

# Dynamic In-game Advertising in 3D Digital Games

## *A Threat and a Possibility*

Olli Raatikainen

### Abstract

Lately, digital games have developed concerning their use as a marketing medium. The present article is part of a study aimed at building a theoretical model for measuring and analyzing *dynamic in-game advertising* in 3D digital games. The study is explorative in nature, because it intends to build a new model of a real phenomenon based on one or more existing theories. Dynamic in-game advertising can be implemented in a 3D digital game without harming the gameplay experience, while still being effective from the marketer's point of view. An optimized dynamic in-game advertisement is realistically and repeatedly, but subtly placed and interactive advertisement of a low-involvement product.

**Keywords:** in-game advertising, dynamic in-game advertising, gameplay experience, marketing communication, digital game

### Introduction

The profile of a typical digital game player has changed remarkably during the past 5 years. It is no longer only 15-year-old boys who play. Instead, women over 18 years of age are the fastest growing demographic group in the digital games industry (ESA 2010). The shift in the gender and age distribution has made digital games an increasingly interesting media also for marketing purposes (Edery 2006). Today, there are several different types of advertisements found in digital games. The term *in-game advertising* generally covers all marketing-related actions in digital games, including advergames (game exists solely for marketing purposes), advertising in synthetic worlds like Second Life, static in-game advertising (SIGA) and dynamic in-game advertising (DIGA) (IABUK 2007: 12-15; ESA 2010: 1-2).

There are three major worldwide companies that offer in-game advertising – IGA Worldwide, Double Fusion and Engage (Double Fusion 2008, IGA Worldwide 2007, Engage 2011). Almost all the biggest digital game publishers including EA, Activision and Ubisoft have already signed advertising contracts with one of these companies (NetworkWorld 2008, Gamasutra 2008, Engage 2011). Nowadays, using digital games as a marketing medium is better characterized as a rule than as an exception.

During the past ten years, digital games have developed in huge steps along with computers, consoles and other related hardware in general. One big step in the evolution

is that the majority of digital games today use 3D graphics (Natkin 2006: 82). Another big step in the evolution of digital games has been on-line gaming via the Internet, where several players play in the same virtual environment regardless of their geographical location. In addition to this technically oriented evolution, and at least partially because of it, digital games have also developed in terms of marketing inside the virtual environment of the digital game.

One important marketing-related change has been the possibility to implement *dynamic* in-game advertising, which means in-game advertising for a *predefined time frame*, which in turn means that the advertisements are changeable. The game publisher can sell “virtual advertising space” inside the digital game’s fictional environment. In practice, these advertisements can be billboards integrated into the virtual environment or product or brand placements. The advertisements can be changed when needed (according to the contract between the advertising company and the game publisher), because the game can be made to load new advertisements (to check the current state of the advertisements) every time the player connects to the multiplayer session via the Internet. Dynamic in-game advertisements have already been used in several campaigns in recent years, one of the most remarkable examples being the presidential campaign of Barack Obama in 2008, which included 18 game titles (GameSpot 2008).

The aim of the study is to build a theoretical model for measuring and analyzing dynamic in-game advertising in 3D digital games. A model is either a model of a real phenomenon or a model of data (Frigg & Hartmann 2006, Routio 2007). The present study targets a real phenomenon – dynamic in-game advertising in 3D digital games. However, because the model is completely based on both earlier theories and research data, the term *theoretical model* is used. These earlier theories then selectively become elements of the new model. The elements are chosen through a detailed literature survey on the basis of their relevance to the research topic. The purpose of the theoretical model is to find an optimal balance between the gameplay experience and the dynamic in-game advertising in 3D digital games. Thus, the scope of the study includes both the advertiser’s and the player’s point of view.

In-game advertising, gameplay experience and consumer information processing were selected as elements of the theoretical model for measuring and analyzing dynamic in-game advertising in 3D digital games. All these elements are “present” when a player plays a 3D digital game that contains dynamic in-game advertising. In the present study, the gameplay experience is seen as an “ensemble made up of the player’s sensations, thoughts, feelings and actions” (Ermi & Mäyrä 2005: 2). This is what the playing is all about. One really cannot play a digital game without gameplay experience. Then again, consumer information processing acts as a “filter” between the player and in-game advertising in a digital game and thus influences the gameplay experience.

In the present study, the gameplay experience consists of the sense of presence and flow. Both of these concepts have been used in analyzing and measuring the gameplay experience (see, e.g., Ravaja, Salminen, Holopainen, Saari, Laarni & Järvinen 2004: 340, 346; Sweetser & Wyeh 2005). In short, sense of presence means a mediated experience that does *not* seem to be mediated (Lombard & Ditton 1997). The concept of “flow” coined by Csikszentmihalyi (1990), in turn, has been widely adapted to different kinds of domains to assess enjoyment (Sweetser & Wyeh 2005: 3). The second element, consumer information processing, is a well-known field of study related to marketing (see, e.g.,

Schulz & Kitchen 2000). The third element, dynamic in-game advertising, is the main topic of the present study, and thus the other two elements are viewed *in relation* to it. Based on the three elements, the study focuses on two themes. The first concerns defining gameplay experience in relation to dynamic in-game advertising. The second theme concerns defining consumer information processing while playing a 3D digital game.

## Gameplay Experience

The gameplay experience is an essential part of a digital game and therefore also an essential part of the present study. Here, the gameplay experience is analyzed using tools from cognitive psychology, because a digital game is “a mediated experience that creates for the user a strong sense of presence” (Lombard & Ditton 1997). Additionally, theories from different fields of study such as social and consumer psychology, human-computer interaction, and mass communication have suggested that the virtual environment of a digital game helps to facilitate more engaging interaction between consumers and advertising stimuli. This is due to the heightened levels of immersion and presence (Lewis 2006: 20). In addition to the sense of presence, the gameplay experience is also analyzed using the concept of flow (Csikszentmihalyi 1990), which has been widely used for assessing enjoyment (Sweetser & Wyeh 2005: 3). The concept of immersion is often seen as a synonym for sense of presence (Ermi & Mäyrä 2005: 4). Because 3D digital games can be compared with the virtual reality applications from which the concept of sense of presence originates, the concept of immersion is not used here (MacMahan 2003: 69-70).

Earlier studies have shown that the most important factors contributing to the sense of presence in a digital game are interactivity and realism (cf. Lombard & Ditton 1997). In this context, interactivity refers to interaction between the player and the virtual environment, including other players in the same virtual environment. Realism refers to the perceived realism of the virtual environment, which can be further divided into *social realism* (social interaction matches the interaction in the real world) and *perceptual realism* (how real do the objects and events appear, including graphics and sound) (Lombard & Ditton 1997). Based on these suggested factors, the following hypotheses have been made to form a theoretical model for dynamic in-game advertising in 3D digital games.

### ***Hypothesis 1: The level of interactivity of dynamic in-game advertising affects the sense of presence in 3D digital games.***

An interactive in-game advertisement can be, e.g., a vending machine or a car of a certain brand in the virtual environment that actually works as it is supposed to work in reality.

The realism of a dynamic in-game advertisement means the way the advertisement has been placed inside the virtual environment of a digital game. This can be done roughly in two ways (Edery 2006; IABUK 2007):

1. Realistically, i.e. such that the advertisements integrate nicely and realistically with the background environment (e.g. a single poster on a wall).
2. Unrealistically/intrusively, i.e. such that the advertisements do not integrate with the background, but are constantly excessively displayed (e.g., most of the virtual environment's walls are covered with the same kind of a poster).

Both approaches have a connection with realism that affects the sense of presence. Earlier studies from Nelson (2002), Book (2004), Chaney, Lin, and Chaney (2004), Nelson and Ronald (2004) and Activision (2005) all show that players can accept advertisements in digital games when they are placed relevantly/realistically. A study from Lewis (2006: 44-45) confirms that the realism concerning the time (era) of placed advertisements compared with the time (era) of the virtual environment affects the perceived overall realism of the digital game. Di Cesare (2005: 15) too states that in-game advertisements need to add to the experience the digital game offers. Based on earlier findings on sense of presence, this leads us to the second hypothesis:

***Hypothesis 2: The realism of the dynamic in-game advertising affects the sense of presence in 3D digital games.***

An example of a realistic in-game advertisement in a 3D digital game would be, e.g., an advertisement for McDonalds in a present-day setting. An example of an unrealistic advertisement would be, e.g., an advertisement for McDonalds in a medieval setting.

Csikszentmihalyi (1990: 6) defines flow in the following way: "Flow is the way people describe their state of mind when consciousness is harmoniously ordered, and they want to pursue whatever they are doing for its own sake." Ermi and Mäyrä (2005: 2-3) note that digital games are generally excellent for providing opportunities for flow-like experiences. Sweetser and Wyeh (2005: 4) compare the elements of flow and the corresponding elements of a digital game. The comparison suggests that the elements of a digital game are indeed almost identical to the elements of flow. When the elements of a digital game and flow (Sweetser & Wyeh 2005: 4) are compared *in context* with previous findings on the sense of presence in 3D digital games, two common elements can be found: *control* (element of a digital game) and *deep but effortless concentration* (element of flow).

Control means, e.g., interaction between the player and the virtual environment (Desurvire & Caplan & Toth 2004, 3; Gee 2004). The sense of overall control over the player's actions contributes to the experience of flow (Sweetser & Wyeh 2004: 8). Players should be able to feel in control over the movements of their character and the way they explore the virtual environment (Federoff 2006: 17). The player should also feel a sense of control over the user interface of the video game, because mastering the video game controls is an essential factor in most games (Johnson & Wiles 2003: 2). Customizing the video game controls should be made possible (Federoff 2006: 13).

The player should perceive a sense of impact on the virtual environment (Desurvire et al. 2004: 3). A feeling of co-creating the virtual environment is important (Gee 2004). This corresponds to the findings presented in the previous chapters on the key role of interaction with the virtual environment as an important contributing factor to the sense of presence. The virtual environment should react to the players and remember their passage through it (Desurvire et al. 2004: 3). Also, the more restricted the player's options are, the less the player feels in control (Sweetser & Johnson 2004: 2). This has also been reported by Kiili (2005: 93), who notes that the game should at least create an illusion that the player decides the progress of the game.

The second common element to both digital games and flow, deep but effortless concentration, often translates to (sense of) presence, which in the games literature im-

plies, e.g., the graphics and audio of a digital game (Sweetser & Wyeh (2005: 4). This deep involvement is often reported by digital game players (Johnson & Wiles 2003: 2). This is also a general reason for playing video games: players thrive when they can think about something other than work and everyday worries (Lazzaro 2004: 1). Digital games should make players forget that they are participating in a virtual environment through a medium (Federoff 2006). The mediated experience should appear as if it were *not* mediated.

The elements of a digital game that contribute to (sense of) presence are, e.g., the graphics, audio and narrative (Sweetser & Wyeh, 2004: 3). This has been confirmed by, e.g., Ravaja et al. (2004: 346), who show that a digital game with 3D graphics (and thus a first-person perspective) and detailed/natural graphics elicit a higher level of presence compared to other digital games with less detailed/natural graphics and lacking a first-person perspective.

Another property of a digital game related to the flow experience, and thus to deep but effortless concentration, is the challenge level of the digital game in question. Challenge has been constantly listed as the most important element of a good digital game (Lazzaro & Keeker 2004: 2). A challenge level higher than the level of skill results in anxiety, and a challenge level that is too low results in apathy (Sweetser & Wyeh 2005: 6). The importance of the challenge level of the digital game regarding the flow experience has also been reported by, e.g., Kiili (2005: 92) and Järvinen (2008: 105). However, in the present study challenge level is not so important, because the in-game advertisements hardly affect the challenge level of the digital game. Based on the findings above, the following hypotheses concerning flow have been made:

***Hypothesis 3:*** *The level of interactivity of dynamic in-game advertising affects flow in 3D digital games.*

***Hypothesis 4:*** *The audiovisual quality of dynamic in-game advertising affects flow in 3D digital games.*

## **Consumer Information Processing**

In-game advertising is a type of advertising, and advertising is a way of doing marketing. For marketing (communication) to work, one prerequisite is having captured the consumer's attention. Mere exposure is not enough (Schultz & Kitchen 2000: 45; Rossiter, Percy & Elliot 2001: 36). In the present study, the terms *consumer* and *player* are considered synonyms, because the player of a 3D digital game is also a consumer, who is the target of the dynamic in-game advertising. The concepts of marketing communication and player/consumer information processing are essential to understanding the fundamentals of the perception of in-game advertisements in 3D digital games. Understanding consumer information processing requires understanding how the consumer's memory works, because memory constitutes the consumer's perceptions and determines whether a (marketing) message is relevant or irrelevant (Dubuc 2002; Lutz & Huitt 2003: 4; Shultz & Kitchen 2000: 45). The goal of marketing communication (including advertising) is that some of the elements of the sender's message are retained in the consumer's long-term memory (Schultz & Kitchen 2000: 45).

As to the context of in-game advertising, many studies on explicit memory (a person's conscious recollection of information) and implicit memory (a person's unconscious recollection of information) have been carried out (see, e.g., Yang et al. 2006: 3). For instance, Duke and Carlson (1993) suggest that implicit memory can influence consumer purchasing decisions. In addition, several studies (Duke 1995, Duke & Carlson 1994, Krishnan & Chakravarti 1993, Krishnan & Shapiro 1996 and Shapiro & Krishnan 2001) have concluded that advertising exposure effects cannot be determined only by explicit memory measures, but implicit memory measures must be used as well. The difference between explicit and implicit memory is important regarding marketing stimuli, because during exposure (to marketing stimuli) consumers are often doing something that requires dividing their attention (Shapiro & Krishnan 2001: 11). Recent research has proven that consumers perceive unattended stimuli and learn unconsciously. This kind of learning influences the decision-making process even though consumers are not aware of such learning (Xia & Monroe 2004: 139).

A recent study by Yang et al. (2006) shows that in-game advertising in digital games does indeed influence players' implicit memory. This leads us to the assumption that dynamic in-game advertising in 3D digital games does not influence explicit memory as effectively as implicit memory, because the player does not have enough time to concentrate on the in-game advertisements (divided attention). This is based on the general finding that the level of attention affects the level of processing allocated to a certain set of stimuli (Law & Braun-LaTour 2004). It seems that implicit memory works "in the background" regardless of the situation. Law and Braun (2000: 1071) also reveal that in-game advertisements seem to work best when people are not aware of their influence. This was also confirmed at least partially by Juhl (2006: 60), who shows that repeating subtly placed in-game advertisements in a digital game did not negatively affect brand preference.

Another research result on implicit memory and therefore also in-game advertising presented by Shapiro and Krishnan (2001: 11) suggests that the purchase decision for low-involvement products is often based on implicit memory. A low-involvement product refers to a product that is not expensive and thus the purchase decision does not require complex processing on the part of the consumer. A chocolate bar is an example of a low-involvement product. In contrast high-involvement products are often expensive or otherwise require more complex processing for the purchase decision to be made. A car is an often-used example of a high-involvement product. In addition, research in consumer behavior has also suggested that many consumer decisions are made under conditions of low-involvement (Xia & Monroe 2004: 138). Low-involvement here refers to a situation when a consumer is not motivated or lacks the opportunity to scrutinize incoming message (Hawkins, Hoch & Meyers-Levy 2001: 2). Based on previous findings on one digital game and divided attention, it could be assumed that low-involvement conditions apply for dynamic in-game advertising in 3D digital games. The following hypothesis has been made based on the findings above.

***Hypothesis 5: Repeatedly and subtly placed low-involvement products get hold of the player's attention most effectively.***

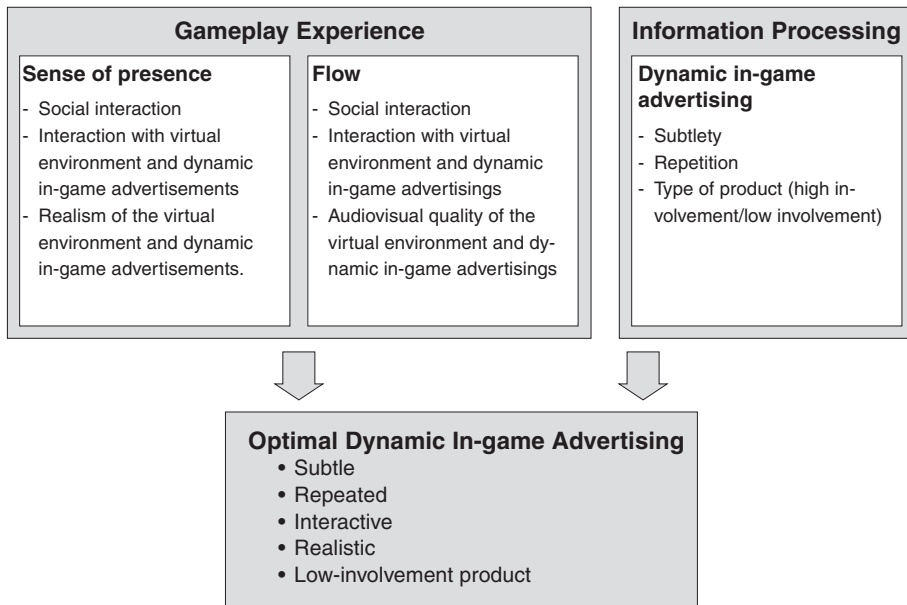


## Modeling Dynamic In-game Advertising in 3D Digital Games

Sense of presence and flow are the main components suggested to form the element of the gameplay experience from a 3D digital game. The factors that affect sense of presence are both social interaction and interaction with the virtual environment, including dynamic in-game advertising and the level of realism (in this case the realism of the dynamic in-game advertising). The factors that affect flow are also social interaction and interaction with the virtual environment (which includes interaction with dynamic in-game advertising), along with the audio-visual quality of the virtual environment, including dynamic in-game advertising. In order to maximize the gameplay experience from a 3D digital game when using dynamic in-game advertising, both sense of presence and flow should be optimized. This means also optimizing the contributing factors.

Based on the work of Lutz and Huitt (2003: 3-4), Dubuc (2002) and Shapiro and Krishnan (2001: 1-11) on Atkinson-Shiffrin model and on the work of Schultz and Kitchen (2000: 45-46), Yang (2006), Law and Braun (2000: 1063, 1071) and Shapiro and Krishnan (2001: 11) on consumer memory usage, the present study suggests that the factors contributing to the element of player information processing are subtlety of dynamic in-game advertising, type of product (high involvement/low involvement) and repetition of dynamic in-game advertising. The elements of the model are combined into one model in Figure 1 below.

**Figure 1.** *Model for Dynamic in-game Advertising in 3D Digital Games*



Based on the model, optimal dynamic in-game advertising has the following properties: It involves the repeatedly, but subtly placed advertisement of a low-involvement product, which is interactive from the player's point of view. In the model, optimality is concerned from both the player's and the marketer's point of view.

Optimal dynamic in-game advertising can also be viewed from another perspective, and in the form of a question: What properties of the dynamic in-game advertising are most obstructive to the gameplay experience from a 3D digital game (sense of presence and flow)? Considering the results, the most obvious property of dynamic in-game advertising that obstructs the gameplay experience from a 3D digital game is the repetition of dynamic in-game advertising. Again, the amount of repetition a player defines as disturbing depends on the player. The amount of repetition of the dynamic in-game advertising relates to the realism of the dynamic in-game advertising: If there are unrealistically large numbers of dynamic in-game advertising of the same product in the virtual environment (repetition is high), this will certainly lower the realism of the dynamic in-game advertising. At some point, the amount of repetition starts to disturb the player, but again this depends on the player.

## **Discussion**

The aim of the study was to build a theoretical model for measuring and analyzing dynamic in-game advertising in 3D digital games. The purpose of the theoretical model was to find an optimal balance for the relationship between the gameplay experience and the dynamic in-game advertising in 3D digital games. The built model suggests that an optimized dynamic in-game advertisement is a subtle, realistic and repeated advertisement of a low-involvement product, which is interactive from the player's point of view. Based on the present model, dynamic in-game advertising can be implemented in a way that does not at all harm the gameplay experience, but enhances it. Thus, dynamic in-game advertising in 3D digital games can be seen as both a threat and a possibility for gameplay experience.

The generic nature of the model can be seen both as a strength and a weakness. The model can be used as a general guide for implementing dynamic in-game advertising in a 3D digital game. For the digital game industry, the model can be used as a general checklist, especially in the production phase of a digital game, because at that stage it is easier to integrate dynamic in-game advertising into the virtual environment. On the other hand, the exact implementation of the dynamic in-game advertising always depends on the digital game in question. Again, the theories and studies that were used to build the model can be adapted to most settings regardless of the digital game, because the basic elements of the model (gameplay experience and information processing) are always there.

Recently digital game production costs in general have risen substantially, sometimes exceeding the production costs of feature films. This is one possible reason for applying the model: Covering the production costs of a digital game title with advertising contracts without harming the gameplay experience could be an interesting strategy for a digital game production company.

The model will be tested empirically in the near future to discover how exact it is. The testing environment will include sensors for electrodermal activity (EDA) also known as skin conductance level (SCL) and heart rate. Moreover, an eye tracking camera will be used. The main idea is to record the gameplay video, EDA and eye tracker data and to sync them temporally. This way a coarse analysis can be carried out easily prior to using statistical methods.



## References

- Baer, R.H. (2005) 'Foreword', in Wolf, M.J.P. (ed.) *The Medium of a Video Game*, ix-xvi. 3<sup>rd</sup> edition. Austin: University of Texas Press.
- Clientwell (2006) 'First Ever Banner Ad Revisited. Cited 14.9.2007', <http://commercial-archive.com/node/114815>
- Csikszentmihalyi, M. (1990) *Flow. The Psychology of Optimal Experience*. New York: Harper & Row, Publishers Inc.
- Desurvire, C. & Toth (2004) 'Using Heuristics to Evaluate the Playability of Games'. Cited 10.10.2008. <http://www.behavioristics.com/downloads/usingheuristics.pdf>
- Dubuc, B. (2002) 'Memory and Learning'. Cited 22.11.2007. [http://thebrain.mcgill.ca/flash/a/a\\_07/a\\_07\\_p/a\\_07\\_p\\_tra/a\\_07\\_p\\_tra.html](http://thebrain.mcgill.ca/flash/a/a_07/a_07_p/a_07_p_tra/a_07_p_tra.html)
- Duke, C.R. & Carlson, L.B. (1993) 'A Conceptual Approach to Alternative Memory Measures for Advertising Effectiveness', *Journal of Current Issues and Research in Advertising*, 15:2, 1-14.
- Duke, C.R. (1995) 'Exploratory Comparisons of Alternative Memory Measures for Brand Name', *Psychology and Marketing*, 12:1, 19-36.
- Economist (2006) 'Wonders of the Metaverse'. Cited: 15.10.2008. [http://www.economist.com/surveys/displaystory.cfm?story\\_id=6794220](http://www.economist.com/surveys/displaystory.cfm?story_id=6794220)
- Ederly, D. (2006) 'In-Game Ads: Quick Q&A with Mike McHale (Konami)'. Cited 15.1.2007: <http://www.edery.org/category/ads-in-games/>
- Engage (2011) 'Engage In-Game Advertising. Cited 12.9.2011'. [http://www.engageadvertising.com/#/about\\_us/engage](http://www.engageadvertising.com/#/about_us/engage)
- Ermi, L. & Mäyrä, F. (2005) 'Fundamental Components of the Gameplay Experience: Analysing Immersion'. Cited 20.3.2008. [http://www.uta.fi/~frans.mayra/gameplay\\_experience.pdf](http://www.uta.fi/~frans.mayra/gameplay_experience.pdf)
- ESA (2008) 'Essential Facts about the Computer and Video Game Industry'. Cited 1.11.2008. [http://www.theesa.com/facts/pdfs/ESA\\_EF\\_2008.pdf](http://www.theesa.com/facts/pdfs/ESA_EF_2008.pdf)
- ESA (2010) 'Essential Facts about the Computer and Video Game Industry'. Cited 25.5.2011. [http://www.theesa.com/facts/pdfs/ESA\\_Essential\\_Facts\\_2010.PDF](http://www.theesa.com/facts/pdfs/ESA_Essential_Facts_2010.PDF)
- ESA (2010) 'Entertainment Software In-Game Advertising'. Cited 12.9.2011. <http://www.theesa.com/games-indailylife/advertising.pdf>
- Federoff, M. (2006) 'Heuristics and Usability Guidelines for the Creation and Evaluation of Fun in Video Games'. Cited 25.10.2007. <http://www.melissafederoff.com/thesis.html>
- Frigg, R. & Hartman, S. (2006) 'Models in Science (Stanford Encyclopedia of Science)'. Cited 4.10.2007. <http://plato.stanford.edu/entries/models-science/>
- Fawcett, J. (1997) 'A Framework for Analysis and Evaluation of Conceptual Models of Nursing', in Teoksessa Nicoll L.H.: *Perspectives on Nursing Theory*. 3<sup>rd</sup> edition. Philadelphia: Lippincott.
- Gamasutra (2008) 'Activision, IGA Partner For PS3 In-Game Ads'. Cited 1.11.2008. Activision, IGA Partner For PS3 In-Game Ads.
- GameSpot (2008) 'Obama Campaigns in Burnout', 17 Other Games. Cited 20.9.2001. <http://www.gamespot.com/news/6199379/obama-campaigns-in-burnout-17-other-games>
- Gee, J.P. (2004) 'Learning by Design: Games as Learning Machines'. Cited 24.10.2007. [http://www.gamasutra.com/gdc2004/features/20040324/gee\\_01.shtml](http://www.gamasutra.com/gdc2004/features/20040324/gee_01.shtml)
- Internet Advertising Bureau (2007) 'In-game Advertising: The UK Market'. Cited 22.8.2007. [www.iabuk.net/media/images/IABingameadvertisingtheUKMarketMarch2007\\_1594.pdf](http://www.iabuk.net/media/images/IABingameadvertisingtheUKMarketMarch2007_1594.pdf)
- Johnson, D. & Wiles, J. (2003) 'Effective Affective User Interface Design in Games'. *Ergonomics* 46: 13/14, 1332-1345.
- Juhl, J.K. (2006) 'The Effectiveness of Product Placement in Digital Games'. Unpublished dissertation. University of Bath.
- Järvinen, A. (2008) 'Games without Frontiers. Theories and Methods for GameStudies and Design'. Cited 25.5.2011. <http://acta.uta.fi/haekokoversio.php?id=11046>
- Kline, S. (2003) 'Video Games : The Interaction of Technology, Culture, and Marketing', McGill-Queen's University Press. London.
- Krishnan, H.S. & Chakravarti, D. (1999) 'Memory Measures for Pretesting Advertisements: An Integrative Conceptual Framework and a Diagnostic Template', *Journal of Consumer Psychology*, 8:1, 1-37.
- Krishnan, H.S. & Shapiro, S. (1999) (1996) 'Comparing Implicit and Explicit Memory for Brand Names from Advertisements', *Journal of Experimental Psychology: Applied*, 2:2, 147-163.
- Law, S. & Braun-LaTour, K.A. (2000) 'I'll Have What She's Having: Gauging the Impact of Product Placements on Viewers', *Psychology & Marketing* 17: 12, 1059-1075.
- Law, S. & Braun-LaTour, K.A. (2004) 'Product Placements: How to Measure their Impact', in Shrum, L.J. (ed.) *The Psychology of Entertainment Media*, 63-78. Mahwah NJ: Lawrence Erlbaum Associates.

- Leplin, J. (1980) 'The Role of Models in Theory Construction', in Nickles, T. (ed) *Scientific Discovery, Logic, and Rationality*, 267-284. Dordrecht: Reidel.
- Lewis, B. (2006) 'Measuring Player Perceptions of Advertising in Online Games'. Cited 26.11.2007. [http://etd.lsu.edu/docs/available/etd-11162006-101838/unrestricted/Lewis\\_thesis.pdf](http://etd.lsu.edu/docs/available/etd-11162006-101838/unrestricted/Lewis_thesis.pdf)
- Lombard, M. & Ditton, T. (1997) 'At the Heart of It All: The Concept of Presence'. Cited 8.8.2007. <http://jcmc.indiana.edu/vol3/issue2/lombard.html>
- Lutz, S.T. & Huitt, W.G. (2003) 'The Information Processing Approach to Cognition'. Cited 23.11.2007. <http://chiron.valdosta.edu/whuitt/col/cogsys/infoproc.html>
- McMahan, A. (2003) 'Immersion, Engagement and Presence', in Wolf, M. & Perron, B. (eds.) *The Digital Game Theory Reader*, 67-86. London: Routledge.
- Natkin, S. (2006) *Video Games and Interactive Media : A Glimpse at New Digital Entertainment*. Natick, MA: A K Peters, Limited.
- Networkworld (2008) 'Top 20 Video Game Publishers of 2008'. Cited: 1.11.2008. Top 20 digital game publishers of 2008.
- Oser, K. (2005) 'Game Enthusiasm Rises up from the Basement', *Ad Age* 76: 37, 51. Detroit: Crain Communications Inc.
- Percy, L., Rossiter, J.R., & Elliott, R. (2001) *Strategic Advertising Management*. Bath: The Bath Press.
- Raby, M. (2007) 'Video Game Ads Expected to Soar by 2011'. Cited 9.4.2007: <http://www.tgdaily.com/content/view/31529/98/>
- Ravaja, N., Salminen, M., Holopainen, J., Saari, T., Laarni, J., & Järvinen, A. (2004) 'Emotional Response Patterns and Sense of Presence during Digital Games: Potential Criterion Variables for Game Design', *ACM International Conference Proceeding Series* 82, 339-347.
- Routio, P. (2007) 'Mallit tieteissä' [Models in science]. Cited 13.6.2007: <http://www2.uiah.fi/projects/metodi/05b.htm>
- Salen, K. & Zimmerman, E. (2006) *The Game Design Reader. Rules of Play Anthology*. Cambridge, Massachusetts: The MIT Press.
- Schultz, D.E. & Kitchen, P.J. (2000) *Communicating Globally: An Integrated Marketing Approach*. London: McGraw-Hill/Contemporary.
- Shapiro, S. & Krishnan, H.S. (2001) 'Memory-Based Measures for Assessing Advertising Effects: A Comparison of Explicit and Implicit Memory Effects', *Journal of Advertising* 30: 3, 1-13.
- Sweetser, P. & Wyeh, P. (2005) *GameFlow: A Model for Evaluating Player Enjoyment in Games*. St Lucia: The University of Queensland.
- Usoh, M., Slater, M., & Alberto, C. (1999) 'Presence: Experiments in the Psychology of Virtual Environments'. Cited 23.8.2007. <http://www.cs.ucl.ac.uk/external/M.Usoh/vrpubs.html>
- Winkler, T. & Buckner, K. (2006) Receptiveness of Gamers to Embedded Brand Messages in Advergaming: Attitudes towards Product Placement. *Journal of Interactive Advertising* 7: 1, 37-46.
- Wolf, M. (2005) *The Medium of the Video Game*. The University of Texas Press.
- Wolf, M. & Perron, B. (2003) *The Video Game Theory Reader*. London: Routledge.
- Xia, Lan & Monroe, Kent B. (2004) 'Consumer Information Acquisition. A Review and an Extension', *Review of Marketing Research*, Volume 1. Ed. Malhotra, N.K. Sharpe Inc.
- Yang, M., Roskos-Ewoldsen D.R., Dinu, L., & Laura M.A. (2006) 'The Effectiveness of "In-game" Advertising. Comparing College Students' Explicit and Implicit Memory for Brand Names', *Journal of Advertising* 35: 4, 143-152.