

Serious Games and the Technology of Engaging Information



Peter A. Smith

University of Central Florida, USA

Clint Bowers

University of Central Florida, USA

INTRODUCTION

The term Serious Games is an umbrella term that refers to any games that have goals other than pure entertainment. The term grew in popularity in the early 2000s when the Foresight and Governance Project at the Woodrow Wilson International Center for Scholars founded the Serious Games Initiative (SGI). The SGI was founded to pursue the goal of helping to organize and accelerate the adoption of computer games for non-entertainment purposes. This included exploring new applications for games in education, training, recruitment, and beyond. At this time many researchers were beginning to understand that games could have positive effects outside of pure entertainment. In Raph Koster's book, *A Theory of Fun for Game Design* (2005) he described the motivating factor of fun in all games as the act of learning. James Paul Gee a well respected games researcher best known for his book, "What video games have to teach us about learning and literacy," focuses on the idea that all good video games exhibit thirty-six learning principles supported by literature in learning science and cognition research (Gee, 2007). While Serious Games are not based solely on the idea that games can teach, the principles behind good game design actually support learning. As a result the research has shown that Serious Games are not just another media for learning through a passive act of absorbing material, but are a technology for engaging with information.

Games researchers are now moving from exploring if games can teach to how games teach. The caveat is that not all games teach but that all good games teach. Leaving a simple truth, it is hard to make a good game, no less a good game that is also educational. The real challenge is getting the people with the right design

abilities to make these types of games and establish best practices and quantify what actually makes games as educational systems work. Efforts to move in that direction must begin with establishing terms and defining a framework for what goes into games for learning as formal systems.

BACKGROUND

Before the more modern notion of Serious Games took hold the military made many attempts at using video games for training. The earliest being in 1980 when the Army commissioned Atari to build the Atari Bradley Trainer (Smith, In Press). This game was a modified version of the popular vector graphics based game *Battlezone*, also published in 1980. Only 2 Atari Bradley Trainers were ever built and shown at a trade show. It is unknown why the Army never deployed the game, but it was never actually used by soldiers.

Another military project was started by 1984, this time by the Navy, to use a video game to teach Morse Code (Driskell & Dwyer, 1984). This project also only made it through the prototyping phase. The military's view of games at the time was that they were not serious enough for military training, though the problem seemed to be one of vocabulary only. This is illustrated by the Marines common use of games under the name, Tactical Decision-making Simulations (TDS) since development of the game *Marine Doom* in 1996 (Smith, 2005). *Marine Doom* is a modification (mod) of the popular first person shooter game *Doom* created by the Marine Corps Modeling and Simulation Management Office (MCMSMO) developed for the training of Marine fireteams.

DOI: 10.4018/978-1-4666-5888-2.ch252

This prejudice against video games didn't carry over to the common practice of table top War Gaming, or the use of Flight Simulator Software on PC's, which were sold as games to the rest of the world. The military did not seem completely ready to embrace games for training until after DARPA created DARWARS Ambush, a mod to the game Operation Flashpoint, which was followed up by the Army creating TRADOC Capabilities Manager for Gaming (TCM Gaming) and deploying Virtual Battle Space 2 (VBS2) as one of many official Army Games in 2008. However this prejudice persisted after Serious Games were well established outside of the department of defence (Smith, 2009).

Paralleling the emergence of games in the military is the development of the ill fated Edutainment market. In the early 1980s Edutainment games became an incredibly popular trend. These games, such as "Where in the World is Carmen Sandiego," "The Oregon Trail," "Reader Rabbit," "Math blaster," among many others flooded the market with games that contained some level of educational content. Mizuko Ito described it as a time where the developers were empowered with a "sense that they were creating possibilities for learning that freed it from the institutional constraints of schooling" (Ito, 2006).

Edutainment games succeeded in capturing an audience, and establishing itself as an accepted part of the games industry, however, they never quite got established as a credible form of education. Ito, suggests that the reason behind this is that, "edutainment embodies the challenges which reformers face in creating new genres of representation and practice..." (Ito, 2006). However the answer is much simpler. In general the games did not achieve the dual goals of being good educational platforms while also being good games. Edutainment, along with many of the other past attempts to develop learning games have largely been deemed failures. A sentiment best stated by Michael Zyda, the Director of the Game Pipe Lab at USC. "The game industry has already witnessed the failure of edutainment, an awkward combination of educational software lightly sprinkled with game-like interfaces and cute dialog. This failure shows that story must come first and that research must focus on combining instruction with story creation and the game development process" (Zyda, 2005).

Clark C Apt's book, *Serious Games*, was published in 1970 and represents the first recorded use of the term Serious Games (Apt, 1970). The term Serious Games was not, however, an instant success. In the 30 years

that followed, serious games had a few false starts on the road to becoming a main stream part of the non-entertainment world, the most dramatic of these being in both the education and training arenas.

Clark C. Apt defined Serious Games as games that "have an explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement" (Apt, 1970). Apt wrote these words over thirty years before the founding of the SGI but his words are still relevant and extremely close to the current definition that most game scholars adhere to for serious games. His definition's one inconsistency is that serious games have evolved to include more applications than just education. Serious games are commonly defined as some derivation of: A game designed for a primary purpose other than pure entertainment. This definition is purposefully open ended in order to allow for the diverse backgrounds of various serious game practitioners.

Mike Zyda, the Director of GamePipe at USC, defined serious games as: "a mental contest, played with a computer in accordance with specific rules that uses entertainment to further government or corporate training, education, health, public policy, and strategic communication objectives" (Zyda, 2005). His particular definition met his vision of what a serious game could be, but others whose application of serious games do not fit into the categories defined were still searching for a definition. Further still, many industries utilize gaming technology but do not explicitly create games with the technology, yet have aligned themselves with the serious games movement.

In an effort to move towards a more open ended understanding of Serious Games, the term became an umbrella term that encompassed the efforts underway, bring all the groups working on Serious Games under one unified vision. The Taxonomy of Serious Games was presented at the Serious Games Summit (SGS) held at the 2008 Game Developers Conference (GDC). It defines the current categories of games that have been developed by the Serious Games industry including, Games for Health, Advergaming, Games for Training, Games for Education, Games for Science and Research, Games for Production, and Games as Work. It further cross references them with the industries that currently use Serious Games. Further slides show the amount of development in each category, illustrating that most of the work in the Serious Games Space was being done for education and training in both schools and the military (Sawyer & Smith, 2008) (Table 1).

7 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/serious-games-and-the-technology-of-engaging-information/112675

Related Content

A Study of Sub-Pattern Approach in 2D Shape Recognition Using the PCA and Ridgelet PCA

Muzameel Ahmed and V.N. Manjunath Aradhya (2016). *International Journal of Rough Sets and Data Analysis* (pp. 10-31).

www.irma-international.org/article/a-study-of-sub-pattern-approach-in-2d-shape-recognition-using-the-pca-and-ridgelet-pca/150462

Vertical Integration of Science: An Approach to Including Information, Knowledge and Its Organization

Emilia Currás (2012). *Systems Science and Collaborative Information Systems: Theories, Practices and New Research* (pp. 1-16).

www.irma-international.org/chapter/vertical-integration-science/61283

Gene Expression Analysis based on Ant Colony Optimisation Classification

Gerald Schaefer (2016). *International Journal of Rough Sets and Data Analysis* (pp. 51-59).

www.irma-international.org/article/gene-expression-analysis-based-on-ant-colony-optimisation-classification/156478

Comparative Studies on Inclusive Digital Teaching in Higher Education in Light of COVID-19

Andreas Ahrens, Parulkumari P. Bhati, Alena Leshchenko, Jeena Zašerinska, Olga Gukovica, Mihails Zascerinskis and Anastasija Aleksejeva (2021). *Handbook of Research on Analyzing IT Opportunities for Inclusive Digital Learning* (pp. 18-45).

www.irma-international.org/chapter/comparative-studies-on-inclusive-digital-teaching-in-higher-education-in-light-of-covid-19/278952

A Novel Approach to Enhance Image Security using Hyperchaos with Elliptic Curve Cryptography

Ganavi Mand Prabhudeva S (2021). *International Journal of Rough Sets and Data Analysis* (pp. 1-17).

www.irma-international.org/article/a-novel-approach-to-enhance-image-security-using-hyperchaos-with-elliptic-curve-cryptography/288520