Fact or Fiction - Soldiers are Gamers: Potential Effects on Training

James Belanich
U.S. Army Research Institute for the Behavioral and Social Sciences
Arlington, VA 22202
James.Belanich@us.army.mil

Karin A. Orvis
Old Dominion University &
Consortium Research Fellows Program
Norfolk, VA 23529
Karin.orvis@gmail.edu

Jennifer C. Moore
George Mason University &
Consortium Research Fellows Program
Fairfax, VA 22030
JMoor1@gmu.edu

Daniel B. Horn
U.S. Army Research Institute for the Behavioral and Social Sciences
Arlington, VA 22202
Dan.Horn@us.army.mil

Jennifer L. Solberg
U.S. Army Research Institute for the Behavioral and Social Sciences
Arlington, VA 22202
Jennifer.Solberg@us.army.mil

ABSTRACT

PC-based games are increasingly being used for military training domains. Proponents of training games argue that younger Soldiers are part of the "digital" generation, and having grown up playing videogames they will respond positively to their use in training. However, in a series of research projects we've found that these assumptions may be overstated. This paper covers two research efforts that analyzed Soldiers' videogame experience, as well as the impact of trainees' prior experience on training outcomes. The first project surveyed a total of 777 first-year U. S. Military Academy Cadets who participated in a team tactics training exercise using *America's Army*, over two years. Results across both years indicated that 60% of Cadets had limited or no videogame experience in the prior year. Additionally, the amount and type of prior gaming experience correlated with training outcomes (i.e., performance, training satisfaction, motivation, and time on task). A second project assessed the frequency that Soldiers of all ranks play videogames compared to engagement in other recreational activities. Results suggest that fewer than 32% of over 10,000 U.S. Army Soldiers surveyed across various ranks play videogames recreationally on a weekly basis (numbers vary by rank). For the ranks with the highest frequency (E2-E4), only about 42-52% play commercial videogames on at least a weekly basis; whereas, more senior enlisted ranks and Officers/Warrant Officers play videogames far less frequently (5-30%). Consistently, our research shows that the assumption that most Soldiers are gamers is exaggerated. Continuing to act on this assumption can be troublesome unless certain precautions are taken.

ABOUT THE AUTHORS

Dr. James Belanich is a research psychologist for the U. S. Army Research Institute for the Behavioral and Social Sciences, researching advanced training methodology. He is currently working on projects trying to improve the effectiveness of game-based training. He has authored/coauthored numerous articles, reports, conference papers, and book chapters on game-based training, distributed learning, instructional technology, and adaptive technology. He received his Ph.D. in Psychology – Learning Processes from the City University of New York.

Dr. Karin Orvis is an Assistant Professor at Old Dominion University. Her research areas of interest include: (a) training and development, with a particular focus on technology-delivered training and self-development, (b) individual difference predictors of human performance, and (c) personnel selection and workplace diversity. Dr. Orvis is also currently working as a Senior Research Fellow in the Consortium Research Fellows Program at the U.S. Army Research Institute for the Behavioral and Social Sciences, researching videogame-based training methodology. She received her Ph.D. in Psychology (Industrial/Organizational) from George Mason University in 2007.

Jennifer Moore is a Master's candidate in the Human Factors & Applied Cognition Psychology program at George Mason University. Her research interests are in the areas of driving, human-computer interaction, usability, and web design. Ms. Moore is currently working as a Research Fellow in the Consortium Research Fellows Program at the U.S. Army Research Institute for the Behavioral and Social Sciences, researching game-based training.

Dr. Daniel Horn is a Research Psychologist with the U. S. Army Research Institute for the Behavioral and Social Sciences. His research focuses on the use of computer technology to support collaboration and training. His current work focuses on understanding the factors associated with effective training games, and he is working on a team that is developing a cross-cultural negotiation training game. He received his Ph.D. in Psychology (Cognition and Perception) from the University of Michigan.

Dr. Jennifer Solberg works as a Research Psychologist at the U.S. Army Research Institute for the Behavioral and Social Sciences in Arlington, VA. She studies the personnel selection and training issues involved in visual target detection. Additionally, her research involves developing a game-based training application for night vision technology use. She received her Ph.D. in Cognitive/Experimental Psychology from the University of Georgia in 2004.

Fact or Fiction - Soldiers are Gamers: Potential Effects on Training

James Belanich
U.S. Army Research Institute for the Behavioral and Social Sciences
Arlington, VA 22202
James.Belanich@us.army.mil

Karin A. Orvis
Old Dominion University &
Consortium Research Fellows Program
Norfolk, VA 23529
Karin.orvis@gmail.edu

Jennifer C. Moore
George Mason University &
Consortium Research Fellows Program
Fairfax, VA 22030
JMoor1@gmu.edu

Daniel B. Horn
U.S. Army Research Institute for the Behavioral and Social Sciences
Arlington, VA 22202
Dan.Horn@us.army.mil

Jennifer L. Solberg
U.S. Army Research Institute for the Behavioral and Social Sciences
Arlington, VA 22202
Jennifer.Solberg@us.army.mil

INTRODUCTION

PC-based training games are increasing in popularity. It has been proposed that training games allow for greater interactivity as well as providing realistic feedback and multi-sensory stimulation (Gee, 2003; Prensky, 2001). The effectiveness of training games, however, is still questionable (Hays, 2005). To realize the full potential of PC-based games as part of a training system, it is important to investigate factors that maximize the training effectiveness of games. For any training system, there are three primary determinants of training effectiveness: a) the training program itself (e.g., the actual videogame), b) the situational context in which the training takes place, and c) the trainee (Campbell & Kuncel, 2001; Colquitt, LePine, & Noe, 2000; Mathieu, Tannenbaum, & Salas, 1992; Salas & Cannon-Bowers, 2001).

In the context of videogame-based training, these three determinants have only been studied in a few instances (Beal & Christ, 2004; Belanich, Sibley, & Orvis, 2004; Garris, Ahlers, & Driskell, 2002; Hays, 2005). Specifically, most research on training games has focused on the first determinant, the features and characteristics of the training game. Game features such as challenge, realism, and interactivity have been found to influence trainee motivation and the length of time in which trainees are willing to invest in mastering the skills taught during game play (Belanich et al., 2004; Corbeil, 1999; Garris et al., 2002; Malone, 1981). Prior research has also focused on the context where the training takes place (Beal & Christ, 2005). However, little research has been conducted on how the *trainee* influences the training system; for instance, how a trainee's prior experience with playing videogames may impact their future success in a game-based training environment.

Proponents of training games argue that younger Soldiers are part of the "digital" generation, and having grown up playing videogames, they will therefore respond positively to their use in training. The Entertainment Software Association (ESA) reports that 69% of American head of households play computer and/or videogames (ESA, 2006). To date, there has been much speculation, but little research on the actual frequency of videogame usage of Soldiers.

The primary purpose of the current research effort was to investigate the frequency of videogame use by U.S. Army Soldiers. This purpose was examined in two research projects. In the first project, we examined the frequency of videogame usage of future U.S. Army Officers (i.e., U.S. Military Academy Cadets). The influence of their prior videogame experience on their future performance in a videogame-based training scenario, as well as on other training outcomes such as training motivation and satisfaction, was also examined. In the second project, we examined the frequency of videogame usage of current Soldiers across all ranks in the Army. In this paper, we will describe each research project in turn and then provide our overall conclusions based on these research efforts.

PROJECT 1: GAME EXPERIENCE OF FUTURE OFFICERS

METHODOLOGY

Participants

Participants were first-year U.S. Military Academy (USMA) Cadets who took part in a tactics training exercise. For *Year 1*, 413 Cadets completed the training exercise and then completed a post-training questionnaire assessing prior videogame experiences and training outcomes. In *Year 2*, two questionnaires were used; a pre-training questionnaire, which assessed their gaming experiences and training motivation, and a post-training questionnaire, which followed the completion of the training and assessed training outcomes. For *Year 2*, 364 cadets completed the pre-training questionnaire, and 80 of these 364 cadets completed the post-training questionnaire. Completion of the questionnaires was voluntary and interested Cadets completed the questionnaires on their own time.

Game

The videogame used was *America's Army*, an online, multi-player, first-person-perspective game. This game was chosen by the tactics instructors because of its ability to simulate small team maneuvers requiring decision-making and collaboration skills. Additional information is available at www.americasarmy.com.

Procedure

During the training exercise, Cadets played the PC game online during their own time, at a location of their own preference. All Cadets first completed the single-player component of the game to introduce game-specific tasks. Next, Cadets were placed into small teams and engaged in multi-player, team missions. In each mission, a team's goal was either to attack or to defend a radio tower. No maximum limit of missions was set. After finishing the training exercise, the Cadets completed the post-training questionnaire online. Cadets also discussed their experiences with instructors as part of an After Action Review.

Research Measures

General Videogame Experience

General videogame experience was assessed using one item, "In the past year, how frequently have you played videogames?" Possible responses ranged from 0 (never) to 5 (very frequently).

Specific Videogame Experience

Videogame experience with specific types of games was assessed using a 6-point Likert scale ranging from 0 (never) to 5 (very frequently). The nine types of specific games assessed were: a) first-person-perspective (e.g., Battlefield 1942, James Bond 007, Medal of Honor); b) flight simulators (e.g., Microsoft Flight Simulator, Lock On: Modern Air Combat); c) massively multi-player online games (e.g., EverQuest, Ultima Online); d) sports/racing (e.g., Madden NFL; Tony Hawk Underground); e) military command/ strategy (e.g., Rome, Axis & Allies, Rise of Nations); f) fighting (e.g., WWE Smackdown, Mortal Kombat Deception); g) life/business simulations (e.g., The Sims, Tycoon); h) fantasy/adventure (e.g., Myst IV, Revelation, Syberia 2); and i) puzzles/card games/ board games (e.g., Minesweeper, Solitaire, Chess). In addition, participants were asked to indicate the extent to which they had previously played *America's Army*.

Training Motivation

Training motivation was assessed using a 5-item scale from Noe & Schmitt (1986). An example item is "I am motivated to learn the information/skills emphasized in the America's Army game." Possible responses ranged from 1 (strongly disagree) to 5 (strongly agree). Training motivation was assessed in *Year 2* only.

Satisfaction with Training

Satisfaction with the training experience was assessed using a 3-item scale. An example item is "I was satisfied with the experience of using the America's Army game." Possible responses ranged from 1 (strongly disagree) to 5 (strongly agree).

Ease of Using Game Interface

Ease in using the game interface was assessed using a 3-item scale. An example item is "How easy/difficult was it to learn how to use America's Army game?" Possible responses ranged from 1 (very difficult) to 5 (very easy).

Team Cohesion

Trainee perception of the cohesion among his/her team members was assessed using a nine-item scale adapted from Craig and Kelly (1999). A sample item was "To what extent was your team engaged in the multi-player missions of the America's Army game?" Possible responses ranged from 1 (not at all) to 5 (great extent).

Time Engaged in Training

Cadets were asked to indicate the total number of hours they played the game during the 4 days allotted for the training. Time spent on the game can be construed as a reflection of a trainee's motivation to continue training, as it was self-regulated, voluntary training.

Training Performance

Training performance was operationalized as the proportion of multi-player missions the trainee won out of the total number of missions completed. Training performance was assessed in *Year 2* only.

FINDINGS

General Videogame Experience

Our findings show that there was a wide range of prior videogame experience across Cadets. These results were consistent across the two years. For *Year 1*, 17% indicated no prior videogame experience, 43% limited experience, 22% indicated having an average amount of experience, and 18% indicated they were highly experienced. For *Year 2*, 12% indicated no prior experience, 48% limited experience, 20% average, and 20% indicated they were highly experienced.

The general measure of prior game experience significantly predicted most of the training outcomes. For *Year 1*, frequency in playing videogames was positively related to satisfaction with the training game experience (r=.33, p<.01), perceptions of ease in using the game interface (r=.37, p <.01), team cohesion *(r=.33, p<.01)*, and time engaged in training (r=.20, p<.01). For *Year 2*, frequency in playing videogames predicted training performance (r=.26, p<.05), training motivation (r =.32, p<.01), satisfaction with the training game experience (r=.23, p<.05), perceptions of ease in using the game interface (r=.25, p<.05), and time engaged in training (r=.32, p<.05). The relationship between videogame experience and team cohesion approached significance (r =.20, p<.10).

Specific Videogame Experience

We also examined the role of prior videogame experience with *specific* game types on the training outcomes. This allowed us to assess how prior experience with various types of games may influence training outcomes.

Separate regression analyses were conducted, where each of the training outcomes (e.g., training satisfaction, ease in using the game interface, team cohesion, time engaged in training, and training performance) were regressed onto the specific types of game experiences. *Year 1* results indicate that generally prior experiences with games very similar to the videogame used in the training were significant predictors of these outcomes. Specifically, previous experience with the *America's Army* game was a unique predictor for all four training outcomes examined in *Year 1* (i.e., p<.05, for training satisfaction, ease in using the game interface, team cohesion, and time engaged in training) (see Figure 1). Prior experience with other first-person-perspective games was also a significant predictor of training satisfaction and ease in using the game interface (p<.01); it approached significance for team cohesion (p<.10). Experience with flight simulators was a significant predictor of time engaged in training (p<.01). Experience playing the other game types that did not share several similar characteristics to the training game used in this research, such as puzzles/card games/board games, life/business simulations, did not predict these training outcomes.

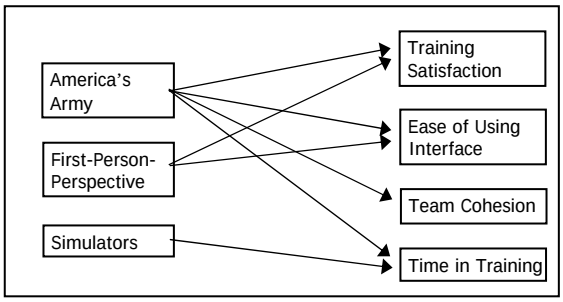

Figure 1. Positive Correlations ($p<.05$) between Specific Game Types and Training Outcomes for Year 1.

Generally, *Year 2* results parallel these findings (see Figure 2). Specifically, previous experience with the *America's Army* game was a unique predictor for several of the examined outcomes (i.e., p<.05, training motivation, team cohesion, time engaged in training, and training performance). Prior experience with other first-person-perspective games was also a significant predictor of most of the training outcomes, including training motivation, training satisfaction, ease in using the game interface, and time engaged in training (p<.05). Experience with flight simulators significantly predicted training satisfaction, time engaged in training, and training performance (p<.05). Experience with fantasy/adventure games significantly predicted team cohesion and time engaged in training (p<.05). Consistent with the *Year 1* findings, experiences using other types of games that did not share several similar characteristics to the *America's Army* game were not predictive of any of the examined outcomes.

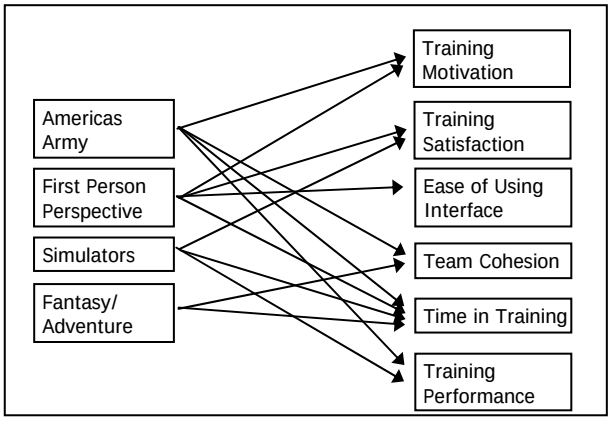

Figure 2. Positive Correlations ($p<.05$) between Specific Game Types and Training Outcomes for Year 2.

PROJECT 2: GAME EXPERIENCE ACROSS U.S. ARMY

METHODOLOGY

U.S. Army Personnel Survey

Data for the second research project was collected as part of a large-scale survey, the Sample Survey of Military Personnel (SSMP), conducted in 2006. The SSMP is conducted every 2 years by ARI's Personnel Survey Office. This survey is sent to a representative sample of Army personnel across all ranks, and is only sent to those in active service who are not deployed to a war zone. In the 2006 survey, over 10,000 U.S. Army Soldiers serving on active duty (5,248 enlisted, 4,796 officers/warrant officers) responded. The SSMP covered a broad range of issues concerning Soldiers' personal experiences in the Army, as well as relevant demographic information.

Fifteen of the items included in the 2006 SSMP survey were directly relevant to the present research project. These items assessed Soldiers' videogame and/or computer usage, as well as engagement in other recreational activities. Specifically, Soldiers were asked about the frequency in which they engaged in particular recreational activities (when they are not deployed). These activities included: exercising, watching TV, playing sports, talking on the phone and emailing with friends, reading, automotive work, hunting, surfing the Internet, hanging out with friends, craft/hobbies, card/board games (not on a computer), and playing videogames.

FINDINGS

Overall Videogame Usage

Contrary to popular belief, we found that less than 32% of Soldiers who responded to the survey play any type of videogames at least once a week. When examined by rank, the usage report ranges from 11.1% to 58.1% (see Table 1 for specific breakdown). Officers and Warrant Officers have lower percentages, while higher percentages are mainly attributable to Enlisted Soldiers. Moreover, perhaps surprisingly, 43% of Soldiers, across all ranks, reported that they *never* play any type of videogame, and over 24% of junior Soldiers (i.e., E2-E4) reported never playing games.

These findings are not consistent with ESA's reporting that 69% of head of households play videogames. The differences might be due to different samples (Army personnel versus the general population) or the way in which the question was phrased. Either way, the implication from our findings is that most Soldiers are not frequent videogame players.

Table 1. Frequency/percentage of Soldiers who play any videogame on at least a weekly basis.

Rank	Frequency	Percentage
PV2	263	58.1
PFC	275	56.6
CPL/SPC	416	49.6
SGT	398	45.6
SSG	316	36.2
SFC	231	30.6
MSG/1SG	112	20.1
SGM/CSM	60	14.5
TOTAL ENLISTED	**2071**	**40.3 ***
2LT	136	34.8
1LT	189	28.3
CPT	225	25.4
MAJ	146	21.2
LTC	119	18.2
COL+	55	11.1
TOTAL OFFICERS	**1131**	**24.1****
WO1	20	27.8
CW2	109	31.7
CW3	67	21.8
CW4	53	23.8
CW5	12	17.9
TOTAL WARRANT OFFICERS	**261**	**26.2*****

Confidence intervals: * ±1%, ** ±2%, * ±3%**

Videogame Usage vs. Other Activities

Being that not all individuals and videogames are the same, we divided the videogames into two separate categories, "traditional games" and "commercial games." "Traditional games" were classified as games that have been adapted to computer/videogames, such as board games, puzzles, and card games; while "commercial games" were focused on videogames based on military/war, sports, adventure, etc.

When broken down by type of game, no more than 52% of Soldiers play videogames at least once a week for any given rank (52%= PV2 for commercial games); with many ranks playing far less, as low as 5%. In fact, we found that there was a negative correlation between frequency of videogame play and rank, in that Soldiers of higher rank were less likely to play videogames. This may be due to an age factor or a job responsibility issue. See Appendix 1 and 2 for the specific percentages of Enlisted Soldiers and Officers at each rank reporting that they play traditional and commercial videogames on an at least weekly basis.

Finally, in comparison to other recreational activities, we found that Soldiers participated in many other activities, including recreational reading and exercising, with much more frequency than videogame play. Specifically, on average across Enlisted Soldiers and Officers, 60% of Soldiers reported reading for pleasure and 90% of Soldiers reported exercising on at least a weekly basis (see Appendix 1 and 2).

OVERALL CONCLUSION

The important take away point across both research projects is that the majority of future Officers (i.e., USMA Cadets) and current Soldiers (both Enlisted and Officers) are not regular videogame players, contrary to popular belief. In research project 1, we found that 60% of USMA Cadets, based on two different samples, either have no experience or limited experience playing videogames. The findings of research project 2 mirror these statistics; we found that across all ranks no more than 60% of Soldiers play videogames on an at least weekly basis, with many ranks reporting much lower videogame usage. Further, in project 2, we found that as rank increases, the likelihood that a Soldier will have experience playing videogames decreases a great deal. For instance, only 36% of Staff Sergeants and 21% of Majors report playing any type of videogame on a weekly basis.

The findings from research project 1 also indicate that trainees' prior videogame experience may influence their future outcomes in training programs that incorporate videogames. We found that trainees more experienced with games had higher training performance and reported higher levels of training satisfaction, greater ease using the training game interface, and increased motivation to train with the game. The results also demonstrate that previous videogame experience may influence how trainees collaborate in team-based, videogame-based training environments. In the current research, trainees with more experience more easily formed cohesive relationships with team members in the multi-player component of *America's Army* as compared to trainees who had less prior experience.

Finally, our findings indicate that a trainee's prior experience with specific types of games has differential effects on training outcomes. Trainees with greater experience in playing games related to the current training game environment reported more positive training outcomes. In contrast, prior experiences with specific games that do not share similar characteristics with the current game-based training environment generally did not positively influence the training outcomes.

Implications for Military Training

Gaming technology have captured the attention of training professionals and educators (Gee, 2003; Garris et al., 2002; Prensky, 2001) and PC-based videogames are emerging as an increasingly popular training tool in the military (Hays, 2005). To date, little research had been directed towards identifying specific individual characteristics of trainees that may facilitate or impede the effectiveness of videogames as training tools. The present research demonstrates that the attributes and experience that Soldiers bring to the game-based training environment may influence training outcomes relevant to this type of learning environment.

The good news is that experience with videogames is a relatively malleable trainee attribute that can be influenced by instructors. We suggest that instructors assess trainees' prior game experiences to identify those who may lack the prerequisite game experience. In turn, instructors can then provide trainees with targeted opportunities to gain prerequisite experiences prior to training. For example, if learners are to engage in a first-person-perspective game-based training program and some learners have little prior experience with this type of videogame, then the instructor should give them ample practice time before the learning segment of the training (i.e., when learners are acquiring the new knowledge/skills taught in the game). To facilitate instructors in providing the appropriate amount of preparatory practice for a given learner's needs, training game developers should incorporate a feature within training games that enables the instructor to select the desired amount and content of trainee orientation and practice.

It may be assumed that most junior Soldiers who grew up in the digital age would have a great deal of experience with videogames; but the results of these two research projects have demonstrated that the majority of Soldiers are not frequent gamers. This research does not imply that videogames should be avoided as training tools in the U.S. Army due to the lower than expected frequencies of Soldiers playing videogames. We believe that instructional games hold promise as effective instructional tools, and that Soldiers without videogame experience should not be neglected. We do believe that continuing to act on the "Soldier = gamer" assumption can be troublesome unless certain precautions are taken, such as providing preparatory practice with games. If introductory/pre-training is not provided, over 50% of learners may be

at a considerable and persistent disadvantage due to their lack of experience. Thus, when developing game-based training systems, Soldiers' level of prior videogame experience (or lack there of) must be taken into consideration or the training will fail to be optimally effective.

REFERENCES

Beal, S.A., & Christ, R. (2004). *Training effectiveness evaluation of the Full Spectrum Command game*. (ARI Technical Report 1140). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Beal, S.A., & Christ, R.E. (2005). *Soldier perceptions of the Rapid Decision Trainer*. (ARI Research Report 1835). Arlington, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Belanich, J., Sibley, D., & Orvis, K.L. (2004). *Instructional characteristics and motivational features of a PC-based game* (Research Report, No. 1822). U.S. Army Research Institute for the Behavioral and Social Sciences: Arlington, VA.

Campbell, J.P., & Kuncel, N.R. (2001). Individual and team training. In N. Anderson, D.S. Ones, H.K. Sinangil, & C. Viswesvaran (Eds.), *Handbook of industrial, work and organizational psychology*. Thousand Oaks, CA: Sage Publications.

Colquitt, J.A., LePine, J.A., & Noe, R.A. (2000). Toward an integrative theory of training motivation: a meta-analytic path analysis of 20 years of research. *Journal of Applied Psychology, 85*, 678-707.

Corbeil, P. (1999). Learning from the children: practical and theoretical reflections on playing and learning. *Simulation & Gaming, 30* (2), 163-180.

Craig, T.Y., & Kelly, J.R. (1999). Group cohesiveness and creative performance. *Group Dynamics: Theory, Research, & Practice, 3* (4), 243-256.

Entertainment Software Association. (2006). *2006 Essential facts about the computer and video game industry*. Retrieved from http://www.theesa.com/archives/files/Essential%20Facts%202006.pdf.

Gagnon, D. (1985). Videogames and spatial skills: an exploratory study. *Educational Communication and Technology Journal, 33*, 263-275.

Garris, R., Ahlers, R., & Driskell, J.E. (2002). Games, motivation, and learning: a research and practice model. *Simulation & Gaming, 33* (4), 441-467.

Gee, J.P. (2003). *What video games have to teach us about learning and literacy*. Palgrave Macmillan: New York.

Hays, R.T. (November, 2005). *The effectiveness of instructional games: a literature review and discussion* (NAWCTSD-TR-2005-004) Naval Air Warfare Center Training Systems Division, Orlando, FL.

Malone, T. W. (1981). Toward a theory of intrinsically motivating instruction. *Cognitive Science, 4*, 333-369.

Mathieu, J.E., Tannenbaum, S.I., & Salas, E. (1992). Influences of individual and situational characteristics on measures of training effectiveness. *Academy of Management Journal, 35* (4), 828-847.

Noe, R.A., & Schmitt, N. (1986). The influence of trainee attitudes on training effectiveness: test of a model. *Personnel Psychology, 39*, 497-523.

Prensky, M. (2001). *Digital game-based learning*. New York: McGraw-Hill.

Salas, E., & Cannon-Bowers, J.A. (2001). The science of training: a decade of progress. *Annual Review of Psychology, 52*, 471-499.

Appendix 1. The percentages of respondents of various enlisted ranks that engage in particular recreation activities at least weekly.

	PV2	PFC	CPL/ SPC	SGT	SSG	SFC	MSG/ 1SG	SGM/ CSM	Avg
Exercising/Physical Fitness	84	84	82	87	89	90	95	94	88
Watching TV/Movies	79	80	79	85	83	84	86	80	82
Watching Sports (incl. TV)	52	48	49	56	57	62	63	62	56
Reading Books, Magazines	44	47	48	49	49	54	57	63	51
Extended taking on the Phone/Emailing	69	66	56	48	41	43	37	41	50
House/Yard Work	30	32	40	48	56	61	68	62	50
Internet Surfing/Chatrooms	42	52	46	41	40	39	35	30	41
Hanging Out with Friends	63	64	50	38	27	27	20	18	38
Playing Sports	36	31	32	32	31	33	33	30	32
Playing Other Video/Computer Games (such as military/war games, sports, adventure)	52	49	42	38	30	23	13	10	32
Playing Video/Computer Games (such as board games, puzzles, cards)	45	41	39	36	29	23	16	10	30
Crafts/Hobbies	21	23	20	20	20	24	21	20	21
Card/Board Games (Non-Computer)	18	19	32	47	13	11	8	6	19
Automotive Work	19	23	19	21	18	19	18	14	19
Volunteer Work	11	12	10	10	12	11	11	14	11
Playing a Musical Instrument	14	15	12	10	8	6	8	7	10
Hunting/Fishing	12	11	10	9	10	8	9	7	9

Appendix 2. The percentages of respondents of various officer ranks that engage in particular recreation activities at least weekly.

	2LT	1LT	CPT	MAJ	LTC	COL+	Avg
Exercising/Physical Fitness	93	93	94	94	95	94	94
Watching TV/Movies	88	85	87	85	83	83	85
Reading Books, Magazines	71	67	73	75	76	77	73
House/Yard Work	49	51	59	65	67	67	60
Watching Sports (incl. TV)	56	54	54	56	56	56	55
Extended taking on the Phone/Emailing	63	57	50	38	36	34	46
Internet Surfing/Chatrooms	50	49	44	41	33	22	40
Playing Sports	42	37	35	34	29	24	33
Hanging Out with Friends	52	41	28	18	12	10	27
Crafts/Hobbies	18	19	22	20	23	21	20
Playing Other Video/Computer Games (such as military/war games, sports, adventure)	30	24	20	15	11	5	18
Playing Video/Computer Games (such as board games, puzzles, cards)	23	20	17	16	14	10	17
Volunteer Work	10	10	11	12	14	12	11
Automotive Work	8	9	9	7	8	8	8
Playing a Musical Instrument	11	9	7	7	6	6	8
Card/Board Games (Non-Computer)	9	9	7	9	8	4	7
Hunting/Fishing	7	5	4	4	5	3	5