

## TIPS ARTICLE

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"Video Games Industry Research"

By John Kirriemuir

First, a question. How many of the following have you heard of: Space Invaders, Pacman, Atari, ZX Spectrum, Nintendo, Tetris, Mario, Lara Croft, Playstation, Metal Gear Solid, Sega, Game Boy, Xbox, Halo, Jet Set Radio? Score 0-3 and much of this article may come as a surprise. Score 4-9, and you have probably been aware of mentions of video games in the press, but are not a player. 10-12 and you are, or have been, a video game player; 13-15 and you are probably reading this while taking a short break from your latest game.

The global computer and video game industry, generating revenue of over 20 billion US dollars a year, forms a major part of the entertainment industry. The sales of major games are counted in millions (and these are for software units that often cost 30 to 50 UK pounds each), meaning that total revenues often match or exceed cinema movie revenues. Game playing is widespread; surveys collated by organisations such as the Interactive Digital Software Association <<http://www.idsa.com/releases/4-21-2000.html>> indicate that up to 60 per cent of people in developed countries routinely play computer or video games, with an average player age in the mid to late twenties, and only a narrow majority being male. Add on those who play the occasional game of Solitaire or Minesweeper on the PC at work, and you are observing a phenomenon more common than buying a newspaper, owning a pet, or going on holiday abroad.

Why this popularity? Essentially, most people spend much of their time playing games of some kind or another. Make it through traffic lights before they turn red; catch the train or bus before it leaves. Can you complete the crossword, or answer the questions correctly on Who Wants To Be A Millionaire or The Weakest Link before the contestants? "Office politics" form a continuous, real-life strategy game which many people play (whether they want to or not), with player-definable goals such as "increase salary to next level", "become the boss", "score points off a rival colleague and beat them to that promotion" or "get a better job elsewhere". Gaming philosophers who frequent some of the many game-related online forums <<http://www.futureforums.co.uk/edge/>> periodically compare aspects of gaming to "real life" - with the key difference being that when "game over" is reached in real life, there is no "restart game" option ...

But video games? Such entertainment and culture is not new, being available for home use for over 30 years <<http://www.icwhen.com/>>. Rapid advances in graphics, processing power, game design and complexity have resulted in contemporary games rendering those of even just a few years ago crude and simplistic in comparison. Games are designed to sell, and therefore to be attractive, challenging, mind-engaging, stimulating, increasing curiosity, and inviting further exploration and an urge for "just one more go" - factors that have resulted in interest from the education, teaching and learning sectors; but more on this later.

Video games are most often found on video gaming consoles that plug into your television. These are produced by three well-known companies; Microsoft (who make the Xbox: <<http://www.xbox.com/>>), Sony (Playstation and Playstation2: <<http://www.playstation.com/>>), and Nintendo (GameCube: <[http://www.nintendo.com/systems/gcn/gcn\\_overview.jsp](http://www.nintendo.com/systems/gcn/gcn_overview.jsp)> and the handheld portable GameBoy series: <<http://www.gameboyadvance.co.uk/>>).

The PC is a major host of games, many of which make use of the standard keyboard and mouse input configuration for games such as

strategy simulations. Other media devices, such as Interactive TV, handheld PCs and Palm Pilots, and the newer generations of mobile phone, play host to increasingly complex games - basically, where there is a processor and a screen, so there is the potential for games which is usually quickly filled.

It is important to note the increasing complexity of the aforementioned video gaming consoles, which increasingly resemble specialised, performance enhanced PCs - though without the cost, instability, long start-up waits, complexity and need for upgrades. The Xbox, for example, contains a hard drive for saving game positions and tracks from your favourite CDs, which then form the background music of various games. These consoles also offer broadband capabilities for fast online gaming play, though how they will work in practice when operational over the next few years remains to be seen. Currently, the PC, Macintosh and Sega Dreamcast video game console are the devices to use for online gaming.

This particular area of the games sector is of great relevance to the library and information community. Online gaming has actually been around for quite a few years on the PC, and was successfully implemented through a game called Phantasy Star Online on the Dreamcast console. The more popular online games, such as Everquest, allow complex and simultaneous in-game interaction between many thousands (and sometimes tens of thousands) of people (irrespective of physical location). In these games, people can exchange information and items, fight, move through a virtual world and observe the actions of others.

In an office where I recently worked, one person was playing such a game on his PC, interacting and communicating simultaneously with large numbers of players from around the (real) world in a shared, common (virtual) world. At the adjoining PC, another colleague was engaged in a long-term struggle to build a distributed bibliographic system, allowing a small number of people to simultaneously search a common database of the stock of several libraries. The technological and informatics parallels between the two systems - and which was the more successful implementation - were striking. Unfortunately, to date and to its loss, the informatics sector has not deeply investigated online gaming to see which techniques, technologies and concepts are transferable to systems using information access, discovery and management.

The last few years have seen an increase in the number of game-related courses in academic institutions, both in the UK  
<<http://www.dcs.shef.ac.uk/~steve/games/gamesCourses.html>> and further afield <[http://www.igda.org/Endeavors/Outreach/Students-Newbies/students-newbies\\_schools.htm](http://www.igda.org/Endeavors/Outreach/Students-Newbies/students-newbies_schools.htm)>.

Most contain some element of game design or programming; demand comes from the large number of prospective game developers, and companies faced with the continuing shortage of skilled staff.

Skills gained on these courses are transferable to other technological areas, such as health and medicine (e.g. body, illness and drug action simulation), the military (strategic, battle and weapon simulation, without costly weapons or friendly-fire injuries), and business and management (economic and management simulations). Grades for admittance on such courses are usually high, and applications oversubscribed. In the UK, several universities are planning new game-related courses for the 2002 or 2003 academic years.

In addition to courses, a number of game-related research centres have emerged of late in institutions such as Abertay in Dundee  
<<http://www.iccave.com/>>, Liverpool John Moores  
<<http://www.icdc.org.uk/>>, Bournemouth  
<<http://ncca.bournemouth.ac.uk/>>, Manchester

<<http://www.digiplay.org.uk/index2.php>> and Teeside. Numerous other game-related projects and research groups are scattered around universities and colleges.

It is important to note that academic research is not confined to the programming side of video games. Academic subjects increasingly involved with the gaming sector include:

- the arts (graphics and character design)
- music (soundtracks and special effects)
- history (providing accurate detail from factual events)
- geography (landscapes and settings)
- literature (plot and script construction)
- biology and the life sciences (accurate plant and animal growth and behaviour)
- sports sciences (how athletes run)
- built and urban sciences (building design and layout)
- engineering (vehicle dynamics and handling)
- sociology (effects of games on society...)
- psychology (...and on the individual)

Such involvement has benefits for all parties. For academics, revenue is generated, staff kept on, and research used for practical purposes in the real world. Games companies receive relevant input, with the backing of academic expertise.

Not surprisingly, this research has led to a steadily increasing collection of articles, papers and reports, which a growing number of people and organisations are attempting to categorise and index:

<<http://www.game-culture.com/journals.html>>,  
<<http://www.game-culture.com/articles.html>>,  
<<http://www.knowledge.hut.fi/projects/games/gamelinks.html#Papers>>,  
<<http://www.digiplay.org.uk/books.php>> and  
<<http://www.gamasutra.com/features/>>.

One of the most exciting areas where academia and the gaming sector overlap is that of education and learning. This can take one of two forms: using conventional computer and video games to enhance learning, or using gaming technologies and techniques to design and produce more effective learning software and material.

A number of research groups and centres are making progress with various aspects of gaming and education, such as the E-GEMS group in Canada <<http://www.cs.ubc.ca/research/e-gems.htm>> and the Games To Teach project in the MIT <<http://cms.mit.edu/games/education/about.html>>. In the UK, TEEM (Teachers Evaluating Educational Multimedia) have investigated the use and educational value of computer games both at home and at school <<http://www.teem.org.uk/howtouse/resources/>>, while BECTa (British Educational Communications and Technology agency) have carried out similar investigations and produced guidelines on how computer games can support learning <<http://www.becta.org.uk/technology/infosheets/html/computergames.html>>. It is encouraging to see an increasing number of educational and ICT funding bodies, such as the JISC (Joint Information Systems Committee) <[http://www.jisc.ac.uk/techwatch/reports/tsw\\_02-01.rtf](http://www.jisc.ac.uk/techwatch/reports/tsw_02-01.rtf)> either monitoring or funding exploratory or research work in this area.

In addition to official exploration and research of non-gaming uses of computer and video games, and gaming consoles, there are plenty of people who take a great delight in "making stuff do things it wasn't designed to do". As soon as a video game console is released, a community of people determined to take it apart, write their own programmes and increase the functionality, springs up. The hand-held GameBoy Advance, which is cheap and easy to develop software for (in an unofficial capacity), is the device of choice for many such

developers <<http://c.webring.com/hub?ring=thegameboyadvanc&id=2&hub>>. For example, one student has developed a web server on his GameBoy Advance as part of his final year undergraduate project <<http://www.fivemouse.com/>>.

This article has scratched the surface of a number of game-related issues. However, to really appreciate games and their potential application in other areas, it is best to simply "play more". Games recommended by the author are Ico (Playstation 2), The Sims and Operation Flashpoint (PC), Advance Wars (GameBoy Advance), Halo (Xbox), and Super Monkey Ball (GameCube). Highly recommended - as it is my favourite game :- ) - is Jet Set Radio Future (Xbox).

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John Kirriemuir is an independent consultant in Digital Technologies, specialising in the application of video games and gaming technologies to education and the learning process. In younger days he worked in a number of organisations and services in the UK academic digital information sector, including UKOLN, the ILRT, and OMNI. On rainy days, John plays video games; on sunnier days, he explores the Scottish Highlands and Islands, taking digital pictures. Three of his ten favourite beaches in the world are in the Outer Hebrides. His web site, containing details of his work and publications, can be found at <<http://www.ceangal.com/>>.

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