International Journal of Sport Management, Recreation & Tourism

A Study on the Effectiveness of In-Game Advertisements

LENG Ho Keat

Physical Education and Sports Science

National Institute of Education

Nanyang Technological University

Correspondence with:

LENG Ho Keat

hokeat.leng@nie.edu.sg

NIE5-03-24, 1 Nanyang Walk

Singapore 637616

Republic of Singapore

International Journal of Sport Management Recreation & Tourism, Vol.8, pp.65-80, 2011

To link to this article: http://dx.doi.org/

DOI: 10.5199/ijsmart-1791-874X-8d

A Study on the Effectiveness of In-Game Advertisements

Abstract

In recent years, commercial organizations have shown an increasing interest in advertising their products in video games. While there is some research in this area, the complexities of product placement research, with in-game advertisement research in particular, suggest that more research is needed in this area. The aim of this paper is to add to the literature on the effectiveness of in-game advertisements through recognition and recall tests. By using the same survey instrument for three different games from the same genre, this research allows for comparison across games and findings can be generalized to games in the same genre. The sampling strategy adopted allows for the findings to be compared between genders and addresses one of the common criticisms of earlier studies. In addition, this research also examines whether gamer experience and perceptions of game can influence recall and recognition rates of in-game advertisements. The findings concur with earlier studies that recall rates of in-game advertisements are low, and that gender and gamer experience had no effect on recall rates. The research also suggests that the relationship between perceptions of game in affecting recall rates is complicated and require further research.

Keywords: in-game advertisements; product placements; sports video games; racing games

A Study on the Effectiveness of In-Game Advertisements

Introduction

In recent years, commercial organizations have shown an increasing interest in advertising their products in video games or in-game advertisements (Clavio, Kraft, & Pedersen, 2009). Indeed, in-game advertisements were even used in the 2008 United States Presidential Elections. This suggests that in-game advertisement is not just a new advertising fad, but possibly a major new advertising medium. More importantly, in-game advertisements are not restricted to traditional computer and video games. With the growing popularity of online games, especially for games that are available on social networking sites, in-game advertisement can potentially reach a large number of gamers for advertised products. Hence, it is not surprising that advertisers have been interested in this new advertising medium.

Although there is growing interest among researchers in the effectiveness of in-game advertisement in recent years, the number of research studies remains relatively small. As such, it remains an area that needs more research. The aim of this paper is to add to the literature on the effectiveness of in-game advertisements by detailing the results of three experiments designed to examine the effectiveness of in-advertisements across different games.

Review of Literature

Product placement is a paid message aimed at influencing audiences through the use of a brand within a scripted medium. Although product placements are commonly used in various mediums, due to technical difficulties in testing, understanding of consumers' responses to such messages remains limited (Balasubramanian, Karrh & Patwardhan 2006). Still, it has been maintained that as the audience cannot skip or turn off the advertisements, they are captive audience for the brand and hence, product placement can be an effective advertising medium.

In-game advertisements are considered a form of product placement. However, unlike product placements in television shows or movies, the audience for computer games does not passively watch the show and process the additional stimuli of the advertised products. Playing games require the player to actively interact with the game. By devoting attention to playing a game, the player will have less available attention capacity to process the additional stimuli of advertisements in a game (Schneider &

Cornwell, 2005; Yang, Roskos-Ewoldsen, Dinu & Arpan 2006). Hence, in-game advertisements had been found to be less effective than advertising in televised sports contests (Kim, Walsh, & Ross, 2008).

Earlier research has established that the recall rate of advertisements is affected by the placement of the advertisement. Advertisements that appear in situations or locations that are central to the game are recalled at a higher rate than those that are peripheral to the game (Acar, 2007; Chaney, Lin, & Chaney, 2004; Lee & Faber, 2007; Leng, Quah, & Zainuddin, 2010; Schneider & Cornwell, 2005). For example, in sports racing games, advertisements that appear near the car are more likely to be remembered than advertisements which are further removed from the car.

More importantly, where the brands are part of the game, in-game advertisements are more involving for gamers and the recall rates of such brands are higher (Nelson, 2002; Yang & Wang, 2008). For example, the advertised brand may appear as characters, equipment or locations central to the game. Gamers will need to interact with the brands as part of game play like choosing the brand of the sports car for a sports racing game or equipping the character with different brands of shoes and attire for a basketball game.

When advertisements appear in a spot where the gamer is likely to be very focused on the game, then the gamer is unlikely to notice the advertisement (Chaney et al., 2004). For example, billboards in sports racing games which appear in the background and have no consequence in the game play, are less likely to be noticed by players (Glass, 2007; Nelson, 2002). However, if the billboards are large and colorful and are repeatedly exposed to gamers, then there is still a possibility that gamers are able to process the stimuli (Balasubramanian et al., 2006; Leng et al., 2010; Schneider & Cornwell, 2005). Interestingly, if the billboards are located around a sharp bend or other locations where there is a high probability that gamers are going to crash into it, then due to the unintended interaction with the game, the advertisement is likely to be recalled to a greater extent (Schneider & Cornwell, 2005).

Studies have also suggested that the relationship between the level of involvement with games and recall rate of advertisement is not a simple one. When gamers are uninterested and less involved in the games, they are more likely to be easily distracted by other stimuli external to the game. Hence, they do not pay much attention to the advertisements in the game and the recall rate of advertisement is lower. When the game is perceived to be more exciting or faster in pace, gamers are more involved in the

game and may notice more of the advertisements in the game (Leng et al., 2010). However, at higher levels of involvement, the gamer may focus so much of his attention on the primary task of playing the game that there is no additional attention capacity to notice advertisements in the game (Lee & Faber, 2007). Hence, the relationship between the recall rate of advertisements and the level of involvement of the gamer had been suggested to follow an inverted U-shaped curve.

It follows that prior experience in playing games will have a mediating effect on the relationship. An experienced gamer may be able to anticipate what will occur during a game. This allows the experienced gamer to devote less attention to the game and more capacity to process other stimuli like advertisements in the game when compared to an inexperienced player (Lee & Faber, 2007; Schneider & Cornwell, 2005). However, in other studies, game experience did not have a significant effect on recall rate of advertisements (Chaney et al., 2004; Leng et al., 2010). Indeed, the experience argument had been extended to show that higher levels of sports consumption, which is a reflection of experience in sports, did not translate to higher advertisement recall rates in sports video games (Walsh, Kim, & Ross, 2008).

The above suggests that there are many factors affecting the effectiveness of in-game advertisements. Placement and prominence of the advertisement are established in the literature to have an effect on the rate of recall and recognition of in-game advertisements. However, findings remain mixed as to whether gamer experience and perceptions of the game have any effect on the recall and recognition rate of in-game advertisements. In this research, the effectiveness of in-game advertisements, and how this is influenced by gamer experience and perceptions of the game will be examined.

Methodology

Findings in earlier research were often limited to a specific game. In order to examine if there is any difference in the recall rate of in-game advertisements across games, the research design involved three different groups with each using the same survey instrument but with different games from the same genre. This was similar to an earlier study in using two different video games to decrease the likelihood that results are due to game-specific characteristics (Yang et al., 2006).

In this research, sports racing games were selected. This is because advertisements that appear in sports racing games were considered to be more realistic as real-life tracks are also filled with numerous advertisements and billboards (Lee &

Faber, 2007; Lewis & Porter, 2010; Nelson, 2002; Schneider & Cornwell, 2005). In addition, the in-game advertisements across the games were primarily in the form of large billboards which allowed for comparison.

Specially developed games with fictitious brands are commonly used in advertisement recall research. This is to control for prior exposure to the games and advertisements (Lee & Faber, 2007). However, if a new video game is used, the gamer may not find the controls intuitive. Hence, there might be a steep learning curve and this can affect the attention paid to advertisements (Cianfrone, Zhang, Trail, & Lutz, 2008). As such, some earlier studies have opted to use commercially available games in their studies instead (Cianfrone et al., 2008; Glass, 2007; Leng et al., 2010; Lewis & Porter, 2010; Nelson, 2002; Schneider & Cornwell, 2005; Yang et al., 2006). For this reason, commercially available console games were used in this research.

It was found in earlier research that respondents do not remember the brands that they see in games after some time (Nelson, 2002; Yang & Wang, 2008). As such, for this research, the games selected were older so as to limit the effect of respondents' prior exposure to the games and advertisements.

Respondents were required to play the games in a tutorial room to control for factors which may distract the attention of respondents and thus have an effect on the advertisement recall rate. This measure is similar to earlier studies where the environment is controlled for competing stimuli (Schneider & Cornwell, 2005).

Game options that may affect the recall rates of the advertisements were also pre-determined. These included the selection of the race track and the number of laps for each race. Each respondent was exposed to the game for approximately 10 minutes depending on the amount of time the respondent spent playing the game. This was comparable to earlier studies and respondents are expected to be exposed to all of the brands in the game (Lee & Faber, 2007; Nelson, 2002; Walsh et al., 2008).

Respondents were not informed of the objective of the research prior to the game but were only informed that they should complete the race in the shortest possible time. A member of the research team explained the objectives of the game and the controls to the respondent but generally refrained from commenting on the progress of the game. Following Schneider & Cornwell (2005), deception was necessary as a means to ensure that respondents were not primed to look out for and remember advertisements in the game.

At the end of the game, respondents were required to complete a survey. The survey instruments in all three studies included a test on the recall of advertisement in the game. Like most research studies, this research is focused on explicit, short-term memory (Balasubramanian et al., 2006). Explicit memory refers to the intentional and conscious effort to recollect a specific past event. In contrast, implicit memory involves memory effects that occur without intentional or conscious recollection of an event (Yang et al., 2006).

The remaining questions in the survey instrument included questions on demographics, frequency and duration of playing games, and perceptions of the game. The perceptions of game was based on Leng et al's (2010) study and consists of four Likert-scale questions on the excitement level of the game, game pace, graphics and ease of game play. The total number of questions was about 15 questions as minor modifications were made to adapt the survey instrument across the three studies. As a token of appreciation for the time taken in participating in the research, each respondent was given a one-dollar fast food voucher.

The majority of gamers are between 18 to 34 years of age (Kim et al., 2008). As such, the three studies discussed in this paper, like earlier studies, focused on this specific demographic group. Students from a tertiary institution in Singapore were recruited to participate in the three different studies using convenience sampling. The studies were conducted simultaneously and checks were in place to ensure that none of the respondents participated in more than one study. The students in the tertiary institution were mostly between 17 to 25 years of age.

Many of the earlier studies used samples that were made up of predominantly males (Chaney et al., 2004; Cianfrone et al., 2008; Nelson, 2002; Schneider & Cornwell, 2005; Walsh et al., 2008). As gamers tend to be young males, it has been argued that the samples used in these studies are representative of the population. However, female gamers are more accepting of in-game advertising (Lewis & Porter, 2010). Following Schneider & Cornwell's (2005) call to expand the demographic profile of participants, it seems opportune to examine if there is a difference between the genders in the recall rates of in-game advertisements in this research. As such, the sampling strategy sought to obtain significant representation from both genders.

The details of each study and the demographics of the sample are described below.

Study 1 - Corvette Evolution GT

A total of 51 respondents with a mean age of 19.6 years were involved in this study. 34 (67%) of the respondents were male. For this study, the car racing game, Corvette Evolution GT (Milestone, 2006) was used to test for the effectiveness of in-game advertisements. In this study, all respondents were required to select “Quick Race” and complete four laps of the “Berlin” track in “Sunny Weather”. Respondents were allowed to choose any of the four available models of race cars and the color of the car for the race.

In this study, a recognition test was used to test the effectiveness of in-game advertisements. Similar to earlier studies, respondents were asked to identify the brands that appeared in the game from a list of 20 brands where only 10 of the brands appeared in the game. The number of correctly identified brands is used as the measure of the recognition rate (Lee & Faber, 2007; Walsh et al., 2008; Yang et al., 2006).

Study 2 - Suzuki TT Superbikes

A total of 43 respondents with a mean age of 19.4 years were involved in this study. 19 (44%) of the respondents were male. For this study, the motor bike racing game, Suzuki TT Superbikes (JesterInteractive, 2005), was used to test for the effectiveness of in-game advertisements. In this study, all respondents were required to select “Arcade Mode” and a standard 1000 cc bike with a standard rider. All respondents were required to complete 3 laps on the “Alpinestars Southern 100” track. Respondents were given three minutes to practice on the track before the actual game. This practice session was introduced because respondents were less familiar with controls for motor bike racing and required some practice for the game to progress meaningfully. In addition, this game had one lap less than the other two studies.

For this study, unaided recall was used to test the effectiveness of in-game advertisements. Respondents were required to list down the advertisements that they remember seeing in the game. The number of correctly identified brands is used as the measure of the unaided recall rate including those where the brands were clearly misspelled.

Study 3 - Gran Turismo 3: A-Spec

A total of 53 participants with a mean age of 18.9 years participated in this study. 27 (50.9%) of the respondents were male. For this study, the video game Gran Turismo

3: A-Spec (PolyphonyDigital, 2001) was used to test for the effectiveness of in-game advertisements. All respondents were required to select “Swiss Alps” for the track, “Arcade” for the game play mode and “Easy” for the level of difficulty. Respondents are required to complete 2 games of 2 laps each, making a total of 4 laps. The vehicle used in all games was standardized to the Mitsubishi Lancer Evo V6. Other options including the controller configuration, sound effects and soundtracks were also standardized across the games.

For this study, unaided recall was used to test the effectiveness of in-game advertisements. Respondents were required to list down the advertisements that they remember seeing in the game. The number of correctly identified brand is used as the measure of the unaided recall rate.

Results

The recall rates of advertisements for the three studies are detailed in Table 1 below. The maximum number of advertisements recalled in the studies was 3 advertisements, 5 advertisements and 2 advertisements respectively. The mean number of advertisements recalled was low and ranged from 0.37 to 0.86 advertisements across the three studies. This was due largely to the majority of respondents who did not remember any advertisements correctly in the games. The proportion of respondents who did not remember any advertisements correctly in the games were 78.4%, 51.2% and 58.5% respectively. This was comparable to an earlier study which found about half of the respondents did not remember any advertisements correctly (Yang et al, 2006).

As the number of advertisements that appeared in the three games was different, for comparison purposes, the percentage of advertisements recalled was calculated by dividing the number of advertisements recalled with the number of advertisements that appeared in the game. The percentage of advertisements recalled ranged from 2.7% to 4.8%. A one-way between subjects ANOVA conducted to compare the effect of different games on the percentage of advertisements recalled showed that there was no significant difference across the games, $F(2, 144) = 1.2956$, $p = 0.277$).

Table 1. Advertisements Recalled.

	Mean Advertisements Recalled	Percentage of Advertisements Recalled	*F-value*
Corvette Evolution GT	0.37[a] (SD=0.12)	3.7%	1.2956
Suzuki TT Superbikes	0.86[b] (SD=0.19)	4.8%	
Gran Turismo 3A-Spec	0.45[c] (SD=0.08)	2.7%	

Note. [a]*n*= 51. [b]*n*=43. [c]*n*= 53.

To examine if there is a difference between the genders in the recall rate of in-game advertisements, the mean advertisements recalled in each game by gender is produced in Table 2 below. For Study 1, male respondents had a mean recall rate of 0.32 advertisements while female respondents had a slightly higher recall rate of 0.47 advertisements. Study 3 also showed that male respondents had a lower mean recall rate of 0.44 advertisements compared to female respondents who had a mean recall rate of 0.46 advertisements. Interestingly, Study 2 showed that male respondents had a higher recall rate with a mean of 1.21 advertisements as compared to 0.58 advertisements for female respondents. Statistical analysis showed that the differences between the genders across all three studies were not significant. This was expected as there was no clear pattern across the three studies. This lends support to earlier studies which contends that there is no difference between the genders in the rate of recall of advertisements between the genders.

Table 2. Mean Advertisements Recalled by Gender.

	Mean Advertisements Recalled (Male)	Mean Advertisements Recalled (Female)	*t-value*
Corvette Evolution GT	0.32[a]	0.47[b]	0.5809
Suzuki TT Superbikes	1.21[c]	0.58[d]	-1.6171
Gran Turismo 3A-Spec	0.44[e]	0.46[f]	0.1069

Note. [a]*n*= 34. [b]*n*= 17. [c]*n*= 19. [d]*n*=24. [e]*n*=27. [f]*n*= 26.

A t-test was conducted to examine if there is a difference in the ability to recall advertisements by respondents' familiarity with playing games. Following the criteria established by earlier studies, respondents who play console games for at least an hour in a week were considered regular gamers (Kim et al., 2008; Lee & Faber, 2007). Mean advertisements recalled between regular gamers and non-regular gamers were then compared. This is shown in Table 3 below.

Table 3. Mean Advertisements Recalled by Regularity of Game Play.

	Mean Advertisements Recalled (Do not Play Games Regularly)	Mean Advertisements Recalled (Play Games Regularly)	*t-value*
Corvette Evolution GT	0.40[a]	0.36[b]	0.1440
Suzuki TT Superbikes	0.58[c]	0.97[d]	-1.2248
Gran Turismo 3A-Spec	0.45[e]	0.45[f]	-0.0272

Note. [a]*n*= 15. [b]*n*= 36. [c]*n*= 12. [d]*n*=31. [e]*n*= 20. [f]*n*=33.

Respondents who play games regularly had a mean advertisement recall rate of between 0.36 to 0.97 advertisements across the three games. In comparison, respondents who do not play games regularly had a mean advertisement recall rate of between 0.40 to 0.58 advertisements across the three games.

While the difference is not significant for all 3 studies, the result for Study 2 was interesting as there is a larger difference in the mean advertisements recalled dependent on whether the respondents were regular gamers. As noted above, controlling a motorbike is less intuitive than controlling a car. Hence, because of the game characteristic, a player who plays console games more regularly may be able to learn the controls faster and hence have more opportunity to look at and remember advertisements as compared to a gamer that does not play games regularly and has to focus on controlling the motorbike throughout the experiment (Lee & Faber, 2007).

Following an earlier study, respondents' perceptions of the game in terms of its excitement level, pace of game, attractiveness of game graphics and the ease of game were collected (Leng et al., 2010). The mean advertisements recalled rate was then compared using t-tests to determine if there is a difference between respondents who differed in their perceptions of the game. The analysis is detailed in Table 4 below.

Table 4. Mean Advertisements Recalled by Perception of Game.

	Boring	*Exciting*	*Slow*	*Fast*	*Dull*	*Colorful*	*Easy*	*Difficult*
Corvette Evolution GT Mean Advertisements Recalled	0.45[a]	0.22[b]	0.42[c]	0.23[d]	0.28[e]	0.53[f]	0.37[g]	0.38[h]
t-value	1.1153		0.8647		-0.9305		-0.0610	
Suzuki TT Superbikes Mean Advertisements Recalled	1.00[i]	0.74[j]	0.92[k]	0.79[l]	0.81[m]	0.94[n]	1.10[o]	0.31[p]
t-value	0.6866		0.3428		-0.3033		2.7904*	
Gran Turismo 3A-Spec Mean Advertisements Recalled	0.46[q]	0.44[r]	0.48[s]	0.42[t]	0.39[u]	0.78[v]	0.41[w]	0.53[x]
t-value	0.1073		0.4133		-1.655		-0.6748	

Note. [a]*n*= 20. [b]*n*=23. [c]*n*= 24. [d]*n*=19. [e]*n*= 27. [f]*n*=16. [g]*n*= 30. [h]*n*=13. [i] *n*= 33. [j]*n*=18. [k]*n*= 38. [l]*n*=13. [m]*n*= 32. [n]*n*=19. [o]*n*= 30. [p]*n*=21. [q]*n*= 26. [r]*n*=27. [s]*n*= 29. [t]*n*=24. [u]*n*= 44. [v]*n*=9. [w]*n*= 34. [x]*n*=19.

**p<.01*

There is no significant difference in the mean advertisements recalled between the groups who perceived the game differently in terms of the level of excitement, pace and quality of graphics in all the three studies. While not significant, the analysis shows that consistent across all three studies, respondents reported a higher rate of recall of advertisements when the game is perceived to be boring (see Table 4). However, there was significant difference in the mean advertisements recalled between respondents

who perceived the game in Study 2 differently in its ease of play (t = 2.7904, p < 0.01). Respondents who found the game easy in Study 2 recalled a higher number of advertisements ($\bar{x}_{\text{Easy Suzuki TT Superbikes}}$ = 1.10) than those who found the game difficult ($\bar{x}_{\text{Difficult Suzuki TT Superbikes}}$ = 0.31). Interestingly, this finding was not only not replicated in Study 1 and 3 but both studies indicated that respondents who found the game difficult had a marginally higher rate of recall of advertisements.

Discussion and Conclusion

The findings from the three studies is contrary to an earlier research which found that gamers are more likely to remember advertisements when the game is perceived to be fast paced (Leng et al., 2010). It is noted that in the earlier study, the game selected was a football game belonging to a different genre. Hence, this may explain some of the difference in the findings between the studies. However, it seems more likely that the difference stems from the complex relationship between the various factors and recall rate of in-game advertisement. This study only confirms the need for more research to be conducted to establish the factors that have an effect on recall rates of in-game advertisements.

In sum, the findings in the three studies suggest that, in concurrence with earlier studies, the recall rate of in-game advertisements is low (Cianfrone et al., 2008; Lee & Faber, 2007). This research provides empirical support to earlier studies which alluded that there is no difference between the genders in terms of the effectiveness of in-game advertisements. In addition, differences in gamer experience had no effect on the rate of recall of in-game advertisements. Lastly, the findings indicate that game perceptions had an effect on the recall of in-game advertisements although this relationship is complex and need to be researched further.

Despite the low recall rates of in-game advertisements, it has been argued that there in-game advertisements can still be effective as gamers generally spend a long time playing each game. They may play the scenarios repeatedly and be exposed to the in-game advertisements for a prolonged period of time. Repeated exposure breeds familiarity or perceptual fluency which makes it easier for the gamers to process the advertisement and hence recall the advertised brands to a larger extent (Acar, 2007; Leng et al., 2010; Schneider & Cornwell, 2005). It is this argument that has yet to be tested that lays the promise of in-game advertisements. It is beyond the scope of this study to examine this argument and future research will be needed in this area.

Another argument for the continued promise of in-game advertisements lies in the limitation in using explicit memory as a measure of the effectiveness of in-game advertisements. While most studies in this area employ explicit memory, there are weaknesses to such recall and recognition tests. The large number of wrongly identified brands suggests that there may be an element of guesswork in such recall and recognition tests. Participants may not remember seeing the brands but simply guessed that these popular brands had been present given the nature of the game. In addition, explicit memory test do not properly assess the extent of brand placement's influence on memory because implicit memory may still be influenced by brand placements even though viewers have no explicit memory for seeing the brand (Yang et al., 2006).

The findings also suggest that the factors affecting recall rate of in-game advertisements remain complex. While the studies found that the experience of the gamer had no significant effect on the recall rate of advertisements, the findings also suggest that gamer perceptions of game play can affect the recall rate of advertisements. Future research will need to determine the extent of such differences.

Due to the experimental nature of the studies and the resources involved, many earlier studies had fewer than 40 respondents (Chaney et al., 2004; Leng et al., 2010; Nelson, 2002; Walsh et al., 2008). Similarly, these three studies were also limited by small sample sizes due to time and resource constraints.

A final limitation of this research lies in the unfamiliarity that respondents may have with all the brands that appear in the games. On the one hand, this lack of familiarity may have reduced the rate of recall of the advertisements as brand familiarity is one of the factors identified in earlier research that has an influence on the rate of recall of advertisements (Schneider & Cornwell, 2005). On the other hand, it has also been argued that unfamiliar or unexpected brands are more likely to encourage cognitive processing and hence lead to higher recall (Balasubramanian et al., 2006; Lee & Faber, 2007; Nelson 2002). This issue of brand familiarity may not be an issue when the research is conducted with audience that is familiar with the brands in the games, but in this research where the audience is from a different country from where the game is produced, it is unclear how this brand unfamiliarity may have an effect on the recall rates. This remains to be tested in future research.

Acknowledgements

I will like to thank my students for their assistance in this research. They are Chan Ming Beam, Chong Kam Weng Clement, Eng Chun Kwee David, Fam Han Bin Norman, Goh Sze Hui Mary, Ho Ren Shi Jessie, Iskandar Bin Ishak, Izwan Nazree Bin Othman, Koh Yan Xiang, Nanthini Balasundaram, Nurfarizan Bte Isahak, Sabira Bte Mohd Jalal, Tham Soon Tuck Allan, Wong Jing Kai.

References

Acar, A. (2007). Testing the effects of incidental advertising exposure in online gaming environments. *Journal of Interactive Advertising, 8*(1), 45-56.

Balasubramanian, S. K., Karrh, J. A., & Patwardhan, H. (2006). Audience Response to Product Placements: An Integrative Framework and Future Research Agenda. *Journal of Advertising, 35*(3), 115-141.

Chaney, I. M., Lin, K. H., & Chaney, J. (2004). The effect of billboards within the gaming environment. *Journal of Interactive Advertising, 5*(1), 54-69.

Cianfrone, B. A., Zhang, J. J., Trail, G. T., & Lutz, R. J. (2008). Effectiveness of In-Game Advertisements in Sport Video Games: An Experimental Inquiry on Current Gamers. *International Journal of Sport Communication, 1*, 195-218.

Clavio, G., Kraft, P. M., & Pedersen, P. M. (2009). Communicating with consumers through video games: an analysis of brand development within the video gaming segment of the sports industry. *International Journal of Sports Marketing & Sponsorship, 10*(2), 143-156.

Glass, Z. (2007). The effectiveness of product placement in video games. *Journal of Interactive Advertising, 8*(1), 1-27.

JesterInteractive. (2005). Suzuki TT Superbikes: Valcon Games.

Kim, Y., Walsh, P., & Ross, S. D. (2008). An examination of the psychological and consumptive behaviors of sport video gamers. *Sport Marketing Quarterly, 17*(1), 44-53.

Lee, M., & Faber, R. J. (2007). Effects of Product Placement in On-Line Games on Brand Memory: A Perspective of the Limited-Capacity Model of Attention. *Journal of Advertising, 36*(4), 75-90.

Leng, H. K., Quah, S. L., & Zainuddin, F. (2010). The Obama Effect: An Exploratory Study on Factors Affecting Brand Recall in Online Games. *International Journal of Trade, Economics and Finance, 1*(1), 1-5.

Lewis, B., & Porter, L. (2010). In-Game Advertising Effects: Examining Player Perceptions of Advertising Schema Congruity in a Massively Multiplayer Online Role-Playing Game. *Journal of Interactive Advertising, 10*(2), 46-60.

Milestone. (2006). Corvette Evolution GT: Valcon Games.

Nelson, M. R. (2002). Recall of Brand Placements in Computer/Video Games. *Journal of Advertising Research, 42*(2), 80-93.

PolyphonyDigital. (2001). Gran Turismo 3 A-Spec: Sony Computer Entertainment America.

Schneider, L., & Cornwell, T. B. (2005). Cashing in on Crashes via Brand Placement in Computer Games: The Effects of Experience and Flow on Memory. *International Journal of Advertising, 24*(3), 321-343.

Walsh, P., Kim, Y., & Ross, S. D. (2008). Brand Recall and Recognition: A Comparison of Television and Sport Video Games as Presentation Modes. *Sport Marketing Quarterly, 17*(4), 201-208.

Yang, H. L., & Wang, C. S. (2008). Product Placement of Computer Games in Cyberspace. *CyberPsychology & Behavior, 11*(4), 399-404.

Yang, M., Roskos-Ewoldsen, D. R., Dinu, L., & Arpan, L. M. (2006). The Effectiveness of "In-Game" Advertising: Comparing College Students' Explicit and Implicit Memory for Brand Names. *Journal of Advertising, 35*(4), 143-152.