trials. However, many teachers insisted on more concrete’ proof’ and were largely unwilling to recommend the game without this assurance”(Tam 2007).

It emerged that the major concern of teachers was the lack of an empirically reliable yardstick in which to measure, record, and prove student performance. Given that the teachers were initially happy with the verification measures already installed in the game it is possible, at least to speculate that their concerns with verifiability were directed more towards their institutional overseers Teacher caution, towards the game was in marked contrast to the enthusiasm of the student body. Over 88% of the students claimed improvements in learning English from having played the game while over 93% found the range of activities suitable.95% found that it increased their interest in learning and 85% reported that they preferred the game to traditional exercise book.

The developers were disappointed at the reluctance of teachers to embrace educational computer games however they could appreciate that teachers were as much prone to the stereotypes of addictiveness and violence which hold sway in society, perhaps more so as they were conscious of having a guardianship role in relation to their charges(Tam 2007) . The developers cite the plethora of educational software currently available as an obstacle to choice. They point to the time constraints commonly operating in the classroom both for the student in terms of achieving tangible results and for themselves in having sufficient time to familiarize themselves with the technology.

In conclusion it can be seen that many of the features in the study by Kirriemuir were present when it came to a real life attempt to make educational games part of the
school reality. However the strongest feature is the marked distinction between the initial enthusiasm of the teachers and their later misgivings when asked to consider the induction of educational games as part of teaching practice. One can assume that the initial enthusiasm was unfeigned so it falls to consider what has changed. Remember their concerns with proof and a reliable means of measuring the results achieved. It seems reasonable to conclude that the standard of proof that would be required when faced with the actual arrival of games as part of teaching practice would be its acceptability to school administration and to higher authorities outside the school. However there are also the observed misgivings and consequent resistance of the teachers themselves. The resistant practices of educators differ in one crucial way from the resistance of students, Educators resist from a position of power while students resist because they are powerless.

We consider this chapter to be the crux of our study. Much that has preceded it and follows should be seen in a supporting role to what has been discussed here. Expressed informally, the basic idea is that since kids like playing computer games so much it would be good for education if we could siphon some of that energy by building educational computer games. More formally we are persuaded of the motivational effects of computer games and want to explore how to transpose that motivation for the benefit of learning.

We began with a discussion of fantasy and play because we were trying to demonstrate a basic incomprehension of both dynamics among those who develop computer games. Importing the flawed understanding of another field is a recipe for more problems and we would argue that the need to understand the fantasy/play dynamic is raised to an even higher level of necessity in educational games.

The question of motivation needs to be situated in dialectic. As it is it is a self-subsisting positive. If we posit a subject that can be positively motivated for learning we cannot avoid the possibility of the obverse. The articulated form of the obverse is resistance. The notion of resistance can be seen as postmodern while that of motivation is essentially modernist. Modernism sees the subject as centred and capable of persuasion by the grand narrative of reason while postmodern subjectivity is multi-centric, capable of persuasion at one level but refusal at another. The postmodern subject can be both the hero and the victim of consumerism. As such its relationship to culture is both complicit and resistant.
Seen from this perspective, motivation, at least an unreflective use of motivation, in educational games is likely to lead to problematical outcomes in the design of learning games but also in the ways in which learning games are presented. This last point about presentation is crucial because there is a possibility that educational games might appeal to underperforming (and normally resistant). We will discuss the work of Virvou and Katsionis (2008) later who seem to argue for this. We link the postmodern subjectivity of the resistant student to a sense of ease with emerging complexity and will argue that what Virvou et al have noted is the possible emergence of a new type of learner.

7.6.5. Educational computer games as a source of empowerment for underperforming students?
With this in mind we now turn to a study of *VR Engage* by Virvou, Katsionis and Manos (2005) to teach geography to fourth grade students. The challenge was to find a path through a virtual environment and answer a series of questions based on geography, the answers to which would affect the course of the game. When the students failed to answer a problem they were assisted by the appearance of virtual agents to help negotiate the solution. This feature immediately hallmarks the educational posture of the game. In a comparison between game educational software and non-game educational software the researchers found that underperforming students benefited more through their contact with games than did the high performing students, whose performance remained high in either game or non-game medium.

The conclusion was that games offered a motivational inducement to underperforming students. This observation was foreshadowed in Carbonaro, *VR Engage* has a number of virtual worlds through which the player/student can navigate. A collection of fantasy scenes, from castles under water, forests, corridors and passageways underground lend it comparison with popular games such as *Doom* (ID Software 1994). This is a sensible design feature as it matches the expectations of the player/student. Like Doom, *VR Engage* uses an advanced 3d engine. This helps to prevent the risk of poor comparison on technical grounds. Communication with the students is either by text boxes or through voice synthesizers. There are two virtual agents, a dragon (the player’s opponent) and an angel who is a companion. Both agents can use either text box or synthesized voice to communicate. The narrative of
the game is built around the adventure genre which, as has been previously discussed, is a well suited format for learning given its point of origin/definition of objective/challenge/attainment of objective construction. The goal of the game is to enter the virtual world, overcome various challenges and find the lost book of wisdom. Doors to various parts of the underworld are guarded by dragons who will only give entry with correct answers to a number of questions. This particular game is designed for geography learning; however it is worth considering how many other curricular subjects it would serve. An important feature of this game is that the player that fails to provide the correct answers is allowed to ask the dragon for a “negotiation” (Virvou 2005).

This is the point at which the student modelling component mentioned earlier, comes into effect. The component is based on a cognitive theory developed by Collins and Michalski (Collins 1989) and known as Human Plausible Reasoning Theory. The theory observes how inferences are generated by the acquisition of an awareness of similarities, dissimilarities, and generalisations that can be deployed to propose a series of plausible guesses on topics where knowledge is partial. The error the student made in reaching their conclusion is regarded as plausible if they have followed part of a known pattern from the theory. The student is thereby awarded points not only for how close the answer was to being correct but also how plausible was the reasoning process that was used to arrive at the answer.

It is striking to consider that a successful negotiation of the VR Engage game based on knowledge previously acquired, might be of less educational value than for a student who had to struggle to complete the game. Consider that a student, well versed in the subject might have acquired knowledge in a rote context in which case the game experience might be closer to that of Edutainment. On the other hand a student with imperfect knowledge, forced to assemble knowledge through pattern analysis, comparison and the risk taking required for making guesses may emerge with improved cognitive abilities. Arguably the most powerful pedagogic element in this game is the student modelling component. Whereas a straightforward give-the-correct-response-game-and-win is basic Edutainment the addition of the negotiation component raises the game from using a form of educational technology to an educationally informed use of technology. The game allows for negotiation of meaning and knowledge in a learner/teacher context with Artificial Intelligence software taking the role of teacher. As processing power increases and costs fall the
opportunity for the application of Artificial Intelligence (AI) software in educational computer games can only continue. One of the more promising features that AI seems to offer is the possibility of collaborative discourse. Such is the changing pace of developments in the fields of technology and its impact on education that what is being discussed seriously for its present use and significance is either in the process of being superseded or has already been superseded by contemporary developments. Virvou et al (2008, 2005) have used an ITS as part of their study, however technology moves on and “no longer the ITS-paradigm dominates the field of AI and Education” (Andriessen and Sandberg 1999 130).

The second, third and fourth part of Virvou’s evaluation is of interest for the potential benefits of educational games to underperforming students. The purpose of the evaluation was to compare how a designed educational game – VR Engage- would perform against an Intelligent Tutoring System (ITS). Ninety students from a fourth grade elementary school were involved. The ninety were further subdivided into three groups rated as poor, mediocre, and good. These three groups were further divided into fifteen each, one group to use VR Engage and one to use the ITS. Post-test the VR Engage student/players who had been either poor or mediocre made 48.97% and 38.5% less mistakes respectively, compared to pre-test levels. The previous academic performance of the poor students showed a 17.4% and a 6.86% improvement respectively in their performance compared to the group that had used the ITS application.

“In summary, the above results showed that the sub-group of students of previous poor performance, which had used VR-ENGAGE, benefited the most of all the sub-groups from the educational game. In addition, the subgroup of VR-ENGAGE students of previous average performance had also benefited more than the respective sub-group that had used the simple ITS since they made fewer mistakes (and the difference was statistically significant). On the other hand, good students who had used VR-ENGAGE benefited in a similar way with the good students that had used the non-game ITS” (Virvou 2005, p63)

Follow up interviews were carried out with the students to evaluate their reactions to the use of the new software. The interviews revealed a fascination with and enthusiasm for the game software which exceeded reactions to the ITS software used.
by the other group. Praise was not, however, unconditional. The students who had
given a positive verdict on *VR Engage* were the same students that “criticised the
game in comparison with other commercial games and said that they would like *VR-
ENGAGE* to have more virtual objects, a more sophisticated environment, more
adventure and more action” (Ibid 63) The students who made these comments were
experienced commercial game players. This goes to our previous discussion about the
inherent disadvantage under which educational game development labours, now and
for the foreseeable future. Commercial games command budgets of millions of
dollars. Educational games would be regarded as doing very well to raise even half of
that in revenue (Dovey and Kennedy 2006). As more students become experienced
gamers the possible dissatisfaction with educational games as compared with
commercial games may become ever more apparent. In common with Kirriemuir and
MacFarlane’s (2002c) study the researchers were impressed with the degree of
involvement and motivation promoted by the use of VR Engage. Formerly boisterous
students were observed working quietly, absorbed in the task and not bothering their
fellow learners. To some degree this also applied to the unruly students given the ITS
software confirming a view among the teachers that computers in the classroom
seemed to have a positive effect on poorly disciplined students. Some of the teachers
were convinced that the involvement in gameplay had had a transformative effect on
previously unruly students: “they thought that those who had used the game seemed
so immersed that their behaviour in class had changed completely and they had
appeared to be very satisfied and interested in the educational content” (Virvou 2005,
p.64). Certain teachers intended making further use of *VR Engage* by running it from
their lap tops to the classroom projector so that the class could continue with it.

Virvou et al had a positive verdict for the potential of educational games in the
classroom:

“The results from the evaluation showed that students would benefit from
educational games in classrooms and would be quite happy to work with a
computer game, which represents a more amusing teaching fashion than that of
conventional educational software” (Ibid 64).

They emphasized the improvement of learning performance for the underperforming
group as compared with the high performing. The researchers posit that high
performing students will do well always and in varying conditions. This seems to be
confirmed by the relatively insignificant statistical difference between the high

performing scores from the ITS group as compared with the scores of the high performers in the VR Engage group.

The tendency to see the marginal student as someone who can once again be drawn into the path of learning by attracting his wandering attention (we are talking about boys, at least for the present) with some evanescent piece of technological innovation, is an attitude endemic throughout much of games studies. As with other misalignments in games studies it goes to a failure of not starting from, and continuing with, sound educationally based theory. The strength of the research by Virvou et al is a reliance on sound educational theory. We have contended that any other approach than basing games (and all educational technology) on anything other than sound educational theory is doomed to expensive failure. It enables the ongoing capitalist project of the commodification of education where it will always be easier to stuff a game with “eye candy” than design around proven educational theory. It is a sound principle to identify the problem as motivational nevertheless there seems to be a view that motivation is a emotionally neutral energy that can be mobilized easily enough by the application of technical solutions. We have argued against this view.

As we saw in Sanford and Madill (2006a), computer games provide social spaces where players are accepted as peers without pre judgement. Arguably the adolescent creation of a social space is premised on the mutual recognition of the need for and the respect of private space. It follows therefore, that underperforming learners find access not only to a social space but to a neutral space in the game where they feel safe from the public ownership of their performance (or underperformance), the (expected) disapproval of their teachers, and the mockery of their fellow students. In this neutral space they feel sufficiently at ease to risk answers which might have brought embarrassment in the classroom and make attempts at guesses which might have attracted similar results. Failures are mitigated by success which enhances learner confidence and a virtuous circle is established. Piaget, (1952) proposed a function for play as providing an anxiety free space for the acquisition and testing of new knowledge. The implications of Virvou et al (2008) seem to suggest a return of that dynamic to the classroom.

The observations of Virvou et al are supported, albeit indirectly, by Prensky (2001) who proposes that the bulk of students, being heavily invested in a participatory culture with a fundamentally different mode of relationship to data and knowledge, are consequently prone to be resistant to traditional teaching techniques. In most
schools the high performing students, continue to be the cynosure of teachers’ approval and attention. The crucial observation made by Virvou was that, though the high performers did well with VR Engage, they did not do significantly better than had they followed traditional learning modalities while their underperforming classmates showed significant improvement. The high performing student might, therefore, be seen as kin to Caillois’(1961) agonistic subject. The agonistic prefers structure and rules, likes to know what is to be gained from a certain investment of effort and expects defined rewards. He is by implication, an expert at the deferral of pleasure.

On the other hand the aleatory subject seems to evoke the underperformer. He prefers openendedness, lack of structure, a distinct aversion to rules and takes pleasure in exploration (Caillois 1961). He wants his rewards now. Remembering how little investment games makes in providing players with information we can see that the aleatory subject, echoes the profile of the games player. The resister disdains the conformist self-denial of the agonistic:

“We wanna live for now, wanna live while we’re young, want money to go out, wanna go with women now, wanna have cars now and uh think about five, ten, fifteen years’ time, when it comes, but other people, say people, like the ear ‘oles, they’re getting their exams, they’re working, having no social life, having no fun, and they’re waiting fifteen years’ time when they’re people, when they’ve got married and things like that. I think that’s the difference We’re thinking about now and having a laff now and they’re thinking about the future and the time that’ll be best for ‘em.”(Willis 1977, p.97).

Framed in these terms it is possible to ask if the questions of motivation and resistance are part of the larger human narrative and if they are ever likely to be resolved in the confines of a debate over educational computer games.

Educational games seem to work better for the underperforming student. They work in terms of the student rediscovering and re-evaluating his/her own abilities as a learner. Also they have an institutional benefit; instead of funding expensive remedial teaching (which serves to underscore public ownership of underperformance) the school has a student capable of independent learning. If the neutral space in the game allowed the learner the freedom and opportunity to improve, it suggests that there is more to the appeal of games than pleasure and immersion If the concept of neutral
space is valid as a conclusion it is good news for the project of developing educational computer games. There is a danger, however, and one that goes right to the heart of the question of the viability of educational games for the classroom. Again the issue seems to devolve around the consideration of boundaries. Students are encouraged to learn through the medium of computer games yet there seems to be no guarantee nor any effective means of preventing the student from treating the game as a ludic but not necessarily learning experience:

‘Researchers increasingly suggest that a student should clearly see that a particular game is about learning a specific topic and appreciate the expected result. Without explicitly framing the experience as educational, the goals and rules in play take over, [especially] when the game goals work against the learning goals’(Egenfeldt-Nielsen 2008, p.217).

Earlier we discussed what we termed “The Bart Simpson Syndrome and we contended that when students actively resist being taught by games they would do so because of the transgression of boundaries by educational game developers. Bart rejected the game because it was edutainment. In return for the carrot of entertainment students are expected to accept the stick of education. Egenfeldt Nielsen et al (2008) argue that, rather than concealing the learning effect in a welter of play it is procedurally more effective to be transparent as to the educational intent of the game. We would add to this by saying that to optimise transparency, it is time to start thinking in terms of a distinct look, a brand identity, for educational games. They will always suffer by comparison to commercial games. Educational games need to opt out of head to head competition with commercial games. They simply do not have the resources. If educational have their own brand the player can accept their lack of visual sophistication as part of their identity. We are not speaking of an actual brand, as this would raise ownership and copyright issue. Rather a design created under the Creative Commons principle which all educational designers could employ.

Virvou et al(2005) reported that the quietest and most intent students playing VR Engage were normally the most unteachable and disruptive-a collection of Bart Simpsons. The game will attract the learner in but it takes more than entertainment to keep him there. If the learner wanted only to play a game there is a vast choice of non-entertainment titles which are of much higher quality. A game such as VR Engage succeeds because it provides the learner with a personal space free of
oversight and it keeps the learner immersed in that space by contact with a tried and tested learning principle. This is good news for educational computer games because it means that they can opt out of a competition they were never likely to win. Even in the unlikely event of having a matching budget, as long as educational games are designed only for pleasure they will lose because educational games are playing away and commercial games have home advantage. In Freudian terms it is Id-entertainment games-versus Superego-educational games. There is pleasure to be had from educational games but it has to be seen for what it is, a secondary product of a dominantly meaningful experience.

8. The Practice of Educational Games

8.1. Introduction.
A key element for the successful use of computer games is that they mobilise and deploy sound pedagogic strategies to foster their integration in the classroom. (De Castell 2004, Kirriemuir 2002c). We have debated the merits of having an educational theory of technology in comparison with a theory of educational technology however we would contend, in support of De Castell and others, that in relation to the uptake of technology in education it has been a weakness to adopt an uncritical assumption that technology would have nothing but benefits for pedagogy.

Players should be encouraged to think about the game and verbalize their thoughts outside the immediate experience of play. One proven strategy is Debriefing which has a powerfully motivational effect (Crookall 1990) The increasing availability of portable technology (cell phones, PDA’s, GPS and video cameras), has ushered in the
opportunity for students to take learning outside the classroom thereby lengthening and intensifying the learning experience (Tomlinson 2003).

8.2. Insufficient Longitudinal Research.

In this chapter we will look into the actual experiences of using computer games in classroom environments. It is an indication of the relative youth of the field that much of what we discuss will be drawn from research studies. The lack of longitudinal research is a substantial disadvantage to the field and we wonder if it actually is possible to carry out longitudinal research in the area and whether or not this difficulty might serve to explain their relative absence. The difficulty that possibly militates against the provision of longitudinal research may derive from the self-same issues we identify as obstacles to the actualization of educational computer games. While teachers and educators might be willing to entertain the presence of researchers for a limited time, they might be less willing to allow and participate in the efforts needed over a more extended period. Furthermore resistance on the part of teachers and educators may be prompted by more than qualms regarding extended commitments. There is a difficulty here which goes right to the heart of the feasibility of educational computer games. We have sought to highlight various cultural antagonisms that exist in the area. It seems that educational computer games may be prone to a peculiar disadvantage. The very factors that inhibit the introduction of developed games into the classroom (Tam 2007) may also be operating to deter the possibility of longitudinal research. We argue this on the grounds that considerations as to sanctioning longitudinal research are similar to the processes involved in accepting an educational computer game on a full term basis. They both require a willingness to commit resources but also they require a time commitment. Added to this is an issue of possibly greater import.

Computers as technological artefacts may appear to be value neutral but computer games are not therefore research into computer games cannot be readily carried out in the classroom (unlike, for example an investigation to amend or develop a particular educational hypothesis) because it is difficult to even begin to have a space free of the attendant tastes, attitudes, proclivities, ideologies and prejudices of the people present. Egenfeldt Nielsen (2008) observed how difficult it is to keep students in a zone of learning during the course of engagement with an educational game. It seemed that the temptation to gravitate towards playing the game purely for its pleasure was too hard to resist. This observation would not fail to register with
experienced teachers. We will now move to consider the knowledge garnered by important studies carried out to establish the worth of educational games.

8.3. Landmark Studies.

“The Sims, RollerCoaster Tycoon, and Railroad Tycoon are all video games that are akin to hobbies, rewarding the participant for insider knowledge and expertise within the domain” (Squire 2008 Chapter 8)

Here we combine Kirriemuir and McFarlane’s (2002c) study, “Use of Computer and Video Games in the Classroom” with McFarlane, Sparrowhawk and Heald’s (McFarlane 2002) report on the same area for the sweep of topics they discuss with respect to use of computer games in educational settings. We will conclude with a discussion of what happened when the research ended and the reality of placing an educational game in a school was actively proposed. We are interested in the insights produced by the researchers, in the questions they ask and the answers they obtain. Surveys to investigate the actual use of computer games in the classroom revealed a number of factors some of which ran counter to the expectations of researchers. Games such as Sim City, (2000) Roller Coaster Tycoon (1989) and Civilization (1991) were found to be most in use (Kirriemuir 2002c) The quote from Squire above suggests how effective learning can take place when the previously impermeable layer between pleasure and learning is breached by participation in hobby like activities. Games such as Railroad Tycoon are simulations of management tasks that come equipped with a set of digital tools and resources that enable the player/learner to embark on management challenges. They are designed around historically accurate scenarios, utilising graphs and spreadsheets. Railroad Tycoon is based on the historically important phase of railroad construction that followed the American Civil War. The popularity of such a game can be compared to the overall lack of interest in the subject of history (Squire 2008).

The majority of the games were PC based as might be expected given a number of years investment in computer technology. The majority of the games used in the classroom were education oriented. Teachers were aware of the impact of console based games on their pupils but were reluctant to oversee their deployment in the classroom because of their “fun” connotations (Kirriemuir 2002c). Teacher reluctance
to take on the management and supervision of yet another species of technology was also a concern (Kirriemuir 2002c)

Kirriemuir and McFarlane’s survey revealed:

1. Children were immersed in the play activity and often played beyond the allotted time.
2. Teachers found the games more difficult to manage than they had expected.
3. Games not specifically designed for classroom use often had distracting features, e.g. over extended introductory sequences.
4. Games had unplanned features, which could not be disabled, and often lead to unexpected outcomes (Ibid)

Most of the schools that took part in these research initiatives did not continue using games once the research period was concluded. The schools regarded the use of games in the classroom as overly experimental. Some schools exploited the apparent enthusiasm among their students for computer games by encouraging literacy skills, for example describing favourite games or analysing games in general. However this involved students writing about their experience of games rather than using the games. Examples were found of students writing web logs and contributing to online discussions of particular games. As an indicator of the motivational reach of computer games some schools were found setting aside computer time on games as a reward for good performance. Conversely, other schools restricted access to games as a punishment (Kirriemuir 2002c)

In some cases school policy was averse to students bringing their games to school for reasons of theft or inappropriate use:

“Electronic hand-held toys and games are prohibited on the school buses and on school property. These toys/games are banned due to issues of classroom disruption, potential for isolating behavior, and damage or theft liability. These toys include, but are not limited to, the following: Nintendo games, video games, Walkman (personal stereos), laser pointers, etc.” (Blanchard Memorial School Kirriemuir 2002c)

When trying to gauge the attitudes of institutions towards computer games it is instructive to observe what they consider worth banning and their motivation for doing so. Of the reasons cited above the first is classroom disruption. The second is “isolating” behaviour which demonstrates that the school authorities subscribe to the
popular media archetype of the isolationist effect of computer games. The third is standard administrative fare; concern about theft and possible legal issues. The study found that most of the games used in the classroom tended to fall into one of two genres, either strategy games or simulation games. This was not unexpected as strategy games are effective at recruiting information evaluation, discussion and logic skills while simulations have a long history for effective modelling and demonstration.

RollerCoaster Tycoon was used in the classrooms because of its pre established appeal to students. The game consists of owning and operating a rollercoaster and could be used, for example, to model effects of acceleration gravity and force (physics), as well as the business of operating the park (commerce/economics). Farmington High School used the game as part of a physics lesson:

“This activity will provide students with the opportunity to research the history of roller coasters and the physics behind the operation of roller coasters. After the students have a good understanding of roller coaster physics, the students will use Hasbro's computer software demo, RollerCoaster Tycoon, to design and test possible roller coasters. Finally, students will design a model roller coaster, and then actually build the model and test it for operation.”

(Farmington High School, cited in Kirriemuir and McFarlane 2002)(Kirriemuir 2002c)

The researchers noted a certain resistance to the actual use of the word “game”; instead the school website used “software”, “simulator”, or “demo”. Teachers were enthusiastic about games, finding that their students could do more with them than originally intended. However even with relatively new equipment and software that did not overly tax the graphics cards, breakdowns were a problem. One teacher later contacted the researchers:

“After examination of the BECTA and TEEM reports, I decided to experiment with City Traders in my class of 13 to 14 year olds, as they are a bright lot and, unless challenged, became easily bored. The students found the game itself relatively easy to play. However, they did have an uncanny knack
of doing thing that I suspect the game designers never thought possible; after
the first session I realised that a far more rigorous lesson plan and game
instruction was required than that I had originally provided! “
(Paul Smith, cited in Kirriemuir and McFarlane 2002)(Kirriemuir 2002c)

A consistent theme amongst the teachers was the degree of motivation they witnessed
in their students. One teacher, who had found some spare time, allowed her students
to go back to a game, was struck by the strength of their involvement. She noted in
particular that her normally quiet and isolated students were the most voluble and
enthusiastic. However, realities of school life intervened:” It is a pity that the testing
oriented timetable means that opportunities such as this will not arise for the rest of
this year at least” (Gillian Reynolds cited in Kirriemuir and McFarlane
2002)(Kirriemuir 2002c)

Of the obstacles to the use of games one of the more frequent was the consideration
of time. The limited time that could be devoted to a particular lesson meant that there
was limited scope for preparation either in introducing and establishing the theme or
simply ascertaining the level of student familiarity with the game. Teachers were
wary of games that did not come with educational credentials or that had not been pre
verified as having learning content (Kirriemuir 2002c)It was also noted that the
teachers would require support in terms of background materials for the game.
Legalities also encroached as several teachers queried whether they had the required
legal permits for utilising the games. Teachers would have preferred to have used
games which had a “save” facility thus allowing them to start at the point they had left
off at in the previous game(Kirriemuir 2002c). The issue of having a game tailored to
a specific curriculum illustrated a key pedagogical weakness of commercial games.
Learning momentum was wasted because games lacked the options for further
exploration and discovery. Instead there was simply the “Play Again” option (Ibid).
Support for teachers was mentioned in this report however, it failed to discuss support
for learners, at least explicitly. Key terms associated with use of computer games in
the classroom, i.e. scaffolding and particularly, debriefing, were not mentioned.
In the McFarlane et al study (2002) the researchers noted a broad consensus among
teachers as to the features they would expect to see in any educational computer
games. Many of the more attractive and useable features of the games could be
deployed with relatively little difficulty. The researchers were keen to emphasise this
and recommend it as a key consideration of successful design. Similar to Kirriemuir (2002c) they criticised the lack of provision in games for recording scores and providing useful information on progress. Also they noted the absence of a save and restart feature. In games that encouraged practising, games that catered to individual practice levels were noted as being particularly valuable. As with Kirriemuir McFarlane baulked at games being overlong for completion in school suggesting that they could be completed at home. The more complex the game, the more challenging; a feature which might be remedied: “All this information, on structure content and underlying models could be provided in an easy to read handbook, making the adoption by teachers more realistic” (McFarlane 2002, p.11). The researchers were alert to the dangers of a game departing too widely from acceptable pedagogic standards: “for example one game where magic spells and sacrifice improved a village’s chance of survival was deemed suspect by teachers” (Ibid p.13) Ease of use with the interface is optimal, especially for younger students. In this case no written instructions, (to operate the user interface) is the preferred option (Ibid). A potential weakness of adapted commercial games for classroom use is their-one size-fits-all tendency. In a given class there may be players with a varying level of game skills, who play a preferred regime of games: “Unlike home contexts, young pupils will usually need to be able to play the game largely independently once the task is set up. Indeed the development of this autonomy is an important learning outcome (Ibid, p.11). This appears to mould learners into a homogenous group, surely a discredited practice of traditional education. Even more problematically McFarlane et al observe:

“Games vary as to the amount of content they contain which is of direct relevance to the school curriculum, but this is generally low. Even where the context seems to be relevant to curriculum content, the contribution this made to the child’s learning may be very peripheral” (Ibid, p.12)

The quest game format was seen by McFarlane et al (2002) as valuable to learning at all stages. Freire, (1996) is eloquent in his criticism of pedagogy’s dependence on narrative nevertheless it is difficult to see how a case could be made for its replacement.
Skills development is a central plank for those like Gee (2007) and Squire (Squire 2008, Purushotma 2008) who are keen to see a generation born in the digital age equipped with the appropriate abilities to prosper in the new century. Problem solving has been widely referenced but skills including deductive reasoning and information sequencing were noted to occur in commercial games. Socialisation skills included peer tutoring, co-operation, collaboration and co-learning, (McFarlane 2002).

The studies accomplished by Kirriemuir and MacFarlane(2002c) reported that the students were highly positive towards the presence of educational computer games in class. Children were noted to be deeply immersed and often played beyond their time allowed. On the other hand teachers reported difficulties, with management issues and concerns over unfamiliarity and lack of expertise Games not specifically intended for classroom use had features which were poorly adapted for learning. Teachers expressed a desire for certain features to be made available on the games, e.g. save and re-start facilities The observations made by the MacFarlane, Sparrowhawk et al (2002) study might be seen as delivering a negative verdict on the use of commercial games in the classroom:

“Games vary as to the amount of content they contain which is of direct relevance to the school curriculum, but this is generally low. Even where the context seems to be relevant to curriculum content, the contribution this made to the child’s learning may be very peripheral” (Ibid p12). 

One issue reported was the desire of teachers for additional features to be included in games so as to make them make them more pedagogically useful. They would like to have seen the inclusion of interrupt features and the ability to save and restart games at desirable points. This is a perfectly reasonable position for teaching yet it points to a chasm between education and entertainment that is the central fissure running through the discourse of educational computer games. We asked the question; why would commercial operators agree to this request? What is in it for them? The answer would be that the rewards might be minimal and the drawback might be substantial. Developers create games for players to play and continue to play. The provision of facilities that stop the sense of flow takes the player out of the game, interrupting the
hedonic (and possibly addictive) experience. It does not help to offer that players could simply ignore the educational features and simply play for pleasure. We discussed what we termed The Bart Simpson Syndrome and here is an example of where the syndrome might be seen to operate. The central thesis of our study is that influential voices in the discourse have not recognized that cultural attitudes will have the last word on whether or not educational games can realize their vaunted educational potential. The corollary to our prime thesis is that if we can understand these cultural dynamics we can anticipate at least the more pertinent issues and this might help with the introduction of computer games into the classroom.

8.4. The Views of Teachers.

“Tolerance of games with little content relevance is greater in primary schools, but secondary schools cannot afford time in class on activities which do not feed significantly into subject knowledge, even where there are related learning spin offs which are not content specific” (McFarlane 2002, p.12).

Part of the object of this study is to seek to identify the ways and means of having an educational theory of technology rather than a theory of educational technology. To this end teachers are central to the project. In our view teachers are a heavily underrepresented constituency in this debate and one moreover that has vital contributions not just to the development and deployment of educational computer games but to the broader debate over the introduction of technology into education. This being said we are not idealising teachers nor present modes of teaching. As we note in Kirriemuir et al (2002c) and McFarlane’s, (2002) study while teachers did seem to report positive evaluations of the potential and actual use of educational games in the classroom they also had their misgivings.

Even more pronounced was the concern detected by Tam and Milton (2007) who encountered professed enthusiasm from teachers when games were first mooted in the development stage but resistance later when it came to their actual deployment in the classroom. This discussion will be developed further later but now we will look into how teachers regard the use of computer games for education. Given that they had been presented with a game very much suited to the educational needs of the proposed
education district, one is, (at first) taken aback by the negativity of teachers presented with the introduction of commercial games. Here we have in outline the key difference between for-purpose educational games and adapted commercial games. Commercial games continue to receive earnest consideration as useful in the classroom despite all their reported faults. Part of the reason for their continued presence might be that children are familiar with them, but another might be that they tend to be cheap and are easily discarded whether they have served their purpose or not. Using off the shelf games is a safe option for teachers in contrast with the challenge of having to take on a longer commitment to a new technology they can exploit the novelty of a commercial game, re focus their students motivation and achieve some (possibly limited) learning outcome.

Recent studies have reported that more than half of teachers surveyed would be interested in trying games in the classroom (Becker 2005) These kinds of surveys, however, need to be framed in the context of other more pragmatically informed studies where the same enthusiasm for educational games was expressed while their proposed introduction was still in the realms of possibility but where profound resistance was evident when it came to their actual deployment in the classroom.

The numbers of respondents who favour the introduction of games as simulations is considerably higher than those who support the introduction of games as games. Game simulations have a far longer history than games for entertainment purposes. As discussed earlier simulations were pre technological in origin and developed for training purposes. The issue of time constraints also affects the use of simulations:

“Games with the greatest potential here are simulations, but there is concern about the models driving these, and the extent to which they replicate real world models. Even here the time needed to work on a complex simulation is much greater than the related topic would receive in the school schedule” (McFarlane 2002, p.12).

Similar constraints as to availability of time operate for simulations as for games. The greater acceptability of simulations is striking Note that there was a tendency to avoid the actual use of “game” in favour of another, more anodyne phrase (Kirriemuir 2002c). There seems to be an inchoate resistance to allowing the presence of the term in the classroom.
Teachers who are positively disposed towards using games in class encounter a lack of support when they need guidance on the types and suitability of games, where they are located and how to use them (Becker 2007). The bulk of research on games for education appears in academic formats intended for academic publications. Working teachers have little time to synthesize this information in such a way as to make it relevant to everyday teaching (2007). This would seem to produce, or likely to produce an anomaly. By focusing on the academic research into the concept of educational games to the detriment of considering how practicing teachers might use educational games successfully theorists risk pursuing research that might not ultimately be worthwhile. It must be seen as a defect where energies are being consumed in expensive research while at the same time there is a neglect of the basic requirement of determining whether or not the research is viable.

Factors such as time pressures have significant influence on whether or not teachers can engage with new technology but there are other considerations. Teachers find themselves lagging behind the pace of technological change (Sprague 2004) and this can shape their attitudes towards technology (Russell 2003). Teachers have been credited with being prime adopters of technology (Guptha 2009) however they can be resistant to the notion of computer games as educational:

“digital games are often considered more of a nuisance than an asset. Some teachers will resist all attempts to alter their opinions about the use of games as learning technologies, and individual opinions must be respected, but if the attitude one holds is the result of insufficient information, then providing that information can only help. Teachers deserve to be provided with up to date information on the potential of games in the classroom.” (Becker 2007 481) (Becker 2007).

Becker’s attention is directed towards those teachers that adopt a resistant attitude towards games in the classroom. She posits that resistance may arise from “insufficient information” and that could be remedied by provision of documented evidence that confirms the potential for educational games in the classroom. We propose that such an antidote to the perceived resistance of teachers might not work in all cases. It must be recognised that the misgivings felt by teachers may constitute a valid and durable standpoint. We noted in Kirriemuir and MacFarlane (2002c) that teachers have reasoned and reasonable objections to the use of computer games in the
classroom. Not all objections, neither practical nor theoretical should be seen as misdirected. When teachers object to games they do so from a fund of experience which, conceivably, may not be abrogated by provision of sufficient information.

We see, from the Becker and Jacobsen (2005) study that teachers have a preference for games as simulations than for games themselves. This might be a cause for concern for two reasons. The first is that they demonstrate a bias for simulation games whose place in education is useful where education comprises the fostering of skills. Some might argue that simulation games are now so sophisticated that the also promote cognitive skills. That may well be so but if so they are no longer simulations and have to be regarded as a different form of game. The second concern is that, by displaying a preference for what are not more than training games teachers are complicit in the very drive towards educational technology that might eventually debase the quality of general education.

Pragmatically based objections to the deployment of electronic games in the classroom are not the full picture, however, when it is a matter of evaluating teachers’ attitudes towards the deployment of educational games. There is always the possibility that teachers can simply dismiss games as being unable to achieve a worthy educational outcome:

“If you’re going to replace traditional methods of education with something new, you should replace it with something better. If this guy thinks that playing some goddamn video game is the equivalent of memorizing a Shakespeare soliloquy, that’s crazy” (Smith quoted in Carlson 2003, n.p.)

Colourful as it is, Edward C. Smith’s objection is well grounded. It is perfectly valid to challenge a proposed replacement with a higher standard. The worrying feature of much of the debate that surrounds education and computer games is that the proponents of games seem more directed towards a negative critique of traditional education than a positive analysis of what they intend to replace it with.

8.4. The Views of Parents.

When educational games were moved to a domestic setting it was found that similar problems with the lack of useable features presented for those who utilised the games at home. The feature which the players most wanted to have in the games provided was a facility to save games at desirable stages (McFarlane 2002). Parents reported to
the researchers on the high levels of co-operation and motivation displayed by the children often with groups of friends.

“My youngest son (9) enjoyed playing the game and spoke about what he was doing just about all the time he wasn’t playing it. By the second day his elder brother (14) joined in and they took it in turns 1 hour each alternating although they would put their heads together to sort out a difficult situation. When they aren’t playing they discuss what they have done and what they are going to do” (McFarlane 2002, p.18)

Parents commented that the children found them more challenging and enjoyable than their usual games to the point where they were observed taking time away from the games to discuss and plan game progress: “Another commented that ‘Everyone took turns, and gave ideas. They talked away from the computer about what they found difficult.’ (McFarlane 2002). Although children benefited from working with another child of a similar skill level they also benefited from mentorship supplied by a player at a more advanced skill level.

If we look at the descriptions of the games above we note the approval with which the immersion taken by the children is greeted; and rightly so. The problem is that these are not educational games. We are back with the carrot approach to learning that was the hallmark of edutainment. It avails little to point out the other pedagogical values, skills acquisition, cooperation, problem solving that attend these games. Older games also had these qualities albeit not in a technologically sophisticated form. Having expunged the notion of edutainment from educationally purposed games we seem willing to entertain the phenomenon in commercial games. This is an anomaly that does not seem to attract sufficient attention. Using entertainment games for an educational purpose is akin to borrowing a custom built bicycle from a person of average height when the borrower is six feet tall. The bike was not built for the six footer and it will soon be obvious. The difference will be obvious when it is no longer a short spin. How many edutainment games are short spins? If entertainment games in the classroom fulfil the need for short spins and are asked to do no more than this, that is well and good, however that does not seem to accord with the ambitions for games professed by Gee, Squire, Jenkins and others.
The ability of a game to hold and maintain a child’s attention was highlighted by McFarlane et al.’s observation that this was precisely what the games under investigation failed to do.

“Games which consisted of a series of adventures or challenges sometimes in levels or through an environment attracted children’s attention until they had completed them. The satisfaction of completion was generally sufficient to mean that the game was not likely to be played with subsequently... The completion of the challenge marked the end of the child’s interest” (McFarlane 2002 p 18).

Here is a real concern directed at the heart of the viability of educational games. In brief, once the children had completed the challenges in the game they stopped playing the game. It seems that there is a narrow window of opportunity for learning with these kinds of games. This is a strategic and not a tactical problem. We have already seen teachers’ discomfort with the use of the word “game” in the classroom. Computer games are an avatar of a hedonic culture newly arrived in education; a space where structure and rules come up against the impulsive an id driven constitutions of children Education is presently receiving a barrage of criticism and much of it is merited. Yet it is incumbent on anyone who cares to adopt an intellectual basis for reflection not to be swayed by the spirit of the age. We argue that this spirit, which abjures notions of discipline and order in favour of notions of liberality and spontaneity, should be seen for what it is, a fashion.

Older age groups were observed to exhibit boredom with certain games that appealed both to younger players and players of a similar age evoking the comment that “the success of games is likely to be as variable as other media in engaging children’s interest (McFarlane 2002). Changes in taste as players get older is significant for educational games. While younger players showed interest in and willingness to use games with a simple educational purpose, e.g. maths skills, older players came increasingly to value games for their direct entertainment value(Ibid).

Parents were asked to rate the value of computer games for teaching school based subjects.. Almost half mentioned maths, a third spelling and a quarter reading and 10% computer literacies. It is striking how the “Three R’s” still loom large in parental concepts of school at a time when theorists are advocating an entirely new approach to educational requirements. Based on these kinds of reports one might be excused from considering parents as a bulwark of educational conservatism.
One troubling issue that McFarlane et al. (2002) seem to have skirted here is the question of whether or not there is an actual boundary line between playing games as learning and playing games as entertainment. We gave argued in our discussion of resistance for a potential boundary line between the player that plays for entertainment and the player that plays for education. Consider the following:

My son and friend (both 13) played for a couple of hours and seemed to really enjoy setting up the cars and choosing drivers and selecting car tracks. My son found controlling the car during a race quite difficult but it was clear that the more he played the better he got. Both took turns and whilst one was racing the other watch keenly and was offering tips and instructions (McFarlane 2002, p.18).

How much, if any, of the quote above is descriptive of a specific educational outcome? Surely it describes two children simply playing and enjoying a video game? The worry is that this kind of approach to games risks the return of Edutainment. Egenfeldt Nielsen (2007) and Egenfeldt Nielsen, Heide Smith et al. (2008) demonstrated the unsuitability of the Edutainment principle in educational games. Their worst attribute is to seek to package educational outcomes in entertainment bindings. We remember that Edutainment games were marketed to parents who took the view that when children were playing it would be beneficial if they were also learning (Egenfeldt Nielsen 2007): “85% of the parents evaluating games with their children believed that computer games contributed to learning as well as providing entertainment” (Ibid p 18). (Egenfeldt-Nielsen 2007, p.18) For parents Edutainment continues to be desirable and has never left the stage.

Having explored the views, mores, and attitudes which teachers profess towards the deployment of educational games in the classroom it would be instructive to seek a different perspective of the same activity. The judgements reported by the teachers from Kirriemuir and McFarlane’s (2002c) and McFarlane, Sparrowhawk and Heald’s (2002) study were almost uniformly positive yet this must be tempered with the realisation that the entire process had a hypothetical basis and was limited by time constraints.


There are a number of options when it comes to the development of educational computer games and the only prediction that might reasonably be made as to what educational games might look like when they become as ubiquitous and accepted as
mobile telephones is that they will not look remotely like educational games as they are currently conceived or utilised. This is a function of the youth of the field and the pending arrival of technologies that have yet to impact. There are three broad areas in which computer games are being proposed and purposed for education. We will argue that the first option, i.e. Commercial Off The Shelf games (COTS) is not really viable and should be retired. The second option is purchasing educational games developed for education by commercial entities. This also has problems but is superior to the first. The third is self-created games by the learner.


*SimCity* 3000 can be used in the classroom to enhance just about any instructional unit. It can stand alone as an enrichment computer activity, or it can be used as a pivotal activity connected to other activities and projects done before, during, or after using the computer program. Use the lessons in this guide to integrate *SimCity 3000* into your curriculum, with minimal preparation, or to create custom lessons to suit your needs."(Maxis Games 2004)

Kirriemuir and McFarlane (Kirriemuir 2002c) noted that their survey was relatively limited in size and scope and therefore should not be taken as definitive on any issue. Nevertheless much of what they discovered will be seen as relevant in other parts of the current study.

It would be helpful to gain some insight into the thinking that goes into a teacher’s repurposing of a commercial video game. Developing educational games involves heavy commitments of finance and expertise. It is possible to make use of commercial off the shelf games (COTS) however caution is required (Puentedura 2007). Studies have reported success with the use of commercial games repurposed for the classroom (Randel 1992). Before adapting a commercial game for the classroom, there are a number of questions that have to be dealt with. Is the purpose of the game to provide domain specific content? For example a biology teacher wants the students to recognise certain kinds of insects. Will analytical skills be required for a particular class? If an engineering teacher wanted to use *Rollercoaster Tycoon* to apply design skills to the construction of a rollercoaster would the skills acquired transfer readily to a real life setting? How to enhance the transfer of skills? Could narratives found in roleplaying games be reshaped as storytelling activities?
Puente
dura’s view on the successful transfer of domain specific content is generally negative –“few commercial games are solid in this regard” (Puente
dura 2007, p.34). The insects found in commercial games may not be either realistic or recognisable to a biology class. A historian trying to make use of a history game might find a high degree of involvement for the students but a lack of historically accurate detail. This point will recur when we consider the use of history games later. The improvement of analytical skills in a certain domain is more feasible, Sim City can enhance planning and urban design skills for student engineers to build upon. Teachers can encourage writing skills among their students by asking them to write up the games they play for fan sites or web logs. However this depends to a degree on the number of students that are enthusiastic game players. It might also be argued that it does not recommend games as unique to the process. It might be of more use (and less cost) to get the students to write about American Idol There have been reports from small scale studies that games can have an enhancement effect on general cognitive processes but these studies are too small to be relied upon (Puente
dura 2007). However well conducted studies have reported augmentation of brain activity (Preiss 2005, Cole 2005).

While Gee is often cited by theorists who attempt to validate the potential of games for educational purposes it is not always clear that Gee has a clear educational benefit in mind when discussing games. Gee’s most well known contribution to the debate on video games has many valuable (possibly ground breaking) elements; yet it leaves the reader with a sense of dissatisfaction. That sense comes, in part, from a seeming lack of interest by Gee in learning content. In fairness to Gee this may have more to do with the enthusiasm of his acolytes to apply his theory to curricular and mainstream education. In What Video Games Have to Teach Us About Learning and Literacy (Gee 2004a)Gee makes little or no reference to specific curricular subjects. In a recent publication co-authored with Hayes (2010) Gee discusses the attributes of Spore (2008) that encourage players not only to play the game but participate in its creation. However Gee neglects to debate the educational defects of Spore as outlined so critically by Puente
dura (Puente
dura 2007).It has to be asked now how much the exercise is mitigated when the end product is, as Puente
dura argues, unscientific and non-educational?

One possible explanation for Gee’s seeming neglect of the value of content is the prioritisation of form. Gee interprets the plethora of information and forms of
information, the almost instantaneous ability to locate and access whatever data is required as implying that the acquisition of information (the task of traditional learning) has become marginal to the task of managing that information. Form takes precedent over content. The thorny issue of boundaries rises once again because there is a question of ethics and of intellectual rigour at stake here. There is a large epistemological problem in deciding for example whether “Byron was a Romantic poet”, is information or knowledge. The answer might be; it depends on the context. But when we meet context we are, once again, caught in the tangle of ideology and power.

9.1.1. The Trouble with the Sims

It is possible to argue, from the example discussed above in Puentedura that prioritising form over content could lead to a situation where students are learning nonsense. With respect to an educational function, the Sims series of games have an endogenous design i.e. the academic content is said to be integrated into the workings of the game. Players are said to learn through their interaction with the virtual world of the game as a symbolic system. They learn about relationships in the game however the quality of that learning can be distorted. *SimCity* has been lionized for its applicability in the classroom as a means of teaching urban planning, however, one planner has concluded that the net learning of *SimCity* is to assist the learner to design a city that nobody would want to live in (Squire 2005). The picture that begins to emerge is a caution against over exuberant expectations being invested in educational games. Predictions regarding the expected demise of traditional educational practices come into perspective when it is observed that students fared best when given lectures that supported their activities in problem solving (Bransford 2001). Clegg (1991) stipulated that the educational context of the game was a better predictor of its educational value than the game itself. The quality of collaborative activities integrated into the gameplay and the thoroughness of the debriefing process were crucial in evaluating the educational potential (Clegg 1991). It could be argued that the teacher, and not the game is the central character here, since the teacher identifies the required learning activities and carries out the debriefing; the point at which the quality of learning outcome can be assessed.

The simulation game *Spore*, created by *Sims* designer, Will Wright, allows the learner to create organisms from the multi cellular level to complete civilizations. The creatures have the capacity to interact with other organisms and the player can influence their destiny in a number of ways. The designers of the game have advocated it as a basis for learning the mechanics of evolution (Puenteedura 2007). Among its learning virtues it is claimed that it provides an understanding of atmospheric feedback, and is a working substrate for storytelling. There are several drawbacks to the notion of the game as an introduction to evolutionary theory. While creatures “mate” to produce offspring there are no procedural nor scientific constraints on the direction the creature will evolve. The creature thus created will operate effectively in the game world without any constraints comparable to those required and observed by genetics or general science. The landscapes created in *Spore* have little relation to the natural world with its evolved ruling conditions (Puenteedura 2007). The world of *Spore* is teleological, i.e. it has an end view in mind, unlike the world of reality. The player’s ability to intervene provokes Puenteedura’s criticism that the game encourages notions found in Creationism, something as far from Darwinian evolutionary theory as it is possible to get.

We see here some of the dynamic that will be seen again later; how a game, either strategy or simulation begins under relatively uncomplex conditions but quickly becomes overly complex in terms of its relation to precise learning (Egenfeldt-Nielsen 2007). The expectation is that more sophisticated Artificial Intelligence characters in games software might be capable of handling rising complexity and in future this might be a possibility given the continuing rise in the power and capacities of characters generated by Artificial Intelligence software.

For example, will we be able to devise character AI architectures in which we can “grow” or evolve a game character off-line –independent from the game – and then insert this character into the game so that it will continue to learn” (Charles 2003, p.218).

Characters that can learn can also teach and may be useful in educational games.

There are reasons for using commercially repurposed games in education but as we have seen there are a number of drawbacks. Utilising an already available game for education has the cost advantage that it saves on the development of a complex, and expensive specialized educational game.
9.2. Commercial Educational Games.

Much has been said of educational games produced by the private sector for use in the classroom. However we do not intend to devote a large amount of consideration to this option as, to put it briefly, commercial educational games seem to combine the worst attributes of COTS while lacking the freedom and creativity of the third option i.e. self-created games. For all the drawbacks of COTS games they have the virtue of being cheap and easily disposable.

9.3. Kids Are Doing It for Themselves: Self Directed Learning and Student Centred Games Development.

Rather than proceed directly to what we consider to be one of the more exciting forms of educational games, we have first to take time to venture into an area which has potentially restrictive consequences. Our discussion centres on an emerging cultural debate which, in its details, has the potential to obstruct the development of student authored games.

“All the while, businesses exact a toll for owning, not the means of production (for they do not own the groups that make culture), but rather the means of consumption: the bandwidth and server space. It is possible to conceive of a dystopia in which some day all of us will pay a fee for the privilege of being social. Thousands of Netizens already do it” (Postigo 2003. p.605)

9.3.1. Intellectual Property and the End User Licence Agreement.

In the vast majority of instances throughout the current study any statement of expert or specialised knowledge would be supported by the associated reference. The discussion below however is directly influenced by personal knowledge and expertise gained in an earlier occupation. For a number of years it was part of our duties to conduct negotiations for the use of copyright with corporations that included Paramount, Warner Brothers and the British Broadcasting Corporation. The overwhelming impression from that time is the intense protectiveness that commercial concerns exert over their properties and the acquisitive, almost predatory, animus they display to the intellectual properties of those companies without the skills or resources to protect their property. The consequence of this experience is a sense of caution
when considering issues of educational use and adaptation of these forms of commercial property.

We would argue that it is an indication of the lack of a cohesive vision as to how to bring educational computer games into mainstream education that insufficient attention has been given to the legal obstacles that are likely to impede that process. In our discussion of the hegemonic nature of those corporations that control computer games we proposed that the behaviour of the corporate sector is aggressive and colonising (Fron 2007). Matters are not improved by those in academia who actively cooperate with a corporatist agenda (De Castell 2002).

There is a legal question concerning ownership of any games used either for pleasure or education. This is an issue which has to be aired before the potential of educational computer games can be discussed more fully. This area represents a zone of unresolved conflict and merits at least a broad understanding of the issues at stake. To their credit, the teachers in Kirriemuir and MacFarlane’s (2002c) study were alert to the issue, enquiring if the necessary legal clearance was in place before proceeding to utilise computer games. However the discussion here will centre on the potential inherent when students author and create their own games. This is very much a gray area for the creators of the games, but by no means a gray area on the part of the corporations.

It is a common experience in the course of setting up a recently purchased item of software to click on the “I Agree” icon without giving it much consideration. What has happened, however, is a binding acceptance of an agreement which stipulates that any additions made by the player are the property of the game producer. These End User Licence Agreements (EULA’s) are a symptom of a gathering conflict between a generation which has become accustomed to not being charged for what it receives through digital technology and an industry which is intent on not only maximising hegemonic control and profitability but is committed to preventing the free download culture which (according to their perception), destroyed the music industry (Lessig 2004). The looming struggle between a generation habituated to the expectation of free access and the agenda of corporate interests intent on the reestablishment of control promises to be one of the major cultural conflicts of our time (Zizek 2008).

We will now refer to the views of a recognised authority on the area of Intellectual Property.

Lawrence Lessig is a professor of Law at Stanford University and the creator of the intellectual property sharing protocol known as the Creative Commons
His central criticism of the current legal arrangements which safeguard the ownership of Intellectual Property is that they were designed and intended for a radically different environment than the one that has obtained since the rise of participatory culture with all the possibilities for individual creativity that followed (Lessig 2004). Lessig identifies two periods prior to the emergence of the present epoch. The first period ended and the second commenced with the visit in 1906 to Washington D.C. of John Philip Sousa who deplored the rise of the newly introduced music recording devices, which, in Sousa’s view would vitiate the popularity of musical gatherings at home where people were accustomed to producing their own music. In Lessig’s view this marked a transition from a time of individual music production to the rise of a mass industry which was hierarchically organised and controlled. Copyright law was deployed to protect the interests of the few producers against the predations of the many consumers. Lessig typified the change as a decline from a “read/write” culture to a “read only” culture (Lessig 2004) The advent of the network society, Lessig argues, has signalled the transition to a new form of “read write” society where personal creativity and initiative are re constituted. It is possible to cavil with Lessig’s thesis, not least on the doubt that periods can be as neatly separated nevertheless his argument is sound in that it is a deconstruction of an ideology rather than a lesson in cultural history.

It is difficult to prosecute a single individual for alleged breach of copyright however we would argue that schools and the departments of education responsible for them are potentially vulnerable in this instance. Suppose an enthusiastic and motivated teacher developed a game which resonated with her class, which suited her curricular objectives, teaching style and the learning practices of her classroom. Suppose that the game spread throughout the school system. The question will arise; who owns it? If there was an End User Licence Agreement in place (and how many people remember when they clicked on the “I Agree” icon), the answer is, the game developer (Heide Smith 2007). Despite the supposed independence of individuals institutions, in this case government departments, are particularly vulnerable to possible legal sanction. The concern is, if anything more pertinent when it comes to students creating their own games. A teacher may well be mature enough and professional enough to be cautious but what about kids? Even if there was no EULA in place the developer might contend that they have grounds on the possible basis of unpermitted use of proprietary technology. It is not enough for an idea to be good for application in a
narrow sense. In order to develop a computer game for education the idea must be sturdy enough to withstand objections and to meet conditions at every stage of its development.

Games research has to think carefully about the advantages of encouraging people – notably students and/or teachers - about the consequences of creating games for learning. Games research needs to broaden the base of what it considers to be consequential. There is little sense in encouraging the creation of learning games for education either by modification of existing games or through original creativity if the possibility exists that either the property can be taken over by a corporate entity, or result in the school being sued for infringement of Intellectual Property. This is not to argue for an abandonment of these kinds of teaching initiatives but what does suggest is that teachers will have to be aware of these potential issues. As the area develops there are grounds to be optimistic that games which do not risk legal sanction can be utilised either with the expressed agreement of the developer or sourced from a private or government funded project. Having discussed the need for caution when dealing with student created games we will now outline the justification for continuing to engage with the new technology of games self creation The principle of students creating their own learning games is a nascent development yet it has two strong elements to recommend it. First it dispenses with the commitment to games designed and delivered from external sources in the sense that the player is required to stay with a game sourced from third parties. This freedom gives the student/player (and the teacher) scope to develop beyond the strictures imposed by corporate interests. There are potential issues around the question of End User Licence Agreements which have to be negotiated. The second element is that the freedom gained by being able to author and design their own games situates the student/player in a rich, self-motivated learning environment.

During the discussion on the theory behind educational games in the previous chapter it was our contention that maths and languages are privileged in educational videogames. However we also explore other topics such as history and geography with the hope that we can illustrate how educational games might be applied in the areas of the humanities. It is important to consider the use of games for the promotion of Literacy, particularly in its New Media avatar. We note the emergence of positive trends which we believe have potential for both teaching and learning in the years ahead. We believe that game creation by the learner has the potential to be a notable
development for the project of educational games. Our argument in this study has been, and continues to be based on a favourable evaluation of educational technologies which are predicated on proven educational theory. We have discussed the legal issues impacting on the design of games and repeat that, in our view getting involved with commercial developers requires caution when there is no clarity over the issue of Intellectual Property. If anything the situation over IP is worsening as the courts take retrograde and punitive steps in favour of the corporations. According to Lessig “common sense sleeps”(2004, p.154).

Furthermore such technology merits greater approval when it is low cost (i.e., built on open source software), can be initiated and controlled at a local level, is tailored for local needs and avoids any legacy claims connected with ownership of IP. These are the basic requirements of the features which we argue would be included in the makeup of successful educational games. Successful educational games are being developed. We trace their development below. They are still in development and are by no means free of flaws, as we will see. One of the consequences of copyright control was the prevention of the sale of lifesaving anti viral pharmaceuticals in Third World countries stricken by AIDS (Lessig 2004). A similar consequence might flow from the copyright ownership of educational games by corporations, though with less deadly consequences.


Hegemonic control of the games industry has consequences for the success of educational games. As we have seen the games industry itself is indifferent to the low revenues and under developed nature of educational games (Earle 2009). However it is by no means reticent about safeguarding any perceived threats to its Intellectual Property (I.P.) and is supported in this by a legislature (in the U.S. but worldwide also) that, if anything, is moving to consolidate the protection of virtual copyright ownership (Lessig 2004). This creates a potentially serious problem for those intent on availing of and designing educational games. The danger arises because the boundaries in virtual copyright ownership are blurred, lawmakers are either unwilling or incapable of legal reform and meanwhile the terrain is controlled by conglomerates. The blurring of formerly clear boundaries is a trait of digital technologies (Postigo 2003).
Further research would be needed to determine the degree of awareness of this issue among educational policymakers but if they become aware through news of a substantial legal action against a department of education (anywhere in the world) there is likely to be a negative reaction to the proposed use of computer games in their particular area of responsibility. One might respond to this by asserting that the legal onus would be on the producer of the game and in a pre-digital world this might have been valid but this is where we argue the phenomenon of blurring of boundaries starts operating. Producers of educational games therefore, have both an ethical and practical motive for ensuring that their games are not vulnerable to legal challenge. This is not an easy task. Ethically they cannot allow an end user, student, teacher, school or department, to find itself in a vulnerable position. The entire area is still evolving and becoming so complex that even the most ethical precautions may not avail. Practically, if they allow the end user to suffer the consequences of legal action from owners of copyright it is difficult to see how further games would be positively received. In our review of Rockstar Mechanic we discussed the development of a self-built game that owed no copyright nor legal debts to any commercial entity. This would seem to answer the concerns expressed above. Postmodern consciousness is so heavily saturated with commercially produced motifs, images, characters, and symbols that it is difficult to use anything with the full confidence that someone might emerge with a prior legal claim. The validity of the claim can be beside the point. Conglomerates that are willing to pursue individuals would certainly not demur at a school department who may well settle rather than face protracted legal action. Even the game in question Rockstar Mechanic takes half its title (Rockstar) from a trademark protected producer of successful games. This game was devised by a number of experienced academics and media professionals. How aware are students going to be of issues of I.P. when they decide to use graphics or a character from one of their favourite films?

9.4. Games Modification.

“But can students design and build successful educational games? The answer appears to be yes, as well, especially under the right conditions. And that is very good news for our schools and our learners. Because the next generation
of educational games – the games that will truly engage and teach students – is likely to come from the minds of other students, rather than from their teachers. And it is likely that learners will relate to these games, and learn from them, in a way that is not happening today.” (Prensky 2001, p.64).

A consensus is beginning to emerge that not only can students benefit from playing computer games, they can readily benefit from making them (Futurelab 2005). Designing games is seen as motivational, raising perceptions of self-esteem and creating a voice for the learner (Ibid). Game authoring can be seen as part of a developing wave of tailored education, individualised learning goals, and an increased movement among students to involve themselves in the definition of how and what they learnt at school (Ibid). Corporate media interests display a predatory behaviour towards young people (Grimes 2006) and the relationship between youth and media has been problematical and in need of intervention (Sefton Green 1998). Students gain directly from authoring their own games through enhanced literacy. However literacy is more than mono dimensional and there is a case to be made for a more critical awareness of media than students can acquire in the process of games creation (Futurelab 2005). If young people are to use and consume media in safety there may be a need for them to acquire a more measured, critical distance about the processes of its production (Ibid). We would add to this an observation that students (and their teachers) need to be aware that they are wandering into a legalistic and litigious landscape with attendant consequences for the unprepared and uninformed.

These concerns fit broadly into the recently emergent area of New Literacy Studies which takes literacy as more than just a bundle of basic skills but as a set of social practices which are contested and negotiated around agency and power (Futurelab 2005). Researchers in game creation look at the way in which making games supports the student/player in the construction of knowledge drawn from English, Maths, Media Studies, Design, and ICT (Ibid). At the Institute of Learning Sciences in Nottingham, Jacob Habgood uses Stagecast Creator, an inexpensive authoring tool, to integrate learning with computer games. An after school computer club was set up with forty students to explore the educational benefits of authoring games e.g developing logical thought patterns, mathematical understanding and creative skills (Futurelab 2005, El-Nasr 2006).
At a more challenging level students have been motivated to master high level programming skills to enable the modification of new games (El-Nasr 2006). Known as “modding” it has a long tradition in computer games and was a practice of the earliest gamers who hacked commercially available titles to see how they could be improved (Perry 2009a).

Adventure Author is a prototype designed at the Edinburgh University School of Informatics and Glasgow Caledonian University with support from Futurelab. The purpose is to enable young student/players to develop games fit for other students to play. Players can choose from a selection of characters, situations, and environments. The project is designed to support literacy in young people. Through authoring their own games student/players are encouraged to think about plots and their construction. They deal with characterisation and how to create seamless transitions from one phase of narrative to another (Futurelab 2005). The research confirmed the value of feedback. Game authors listened to critiques and instituted suggestions in subsequent redesign. The creators of the games benefited by nurturing skills related to authoring, editing, revising and construction, while the readers acted as observers and critics.

The practice of “modding” is carried out collaboratively and requires high order levels of analysis and complex thinking. Games which are released today often include “modding” tools to allow the user to contribute their talent and creativity to the construction of new game environments. We will now highlight a case where researchers were alert to the possible learning benefits accruing from a redeployment of this technique in education.

Students using off the shelf games in class is one area of research, students using custom designed educational games is another. There is a third category which offers pedagogic benefits which arguably are richer, and more rewarding than either of the previous two. Becoming the authors of their own games is the point where young people enter the participatory “read and write” culture that many are now familiar with. We also contend that this point, where students move from being consumers to producers, marks the point also at which they become potentially at risk from corporate ownership and control of copyright. This is why we have been at pains to tease out the issues of copyright as it affects the spontaneous creation of Intellectual Property. We offer two examples of self-authoring. The Carbonaro (Carbonaro 2008)
study is ground breaking yet it offers itself to potential legal challenge by its links to the commercial property from which it originated. Of course ScriptEase was probably only intended as a research tool, nevertheless the principle holds good. Potentially, the worst outcome for an educational game developed off the back of a commercial success is not failure, it is success. In our view, therefore Salen’s Gamestar Mechanic is preferable as it was developed from concept by funding from a private foundation (Salen 2007)

At this juncture we should widen the discussion to the possibility of students creating and developing their own learning tool independently of teacher contribution and, as Prensky (2007) argues regarding the leadership of teachers as an impediment. “Quite often, educational games or games for education created by educators or textbook publishing houses smell too much like school,”(Cher Ping Lim in Prensky 2007). Although the virtual environment is unique, composed of its own ruling conditions, narratives, requirements, and challenges the environment is seen as an extension of the school with a continuation of the power relations where the relationship between teacher and student is normalized into one of the teacher as fount of knowledge with the student as empty vessel waiting to be filled (Prensky 2007).

Storytelling is one of the two modes of human thought, the other being the logical-scientific (Bruner 1986). Therefore, creating stories is a key aspect of human expression making stories “one of the most fundamental and powerful synthetic experiences available to us (McLellan 1994, P.76). Tompkins (1982) provides six justifications for children writing stories. They stimulate artistic expression, are pleasurable, encourage literacy skills stimulate imaginations, clarify thinking processes, and support the task of shaping self-identity. Underlying almost all the research into games is the assumption of the player as consumer rather than producer of his or her game What underlies almost all research in this area is that users are studied as ‘‘players of games’’ and not as ‘‘builders or designers’’ of games (Mitchell and Savill Smith 2004. Robertson and Good 2005)(Robertson 2005).

Up to very recent times the ability to design, and to create stories for games has been, by necessity, left in the hands of the corporate game developers. However even in the earliest years talented programmers were able to retask the code of commercial games to augment and personalise their own game creations Recent years has seen the release of game creation tools by a number of companies such as Bioware and Bethesda Softworks. These tools were hampered in their possible deployment at
school level by the relatively high level of programming expertise they require (Carbonaro 2008).

9.4.1. ScriptEase

The Carbonaro study used the Aurora Toolset system that comes packaged with the Neverwinter Night game series. The objective was to “develop narrative skills such as character creation, plot planning and interactive dialog” (Ibid 57). The workshop employed the services of a visual artist, a professional storyteller, and an experienced game designer familiar with Neverwinter Nights. The Aurora toolset allows for the creation of 3D settings, characters and interactive plots. The most significant finding to emerge was the high levels of student interest and their desire to continue with the process (Robertson and Good 2004). On the negative side the participants found the Aurora Toolset challenging particularly the interface and the plot wizard. The ability of students to engage with the process of game creation was constrained by the demands of the available programming software. This makes the emergence of newer, more user friendly toolsets (such as ScriptEase) all the more timely.

The notion of students building and forming multiple representations of knowledge by creating sharable artefacts is at the core of the constructionist approach to teaching and learning (Papert 1991) endorsing the case for students using computers to devise and build artefacts which can be reviewed and assessed and are open to personal critique and reflection. When students design and construct their own games they can be seen as fulfilling these criteria.

Bioware Corp’s Aurora Toolset is effective for experienced programmers however it required modification to augment its use among students with minimal programming experience. The activity is influenced by factors including creativity, intellectual ability, and previous experience with games. The results demonstrated a high level of success among students in creating interactive stories. Gender did not seem to affect the quality of the work produced even when factors such as programming experience or experience with games were taken into account. A subset of female students actually surpassed the performance of the males. The implication is encouraging for the use of game authoring tools as it implies that native skills and intelligence are optimised over previously acquired technological skills (Carbonaro 2008). ScriptEase allows the successful use of an interactive story writing tool in a constructionist
learning environment. Using ScriptEase students are enabled to construct narratives in which they can place themselves.

The research by Carbonaro et al (2008) lays down five contributions to the promotion of interactive story authoring.

- A viable technology is identified that enables students to engage in interactive story telling. The previous obstacle of over complex programming software has been overcome.
- Second it creates generative patterns of computer code for the automatic production of program scripts. The solution is embedded in easy to use ScriptEase software.
- Third it reports that student that had previously exhibited poor performance seemed to benefit even more strongly than the better performing students.
- Fourth it provided supporting evidence for the claims made in Three.

The issue of underperforming students will resurface when we discuss the research experience of Virvou et al (2008). It is of significance. The original story is a cohesive sets of narratives, usually adventure based. It is created by one or more authors for use by individual players or players in teams (Carbonaro 2008). The focus here is on single user stories. A story trace is a single example of the player contacting and intersecting with the story content. At the point where the student intersects with the trace they are free to interact with the story. The structure of the story is all the possible traces where the player can intersect with the story and interact with it. The game is built on a number of tiles which support the representation of landscape, objects and characters, sound effects and music. Non Playing Characters (NPC’s) can have conversations with student /players as they explore and interact with the virtual world of the game. The facility to not only design NPC’S but to design the form and content of the dialog with the characters is rewarding, not only for the sake of creating the story but has benefits also in language learning. To assist the player everything that will be required is pre built. Tiles representing everything recognisable have been pre built ready for the player to choose from an extensive menu (Carbonaro 2008). Buildings, caves, cities, countryside, mountains, can be customized by the player in a choice of colours and sizes appropriate to the context of the story. The author /player has the facility to create a conversation chart that enables the NPC to speak to the Player/Character. A statement or question can, depending on context, evoke a
different response from the NPC. A certain amount of code writing is unavoidable where author/players need to create narrative links between situations, characters, spaces and contexts. These linking scripts can be as long as the author/player deems appropriate.

The basis of the Carbonaro study was to demonstrate the potential of game authoring tools. It went one step further when it argued that the tools, useful though they might be had limitations in that they placed unreasonable demands on the knowledge of programming of the majority of student

9.5. The State of the Art in Student Game Development.

We have looked at the process whereby students can create their own games and the benefits that might be expected as a result. Before moving on, however, we have to consider one other game. The game we are about to review is more progressive than ScriptEase (for all its merits) because it is independently funded and does not rely on the good graces of commercial firms.

*Gamestar Mechanic* is an epistemic game. It differs from *ScriptEase* in that it shifts the demand on the learner from the challenge of code and programming to the task of becoming a game designer. Granted *ScriptEase* made large strides away from immersing the learner in code, however, the emphasis remained with programming albeit in a more simplified form. *Gamestar Mechanic*, on the other hand:

“allows young people to design digital games - to be game designers - not in order to train them for game industry jobs, but to give them a platform on which to build technical, technological, artistic, cognitive, social, and linguistic skills suitable for our current and future world (Salen 2007, p.304).

*Gamestar Mechanic* is a game about game design. Funded by the MacArthur Foundation, it was developed by collaboration between Gamelab and the Games, Learning and Society Group from the University of Wisconsin at Madison. *Gamestar* is a Role Playing Game suitable for middle to high school age players.

The researchers were interested in a number of attributes of the study group in terms of their engagement with and use of the game. They were keen to observe the playing habits of the students; whether they preferred to operate solo or the degree of
interaction with players and non-players. Was gender a materially influential factor in their application to the game? “Last, and most importantly, we wanted to learn if we had created something that interested them. If they turned their noses up at what we had built, we would need to rethink our whole approach” (Salen 2007, p.310). The players displayed a high degree of independence and self-motivation towards the construction of their own games. Offered the chance to rework an existing game they preferred to start from the very beginning with one of their own. The kids maintained a high level of interest for the full period (90 minutes). There were observable differences as to gender in that the girls demonstrated a more considered approach to the overall design process (Salen 2007). The boys tended to mirror what pleased and appealed to them in the games they commonly played i.e. lots of enemies: “They also tended to build games that were less strategic and simpler than those of the girls” (Salen 2007, p.310). However once the boys had time to see that their first creations did not necessarily generate an interesting game they began to take a more thoughtful approach and eventually produced designs where: “we perceived no qualitative differences in the games they designed” (Ibid). This is a key observation because it offers an alternate perspective to the gender based explanations that have gone to indicate why boys behave differently to girls in their approach to games. Yes, the boys played their fighting games; created their combat scenarios. But when they found that what they came up with was not interesting they changed their approach.

One method of encouraging more reflective and design led games was to ask the kids to make games for each other. The boys responded by making difficult games for their friends while the girls took time to consider what their friends would like. A high degree of socialisation and cooperation was in evidence with the kids quick to supply helpful knowledge they had elicited to other learners.

In the process of their engagement with Gamestar Mechanic the kids took on the role and identity of lead designers, much as Gee (2004a) had recommended. They displayed a grasp of the underlying rulesets that supported the meaning system of the game:

“Perhaps most importantly we witnessed their coming to an understanding of a design system and instantiating this understanding through the creation of fun, playable, and inventive games… We believe that game-making is especially well-suited to encouraging meta-level reflection on the skills and processes
that designer players use in building such systems, be they games or communities of practice. Membership in a community of game producers means sharing your thoughts and experiences with your fellow players. This ability to gain fluency in specialist language and to translate thinking and talking about games into making and critiquing them (and vice versa) suggests that games not only teach literacy skills but support their ongoing use” (Salen 2007, p.318).

Gamestar allows for risk taking in a consequence free context. Learners can develop hypotheses through critical experimentation. The kids developed agency and a sense of affiliation in cooperating with and sharing their games with fellow designers (Ibid).

9.6.Conclusion.

We reviewed the use of COTS games in the classroom and concluded that their value was limited. There is value for a teacher in bringing a game to class for purposes of stimulating discussion and composition however this informal use of COTS games fall short of the larger ambitions entertained for them by their proponents. Commercially developed educational games are a significant step beyond COTS but they have their drawbacks. One is that because of their non-curricular focus (which is necessary, since they must appeal to multiple constituencies) they try to be all things to all people and end by satisfying no one. There is a more serious problem however. Many educational games seem to have difficulty separating fun from pedagogy. In the following chapter we will see how this operates in the attempt to teach history. Strategic games are used to teach history but they have a serious defect. In order to make the game “fun” strategic options have to be included that create so much complexity as to make the game pedagogically meaningless (Egenfeldt Nielsen 2007).

As matters stand, game creation by students seems to be the best available option for educational games. They enhance and develop a range of skills and require a wide and deep range of knowledge. They are low cost (at least potentially). They can be generated to suit particular requirements from the curriculum. They are highly cooperative and allow for students to develop games to teach other students. A game such as Rockstar Mechanic is part of the solution but also, at least in one sense, part of the problem. It is a solution in showing the way to develop games free of corporate influence. It is a problem in that if these kinds of games are to succeed in education the top down, hierarchical ethos that produced the game will have to be retired.
Shirky (2009) made the acute observation that no technology is successful until it becomes so widespread as to be innocuous. Eventually, therefore, the technology to develop self-authored games will have to be freely useable and accessible for all learners.


Introduction.

The Kebritchi study was interesting and useful. In one sense it was also interesting for what was absent from the study. If one looked at the range of games and titles reviewed one would notice a pattern. There was almost a complete lack of what could be termed bread and butter subjects. There is no indication that this was the researcher’s intent. In the following we will look into the application of gaming to more recognisable classroom based subjects. A feature of the subjects that we will now discuss is not only what exists and is available for the various curricular subjects but also what is missing. It is fair to ask why we focused on the games we found. The answer is that there was an apparent dearth of educational games to merit attention. Notwithstanding the reasonable possibility that we may have missed games of significance we would assert that the apparent absence of widely available (and successful) educational games is a symptom of what we have identified as a disconnect between the enthusiasm for educational games by theorists and their nonexistence in actuality.


We will commence with a discussion of Mathematics and Mathematics based subjects. We will then proceed to consideration of language and language learning. We shall see that even as they succeed in certain areas computer games require certain pedagogic adjustments in order to be effective. The most significant of these might be Egenfeldt Nielsen’s (2007) caveat that the guidance of a teacher is necessary to extract the learning potential of educational games. In the case of humanities based subjects it is difficult to force computer games (as currently constituted), to achieve the required curricular “fit” (Egenfeldt-Nielsen 2005) Games are good for conceptual learning. They do well for creativity, for problem solving, general reasoning and decision making; skills which are important in themselves but make no demand of particular subject areas (Bateson 1972).
At the risk of over simplification computer games offer significant (perhaps transformational) benefits to education; but education continues to be a sphere where content is pre-eminent. Where games are teaching the very topics that have made their own existence possible, they do well. When the educational pendulum swings to more humanist subjects they appear to do less well. Those who valorise computer games look askance at traditional modes of learning, hardly any more so than the “drill and practice” method which constitutes the core of the, now out of favour, Edutainment based games. However drill and practice has not gone away nor should it if it’s ease of integration into the curriculum is anything to go by (Squire 2003). The disdain among certain games theorists for Edutainment is mitigated by Van Ecks’ observation that the games environment itself is dependent on drill and practice to establish process skills and acquisition of foundational facts. Not all games work in an identical way when conveying knowledge; sometimes a particular game can deploy a variety of modes of learning to achieve its overall purpose.

Rather than venturing on a quest for the ultimate game, what Van Eck terms the “Holy Grail” of educational games (2006, p.20) it is more pragmatic to employ tried and tested methodologies. With this in mind Ke (2008), proposed and conducted a series of studies in Maths teaching at an American summer school. The aim was to understand the characteristics of drill and practice games, how they work and what students are doing in the game. The objective was to establish the validity of the drill and practice method. There were two research questions: “(1) How did students interact with computer math games and the game based learning environment? (2) Did math game-playing improve students’ math learning outcomes?”

Wilson Elementary is a school district in rural Pennsylvania. Though of lower socioeconomic status it consistently outperforms its neighbours in academic ratings (Ke 2008). A maths program was conducted during the Summer vacation in which each student had access to a computer and enabled to play the ASTRA EAGLE series (2000), of maths games over ten two hour computer game sessions. There are a number of educational games currently on the market. They are designed to teach the player a limited number of skills in basic problem solving, Algebra, and spelling. They are geared towards very early school and even preschool. Computer games have been observed to serve better in terms of learning objectives and outcomes when those objectives are clearly and narrowly defined (Randel 1992, Facer 2004). Titles include Math Blaster and Pyjama Sam. They are classed as
“Edutainment” games, a fusion of education and entertainment, meaning to imply that kids can learn while entertaining themselves. This is a selling point for parents keen to see their children advantaged with an early and, putatively, effective means of learning. The appeal arises from the notion that while the kids are playing they might also be learning.

*ASTRA EAGLE* (2000), was designed specifically to support maths learning in the Pennsylvania junior school system. Developed on Macromedia Flash, it can be presented on any recent browser. The game targeted a variety of math skills including measurement, solving simple equations, and mapping x and y coordinates. Some games were designed through role playing suitable to the players as students. This is in keeping with Gee’s (2004b) recommendation of the player learning through transformation of identity. In a game entitled, ”Cashier” the student is required to play the part of a cashier and carry out a number of cash transactions. “Treasure Hunt” asked the student to use x and y coordinates to locate buried treasure. “Up and Away” required the students to answer a number of maths related questions before flying in a balloon. Each game was designed with a score keeping system and set to intensify in difficulty as the student moved forward.

“When asked about their feelings toward individual math games, what participants stated was usually either ‘It is fun” or ‘I feel bored, it needs too much calculation.” They would not voluntarily comment about a game’s educational values.... On the open day of the math camp, participants showed a lot of excitement, making such statements as, ‘
‘so we will just play games? Cool.

But as time passed by, quite a few participants reported being disappointed and bored:Multiple participants

: Oh. . . they are learning games.Amy,3 (5th grade), proficient in terms of math competency:

Can we play some other games?

Researcher: What kind of games do you want to play?

A: Well, games that are fun.

R: Do not you think this game is fun?

A: Kind of. But I do not like the questions in it. I had to think hard (about the questions).
Tom, 4th grade, basic in terms of math competency: Can I play other games on the Internet if I finish the first level of this game?” (Ke 2008, p. 1614).

The lines above should give pause to those theorists who see nothing but optimistic prospects for the use of educational games in classroom. Although Ke’s study showed high levels of skill and effectiveness with maths it can be argued that the results were mitigated to the extent that, as reported earlier, this was already a high performing school. It would be difficult therefore to separate the performance attributable to maths games with the already established performance that originated from good quality traditional teaching. Follow up interviews encountered a degree of disappointment among the participants who had anticipated “just playing games” (Ke 2008). This is a feature that will be revisited because we believe that the interplay between student perceptions of education space and out of class hedonic space are not sufficiently understood and may have more to say on the future potential of educational computer games.

Why use an Edutainment type game? This was a Summer school involving extracurricular activity. It seems to point to the urge among parents to give their child a competitive advantage. Not only does it highlight the competitive instinct behind parental ambitions it also flags an attitude towards the use of educational games. Note the out of school context. There seems to be a cultural apartheid operating in the attitude towards educational games. One wonders if the achievement scores were not already high, if the parents and school authorities would have sanctioned the use of edutainment games.

The risk with educational games is that since the users (children) are not the purchasers (parents or schools) developers might slip back into “edutainment” mode and thereby try to soothe the conservative habitus which takes a simplistic view of the link between playing games and learning (Maher 2009).

Another issue that raises itself is the perceptible gap between the quality of graphics instructional games developers can afford to put into their games compared with the “eye candy” graphics available in mainstream games. Games developers at Georgia Institute of Technology developed AquaMoose to teach maths. The experimental group expressed enthusiasm for the proposed game at first. Upon introduction the game suffered by comparison with the commercial games the kids were used to:
“However, graphics the students were used to from home consoles and traditional computer games proved superior to that of the team's trial program. Professionally developed games students are used to playing have a high degree of graphical sophistication, and creating educational products from scratch is thus a high barrier” (Rice 2007, p.253).

This might point to an explanation of the relatively lukewarm reception with which the students greeted the game. In VR Engage Virvou et al (2008)placed Human Plausible Reasoning Theory at the core of the game. With ScriptEase Carbonaro (2008)liberated the confidence and creativity of the independent learner. At first examination Maths seemed to have an advantage over Humanities based subjects. Now, however, the possibility arises that, when sound educational concepts are assembled at the core of a subject such as, for example, Creative Writing or Geography, the Humanities can mobilise better motivation.

So many studies augur well for the deployment of computer games in education. Observations that not all students are keen to learn through computer, (De Freitas 2006), are relatively few. Where learners were positive about computer games in the classroom they were overly so expecting that “all learning should be fun”(Ke 2008, p.353). Gardner’s theory of multiple intelligences (1983) with its exposition of visual and the kinaesthetic intelligence would seem to dovetail with the iconic and corporeally based pleasures of computer games, however De Freitas (2006) notes the lack of evidence based research to underpin such speculation.

Too often the curricular and institutional ethos present in much of schooling renders knowledge into a collection of inert facts; to be ingested by the student. The consequence can be a disconnect between the ability to reproduce that knowledge to suit classroom or exam requirements and the capacity to deploy the same knowledge towards the real life demands (Chi 1981). High performing college students had difficulty applying their knowledge of Newton’s Laws of Motion in real world situations whereas they were able to replicate the same information to suit the demands of an exam board (Ibid).

10.3. Language Learning.
“It is critical to underscore that gaming environments should not simply reproduce conventional foreign language pedagogy in a digital gaming format. Rather, we are proposing a framework that emphasizes goal-directed activities within constructed gaming environments. Language, then, becomes a resource that players can and will need to utilize to carry out various social actions (such as role distribution within, and coordination of groups of players) that lead toward successfully completing puzzles, problems, tasks, creation of more complex representational media or objects, and the like” (Purushothama, Thorne, and Wheatley 2008).

Steinkuehler argues (2007) for electronic games as a “third space”; one that is neither the school space nor the exact play space. In this interpretation the social aspects of games offers the opportunity for players to reconnect, to counteract the isolating effects of post capitalist culture. Certainly games are highly social and even those that allow individual play e.g., Zelda, cannot be completed without external support. Steinkuehler sees online games (in this case MMORPGs) as informed by meritocratic sensibilities notwithstanding which they are also sites of opportunity where people of varying nationalities, gender, ages, and abilities can interact productively.

Language Learning through online games draws on some of the conceptual pillars constructed to support the efficacy of games in other forms of learning. The purposeful activity which characterizes game play enables the formation of cognitive and literacy skills necessary for trans domain learning (Lankshear 2006). Online games such as World of Warcraft are therefore suitable venues for language learning with their provision of situated learning environments, peer to peer dialogue and just-in-time language support (Steinkuehler 2007).

Massively Multiplayer Online Role-playing Games (MMORPGs) are a derivation of adventure quest games known as Multi User Dungeons (MUDs). The player assumes a character in the online network in order to pursue a series of structured, purposeful activities in cooperation with other player/characters. The character adopted becomes their avatar the relationship with which fosters high levels of emotional connection and immersion. Relationships are premised and developed through teamwork. Negotiation is a key principle that allows groups and individuals to merge, thus achieving tasks that might be beyond their individual capacities. Players communicate in game and through chat forums. The observed purposefulness and sociability of MMORPGs coupled with the choice of communication tools have generated
assertions that they present optimal conditions for computer assisted language learning (Steinkuehler 2005).

Second Language Acquisition is interpreted differently whether one uses a psycholinguistic or sociocultural interpretation, however both interpretations depend on interaction as their explanatory basis (Lafford 2007). From a psycholinguistic perspective the attributes already mentioned i.e. provision of just in time language contact from authentic native speakers is said to enables the cognitive restructuring that precedes improvement in learning. The interaction allowed and enabled through MMORPG’s tends to minimise linguistic features that promote anxiety in language learning through restricting the capacity for cognitive processing (Rankin. 2008) The focus on linguistic output required by the real time demands of the setting encourages a focus on form and the attention necessary to cope with linguistic problems (Ellis 2005).

MMORPG’s offer advantages for language learning from the sociocultural perspective of language acquisition where language is learned through social interaction (Firth and Wagner 1997). Online role playing games provide real life and real time opportunities for peer assistance and, as we will see, for assistance from experts either gratuitously or from self-interested motives. The help often comes from more advanced game players with more knowledge of both the game and the language.

“Foreign language learning has never fitted nicely into established models of education the way that other disciplines have” (Purushotma 2008).

Language acquisition is in a privileged position when it comes to the business of learning. (Maher 2010) Every other subject is learnt after language is learnt. Therefore it reaps (as we will see) a considerable motivational bonus from the learner being require to engage with language learning as a pre-condition of access to every other subject and topic. We will begin therefore by considering the external effects which support and benefit second language acquisition.

Increased levels of motivation has appeared in disparate studies as a key advantage and justification for the use of computer games in learning (De Freitas 2006). The consensus among researchers was that while games were effective with the general student body “one of the main advantages for us is that it acts as a motivational hook to encourage otherwise hard-to-reach disaffected young people to re engage with learning” (De Freitas 2006, p.350). Games based learning is seen as a powerful
approach for encouraging self confidence in learners Sony’s Lightspan games were utilised to enable spelling and reading tasks among disadvantaged young children. Results were positive, though they called for further research in order to substantiate causality.

We will look at one particular example of an online gaming community to assess its potential as a site of language learning. Socialization is a marked feature of online gaming communities thus providing an ideal opportunity for a language learner outside the L2’s culture to gain access and immersion in the target language (Zhao 1996). Interaction with L1 s’ (i.e. native speakers) is a means for the learner to construct semiotic resources as well as a sense of how to adjust to the norms, dispositions and status based relationship of the target language community (Garret 2008, Castronova 2004). In recent times these kinds of games have begun to attract the attention of language learning research (Thorne 2009).

In 2005 online gaming and social communities were appearing on the internet with increasing frequency. At the time there were an estimated ten million players online with many playing from 20 to 30 hours per week (Castronova 2004). By 2009 World of Warcraft (Blizzard) had fourteen million players and was supporting play in English, Chinese. French, German, Korean, and Russian.

“In what can be described as the ‘intercultural turn’ in L2 education, one of the standout developments has been the mercurial rise in the use of communication technologies that enable language learners direct interaction with speakers of the language they wish to learn, independent of spatial location (though, of course, completely dependent on access to the appropriate technologies” (Thorne 2010, p.1)

World of Warcraft is one of the most popular online roleplaying games. It cost eighty million dollars to build and generates that amount of income in one month (Perry 2009a). Soon after its initial release it was found that some players had reached a level which required one month’s continuous play out of a total period of five months (Leadbetter 2009.). It creates a persistent virtual reality where players can explore, socialize, take on new skills, earn money and cooperate in the process of teambuilding (known as guilds), which is central to successful play. Gaming is complex requiring extensive strategic planning between players from a variety of cultures and languages.
Gameplay in MMORPGs is challenging, requiring the successful transit of virtual topographies, strategic thinking and testing of hypotheses. Nor are the virtual landscapes static. The software is designed to monitor the player’s progress. During the course of play it often happens that easy victories attract ever more fearsome opponents. World of Warcraft (WoW), is a prime example of how this type of online digital game deploys educational principles, in particular what Vygotsky (1978) refers to as the Zone of Proximal Development. Vygotsky must be acknowledged as a prime exponent of the principles of Constructivism which have been illustrated in Chapter 6, subsection 6.1 to 6.5.7.

“Digital games have an inherent capacity to enrich human living in the areas of “control, agency and meaningfulness” (Gee 2004a, p.10). This might offer an alternative explanation as to why players customarily devote so much of their available time to playing digital games. At the least it might serve to alleviate the sense of morbidity linked to addiction as the sole explanatory factor for such behaviour.

The instruction booklet for World of Warcraft (WoW) is a very slim volume and makes no attempt to convey all that will be required to manage and navigate the game. This might come as a surprise to those of an older generation who regard the younger as deficient in attention and concentration.

WoW provides opportunities for peer learning on the pragmatic basis that every player has to be fully trained and fully informed to maximise the success of the guild. It is possible to play WoW alone but very difficult. Critical reviews tend to look negatively on games that can only be played on one’s own. Guilds are key sites where the neophyte player/learner can gain knowledge and expertise by contact with another more established player. The more experienced players habitually share their expertise with other experienced players. This provides the learner with valuable opportunities for attentive listening similar to the strategies adopted by Lave and Wenger’s (1991) formulation of “legitimate peripheral participation” in communities of practice.

Conversation is the key to player communication in which the player acquires knowledge of the procedures, structures, strategy, tactics and ethos of the game. Since WoW is global we can appreciate also that it is for many an avenue to Second Language Acquisition; notably English. Players whose L1 is not English play WoW as a means to immersion in a culture of English Language speakers (Zhao 1996).
“Learning a second language is rather like renovating your house without moving out: you can shift things around and add to the structure, but you still need to be able to live in it” (Purushotma, Thorne and Wheatley 2008).

Willis (2001) advanced the principle of Task Based Learning (TBL) to optimise communicative language acquisition. TBL eschews other form based approaches to language teaching in favour of a specified set of communicative tasks. Priority is given to the exchange of meaning. Research has shown that certain forms of language exchange are more effective than others when it comes to the sharing and negotiation of meaning; specifically, two way information flows operate better than one way, open outcomes are preferable to closed, and narrative discourse work better than exposition (Willis 2001). Even a brief visit to the weblogs and the public (or private) chatrooms that exist around online communities such as World of Warcraft will serve to show that these learning modes are being served in the pursuit of highly immersive play:

“The study of 'tasks' serves to bring SLA [Second Language Acquisition] and language pedagogy together” (Purushotma 2008).

Vygotsky (1981) argued that learners would progress better in situations where they could avail of the assistance of their peers. This is a cornerstone of the extensive amount of learning that is required to play games such as World of Warcraft but it is also a general operating principle in most digital games. The Zone of Proximal Development is seen to operate where players are encouraged by the support and practical assistance of more experienced players. Answering requests for information can be interpreted as a selfish motive on the part of those with a stake in the performance of the team member but there is also an intense sociality evident in these online games and people usually treat even the most neophyte enquiries promptly and courteously. This is evident in the case of fellow guild members although unknown people have also intervened with helpful information (Nardi 2007). Through the use of online roleplaying games, the Zone of Proximal Development (ZPD), and the principle of Task Based Learning act both independently and in a mutually supportive fashion in the process of Second Language Acquisition.

Gaming communities online are not in the business of creating sites for language socialization and the construction of semiotic domains; they do so in the process of developing hugely successful commercial entities.
10.3.1 Testimonies of player/learners

The following quotations have been excerpted from Thorne marker to provide a sense of the motivations of language learners and how they adopt and adapt to online games.

Excerpt 1: Although I’ve learned English -I am Turkish btw- at school I was far away from speaking it. I've been playing WoW for the last 2.5 years and speaking with my buddies in-game has helped me a lot in speaking English fluently. I was reluctant at first on vent [a voice communication tool used by WoW players] but as time’s passed I’ve realised how easy it is to speak with people whose mother language is not English mostly. Having people from many countries wipes away the fear of looking really silly when trying to pronounce correctly ;)

Excerpt 2: Well, being Russian playing on an English realm I have learned English. From nearly zero level to 108 out of 120 points in TOEFL test. I also meet lots of Swedes, Danes and even British from Caribbean.

Excerpt 3: I live in Belgium and I play most of the time on french realms (that’s my mother tongue) but sometimes I go on an alt on a german realm. I love this language but I don’t have other ways to practice it these years. … I master their language more or less and that can be very funny to go through a dungeon [a 5–person team event in WoW] when the 4 other members are talkative (that’s a good context to make you write and understand faster). Emotes [scripted communication units programmed into the game] are great when I want to make jokes or communicate quickly and without mistaken. I confess that I’m not German only if there is a sentence which I have no clue what the meaning is...

Excerpt 4: I’ve been learning Italian for about 4 years and once I finished uni, it became quite hard to meet Italians here in London unless you got Italian friends who could introduce you to others. Luckily, I found an active guild called Cavalieri dell’Alba on EU [European Union server] Dragonblight, who have been around from vanilla WoW. I was in that guild for a few months and communicated entirely in Italian. It really helped me to become more fluent.”

Excerpt one emphasizes fluency. It also confirms the concern with perceived anxieties which were alleviated here by the multi plural sense of community offered by the
game. Excerpt 2 testifies to remarkable improvements in learning grades. The subject in Excerpt 3 takes the opportunity to go on virtual journeys with native language speakers and only highlights his non-native speaker status when encountering a language topic beyond his capability. Similar to 1 excerpt 4 highlights fluency as the main benefit for being on game populated by native speakers.

10.4. History, As Taught Through Computer Games

“In short, I am nothing like a cog in a machine. This is also true of people throughout history. Napoleon was a general, but he was much more than that! Digital games, however, tend not to be able to present the full fluidity and flexibility of what it means to be human”(Schut 2007, p.224).

Computer games featuring historical issues have become a popular phenomenon. They offer historians the opportunity to deepen the understanding and appreciation of history both within school settings and in the wider world. In the following we will consider several approaches to the introduction of history through computer games. Certain of these approaches are more successful than others. The more successful seemed to be distinguished from the less by a strong inter disciplinary ethos which brought together historians, educators, gamers and game designers. In the course of playing Sid Meier’s Civilization Game the player is faced with a series of challenges framed in the context of necessary and impact laden choices. The player is required to think strategically, holistically and tactically. In the role of king or emperor the player begins to think like a historian. Notable academics are emphatically in favour of this development. They even see grounds to hope that a more interactive engagement with the possibilities of history as evoked in successful computer games will equip future decision makers to make more subtle and better informed choices than present or past generations:

““What if D-day had gone wrong?” is only one of scores of counterfactual questions historians have asked about the war. What if the Nazis had invaded
Britain in 1940? What if Hitler had captured Moscow in 1941? What if the Japanese had won the Battle of Midway in 1942? These are questions that computer games ought, in theory, to be able to help answer. And yet no military historian, to my knowledge, has made use of them.... Gaming history is not a crass attempt to make the subject relevant to today’s kids. Rather it’s an attempt to revitalize history with the kind of technology that kids have pioneered. And why not? After all, the Game Boy generation is growing up. And, as they seek a deeper understanding of the world we live in, they may not turn first to the bookshelves. They may demand to play—or rather replay—the great game of history for themselves. And who knows? When they come to make real strategic decisions, maybe this strategically savvy generation will do a better job than we did” (Ferguson 2006, p.3).

Over 25% of all PC based games that have sold more than a million units have had a historical theme (Kee 2009). The kinds of questions around which this type of game is formulated e.g. how empires are founded, maintained and finally collapse are the type of questions historians are commonly concerned with (Ibid). Therefore the prospect of having younger students encountering and engaging with these issues is a gratifying prospect for those who see the subject of history as more than just the ingestion of a multiplicity of facts. Along with Ferguson’s humanistic ideal that the appreciation of history will produce a generation more aware of the lessons of the past there is also an ambition to recruit more adherents for the discipline:

“In this way, history games have the potential to draw players into the discipline. Gamers may be short steps away from becoming historians, if we can discover the best way to express history through simulation”(Kee 2009, p.305).

There is an awareness of the need for an interdisciplinary approach to the creation and design of successful games: “As researchers, we run the risk of ruining what makes a good game if we do not consult with professional game designers”(Ibid 306). The best approach would be a balance between the requirements of pedagogy and the attractions of engagement (Van Eck 2006, Samuel 1994). The emergence of a new approach to engagement with history predated the advent of computer games. It began in the 1960s’ with a reaction against the position of academic historians who saw history as an elite, text based subject and rejected the trend towards its democratization in the form of theme parks and historical re-enactments. Samuel’s
(1994) defence of the new mode did not anticipate computer games specifically yet it is possible to see a foreshadowing of digital games in his critique of the traditional historian’s devotion to the history as text. Historians “give a privileged place to the written word, to hold the visual in comparatively low esteem, and to regard imagery as a kind of trap” (Ibid 22).

Computer games necessarily concern themselves with the particular and in the notion of Micro History, historical studies has a counterpart: “Micro-history is a historical approach, partly method, partly theory, that at its most basic says that we can ask big questions in small places and in so doing find answers that we did not see before” (Kee 2009, p.317). We will review this localisation of history through use of game technology when we come to consider the Akkerman study carried out in the old quarter of Amsterdam. The term “micro” is deliberate and distinguishes a movement in historical study that, by focusing on the minutiae of the past, allows insights to emerge that would be inundated in “macro” considerations. One of the attractions of computer games for the study of history is the opportunity to form interpretations based on analysis of evidence (Ibid) The Civilization game (1991) appealed to individual students in its potential for suiting diverse ethnicities and identities.

“. The challenge for educational institutions will be to marry the collectivist learning inherent in old media, which saw all students literally reading from the same page, to the individualist learning of one student using one computer to explore the digital universe.”(Kee 2009).p322

Games offer new pathways into fostering a qualitatively better approach to the learning of history yet this development is only at its inception with many historians wary of or yet to engage with the genre (Kee 2009). The attractions and pleasure of the “heritage” media that has arisen in the last decades provides a strong attractor for an engagement with history. A heritage approach to history while it leans away from a text based involvement with the topic does not necessarily entail a complete rejection of factuality. It is possible to build attractive games with a high factual content. Constructivist approaches to learning view the learner not only as a recipient of information but as an active and engaged creator of knowledge. This requires that students should only engage with tasks that are meaningful.
Notwithstanding their ludic dimension, games are a powerful site for learning through narrative (Jenkins 2004a). The power of narrative consists not only in its capacity to incorporate knowledge but also to immerse the learner through engagement with the emotion (Aylett 2006). Barton and Levstik (Cited in Akkerman 2007), propose narrative to be a foundational element in learning history because it creates a unitary sense out of a disparate series of facts, situations, personalities and events. Narrative also contributes to the process of retention in memory (Sugiyama 2001).

We will compare and contrast the use of two video game technologies for teaching History. The studies are by Akkerman, Admiraal, and Huizinga; (2007) “Storification in History Education: A Mobile Game in and About Medieval Amsterdam” and “Europa Universalis 2”, by Egenfeldt Nielsen (2007).

10.4.1. Storification in History Education: A Game about Medieval Amsterdam.

“Because the player is immersed in a historical time period, one would assume that there is history to be learnt from playing the game. However, I feel that the historical context is really only incidental and the students I worked with confirmed this view” (McFarlane, Sparrowhawk and Heald, 2002 p 12)

The statement above throws doubt on the educational effectiveness of a history based game. We will see if there is educational potential in taking history games out of an exclusively game based context into physical reality. “Storification” is the meaningful connection of temporality and sequence (Akkerman 2007). It is deployed in this study to counter the (perceived) fragmentation that attends extended narratives concerning historical figure, places, and events. In the game 216 students from 10 secondary schools were assigned to learn the history of Amsterdam by walking through the city using UMTS/GPS mobile devices to stay in touch with a team that were controlling and constructing the learning. The information exchanged through the course of the game was collected by the researchers and the team coaches. The researchers were intent on finding out who benefited from the game and how they did so. A three phase process was devised based on reception, participation, and construction.

The study employed constructivist principles based on situated learning; passive receipt and consumption of information no longer seen as tenable to the needs of
society (Ibid). Games in this view are seen as a means of situating the learner in a meaningful context which emphasizes problem solving and understanding (Shaffer 2005, Gee 2004a)

The authors of the study note their debt to Dettori, Gianetti, Paiva, and Vaz for the three phase process. Reading is a way of receiving the story in an unaltered form where the student has no input over its shape or content. In construction the student takes on the role of author. The task of the constructor is to generate the story narrative by deciding what elements go into it. Participation requires the student to take on the role of actor, allowing the student to experience the story directly. These three modes of “storification” are seen as different paths to experiencing a story (Akkerman 2007). There is a variation in activity from passive to active. The most passive is seen as the receiver of the narrative, the most active, the constructor, while the participator falls somewhere between.

The game, known as Frequentie 1550, is an example of what Jenkins (2004a, p.18) refers to as a spatial games devised for “environmental story telling”. Developed by the Waag Society, it has won the prize as one of the world’s most innovative applications of e Learning. However, it has yet to receive systematic study (Akkerman 2007). At the start of the game the students were briefed on the story line of the game at a central location prior to dispersal in groups of two or three. The city was divided into six thematic areas: labour, trade, defense, government, rules, and knowledge. Depending on the area they were assigned to the students were sent an introductory video clip containing terms that would be helpful in completing their assignments. They were required to conduct location based tasks at certain points before proceeding to their next location.

The groups were rotated in the afternoon so that the “Headquarters Team” (HQT), got the opportunity to go out into the city and the “City Team” (CT), could experience the overall sense of the exercise. The CT was able to access a map of the medieval city via their mobile telephones and the HQT also provided various sources of information as appropriate. There were three kinds of assignments to be carried out in each sector: an orientation assignment, an imagination assignment, and a symbolic assignment. The orientation assignment was facilitated by the provision of texts that would stimulate a sense of the environment. The CT was tasked with proceeding along routes, filming buildings or sites connected with medieval life. The imagination assignment used similar texts and activities to promote situational awareness and
consciousness of historical events and personalities. The CT’s were requested to act out various utterances of historical figures and video tape the results. The HQT’s were then required to interpret these sayings. The symbolic assignment consisted of the CT tracing and locating some elements in the site which were of symbolic value. Examples included details such as key sites represented by the presence of plaques. The CT sent in the images to the HQT who were required to sort them in order of relevance.

Each CT was equipped with a GPS ‘phone and a UMTS video which enabled them to send and receive pictures, text and video messages. The HQT was provided with telephones and computers (with internet connection). The HQT were provided with two maps; one of the medieval city and one of the present day city. The CT’s in the field were provided with the medieval map only. The medieval map important in setting the scene but also in providing the location of key sites e.g. city walls, towers, the harbour etc, in their original historical context. The Global Positioning System allowed the HQT’s to guide and follow the progress of the CT’S throughout the day. Because the HQT’s always knew the exact location of the CT’s they were able to direct the ground teams to precise locations. The HQT’s were also responsible for collecting and storing all text messages and video supplied by the CT’s. Problems arose when the navigation of the old city clashed with the realities of the new. The HQT’s and CT’s were in constant contact especially over navigational issues; more so than the researchers had anticipated. Observers noted that, at times HQT’s and CT’S were not listening to each other. There were also some minor technical difficulties with locator dots not showing correctly.

At the end of the day the various groups reconvened at the headquarters of the project where each group was invited to present their collected media to the other groups. Motivation levels were reported by observers to be higher in the HQT’s who were heavily engaged on tracking, guidance and supplying information and had both responsibility and overview of the progress of the game. Participation was seen as the acting out of the narrative. The students had to plan and be aware of the narrative elements walking through the city, taking video, making utterances were the modes of acting out the narrative. The CT’s on the ground had little overview or sense of the narrative compared to the HQT’s.
‘The students of the CT had no clue of what they had done during the game. They did know that they took a picture of the Montelbaanstower, but had no clue why or what for’ (Akkerman 2007, p.455).

The CT’s being directed through the city had little sense of the context of their actions. The game lacked a sense of flow due to the extended periods taken up in walking from one location to the next and the city environment proved a further distraction resulting in a diminution of the game narrative for some of the students (Ibid). The students were asked to contextualise certain areas to the historical events or personalities that transpired in that location. They were advised to use their cameras from the same angles and perspectives of medieval dwellers. Observers reported a high level of motivation among the groups.

The imagination task consisted of the students acting out a specific passage or utterance connected to a historical character. The objective was to analyze a game supported by mobile technology in terms of its potential as a narrative learning environment. The purpose was to explore how students linked characters and causation to actions and events. The researchers were interested in the process of “storification” which they interpreted as the receiving, constructing and participating in a story. The analysis showed how different elements of the game enabled different paths to interpretation of the narrative. In terms of that construction and participation are active processes in which the learner is author of the story with the freedom to create narrative linkages. Participation was argued to be more “intense” (Akkerman 2007, p.458) than construction as the learner had the scope to act out the story by interacting with physical phenomena, thereby providing a more deeply experienced kind of learning. The experience, however, was mitigated by the distractions of the urban environment. The groups tasked to move through the city were at risk of losing the overall sense of the narrative. In this game the quandary of having one group—the participators—experiencing a more intense interaction with the game than the constructors while the constructors had a more comprehensive sense of the overall narrative, was overcome by ensuring that the groups switched roles halfway through the excercise. Future research would focus on how to combine participation and construction. These perspectives on storification allow a more nuanced
we evaluated how narrative was designed and applied in a mobile history game in order to get insight into the values of game-based learning as a narrative learning environment in secondary education. We investigated to what extent students received, constructed and participated in the story during the game, as well as what kind of effects these different forms of storification"evoked by the pupils" (Akkerman 2007, p.450).

In our view the research fails to keep an authorial promise made in its opening. Citing Wineburg they note that:” The failure to grasp the nature of historical context is often described as an important source of student misunderstanding”(Akkerman et al 2008, 449). If their research interest was game based learning in a narrative environment there is a question mark over whether or not the choice of history was appropriate. Having set out a coherent basis for the role narrative can play in a grounded approach to learning History they venture on an explication of how the game can be used to shed light on the process of “storification” The word “history” is not mentioned again leaving the reader to gravitate toward the conclusion that an interest in history was less their focus than an explication of a process of narrative. This may be regarded as a justifiable enquiry but if narrative rather than history was their concern, they should have said so. Also they appear to have taken certain liberties with history which can be cavilled with. The most notable liberty was the
presence of “fictional” characters. “An additional difficulty was that the historical facts were partly fictional, and partly authentic (in terms of ‘accepted as historically true’) (Akkerman et al 2008, 453). While participations in historical dramatisations can be effective at establishing a good sense of history, the admixture of fact and fiction in what is intended as a learning context cannot be helpful to history as a discipline. The argument for an interest in narrative rather than history is supported by their lack of interest (as it is evidenced in this writing), of what the students actually learned on their day out in the city. The research originated with a sound theoretical principle. Admiraal et al acknowledged their debt to Gianetti, Dettori, Paiva, and Vaz for the three step process of reading history. Therefore they understood the need for theoretical rigour over a preference for technology. However they have not, in our view, shown sufficient interest in what the theory was designed to prove.

What sense of the history of the city was different as a result of the day’s exercise? This would seem to be a relevant and interesting question to have addressed to the students.

There is a problem with the game as a game. Apart from the acknowledged lack of “flow” in the game; a serious fault in its own right, it has a play element, though that is comparatively weak but where are the quantifiable outcomes? It is possible to speculate that indeed the students did reap a deeper sense of the history of the city but it was not, seemingly, a priority of the researchers even if they had foregrounded the issue in the opening sequence. It was noted that those who were privileged with a complete overview have to sacrifice the intensity of experience that comes with direct participation. The researchers have commended the resolution of the problem to future generation.

If as learners and as teachers we are required and require others to adopt an overview central to the growth of critical thinking we are barred from the intensity of direct experience. The researchers solved this dilemma by making sure that the teams switched during the day so that each player had experience of the various roles. It was a simple solution but makers of educational computer games are not so fortunate. Games are alluring because of their power to immerse, the ability given to the player to get lost in another world. Where is the opportunity for the critical reflection necessary for best learning practices?

10.4.2. Europa Universalis 2.
As with Frequentie 1550, Europa Universalis 2 (2001) was a celebrated and successful strategy game in its time:

“Europa Universalis 2 makes it possible to experience history in a new way. It is not about the facts of history, but instead the player engages with the underlying historical dynamics from 1419 to 1820 to change or enact the course of history....The player has many options, some much harder than the others. It is hard to avoid the consequences of history, and to do so the player must use historical knowledge to prevent historical failures. The game has some major historical events that need to be addressed such as the rebellion in England in the seventeenth century, the Thirty Years War and Spain’s bankruptcy due to the overflow of gold from the New World” (Egenfeldt-Nielsen 2007, p.120).

There is an immediate problem with this quote. The problem itself goes to the heart of a particular difficulty that historical games seem to have in relation to history as a subject. When is a fact a fact? The passage begins with the statement “It is not about the facts of history” and ends by declaring “The game has some major historical events that need to be addressed…” Spain’s growing dependence on treasure from its American Empire and its subsequent decline are key facts of history. It seems that certain facts are acceptable in that they accord with the appearance of a process and can be rendered as a dynamic of the game. Nevertheless a fact of history e.g. a battle, an assassination can be just as dynamic.

In 1628 the King of England was faced by a rebellious Parliament who pressured him to sign the Petition of Rights into law. In the game the player has the choice of signing the Petition and if it is not signed the game takes a different course which devolves into a multiplicity of possible scenarios. “The game is capable of entertaining the player at several levels, from the first layer of military conflict to the deeper layers of culture, religion, economy, and policy” (Ibid). The game is controlled by a number of historically derived variables, the most important of which is the stability of the country. Stability is influenced by several factors, one of the more important being the decision to get involved in wars of expansion. For example it is not good strategy for Russia to compete with other powers for lands in the New World when there is unimpeded access to land in Siberia. The course of history, in the game, can be readily changed. The player has the option of preventing the rise of Swedish power.
under the warrior king, Gustavus Adolphus: something that did not take place. Finance is of crucial importance. The player must be constantly aware of inflation and how this might affect the cost of raising and maintaining armies. Political decisions have real consequences in Europa Universalis.

A problem that arises with this kind of history strategy game is what Egenfeldt Nielsen terms “the trickle down effect” (Ibid 122) which means in essence that “the longer one plays, the further one moves away from historical accuracy” (Ibid 124). When Denmark defeats Sweden it changes the dynamics of the history of Northern Europe to a sudden and serious degree. “The player is capable of making radical change. There is not really any solution to this problem and it is both a strength and a weakness. It moves the focus from facts to dynamics as the computer game does not primarily teach about factual history but how history evolves” (Ibid 124). Artificial intelligence in the game software, though improved from earlier version, still lacks flexibility. The game also seems to be prone to crashing. Nevertheless Egenfeldt Nielsen contends that a player who is familiarized with in game help and other features can play the game “at some level” (Ibid) leading to an ability to understand the multifaceted nature of the game. Sometimes fantasy situations can arise as a consequence of gameplay, for example the Creek Indians involved in a war with Austria. The capacity of this kind of game to become complex to the point of meaninglessness is illustrated by the example of the Creek Indians going to war with Austria (Egenfeldt-Nielsen 2007).

In order to test the validity of the game as a tool for education a 10 week course of research was conducted with students, ages 12 to 19. The students were divided in three groups, two of which used the game and one, the control group was taught history in the standard fashion. The procedure for the research was that the game would provide a concrete sense of history while the lectures built on that to generate concepts about history.

The study encountered unexpected resistance from students uncomfortable with the use of computer games in class. It emerged that there were large differences among the students in their attitude to computer game. Far from being homogenous the students varied on a number of critical parameters which were of critical importance for the application of computer games. Not all the students were gamers. Of those who were not all had the relatively high level of skill required to play the game. Further variables emerged related to interest in history and academic aptitudes.
Despite initially positive indications “less than half believed, that, in general, one could learn from computer games “(Egenfeldt-Nielsen 2007, p.132).

In fairness to Europa Universalis and the game avoids a critical defect in history games-the tendency towards violence and militarism. Schut observes the Hollywood ethos implicit in many history games with the attendant devotion to portrayals of violence and glorification of war:

“More blatant than the two themes of economics and politics, however, is the centrality of war. Practically all commercial historical digital games feature some kind of military- or combat-oriented activity, even if it is not the only option available to players. Pirates allows the player to be a peaceful merchant instead of a bloodthirsty privateer, and the Civilization (1991) player may win the game without conquering anyone or anything. In both cases, however, it would be extremely challenging to make it all the way through the game without a single battle. In addition, the mechanics of these games, their manuals and even their promotional literature clearly indicate that game makers wish violence and combat to prominently feature in gameplay”(Schut 2007, p.221).

This is the difference between a for-purpose education game and a game taken out of the commercial sphere. Certain aspects of life are qualitatively difficult for computer games to manage. This is so in the creation and construction of History games. Game developers deal with the more difficult elements of human living either by reductionist systematisation or adding an element of pure randomness. Systematisation reduces the human to a predictable quantity The random is meant to represent the anarchic unpredictability of the human (Schut 2007).

“This is a warning that we should not expect computer games to be an experience that magically all students can approach equally. Especially not if we continue with one specific title being offered to all students who will inevitably (sic) exhibit different game preferences” (Egenfeldt-Nielsen 2007, p.134).

The question has now been complicated by the possibility that not all the students might like or want to use a proposed game. This seems to raise the stakes in terms of the expected investment in computer games for a proposed classroom situation.
The question has to be asked: Have we seen in these newly developed games, a return of Edutainment in newer packaging? A key point to remember is that Europa Universalis is a commercial game repurposed for education. While continuing to assert that Europa Universalis 2 has educational potential Egenfeldt Nielsen goes on to expose serious flaws in their potential application. He concludes that there is an antagonism between the life of leisure and the life of a student which a commercial entertainment game such as Europa Universalis 2 is not equipped to ameliorate. He detects resistance from a conservative attitude among students and a resolute dependence on traditional modes of learning history from textbooks “which hands down the “undeniable” truth” (Ibid 150). While there might be a question of a lack of historical understanding one cannot fault Egenfeldt Nielsen for his objectivity and candour.

It seems difficult, based on the above, to conclude that a computer game of either of the types discussed could enhance the learning of history. Of the two possibly the Amsterdam game might give the students a sense of connection to the history of the city; something valuable in itself. Of course there would have to be preparation and pre teaching and this brings the argument back to traditional teaching. One cannot escape the notion that the students would have benefitted as much, if not more, from a walkabout with their history teacher. At least it would save on the investment into expensive mobile technology. As to Europa Universalis Egenfeldt Nielsen exposes the flaws even as he loyally maintains its potential. Its deepest flaws are its dispensation with factuality and a tendency to become almost unmanageably complex in a short space of time. There is a postmodern vice which belittles facts nevertheless no serious historian would consider, for example, that students fully understood the rise of British naval power if they did not know when, how, and why the Seven Years War was fought. The games investigated did not seem capable of this degree of factuality.

The Storification game has won several prizes yet as Akkerman(2007) acknowledges, it has yet to receive systematic study. Before critiquing what the team might have done better or differently we would support their initial concept of making history both accessible and relevant by the use of mobile technology. This game differed from other history games in that the play element was not located in the technology but vested in the procedures designed around the learner’s actions. Dispensing with the passivity they attributed to reading history they opted for a process of constructing
and participating in history as the students moved through the historical parts of Amsterdam. By alternating the roles of the teams the organizers ensure that all the participants would have experience and benefit from the different phases of the project. Problems begin to emerge when the exercise had been concluded. Initially the researchers focused on the possible benefits for the learners of approaching history in an embodied way. The early reference to history was also the last. If history had been the focus of the research one might have expected to read extended reports and discussions of the greater consciousness among the students. This was largely absent. In our view an opportunity was missed to assess the impact of the core value of the project; the use of a mobile game format. This might have been valuable in its own right as applicable to the learning of other subjects.

10.4.3. Geography and Computer Games.

While we are interested in identifying the educational benefits that computer games offer to a certain curricular subjects we are also keen to note the dynamics of a particular game that may be applicable to other subjects. VR Engage was devised for Geography however it should become apparent that the researchers have identified a powerful concern regarding motivation which could have significance in wider areas. Recent years have seen a decline in interest in Geography due to an alleged failure of relevancy and authenticity. A view has emerged that a new style of pedagogy for the teaching of Geography is required given the changing characteristics of students (Fitzpatrick 1993, Hill 1999). Authenticity was paramount and seen as a concern for local and global issues with the use of real world data. Games have emerged as a means for teaching Geography. Adams (1998) has adapted SimCity in an undergraduate course in urban geography. Sim City is a simulation game allowing the player/learner to construct a functional urban environment complete with roads, buildings, bridges, and electricity generation plants and considerations about complex issues around environment and urban planning. Through their experience of SimCity students began to gain an insight into the complexities and challenges of constructing and managing the built environment (Ibid).

Tuzun, and Zilmaz-Soylou et al (2009) undertook a research project in Turkey to investigate whether computer games could be deployed in the teaching of geography. They determined to address the following questions:
1. What learning outcomes are achieved by students through the implementation of games?
2. What is the nature of the student as a game player?
3. How does this motivation differ from motivation in non-game based learning?
4. How are games integrated and implemented through the curriculum?

The participating school was a private K-8 school in the centre of Ankara, Turkey. The school was part of the three year Comenius project with 17 schools over 15 countries (http://ejournal.eduprojects.net/ipmtools10). The project required the participating schools to conduct activities among students to produce artefacts reflecting on their country, city, culture and traditions. The Geography game selected was specifically intended as their contribution to the Comenius project and because of its virtual dimension could be integrated with other schools globally; the other requirement of the project. Because of its popularity and widespread use, Tuzun, and Zilmaz-Soylou et al (2009) opted for a game design on a 3D immersive environment. The superior graphics of the 3D immersive interface combined with the communicative capacity of networked computers has produced the evolution of 3D Multi-User Virtual Environments (3D MUVE’s). The 3DMUVE provides a number of different affordances for learning. Through the creation and use of an Avatar the student is able to adopt a virtual self and allow this identity to interact with others (Bers 2001). The technology provides the tools for synchronous and asynchronous communication i.e. emails, blogs, chatrooms, backchannels, visuals and conversation through Voice Over Internet Protocol.

The Quest Atlantis (QA) game was selected for its 3D MUVE facility that made it both adaptable and scalable to local and international requirements. In QA players are submerged in a rich world where they are challenged to complete curricular based tasks designed in the form of a quest. The quest designed for the Geography game was sited in the “Global Village” and was based on the notion of several lost children who needed to be traced back to their countries of origin. QA is a complex and lengthy game which requires extended time to apply in full. The limited time period allotted to the study meant that not all the features of the game could be deployed (Tuzun 2009). From the outset the learners were encouraged to take an active role both in the acquisition of domain related information and the structure of the developing game. The design of the game was based on three forms of learning; experiential, enquiry
based, and collaborative. In the experiential context students could communicate with the intelligent agents in the game, thereby acquiring data on countries, cities etc. The students explored the Global Village using an enquiry based learning framework where they collected and compared data obtained from the lost children with facts they had also acquired about various countries. Collaborative learning was fostered as the students brainstormed together (either virtually or in physical space) to determine what countries the lost children had originated from (Tuzun 2009).

Motivation levels were observed as high throughout the game. It was noted that the students celebrated and congratulated each other whenever they found one of the lost children. They were voluble when controlling the various avatars. These observations suggested possibilities for exploration, interaction, collaboration and presence (Tuzun 2009). Students played the game with enthusiasm and attention. Some had to be ejected from the computer room in the evening while all were disappointed when the study ended. The Comenius teacher later reported incidences of the participants sharing their experiences with others, including parents and some parents enquiring where the game could be accessed. The general conclusion therefore for the deployment of educational computer games in the classroom was uniformly high.

There was however, one methodological flaw in the research which might have had serious implications. As we noted earlier a positive feature of educational computer games is that they motivate the underperforming student. Our contention is that, in all likelihood, the school did not weight the participants for underperformance.

Tuzun reported that:

"School administration selected a group of students based on their grade averages and their willingness, and called this group as the Comenius Classroom (CC). The CC voluntarily participated in the Comenius project activities after the regular school hours. The CC consisted of 24 students (12 girls and 12 boys) from fourth to fifth grades. Their English fluency was above the average, they were able to use word processing and presentation software, and utilize the Internet for research and communication. Almost all CC students had ownership of a computer at home, and many of them played computer games regularly. Social and economic status of the students’ families was above average. Although CC students might have covered the subject matter in fragments through their previous courses, it was learnt from
the teacher responsible for the Comenius project that they had no structured prior knowledge of the subject matter.” (Tuzun 2009).

The school is private and therefore funded by parents intent on their children having a high quality education. Note that the school selected on “their grade averages” not on class averages School administration selected the students who would participate based on their academic performance. We can fairly conclude that those chosen for the study had a high academic performance level based on:

a. The school being private.
b. The high level of English.
c. The proposition that no school administration would allow underperforming students to represent their school at international level. Based on personal experience, institutions in Muslim countries are sensitive to being poorly compared with non-Muslim countries.

The weight of the overall study is positive and instructive. Nevertheless the results have a possible flaw in the choice of school may have biased the outcomes. There does not seem to be any information on the schools rankings. As our interest is in the possibility that educational games may appeal to and improve the results of underperforming students it may not necessarily be helpful as it might have been since as Virvou (2008) points out the high performers would have done so in any case.

10.5. The Impact of Educational Computer Games on Health.

“Although I enjoyed the game, as did the children, I do not feel that there was any educational relevance from the point of view of health education or food groups. Parts of the game are set inside organs of the body in an attempt to highlight the health elements of the program. The message is not reinforced as the program goes on and I feel that the idea of food groups became lost in the game. If there is going to be any educational relevance I feel that something about the balance of the food groups would have needed to have been explored. The food pyramid was there but I do not feel that the reason for that was explained (McFarlane 2002, p.12).

10.5.1 Introduction.

Earlier we argued that Commercial Off The Shelf Games (COTS) adapted games are found wanting for their lack of educational value and the tendency to lose important
educational details in the course of the games construction. When the required pedagogical impact is urgent (as in the need to promote good health awareness), their alleged usefulness becomes even more questionable. Contrast the statement above with the considered approach taken to the design and implementation of for-purpose educational games. As we will see below, games have the ability to take on urgent concerns in education and influence the target audience profoundly.

10.5.2. Games for Health Awareness.

Computer games can be used to promote awareness of health issues relevant to children and to educate in the process of acquisition of relevant skills and knowledge. Games have the ability to personalize information in a way that makes it relevant to the needs of the learner.

SMACK was a 1994 New York City educational game devised to educate children to the dangers of using heroin. The game was designed to confront children with decisions to be made regarding the use of heroin and to deal with the negative consequences that might result (Oakley 1994). The game provided reinforcement for those not wanting to have contact with drugs while providing simulations of “experimentation” for those at risk and likely to experiment.

Computer games have been employed for a direct therapeutic effect. They have been used as part of a pain management strategy. A simple computer game was deployed over a 5 week period to enhance the breathing capacities of children suffering from Duchenne Muscular Dystrophy (Vilozni 1994). This game is an example of a serious game designed for health benefits that entertains as it informs or modifies the condition of the player/patient. Congruent with escalating rates of obesity in children (Ogden 2006), is the increase in rates of Diabetic conditions; particularly Type 2 Diabetes (Hussain 2007). Levels of inactivity e.g. sedentary behaviours such as watching TV have been linked to higher rates of obesity (Jago 2006). The form of behaviour that tends to produce these circumstances is complex, not specifically due to a single isolated factor and thereby resistant to change. Therefore rather than challenge behaviour directly researchers seek out the influential mediating factors. Entertainment based media provide socio cognitive, (Bandura 1986), and self-determination models (Deci 2000). Socio Cognitive Theory proposes modelling, goals, and skills development as means to behavioural change. Both theories emphasise the importance of continuous feedback in the process of behavioural change. Effective campaigns by school authorities to impact on the issue of rising levels of obesity and
associated illnesses have been mostly unsuccessful (Thompson 2006). Computer games convey functional knowledge while enabling proactive behaviours such as setting goals, modelling and developing new skills (Baranowski 2008).

Computer games create an environment in which action has immediate and meaningful effect, solves problems and allows the participant to gain an appreciation of the overall process. Serious games designed for health can focus on disease prevention (Thompson 2010) or disease management (Brown 1997). *Escape From Diab* is an action adventure game designed to be played on PC’s. The PC option gives it maximum accessibility whereas it would be restrictively expensive to access any of the available console platforms. The target audience is 10 to 12 year old males. It makes use of movie like cut scenes to convey information to the player. The game studio for the design of the game consisted of artists, animators, programmers, directors, music composers, story writers, sound editors and voice talent. Medical expertise was supplied by psychologists, dieticians, fitness experts, and public health professionals (Thompson 2010).

In all, 81% of the 16 focus groups participating were either Hispanic or African American; deemed as the classifications most at risk from obesity and associated illnesses (Thompson 2010). The designers investigated the expectations and assumptions of the target audience in order to develop the most acceptable game format. Youth showed a preference for action/adventure based games based on a cast of ethnically diverse characters. Physical attractiveness was an indicator and the group showed preference for traditional gender roles.

**Story Construction.**

*Deejay*, finds himself, by accident in the alternate reality which is *DIAB*, a colourless land in which the ruling monarch, *King Etes* oppresses his people by forbidding healthy food and physical activity (Baranowski 2008). The newcomer is spotted by the King’s police and is only rescued by a group of youth resisters who oppose the regime in *DIAB*. They tell *Deejay* of a mythical Golden City where everyone is fit and healthy and the group decides to escape from *Diab* with *Deejay’s* help. On the quest *Deejay* introduces them to the concepts of good diet and physical fitness; attributes they will need to evade their pursuers.

*Deejay* is likeable and attractive, traits which are likely to be persuasive and effective to the audience. Modelling behaviour based on observation is an efficient means of mediating behavioural change (Bandura 1986). *Deejay*, one of the main protagonists,
is an expert on physical fitness and diet. His role is to communicate knowledge and skills on healthy behaviour but also to model the types of behaviour which would produce the desired results. Deejay speaks to the player through dialogue with the other characters- but principally to Delinda, the female protagonist. Delinda is the romantic interest and initially the most receptive to Deejay’s ideas. In the course of the story the group encounters various challenges which they overcome and thereby gain the competence to resist the attacks of the King and the royal police. Non Player Characters (characters controlled by the game software) are used to convey information and mould the player’s attitude, Much of the dramatic tension in the game is generated by the hostility between Deejay’s group and the henchmen of King Etes who (as might be expected), are portrayed as overweight and physically unappealing (Thompson 2010).

Importantly the designers have elected for a coping rather than a mastery strategy. Modelling a mastery strategy would have been psychologically inappropriate in dealing with players who would have experienced failure, perhaps repeated failure, in their previous confrontations with obesity. In the course of the game therefore, characters model perseverance and the refinement of goal setting and problem solving skills (Ibid). The positive emotions that accompany success underscore self efficacy (Bandura 1986) and the designers make sure to underscore this in the character’s reactions but also through dialogue. The presentation of barriers can encourage learners to develop problem solving solutions (Frauenknecht 1995). In DIAB players are confronted with a set of barriers that must be overcome. However the problems presented had to be acceptable and realistic in the opinion of the players and so it was important to vet their suitability through prior interviews (Thompson 2010). Based on the results of the interviews the players are presented with a range of barriers to the possibilities of healthy diet and activity. The player identifies the most likely barrier and devises a solution within the game. The player experiences a growth of internal motivation when they can observe the connection between some significant element in their lives and an aspect of their behaviour (Deci 2000). As part of the game play in DIAB the player is enabled to set goals by the provision of menus from which behavioural choices can be made.

10.5.3. Persons with Disabilities.

A society’s core values are never more obvious than in how it treats those who are ill or disabled either on a temporary or permanent basis. With this in mind it will be
useful to investigate what contribution computer games can make to this debate and therefore we will close the current discussion with a consideration of how computer games impact on the disabled.

Safety.
The issue of safety is of particular concern for game players in general but seems to be of particular and arguably, necessary concern for people with disabilities (Miller 2003). Children stated their satisfaction with the knowledge that they could not experience actual injury in virtual games.

“Anthony, an 8-year-old with Spastic Diplegia, stated that if he bumped into a rock while playing the snowboarding application he did not have to worry about getting first aid, but in real life that would be a major concern: “Because nobody, if you hit a rock, you’ll need the first aid down the hill [Anthony].”(Ibid 629)

Virtual Reality games tailored to the requirements of disabled children offered an arena for acquiring skills and new experiences in an environment which posed no significant physical risk. The consequent sense of safety helped to generate a more rewarding experience for the children.

There is little doubt that playing games places an intense demand on mental and physical fitness. The question of access arises therefore for the disabled. We have debated the hegemonic aspects of computer games elsewhere, however the exclusionary tendencies of video games development comes sharply into focus when we review the difficulties experienced by disabled people in their engagement with this media form.

Microsoft XBOX and Sony Playstation have controls that require operation with both hands and are designed for players with “normal” coordination. Microsoft has an Alliance for Technology access facility where it has been found that the most popular games among people with disabilities are simulated sporting games (Microsoft 2000). Many of the players are aware of an additionally possible benefit. They expect that increased competence in game play will enhance their skill in controlling technology such as motorised wheelchairs (Kearney 2005). Unsurprisingly when the underlying attractions of playing computer games are examined it is clear that players with disabilities value the sociality of games as much as their non-disabled contemporaries:
“Another student interviewed had some use of one hand, and although verbal communication was difficult, he appeared to be comfortable with a computer mouse. His desire was to be able to play Microsoft Xbox games, specifically multiplayer games. He suggested that playing with others was important socially. He said that: “games provide fellowship.”

Both the staff members and I were surprised that he should choose such a word as fellowship, but it appeared to be important that he used this word. He also liked the competition that two player games provided, but unfortunately was unable to use an Xbox or Playstation controller” (Ibid 4).

**Access.**

People with reduced mobility also tend to exhibit reduced spatial awareness (Wilson 1999). Players with disabilities take advantage of the levelling process that obtains in virtual worlds. Within the game world they are enabled to assume other identities and experience a form of social and personal acceptance to which they are commonly excluded (Kearney 2005). The issue of exclusion is underscored by the observation that players with disabilities did not particularly require or expect that new games would be created for them; what they asked for was the provision of such input devices as would permit them to play on XBOX, Playstation, Nintendo and other commonly available platforms. There are a limited number of such devices now available although some tend to be either expensive or cumbersome. Sony’s Eyetoy is a superior example that allows players to interact with digital worlds. Research is continuing with the goal of developing equipment suitable for a variety of console types and a range of disabilities.

**10.5.4. Games as part of the problem.**

“Difficulties in engaging in play activities as a result of physical disabilities may affect child development and compromise a child’s perception of self-efficacy and self-competence. Whether due to sensory impairments, limitations in voluntary movement or mobility as well as environmental barriers, these children may experience limited opportunities to explore the world around them through engagement in play behaviours” (Miller 2003).
Developed nations other than the U.S. have reported in recent times increases in obesity and other related problems that were once taken as the sole preserve of American children. There is a greater tendency to adopt sedentary lifestyles at earlier phases in life (Dorman 1997). Media such as computer games may accelerate the trend towards sedentary lifestyles by displacing commitments to other more physical activities (Ibid). Research has shown however that there are grounds to distinguish the physiological responses induced by TV watching from those induced in playing computer games. In one study the metabolic and cardiovascular responses to computer game playing were measured in a group of 32 males and females, aged between 16 to 25. Playing the game was shown to significantly increase heart rate, blood pressure and oxygen consumption (Segal 1991). While there appears to be measurable changes tantamount to a period of mild exercise, computer games are not recommended as a substitute for exercise (Dorman 1997). The justification for this is scientific rather than ethical. The cardiorespiratory stress induced by computer games is not considered sufficient to promote significant long term improvements in fitness levels for players (Ibid). It was found that cardiovascular response declined with experience of the game. This suggested that responses were triggered by emotional excitement and anxiety. This finding tended to reinforce the view of the unsuitability of games as vehicles for the promotion of exercise on the basis that any tangible training effect would be mitigated by increased competence in the game. Furthermore it pointed to stress as the driver of performance but also as the agent of other medical reactions. Computer game induced seizures have been reported worldwide, however, in many of the cases players were prone to epileptic type seizures or had a previous sensitivity to intense light stimulation (Kastelein-Nolst 1994).

10.5.5. Games as part of the solution.

The Elderly
Despite the ubiquity of computer games in ordinary life, and their increasing use with children as tools for learning the benefits which the elderly could reap from the new
technology were not immediately obvious (Weisman 1995). Elderly people, whether at home or in care institutions need continuing challenge and stimulation to maintain the cognitive process, hand eye coordination and the opportunities to renew the sense of self-esteem by mastering new challenges (Solomon 1982). Maintaining good memory function is important for many elderly. Computer games with their adaptability and non-judgemental attributes are ideal for application in the case of moderate memory loss. Playing games entails bolstering logic abilities and complex modes of thinking; something the elderly can benefit as much from as youth (Weisman 1995). In 1982 a study was undertaken at the Hebrew Home of Greater Washington to determine if and how elderly residents might benefit from interaction with computer games. After designing a questionnaire the next stage was to settle on a game and this brought up a problem. There were a large choice of games available however, they all required exceptional hand eye coordination and the ability to keep track of a number of simultaneously moving objects (Ibid) (Weisman 1995). A number of Apple users volunteered their expertise in rendering the selected games more playable and enjoyable for the residents. The researchers found that the ideal site for using the game was in the noisy coffee shop which served to provoke the kind of cooperation and socialisation they were interested in. Fifty residents, with an average age of 85 years played the games at least twice weekly.

“Residents who were hemiplegic were able to use the equipment as were those with Parkinson’s Disease, multiple sclerosis, moderate senile dementia of Alzheimer’s type, and moderate visual impairment. Two residents who had undergone lobotomies many years ago did well in the games. One woman who had had cataract surgery five days earlier had no problem playing” (Ibid 231).

The four games selected were chosen for their facility to exploit a specific skill or ability. Little Brick Out involved using a paddle which would operate a bat moving right or left to connect with a ball. The aim of the game was to demolish a wall with enough strikes of the ball. Ribbet consisted of pressing a button to make a frog jump at the right moment to catch an insect. The game proved a success because everyone could achieve some form of result with it. The more mentally able could anticipate the right moment and score more points. The less competent did not seem to improve
with practise (Ibid). Reactions and attitudes towards these games (and 2 others, *Country Driver and Hangman*) were strongly positive

“It clears the rust out of my brain. “It’s a challenge and that’s what we need”
“It makes you think and concentrate”“It’s fun” “You’re never too old to learn something new”and “Wait till I tell my son the computer that I’m a computer geek too”(Weisman 1995Ibid 28)

The medical community has recently begun to take notice of the observed physiological and psycho cognitive effects of games. Of particular interest is the possible effect video games might have on Attention Deficit Disorder (ADD). When children with ADD play computer games they demonstrate a reduction in the symptoms linked to the condition (American-Psychiatric-Association 2000).Repeated play evoked an increase in levels of concentration and commitment to task (Houghton 2004).Continued play enhances the patients capacity for selective attention (Green 2003)). Recent studies have proposed the deployment of Virtual Realities as a tool of rehabilitation to provide a level of play experience which can be suited and graded to the abilities of the user(Miller 2003, Reid 2002).Pilot studies report that Virtual Reality Intervention in the form of digital games has led to improvements in upper extremity skills and postural control in children with Cerebral Palsy (Reid 2002).

Children afflicted by Cerebral Palsy find it difficult to engage in normal childhood play activities and this can give rise to secondary problems of a social, emotional. and psychological nature (Missiuna 1991). This can lead to decreased motivation, increased dependency on others and in the underdevelopment of social skills (Howard 1996).

A study by (Hestness 2000) reported that children with disabilities spent much of their time either playing alone or looking on spectator fashion at the game play of their non-disabled contemporaries. Computer games have been used to enhance the handling skills of users of motorised wheelchairs (Miller 2003) Progress is being made to provide disabled children with the means to participate in school activities(Nemire 1994). The issue of suitable and usable technology interface devices became urgent when reports surfaced of declining levels of immersion and interactivity among disabled players. The Mandala Gesture X-TREME VR system is
an example of a technology developed to respond to this concern. The question of difficulties of user interface for disabled and non-disabled alike continues to be a concern (Verhaegh 2008).

“Next to the task of the game, the children have to learn to cope with the challenge posed by the interface. This is less than optimal, unless handling the interface is a separate and explicit educational goal” (Ibid 150)

Verhaegh et al conclude that other non-virtual forms of interfaces e.g. tangible puzzle games, might present a disabled player with less demand “and that the danger that a virtual interface is less effective should be taken seriously” (Ibid 150).

There are issues in the technology that continue to be of concern. In our discussion of literacies we considered the advantages and disadvantages that attend the tendency among hardware developers to make the game experience as seamless as possible. Developers are motivated by the enhanced sense of immersion and pleasure that a player can derive when obstructions and obstacles to long running play are removed. A similar policy seems needed in the design of interfaces to allow disabled people play the same games as others.

The theory of Flow (Csikszentmihalyi 1971) proposes deeply motivational reasons for engaging in game play. Flow is as deeply attractive a justification for disabled players as it is for non-disabled play. Although the introduction of computer games into the sphere of health education is relatively recent they hold out promise in an important area with a variety of urgent concerns. Health based computer games are capable arrogating a freedom which seems to be more restricted in general educational games development. For example in the DIAB game a mixture of design approaches was combined with several technology forms to maximise the instructional capacity of the game. The game also made use of plentiful cut scenes to convey dialog and instruction. This suggests that the game developers of DIAB prioritised educational effectiveness over entertainment value. The use of cut scenes in commercial games is minimised so as to prolong the intensity of the sense of immersion. In educational games the requirement to supply the learner/player with necessary information/instruction is unavoidable; this in spite of theories on the benefits of minimal guidance. However in commercial entertainment games minimal
guidance is the path to maintaining interactivity. It is summed up in the design recommendation “Do, Don’t Show” (Falstein 2005, p.93)

We have discussed the importance of debriefing earlier and it is well to reflect that such a concept marks how different educational games are from entertainment games. Health based games such as DLAB go farther than other educational games in that they allow for interaction with the player during which real world progress in managing the condition is the subject of ongoing review. It could be argued that the issues of health and disability are the motivational drivers which seek to develop the educational relevance of these games. Nevertheless it is at least worth considering how such an approach could be deployed in other areas of education.

Our review of the use of educational issues for health issues served two purposes. First it showed that the idea of education must be expanded to include activities beyond the classroom. Education is beginning to migrate under the effects of digital media and games can have an educational promise beyond the classroom. Second it demonstrated that educational games are effective when cultural effects can be discounted.

10.6. Conclusion.

Language Learning receives considerable support from the availability of online games such as World of Warcraft. The advantages for pedagogy are that it is free, effective, and takes place on the learner’s time. It is not coincidental that a large proportion of educational games are history based. The narrative flow of history is suited to computer games despite the misgivings of ludologists. It remains a problem as to how to achieve exactitude in teaching with the use of many of these games. This applies particularly to history games based on strategy.

10.6.1. The Trouble with Strategy Based Games.

The problem with strategy based games is that they become too complex too quickly. This is what Egenfeldt Nielsen concluded when he reviewed the results of using Europa Universalis 2 with a group of history students. This game was a celebrated success. Again we note the contrasting approaches to the understanding of history and what can be considered historical. This is not a concern that can be laid at the door of computer games, however. Egenfeldt Nielsen states that the game is not about the facts of history, rather the player engages with the foundational dynamics of history to
understand the causes underlying events in a certain time period. The question that has to be asked is are historical dynamics not factual? If they are facts presumably they must be historical facts. A false distinction is therefore being made between facts, certain of which are acceptable and certain that are not. Egenfeldt Nielsen’s use of a historical strategy game is cross cut with questionable positions and inconsistencies. This might be a critical weakness however, it is a strength with Egenfeldt Nielsen as he is forthright about the difficulties and seeks neither to minimise nor evade their implications.

Certain students were negative towards the presence of computer games in the classroom. Following from our discussion of “The Bart Simpson Syndrome” we would have been interested to hear those students formulate their objections but Egenfeldt Nielsen went no further than noting their discomfiture. This objection could conceivably emerge from any subject in any classroom; it is not exclusive to history. Neither is the fact that game players are far from being a homogenous group. This is a critical problem for the introduction of an educational game. There is also wide variance in the skill levels of players. Player’s preference are distinct and getting a learner who plays nothing, for example, but role playing games to switch to strategy games could trigger the resistance computer games were supposed to mitigate
11. Conclusions.

11.1. Introduction.

Edward C Smith’s objection (Cited in Carlson 2003) to computer games is well taken when he points out that if something is to be replaced it should be replaced with something better. If electronic games cannot do a better job in education than that achieved by the facilities and the discourses their proponents have critiqued what is the point? Egenfeldt Nielsen has suggested (see 10.4.2.) that educational computer games might not do as competent a job as current education, they might actually do worse. Furthermore if as some of the foremost theorists, (Gee 2004a, Hayes 2010, Prensky 2001) prescribe, educational games are to be merely an arm of the arsenal intended to arrest the declining economic advantage of the U.S. and western countries, again, what is the point? We have argued that such a policy (utilitarian as it is) is probably not going to succeed on its own merits because the creativity and originality of thought that drives successful economies is available in the kinds of liberal arts based education that is now seen as superfluous.

11.2. Primary Conclusion.

We have seen that serious games have a real potential especially in contexts and cultures not marred by the sense of the exclusively hedonistic nature of computer games. Computer games simultaneously occupy quarters in both of the forces committed to the paradigmatic battle of the age. On the one hand they are hedonic, individualist and anti-traditional (7.6.3.). On the other they are capable of taking resolute moral and ethical positions and pursuing educational agendas (6.8.1.). Our conclusions flowed from a pragmatic ethos towards the research. Approaching such concepts as fantasy and play on a pragmatic level might seem challenging nevertheless we did so on the basis that they needed to be better understood.

Our primary conclusion was that it would be inadvisable to continue with the blanket assumption that computer games could be developed for education on the basis that their motivational appeal could always be relied upon (7.5. to 7.6.5.). We consequently developed a set of secondary conclusions that might support the development of educational games.
11.2.1. Supporting Conclusions.

Our explorations have lead us to offer the following supporting conclusions:

1. Games creation by learners offers a promising avenue for the educational games project. This option can be supported by expert contributions through social media (9.3.).

2. Games creation by non-commercial interests is a better option for developing the kinds of educational computer games that would succeed in classrooms. If games are to be successful in education they have to be designed and implemented for specific curricular requirements. COTS games cannot do this and games specifically designed for educational purposes have not convinced us that they can either. Learner created games can educate, because they are context relevant. Learner can teach themselves and teach others by sharing the games they develop. This is what Prensky saw as far back as 2001 and it is probably the most significant promise of digital game based learning.

3. Adapting existing commercial games is problematic for two reasons, one is their unsuitability and the other is the difficulty of fitting them into a cohesive curricular program (9.1.).

4. Institutional resistance, i.e. from teachers and policymakers may not present itself in an intractable form until games are ready to be introduced to the classroom on a full time basis (7.6.4). The attendant conclusion from this is that for educational games development it is essential to have teachers directly involved in the games development process.

5. That there are two approaches to the deployment of educational games in the classroom is not incidental. Rather it marks what we would argue to be a fault line in educational games development. On the one side are those who value games for the facility to promote problem solving. These would be the ones that value form over function and would include such seminal influences as James Paul Gee. On the other side are those that value function, who praise games for their ability to motivate but as a means to acquiring educational product. It might come as a shock to researchers and theorists of the quality of Kirriemuir and McFarlane to find themselves consigned to a position that questions (but not necessarily) opposes Gee and others. Nevertheless this is what we argue to be the logical consequences of taking the abstracted formulations.
of Gee and trying to make them operate effectively in a world where schools are required to operate traditional curricula

6. There seems to be a lack of insight into the hegemonic nature of the mainstream games industry (2.3.2.). This lack of insight will have profound consequences.

7. In our view it is methodologically problematic to include dedicated educational games (regardless of their quality) with dedicated commercial games that might be used for educational purposes (regardless of their popularity). There seems to be an assumption that they are but different kinds of options for educational use. It appears that there are basic theoretical and practical differences between for-purpose educational games and adapted commercial games. We would argue that building games is the preferred option while adapting commercial games is ultimately not a viable option for use in long term educational contexts. Teachers will make use of games in the classroom to foster interest and engagement. However teachers have long been borrowers of varied techniques, modalities fashions, and topics of interest to engage their students. There is hardly much new in this so why the excitement about adapting commercial games in for the classroom? We have argued that going any further than a teacher buying a game at the store for use in class draws with it a number of problems and obstacles.

8. We have seen instances of successful educational games. Ferguson (2006) praises games designed specifically to teach history, but is less enthusiastic as regard adapting pre-existing commercial games. Puenteura (2007) deconstructs the drawbacks of using commercial games to teach science (9.1.2.). What we are seeing is that, despite the expense, educational games devised as educational from their inception work better than entertainment games that teachers are convinced (or allow themselves to be convinced), they can mine for educational value.

We raised the issue of mainstream developers displaying resistant attitudes to the incursion of education into their games. It seems almost controversial to make such a proposal given the almost ceaseless mantra in praise of games such as the Sims. We noted previously that computer games make little or no concession to the learner in terms of providing information as to how to play a game. This feature has been seized upon by learning theorists as of major educational significance and so it is. Theorists have validated the problem solving attributes of computer games as of prime educational significance. Problems start to surface, however, when others take on the task of actualizing that apparent promise. We have seen theorists lament the
absence of devices which would enhance educational outcomes. The introduction of these kinds of facilities may be desirable but where to draw the line between the need for student autonomy as a problem solver and that student being cosseted by the introduction of helpful devices and facilities as traditional education so often attempts to do?

9. We identified lack of stability as a challenge to the prospect for successful educational games. Games change quickly and players are habituated to being spoilt in terms of lush graphics. This lack of stability is a product of the dynamism of the games industry but also of the ever changing tastes, mores, and attitudes of the user group. We argued therefore for a recognisable identity for educational computer games.

10. Attitudes towards the concept of Edutainment reveal culturally bound positions. Whatever the drawbacks of Edutainment in terms of western culture Edutainment can have a real contribution in other cultures and other contexts (6.8.1.).

11.3. Recommendations.

11.3.1. Main Recommendation.
There is a weakness in research on educational computer games. This weakness stems from a practice of approaching educational games with a theory of technology rather than a theory of education (5.5.). Observing the pleasure and immersion of kids playing computer games and concluding that there would be real benefits for learning if some of that energy could be diverted is to be dazzled by technology. The assumption is automatically positive. A theory that originates in education asks more sober questions. We have asked some of these questions and it is the business of the future to provide answers. The most pertinent and intriguing question to ask and answer is this. There is a possibility that educational games might work for the formerly unmotivated and resistant learner as described by Virvou et al (7.6.5.). We have traced a line that leads from boys underperformance in class, to the development of alternate masculinities, to resistance, finally leading to a place where underperforming students reacquire an interest in learning through contact with educational computer games. Rather than the current explanations that have been advanced to explain poor academic performance of boys compared with girls we have
argued that what we are witnessing is a major cultural turn originally presaged by Caillois (7.3.1.).

11.3.2. Supporting Recommendations.

We would offer the following supporting recommendations.

1. Focus on the issue of the relative improvement of underperforming students through the deployment of educational computer games. This could be key to designing educational games that are effective because if we understand why students can sometimes resist the encroachment of educational games into education and at others cooperate with educational games we may move closer to the creation of educational games that will survive the challenges students are sure to pose for them.

2. The primacy of a not-for-profit alliance of teachers, students and designers to create educational games at minimum cost to suit a diversity of locally determined curricular requirements. Lack of space did not permit a review of this option and it is an option which might not have offered itself readily even five years ago. Yet there are grounds to hope that with the upsurge of online collaboration between people with expertise willing to provide their labour at no cost the kind of alliance we spoke of may be entirely possible. According to Shirky (2009) there is as much as a trillion hours per year of free labour available for projects of this kind.

3. A “Brand” for educational games to preserve their identity and emphasize education. Educational games must be distinctive from entertainment games. We have argued that introducing educational games into a classroom on a widespread basis is laden with difficulty and that one of the difficulties might come from failing to acknowledge the instability of motivation. In an attentional economy education finds itself in direct competition with powerful media forms, including games. If De Castell et al (2004) are to be believed, education is losing ground. As we see it there is one strategy which might preserve a space for educational games. The first part of the strategy is for educational games to choose the ground for struggle and stop competing with commercial games on their own turf. As we have already noted educational
games do not have deep enough pockets. Even if educational games could compete there are grounds to ask if they should. Educational Games do something fundamentally different; they educate.

Educational games, therefore need a recognisable identity. They need a brand. By this we do not mean just a logo or title; we mean a look that is instantly identifiable. This could be done by use of graphics, similar for example to the recognisable look of the *Anime* comic books. The use of an identifiable look to educational games would have two important advantages. First by creating a recognisable set of design features for educational games the learner can identify with and relate to the games, establishing a sense of familiarity and brand loyalty. By establishing a recognisable brand for educational games it might be possible to convert the consumerist eclecticism of youth from a negative to a positive. We mean by this that the attractive and persuasive power of branding can be mobilized in favour of educational games and become an asset rather than a liability. The second advantage flows from the first. A recognisable design limits the options as to how much alteration can or should be attempted with the original. As we noted educational games are seriously disadvantaged when it comes to direct comparison with their commercial cousins. Having their own design means that they no longer dance to the entertainment game tune. Educational games take back the initiative and can decide how and when they will spend their scarce resources. The function of the brand is to make them stand out from entertainment games. A recognisable brand can turn the disadvantages of not having the resources to match entertainment games into advantages. When a player comes to an educational game knowing what to expect i.e. quality learning and what not to expect e.g. the eye candy graphics of *World Of Warcraft* the possibilities of resistance and rejection are defused or at least mitigated. The best way to preserve games in education is to open and maintain clear ground between educational and entertainment games.

4. It might be opportune to reconsider if Commercial Off The Shelf games (COTS) should continue to receive critical attention as to their viability in the classroom (9.1.). We have noted concerns about the pedagogical validity of COTs games. Others cast doubt on their capacity to convey elements of real educational value. There are also concerns that these games are not
educationally flexible in their design and we have argued that to put in the very features that would make them more acceptable to teachers might dilute the very motivational energy that made games attractive in the first place.

There are no conclusions merely continuities. A field such as educational computer games is riven with inter disciplinary cross currents. We will end the present phase of our investigation by posing a question. It has to do with the nature of education and, though it was always the most troubling question it never received proper attention. We might excuse ourselves by arguing that it belongs in another, different, study but the truth is that we simply do not know the answer and worse than this we are not sure that knowing the answer would make any difference. The question is this, is education as we currently recognize it, doomed? The answer is yes if it is the industrial model of education that we inherited with the Industrial Revolution. Notwithstanding melodramatic pronouncements, that is what the critics of education are proposing. They laud the value of play in games but few enough of them seem to understand what play is. The basis of so much of their arguments seems to be that learning should be “fun” but what if “fun” is a corrupted version of play? So much of the animus directed towards education is a product of loathing of discipline, a term that has been pejoratively retooled as “disciplinarian” As parents we know our children need discipline. We have the sense to know that the structure of their lives will be formed by it and that it will only be damaging for the child if the discipline does not originate from love. The answer is no if education is seen as a formal version of the learning instinct that is as much a part of our make up as DNA.

The basic theme of this study was change. To use an analogy from surfing we are all inexperienced surfers-there are none with the right experience- who have found ourselves at the edge of a terrifyingly dangerous and exhilarating series of waves. We know only two things .if we lose our balance it will go badly for us. If we somehow remain upright for long enough the wave will die down. The wave is a metaphor for the vast techno cultural transformations currently being experienced worldwide. Neither education nor educators, for all the overt and inchoate resistance will be exempt from the demands of change. We have found fault with the ethos that educational games play a part in creating the knowledge base to ensure a competitive edge against the younger emerging economies. In our view this is a false ideal and, in
all likelihood, self-defeating. We believe that the creativity and innovation that preserves and grows economies derives from different sources than the technical. It has to do with an ideologically based misperception of the nature of knowledge. The proponents of the knowledge based society believe that we are in the business of creating knowledge. Our understanding of what constitutes knowledge is so overused as to be all but defunct and valueless. We are not creators of knowledge, we are creators of meaning. It seems that there are no questions, no matter how mundane, that will not ultimately lead to asking, what is a good life, what is a life of quality? Some might take the migration of learning into the public sphere as confirmation of their thesis of the necessity to develop our knowledge making capacities. It may be so but it might also be that our search for knowledge is itself a search for meaning.

We stand at a critical moment in the story of the world. Billions are waking to the dream of freedom that they believe we possess in western society. They find themselves in a world not of their making whose economic foundations are threatened because we in the west were so skilled at creating knowledge but incompetent when it comes to finding the meaning of our lives. In that sense we have nothing to teach them and perhaps they know that. The debate around educational games is merely a symptom of the struggle to choose a survivable future.

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