HealthTech

The Children's Partnership

Technology Profile: Health Games

Overview

Health games involve the use of interactive multi-media gaming platforms that support self-management and self-efficacy across a broad range of health conditions, fitness and wellness. Key gaming functions target self-assessment, self-management, education, physical conditioning with a goal of healthier behaviors and skill building. To date the development of health games has been driven by trends in a broad range of computing and communications technologies. Game platforms and formats include traditional video games on game consoles, handheld players, computers and the Internet.

History

Health games are a relatively new market phenomenon that has grown quickly in number and variety in recent years. Consumers and some traditional health services (e.g. health insurers, service providers) have adopted games. The primary drivers of market demand are the convergence between consumer and social trends, advances in user interface technologies, and an increase in the incidence and prevalence of obesity and chronic diseases. Industry analysts estimate that the market currently offers over 300 games focusing on wellness, fitness and a variety of conditions and treatments that include smoking cessation, pain management, and rehabilitation and occupational therapy. The Robert Wood Johnson Foundation's *Health Games Research* is a national program with $8.5 million supporting research to enhance the quality and effectiveness of interactive games to improve health.

Technology	Health Games
Applications	Wellness, fitness, chronic disease management, rehabilitation
Comparison Technology	N/A
Vendors	Nintendo, Konami, HopeLab, Archimage, Second Life, Dakim, Starlight/Starbright
Drivers	Demographics, rise in consumer technologies, growing chronic disease burden and rise of obesity
Barriers	Limited evidence base of direct health outcomes and benefits
Cost	Varies
Reimbursement	N/A

Applications

Health game applications target a broad range of consumer needs across all age groups:

Targeted Need	Health Game Example	Targeted Outcome
Treatment Self-management	o Re-Mission (HopeLab) o Quest for the Code (Starlight Children's Foundation) o Packy and Marlon (Super Nintendo) o Bronkie the Bronchiasaurus (Super Nintendo)	Improve treatment adherence through increased knowledge and self-efficacy for young patients with cancer (Re-Mission), asthma (Quest for the Code) and diabetes (Packy and Marlon). Bronkie the Bronchiasaurus' goal is to reduce symptom days, emergency visits, and average daily doses of corticosteroids.
Healthy lifestyle behavior change	o Escape from Diab (Playnormous) o Nanoswarm: Invasion from Inner Space (Playnormous) o Food Fury (Playnormous)	Improve children's healthy lifestyle behaviors in nutrition and physical activity.

Targeted Need	Health Game Example	Targeted Outcome
Physical activity and fitness	o Dance Dance Revolution (Konami) o Wii Fit (Nintendo) o In the Groove (Roxor Games) o Cybercycling (Union College, Schenectady, NY)	Increase physical activity and improve fitness for all age groups.
Cognitive function	o InSight (Posit Science) o Brain Fitness (Dakim) o Crazy Taxi (PlayStation 2)	Reduce effects of age-related mental decline through exercising areas of memory, language and concentration. Measure executive function and assess visual attention by performance with cognitive speed and skills.
Physical and occupational therapy	o Wii (Nintendo) o EyeToy (Sony) o Trazer (Cybex)	Improve motor control, mobility and balance.
Mental health	o Bejeweled 2 Deluxe (PopCap Games) o Bookworm Adventure (PopCap Games) o Peggle (PopCap Games) o Virtual Iraq (Virtually Better)	Decrease stress and improve mood in treatment for substance abuse and post-traumatic stress disorder.

Besides consumer interest in health games, health insurers and delivery systems have been quick to explore the potential of health games:

Group	Initiative	Description
Humana	Humana Games	Portal offering a series of online health and wellness games for children (Horsepower Challenger) and older adults (Dancetown).
Inland Empire Health Plan	The Xrtainment Zone	Exer-gaming wellness weight-loss program targeting overweight 5-17 year olds who have been referred by a doctor.
Kaiser Permanente	Amazing Food Detective	Game-based activities that promote healthy eating behaviors among children aged 9-10.
Pittsburgh Medical Center	Kids Interactive Creation Kiosk	Touch screen system and software activity package for hospital waiting rooms and other hospital settings to lower stress for children.

Other place-based strategies that involve the use of health games include:

Location	Initiative	Description
Schools	WV Games For Health	Initiative to place the Dance Dance Revolution video game into West Virginia K-12 schools.
Fitness clubs	American Council on Exercise	Organization is conducting research on exer-gaming activities such as Wii Sport and Dance Dance Revolution and how to incorporate the games into personal trainer sessions.
Senior living communities and centers	International Council on Active Aging	A November 2008 survey reports that 61% of more than 350 senior-living and older-adult centers intend to purchase some form of computer-generated or Wii-type game in the next two years. Another 38% were considering buying brain fitness software.

Barriers

Despite the strong consumer interest in health games, the evidence base to validate and support the broad use of health games to deliver measurable health benefits is limited but emerging. For example, the American Council on Exercise confirmed in a study that interactive exer-gaming improves players' endurance, speed, hand-eye coordination and balance, as well as helps to increase energy expenditure and burn calories. The high cost and complexity required for clinical outcomes research represents a barrier to market development for unvalidated health games. Some clinical studies are underway for a number of health conditions, including asthma, cancer, diabetes, and cystic fibrosis, exer-gaming, and cognitive fitness. The development of an outcomes evidence-base will support effective design strategies in future game development.

The Future

Games will continue to introduce greater context-awareness, socialization, and augmented reality as capabilities in mobile and networked computing devices, context-sensitive programs, and immersion technologies advance. This will create mixed reality gaming environments and games that are more predictive of improved outcomes through their ability to monitor, assess and provide customized feedback. Games will also provide social connections and support for players with their peers.

Future digital game play need not necessarily be screen-based. Children's digital games might take place face-to-face and involve information from cell phones as one component of the game, but not as its focus. For example, geocaching is an activity that uses a GPS system and the web via a cell phone to post clues for people to hunt for buried items in the physical world (www.geocaching.com).

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To access additional background, forecast, and policy materials, please go to
www.childrenspartnership.org/HITInnovationForChildren